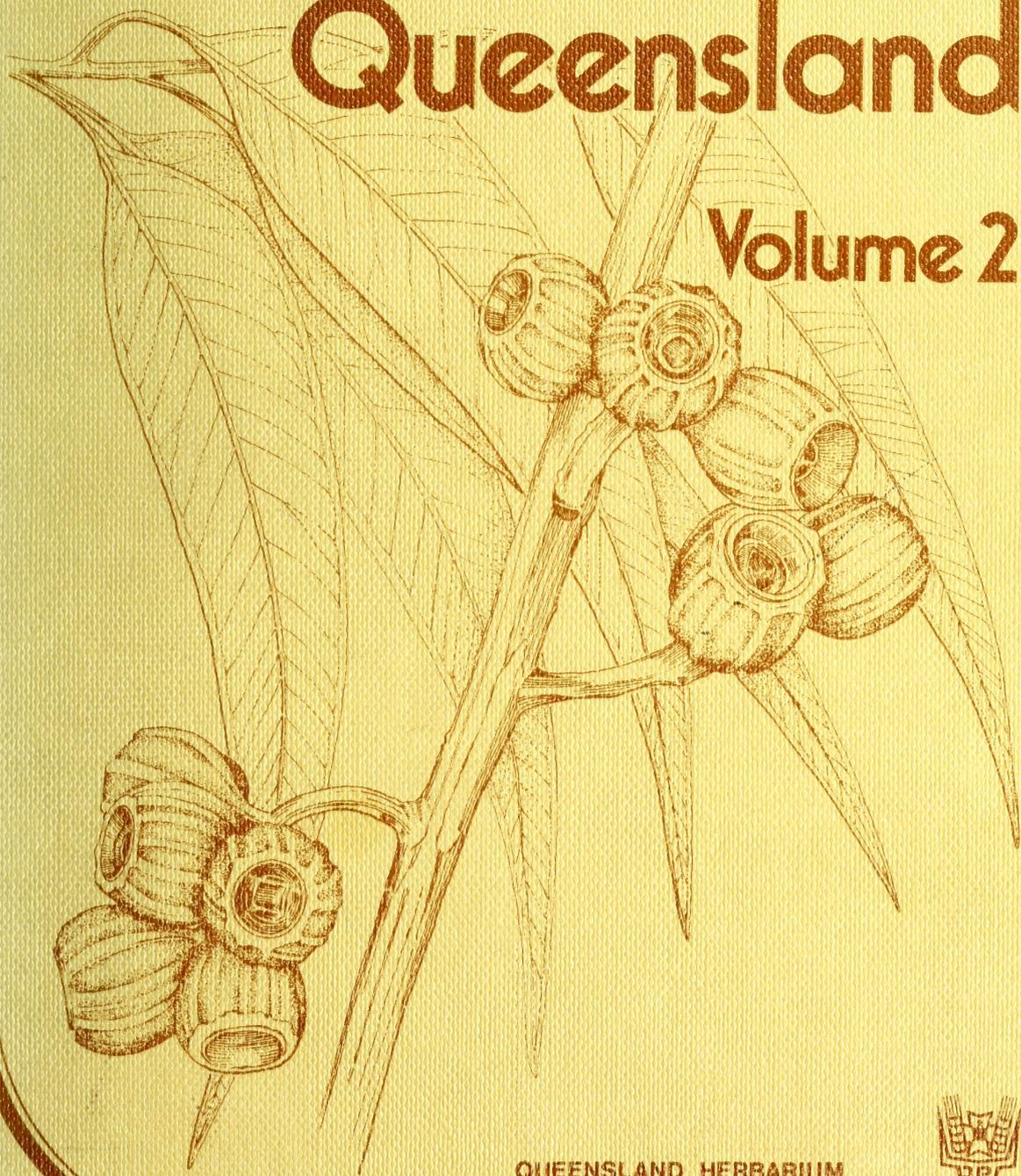


Stanley  
& Ross

# FLORA

## of South-eastern Queensland

Volume 2



QUEENSLAND HERBARIUM



QUEENSLAND DEPARTMENT OF PRIMARY INDUSTRIES







**Flora of south-eastern Queensland**  
*Volume II*



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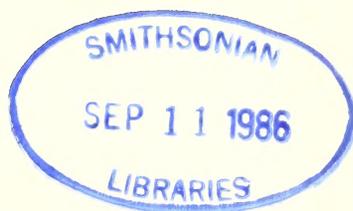
# Flora of south-eastern Queensland, *Volume II*

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Queensland Department of Primary Industries  
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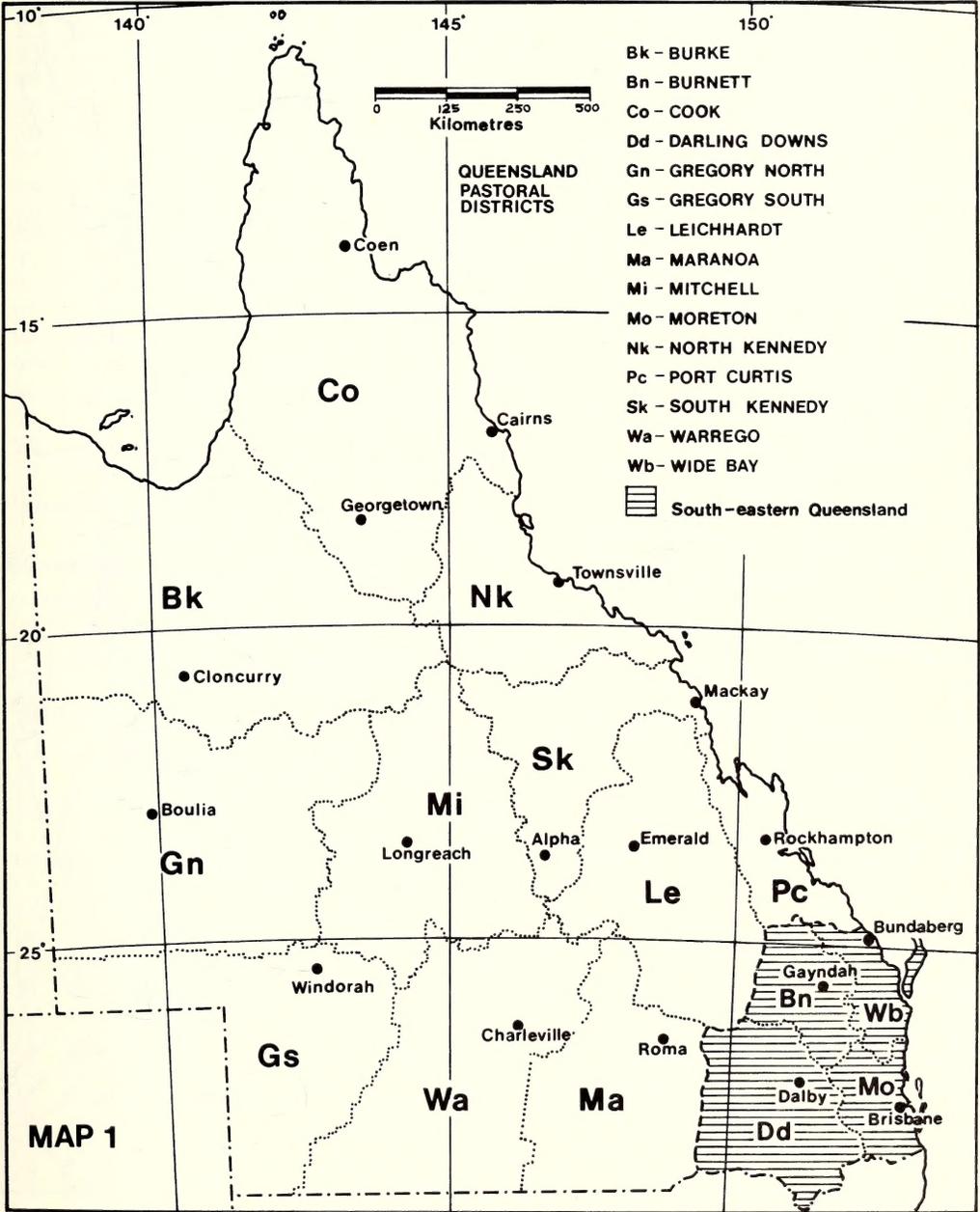
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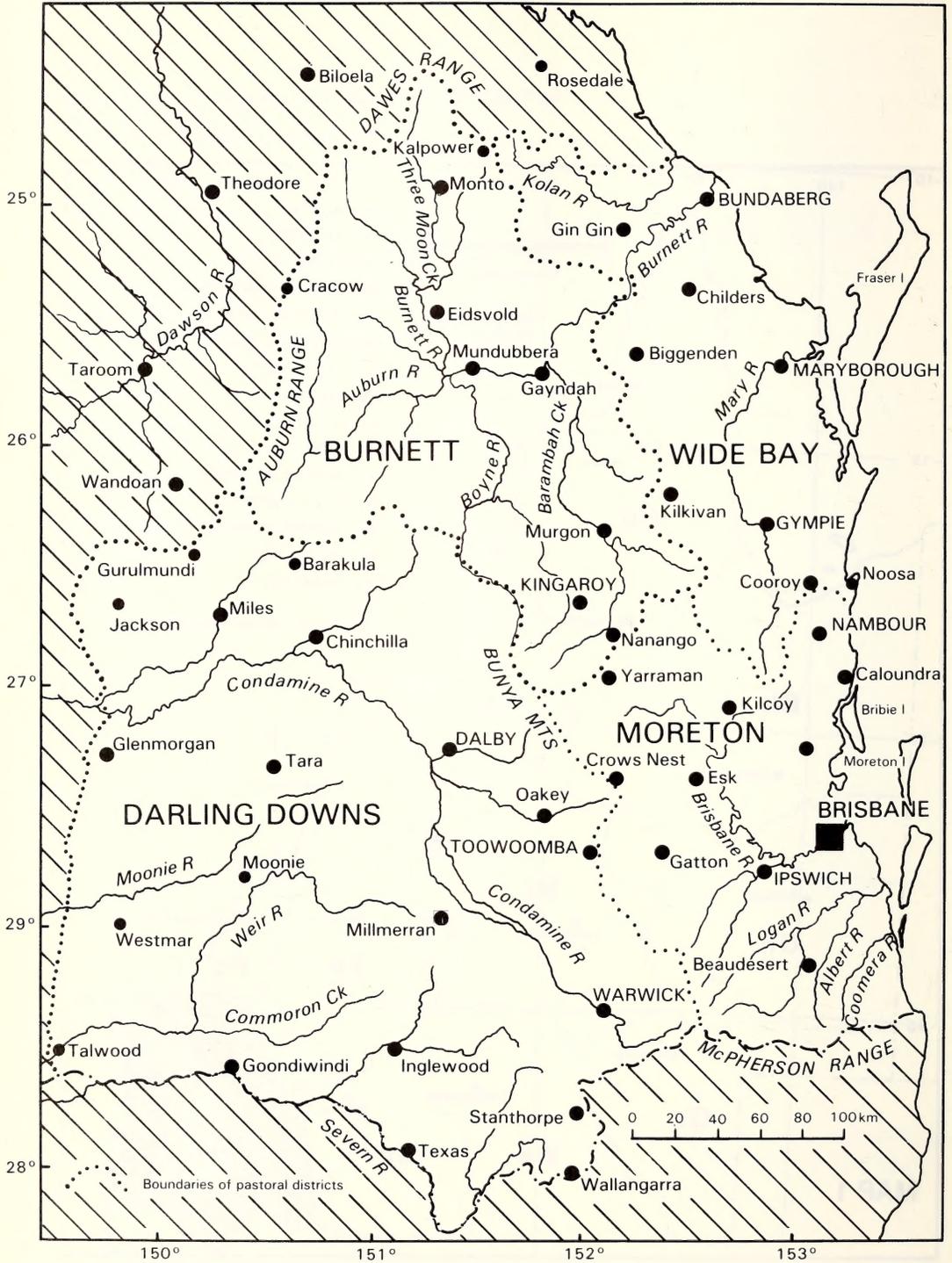
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Australia







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## INTRODUCTION

This volume contains those species of dicotyledons which occur in south-eastern Queensland, not covered in Volume 1. The total number of species of dicotyledons described in Volume 1 and Volume 2 is 2629 in 899 genera and 155 families, with 1347 species in 474 genera and 77 families in Volume 2.

As explained in the Introduction of Volume 1, Family 8 Proteaceae has been included in Volume 2 to allow incorporation of changes brought about by modern revisions in the group but not published in time for inclusion in Volume 1. The format of Volume 2 remains the same as that of Volume 1.

Estelle Ross prepared the families numbered 8, 80–91, 103, 110, 124–127, 136, 148–154, and the genus **Eucalyptus** in 99. Myrtaceae. Peter Taylor of the Herbarium, Royal Botanic Gardens, Kew, Richmond, England, prepared the account of Family 143. Lentibulariaceae and Helen Aston of the National Herbarium of Victoria prepared the account of 123. Menyanthaceae. Families 92–98, 99, Myrtaceae with the exception of **Eucalyptus**, 100–102, 104–109, 111–122, 128–135, 137–142, 144–147 and 155 were prepared by Trevor Stanley.



## ACKNOWLEDGEMENTS

The authors would like to thank the many people who have assisted in the preparation of this work. In particular the authors would like to thank Peter Taylor of the Herbarium, Royal Botanic Gardens, Kew, Richmond, England, for preparing the treatment of Lentibulariaceae and Helen Aston of the National Herbarium of Victoria for preparing the treatment of Menyanthaceae. The authors would also like to thank Norm Byrnes of the Queensland Herbarium, since retired, for making available his unpublished notes on several genera of Myrtaceae, and Bill McDonald also of the Queensland Herbarium for his assistance with **Eucalyptus**.

As in Volume 1, many published works have been consulted in the preparation of this work and although too numerous to list here, the authors wish to make due acknowledgement to them. A list of the most frequently used works will be included in Volume 3.



## 8. PROTEACEAE

Trees or shrubs, rarely somewhat herbaceous. Leaves alternate, rarely verticillate or opposite, exstipulate, simple or variously divided. Inflorescences racemose to capitate, the latter often involucrate; flowers bisexual or unisexual, sometimes on separate plants; calyx corolla-like, coloured, 4-merous, usually valvate in bud, variously split after anthesis; corolla absent; stamens 4, opposite calyx lobes, filaments adnate to lobes, rarely free, anthers free, 2-locular, opening lengthwise; ovary sessile or stipitate, with or without hypogynous scales or disc at base, 1-locular, ovules 1 or more, pendulous or laterally attached, style simple. Fruits nuts, drupes, follicles or capsules; seeds often winged, endosperm absent.

75 genera with 1060 species tropical Asia, Malaysia, Australia, New Caledonia, New Zealand, tropical South America, Africa, Madagascar; *ca* 44 genera with *ca* 870 species Australia; 18 genera with 60 species south-eastern Queensland.

- |   |                        |
|---|------------------------|
| 1. Inflorescences of dense cone-like spikes or heads, subtended by bracts and sometimes bracteoles which become woody in fruit . . . . .                            | 2                      |
| Inflorescences of spikes, clusters, racemes or umbels, but not as above . . . . .   | 4                      |
| 2. Leaves entire or serrate . . . . .   | 1. <i>Banksia</i>      |
| Leaves pinnate or pinnatisect . . . . .   | 3                      |
| 3. Woody floral bracts persistent in fruit, opening to release fruits; perianth split to base, whole perianth deciduous . . . . .                                   | 2. <i>Petrophila</i>   |
| Woody floral bracts falling with fruits; perianth not split to base, upper part falling, leaving persistent base around fruit . . . . .                             | 3. <i>Isopogon</i>     |
| 4. Inflorescences of solitary flowers or rarely 2–3 together, axillary or lateral, or if in a short raceme then flowers yellow . . . . .                            | 5                      |
| Inflorescences of clusters, rarely as few as 4 on a short rachis, spikes, racemes, umbels or corymbs . . . . .  | 6                      |
| 5. Fruits drupes with succulent exocarps . . . . .  | 4. <i>Persoonia</i>    |
| Fruits follicles with almost woody exocarps . . . . .   | 5. <i>Strangea</i>     |
| 6. Ovaries and fruits obconical with tuft of long hairs on top . . . . .  | 6. <i>Conospermum</i>  |
| Ovaries and fruits not as above . . . . .   | 7                      |
| 7. Inflorescences of corymbs or umbels, sometimes several umbels together in a compound umbel or raceme . . . . .   | 8                      |
| Inflorescences of spikes, racemes or clusters . . . . .   | 9                      |
| 8. Inflorescences of corymbs . . . . .  | 7. <i>Oreocallis</i>   |
| Inflorescences of umbels, solitary or several together . . . . .  | 8. <i>Stenocarpus</i>  |
| 9. Fruits indehiscent drupes, but in <b>Macadamia</b> the outer layer peeling off to expose endocarp; seeds not winged . . . . .                                    | 10                     |
| Fruits follicles; seeds winged . . . . .  | 14                     |
| 10. Leaves pinnate to pinnatisect . . . . .   | 9. <i>Hicksbeachia</i> |
| Leaves entire to coarsely serrate . . . . .   | 11                     |
| 11. Flowers zygomorphic, 3 lower segments cohering higher up and not as revolute as 1 upper segment; fruits red, with prominent suture when dry . . . . .           | 10. <i>Triunia</i>     |
| Flowers $\pm$ actinomorphic, all 4 segments separating equally and completely in flower, and equally revolute; fruits dark bluish or brownish or blackish . . . . . | 12                     |
| 12. Most leaves $\pm$ in whorls of 3 or 4; flowers all on separate pedicels . . . . .   | 11. <i>Macadamia</i>   |
| Leaves alternate; flowers mainly in pairs with pedicels partly connate . . . . .  | 13                     |
| 13. Fruits blackish or brownish . . . . .   | 12. <i>Floydia</i>     |
| Fruits dark purplish blue . . . . .   | 13. <i>Helicia</i>     |

- 14. Leaves opposite . . . . . 14. *Xylomelum*
- Leaves alternate . . . . . 15
- 15. Flowers in symmetrical racemes . . . . . 16
- Flowers in clusters or 1-sided racemes, or if 2-sided then leaves  
terete in Queensland species . . . . . 17
- 16. Inflorescences spikes or spicate racemes; flowers actinomorphic;  
ovules and seeds 2, or 1 by abortion . . . . . 15. *Orites*
- Inflorescences racemes, sometimes branched; flowers zygomor-  
phic; ovules and seeds several, 2-seriate . . . . . 16. *Lomatia*
- 17. Inflorescences mainly axillary, seeds winged mainly at upper end . . . . . 17. *Hakea*
- Inflorescences mainly terminal, seeds surrounded by wing or  
wingless . . . . . 18. *Grevillea*

1. **BANKSIA** L.f.

Shrubs or trees. Leaves spirally arranged, scattered or whorled, simple, sessile or petiolate, coriaceous, entire, dentate, lobed or pinnatisect. Inflorescences terminal to a recent branchlet, or at apex of a previous increment, or on short lateral branchlet from an older stem, cylindrical or spherical, axis woody with persistent or deciduous involucre of bracts at base; flowers 200–3 000 in sessile pairs arranged in vertical rows and with spiral pattern, pairs subtended by 2 floral and 1 common bract; perianth linear, actinomorphic or slightly zygomorphic; stamens attached to expanded apical part of perianth, very short, anthers all perfect, apiculate, hypogynous scales 4; ovary sessile, ovules 2, laterally attached. Infructescences woody, of few—many follicles, follicles woody, variously enlarged and exserted, obtuse; seeds with terminal membranous wing.

71 species Australia, Papua-New Guinea, Irian Jaya and Aru I.; 71 species Australia; 7 species south-eastern Queensland.

For a complete list of synonyms for these species, see A. S. George, “The Genus **Banksia** L.f. (Proteaceae)”, *Nuytsia* Vol. 3 (3) 1981.

- 1. Leaves usually more than 4 cm broad . . . . . 1. *B. robur*
- Leaves usually less than 4 cm broad . . . . . 2
- 2. Styles after anthesis hooked just below tip . . . . . 2. *B. spinulosa*
- Styles after anthesis straight or curved, but not hooked . . . . . 3
- 3. Leaves usually entire . . . . . 4
- Leaves usually serrate or dentate . . . . . 5
- 4. Involucral bracts at base of inflorescence 1–2 cm long; perianths  
persistent in fruit . . . . . 3. *B. conferta*
- Involucral bracts at base of inflorescence 0.2–1 cm long; perianths  
early deciduous . . . . . 4. *B. integrifolia*
- 5. Perianths 2.2–2.6 cm long; inflorescences 5–7.5 cm across; usually  
low shrubs ca 1 m tall . . . . . 5. *B. oblongifolia*
- Perianths 3.5–4.5 cm long; inflorescences 8–13.5 cm across; large  
shrubs or small trees . . . . . 6
- 6. Style apices fusiform, 2.5–3 mm long . . . . . 6. *B. serrata*
- Style apices conical, ca 1 mm long . . . . . 7. *B. aemula*

**1. *Banksia robur* Cav.**  
*Banksia latifolia* R. Br.

**BROAD LEAVED BANKSIA**

Shrub with several stems arising from lignotuber, up to 3.5 m tall, young branchlets densely ferruginous pubescent. Leaves with petioles 0.5–6 cm long; blades obovate, rarely obovate-elliptic, apex truncate to emarginate, apiculate, base cuneate, margin undulate, serrate for most of length, rarely almost entire, recurved, (7–)12–30(–34) cm × (3–)5–9(–17) cm, densely pubescent below with curled white to ferruginous hairs, primary lateral veins prominent, parallel below. Inflorescences terminating 1–2 year

old branchlets, 10–20 cm × *ca* 8–10 cm; perianth greenish cream basally to blue-green apically, honey scented, 2.2–2.6 cm long, appressed pubescent outside except for narrowly fusiform apical region 3–4 mm long; anthers ± 1 mm long, prominently apiculate; pistil 2.8–3.3 cm long, glabrous, almost straight except sometimes for a sharp upward turn just before anthesis, style apex narrowly ovoid, 0.5–0.75 mm long. Infructescences massive, old perianths and styles persistent, follicles up to *ca* 100, opening with fire, valves 1–1.3 cm across, tomentose.

Coastal districts in sand or peaty sand usually in seasonally or permanently damp eucalypt or Melaleuca woodland, or in thick sedge shrublands. Flowers summer to winter. Cultivated as an ornamental.

This species has been known to hybridize with **B. oblongifolia**.

## 2. *Banksia spinulosa* Smith

Shrub, either single- or multi-stemmed, with or without lignotuber, branchlets whorled, tomentose to hirsute. Leaves with petioles 1–3 mm long; blades narrowly to broadly linear, apex obtuse to truncate, mucronate, base cuneate, margin revolute, recurved or almost flat, usually serrate at least in upper part, rarely entire, 2–12 cm × 0.1–1.1 cm, white to pale brown tomentose below, sometimes concealed when margins revolute. Inflorescences usually terminating 3–6 year old branchlets with whorl of branchlets below, 6–28.5 cm × 7–8.5 cm; perianth yellow or golden with style yellow throughout or deep red to purple black on upper  $\frac{1}{2}$  or  $\frac{2}{3}$ , 2.3–2.9 cm long, pubescent to appressed hirsute outside, appressed pubescent inside in upper  $\frac{2}{3}$ , apical region narrowly elliptic, 3–3.5 mm long, anthers 2 mm long, apiculate; pistil 3–4.5 cm long, upper part of style strongly hooked through 180°, style apex slightly thickened, *ca* 0.5 mm long, scarcely differentiated. Infructescences with up to 100 follicles, valves 1–1.5 cm across, eventually glabrous, remains of flowers falling within a year. **Fig. 1A.**

Three varieties are found in the region:

- |   |  |   |
|---|--|---|
| 1. Single-stemmed shrubs up to 5 m tall, without lignotuber; branchlets usually very hirsute; lower leaf surfaces pale brown tomentose  | <i>B. spinulosa</i> var. <i>cunninghamii</i> |   |
| Multi-stemmed shrubs up to 3 m tall, with lignotubers; branchlets hirsute to tomentose; lower leaf surfaces generally grey to white tomentose or margins revolute, hiding surface |  | 2 |
| 2. Leaves narrowly linear, margins revolute, usually only finely serrate towards apex, without prominent venation   | <i>B. spinulosa</i> var. <i>spinulosa</i>    |   |
| Leaves linear to narrowly obovate, flat with recurved margins, acutely serrate for much of length, lateral venation evident both surfaces when dried                              | <i>B. spinulosa</i> var. <i>collina</i>      |   |

**B. spinulosa** var. **spinulosa** has been recorded from suburban areas south-east of Brisbane, Russell I., and areas east of Gympie in the northern Noosa R. catchment area, in sandy or clay loam soils or often sandstone areas. **B. spinulosa** var. **collina** (R. Br.) George (*B. collina* R. Br.), GOLDEN CANDLESTICKS, has been recorded from the vicinity of Nambour southwards, in open forest or coastal heath in sand, loamy or shaly soils often over sandstone. **B. spinulosa** var. **cunninghamii** (Sieber ex Reichenb.) George (*B. cunninghamii* Sieber ex Reichenb.) has been recorded from Springbrook, Dave's Ck. Country in Lamington National Park and Mt. Maroon in the Moreton district and near Stanthorpe in the Darling Downs district, on hillsides or rocky areas in heath or eucalypt open forest. All flower autumn–winter, the first two sometimes into early spring. Cultivated as an ornamental.

## 3. *Banksia conferta* George

Shrub up to *ca* 4–5 m tall, branchlets villous when young. Leaves whorled; petioles 0.5–1.5 cm long; blades elliptic, elliptic-obovate, to obovate, or narrowly so, apex acute or obtuse, base cuneate, margin entire or serrate, recurved, somewhat undulate, 3.5–16 cm × 0.7–4 cm, midrib and lateral nerves below hirsute with ferruginous hairs, eventually deciduous, leaving dense white indumentum. Inflorescences terminating 2–4 year old branchlets often with whorl of leaves below, 4.5–22 cm × 4.5–6.5 cm, inner involucre bracts 1–2 cm long, perianth yellowish green in bud, becoming pinkish brown with grey apex, golden to pale yellow when open, 2–2.5 cm long,

pubescent outside, apical region narrowly elliptic, 3–4 mm long; anthers  $\pm$  1 mm long, apiculate; pistil 2.2–2.6 cm long, curved slightly down, then up, style apex *ca* 0.75 mm long, scarcely differentiated. Infructescences woody, follicles numerous, valves 0.9–1.5 cm across, remains of flowers persistent for several years.

Recorded from Glasshouse Mts., Lamington National Park, Mt. Barney, etc. in the Moreton district on steep rocky granite or sandstone slopes in tall open shrubland and low open forest. Flowers autumn to spring.

#### 4. *Banksia integrifolia* L.f.

#### COAST BANKSIA; HONEYSUCKLE OAK

Tree up to 25 m tall, often much smaller in exposed positions, bark roughly tessellated or fissured, branchlets densely pubescent. Leaves in whorls of 3–5; petioles 0.4–1 cm long; blades narrowly obovate or very narrowly oblong-obovate, apex obtuse or acute, mucronate, base cuneate to attenuate, margin entire or occasionally with a few teeth, (3–)4–20(–23) cm  $\times$  0.6–3.5 cm, densely white tomentose below, venation other than midrib obscure. Inflorescences terminating 1–3 year old branchlets, 5–12(–20) cm  $\times$  5.5–7.5 cm, involucre bracts 0.2–1 cm long; perianth pale yellow, 2.2–2.9 cm long, appressed pubescent outside, apical region elliptic, 3.5–4.5 mm long; anthers *ca* 2 mm long, apiculate, pistil 2.7–3.4 cm long, curved gently down, then up, or  $\pm$  straight, style apex 0.7–1 mm long, scarcely differentiated. Infructescences woody, follicles numerous, valves 0.9–1.3 cm across, flowers not persistent, soon deciduous.

Two varieties occur in the region:

1. Leaves 4–10 cm long,  $\pm$  flat, usually dull green above . . . . . *B. integrifolia* var. *integrifolia*  
Leaves (5–)10–20(–23) cm long,  $\pm$  undulate, usually shining above . . . . . *B. integrifolia* var. *compar*

***B. integrifolia* var. *integrifolia*** (*B. integrifolia* var. *typica* Domin) occurs typically on consolidated sand dunes close to the coast and along tidal inlets but also has been recorded from the top of Mt. Lindesay and Passchendale near Stanthorpe. ***B. integrifolia* var. *compar*** (R. Br.) F. M. Bailey (*B. compar* R. Br.) occurs in a wide range of habitats from coastal dunes to montane forest, in south-eastern Queensland in open forest in sand or loam, sometimes on seasonally swampy ground. Both flower mainly summer to winter. Cultivated as an ornamental.

Some populations in south-eastern Queensland are intermediate between the two varieties.

#### 5. *Banksia oblongifolia* Cav.

#### DWARF BANKSIA

*Banksia integrifolia* L.f. var. *oblongifolia* (Cav.) Domin; *B. latifolia* R. Br. var. *minor* Maiden & Camfield; *B. robur* Cav. var. *minor* (Maiden & Camfield) Maiden & Betche; *B. salicifolia* Cav.; *B. aspleniifolia* auct. non Salisb.

Shrub with several stems arising from lignotuber, up to 3 m tall, but usually *ca* 1 m tall, young branchlets densely ferruginous to dark grey pubescent. Leaves with petioles 2.5–7 mm long; blades narrowly obovate to oblong-obovate, apex obtuse to truncate, apiculate, base cuneate, all or most of margin serrate, rarely  $\pm$  entire, 3–10(–14) cm  $\times$  0.8–2(–3.5) cm, white woolly below or sometimes ferruginous hairs on veins, lateral veins parallel, prominent. Inflorescences terminating 1–3, rarely –5 year old branchlets, usually with whorl of several younger branchlets below, 4.5–15 cm  $\times$  5–7.5 cm; perianth pale yellow, in bud with a grey tinge, 2.2–2.6 cm long, appressed pubescent outside, apical region narrowly elliptic, 3–4 mm long, appressed hirsute; anthers  $\pm$  1.5 mm long, apiculate, pistil *ca* 2.5 cm long, glabrous, straight but apex upturned just before anthesis, style apex narrowly ovoid, *ca* 0.75 mm long. Infructescences with up to 80 follicles, valves 1.3–1.7 cm across, eventually glabrous.

Usually in seasonally damp or swampy wallum areas, occasionally in sandstone or granite areas. Flowers autumn–winter.

This species has been known to hybridize with ***B. robur***.

**6. *Banksia serrata* L.f.**

## RED HONEYSUCKLE

*Banksia aemula* auct. non R. Br., Sieber ex Meissn.

Usually tree up to 16 m, sometimes shrub 1–3 m tall, with single stem; bark tuberculate verrucose, branchlets tomentose. Leaves with petioles 0.5–2 cm long; blades narrowly oblong-obovate to very narrowly so, apex obtuse to  $\pm$  truncate, apiculate, base attenuate, margin serrate or entire for 1–5 cm from base, 6–26 cm  $\times$  1.4–3.5(–4.5) cm, becoming almost glabrous above and below, lateral veins parallel, not looping. Inflorescences terminating 1–2 year old branchlets, subtended by leaves, 7–16 cm  $\times$  10–13 cm; perianth creamy grey, 3.8–4.6 cm long, pubescent outside, apical region narrowly fusiform, 7–8 mm long, densely pubescent outside; anthers *ca* 3 mm long, apiculate, pistil 4.7–6 cm long, gently curved down, then up, style apex fusiform with thickened basal ring, obtuse, 2.5–3 mm long, 8-ribbed. Infructescences massive, follicles up to 30, valves 2.5–3.5 cm across, tomentose but eventually glabrous, remains of flowers long persistent. **Fig. 1B.**

Deep sands of consolidated dunes or shallow sand over sandstone near the coast from near Cooloola southwards. Flowers summer to winter. Cultivated as an ornamental.

This species is known to hybridize with *B. aemula*.

**7. *Banksia aemula* R. Br.**

## WALLUM BANKSIA

*Banksia serratifolia* auct. non Salisb.

Bushy shrub or robust tree up to 8 m tall; bark verrucose, branchlets tomentose. Leaves with petioles 0.4–1.5 cm long; blades narrowly obovate to very narrowly obovate-oblong, apex obtuse to truncate, apiculate, base attenuate, margin serrate throughout, (3.5–)5.5–18.5(–22) cm  $\times$  (1–)1.5–2.5(–3) cm, becoming almost glabrous above and below, lateral veins parallel, not looping. Inflorescences terminal, surrounded by leaves, (4–)8–15(–20) cm  $\times$  8–12.5 cm; perianth pale yellow to greenish cream, 3.5–4.5 cm long, appressed pubescent outside, apical region fusiform, 4–5.5 mm long, densely pubescent outside; anthers *ca* 2 mm long, apiculate; pistil 3.5–4.5 cm long, slightly sigmoid, style apex conical, obtuse with thickened basal ring, *ca* 1 mm long, obscurely ribbed. Infructescences massive, follicles up to 25, valves 3–4.5 cm across, tomentose but eventually glabrous, remains of flowers long persistent. **Fig. 1C.**

Consolidated sand dunes, in swales or sandy flats as a major component of wallum, or in eucalypt open forest near the coast. Flowers autumn–winter.

This species is known to hybridize with *B. serrata*.

**2. PETROPHILA R. Br.**

Shrubs. Leaves rigid, entire or divided, terete, or if flat usually narrow. Inflorescences dense terminal or rarely axillary cone-like spikes, globular, ovoid or rarely cylindrical, receptacle or rachis woody, each flower sessile within a bract, bracts broad and hardened after flowering, persistent at least at base, and imbricate at base of cone, also basal involucre of several imbricate empty bracts; flowers bisexual, actinomorphic; perianth segments falling separately or remaining united; anthers sessile on base of expanded apical region, connective produced into a small appendage; hypogynous scales absent; ovary sessile, ovules 1 or very rarely 2, collateral, pendulous from near apex and orthotropous or slightly amphitropous, style filiform, apex dilated into shortly hispid or papillose brush. Fruits small dry indehiscent nuts, usually compressed, sometimes winged with coma of long hairs on margin or from base only, or very rarely on both faces, usually shorter than bracts, but coma frequently protruding.

35 species endemic in Australia; 2 species south-eastern Queensland.

- |  |                        |
|--|------------------------|
| 1. Leaf segments ultimately 0.75–1 mm thick; inflorescences on peduncles 2.5–4 cm long . . . . . | 1. <i>P. shirleyae</i> |
| Leaf segments ultimately 0.5–0.75 mm thick; inflorescences ± sessile . . . . .                   | 2. <i>P. canescens</i> |

**1. *Petrophila shirleyae* F. M. Bailey**

CONESTICKS

Woody erect shrub up to 1.2 m tall, ± glabrous. Leaves 2–3-pinnate, 9–20 cm long, segments ± terete, pungent pointed, grooved above, *ca* 0.75–1 mm thick. Inflorescences terminal, usually solitary or 1 or 2 just below it, peduncles 2.5–4 cm long, whole inflorescence (2–)3–8 cm × *ca* 2 cm diameter at base, bracts broadly ovate, acuminate, 2.5–3 mm × 2.5–3 mm, enlarging to 6–7 mm × 7–9 mm in fruit, velvety pubescent, eventually glabrous; perianth ± white, 0.9–1.1 cm long, white silky pubescent, apical region *ca* 4 mm long with subulate points 0.5–0.75 mm long; anthers *ca* 3 mm long on filaments *ca* 0.5 mm long; pistil *ca* 1 cm long, style apex thickened, *ca* 3 mm long, shortly hirsute. Nuts broadly ovoid, compressed, with long beak, *ca* 3 mm × *ca* 3.5 mm, with coma of white spreading hairs 4–6 mm long over both surfaces. **Fig. 1D.**

Coastal districts in heathy areas or in wallum, on sand or sandy soils. Flowers spring–summer.

**2. *Petrophila canescens* Cunn. ex R. Br.**

CONESTICKS

*Petrophila sessilis* Sieber ex J. A. & J. H. Schultes

Erect woody shrub up to 2 m tall, young parts hoary tomentose or almost silky. Leaves divaricately divided, 3–11 cm long, petioles *ca* as long as or sometimes longer than blades; segments ± terete, grooved above, *ca* 0.5–0.75 mm thick. Inflorescences terminal, usually solitary, ± sessile, 1.5–3.5 cm × 1.5–2 cm diameter at base, bracts broadly ovate, acuminate, *ca* 5 mm × 3 mm enlarging to 6–8 mm × 6–7 mm in fruit, velvety pubescent, eventually ± glabrous; perianth white to slightly cream, 0.9–1.2 cm long, appressed white silky pubescent, apical region *ca* 4 mm long tipped with subulate points 0.5–1 mm long; anthers 2.5–3 mm long on filaments *ca* 0.5 mm long; pistil *ca* 1 cm long, style apex thickened, *ca* 3–3.5 mm long, shortly hirsute. Nuts ovoid or somewhat triangular, compressed, with long beak, *ca* 2.5–3 mm × 2–2.5 mm, with coma of white spreading hairs 4–6 mm long over both surfaces.

Moreton and Darling Downs districts, on consolidated sands or sandstone or rocky areas. Flowers late winter to early summer.

**3. ISOPOGON R. Br.**

Shrubs. Leaves rigid, entire or divided, terete or flat and sometimes broad. Inflorescences dense terminal or rarely axillary cone-like spikes, hemispherical, globular or ovoid, receptacle or rachis woody, each flower sessile within a bract, bracts imbricate, deciduous after flowering or if long persistent readily detached and always falling with seed, also a basal involucre of imbricate empty bracts; flowers bisexual, actinomorphic; perianth tube slender, upper part falling entire leaving a persistent base which finally splits or is shed as fruit ripens; anthers sessile within expanded apical section of perianth, connective produced into appendage; hypogynous scales absent; ovary sessile, ovule 1, orthotropous or slightly amphitropous, pendulous from near apex, style filiform, usually ± dilated or clavate apically, separated from narrow, often bulbous-based brush by a short constriction, lower clavate part usually papillose, stigma terminal. Fruits small dry indehiscent usually ovoid-conical nuts, scarcely compressed and not winged, hirsute all over, lower or nearly all hairs forming long coma.

30 species endemic in Australia; 1 species south-eastern Queensland.

**1. *Isopogon petiolaris* Cunn. ex R. Br.**

Low spreading shrub up to 1 m tall, young parts pubescent. Leaves dissected, 4–15 cm × 2–10 cm, petioles often ± as long as blades, segments flat, apex pungent, 2–4 mm

wide, eventually glabrous, striate with 3–5 nerves. Inflorescences terminal,  $\pm$  sessile, globular to ovoid, 1.5–2 cm  $\times$  1.5–2 cm, bracts broadly cuneate, aristate, *ca* 4 mm  $\times$  *ca* 2.5 mm enlarging to 4–6 mm  $\times$  2–4 mm, dense woolly pubescent outside; perianth yellow, slender, 8–9 mm long, glabrous except for tuft of white hairs at apex, apical region 3–3.5 mm long; anthers *ca* 2.5 mm long; style *ca* 8 mm long, apex conical, *ca* 3 mm long, ribbed when dry, constricted and then expanded into bulbous papillose region *ca* 2 mm long. Nuts ovoid, beaked, *ca* 3 mm long, covered with spreading white hairs 6–7 mm long.

Granite Belt area of Darling Downs district. Flowers spring.

#### 4. *PERSOONIA* Smith

Shrubs or small trees. Leaves alternate or rarely appearing whorled, entire. Flowers solitary, axillary, or rarely due to reduction of floral leaves, forming short racemes, very rarely in slender terminal 1-sided racemes; flowers bisexual; perianth actinomorphic, cylindrical in bud or constricted above base, segments  $\pm$  free, upper part recurved after anthesis, apical section hardly expanded; anthers on short filaments inserted at or below middle of perianth segments; hypogynous scales or glands usually small; ovary stipitate, ovules 2, rarely 1, orthotropous, pendulous with short funicles, not strictly collateral, 1 ovule with funicle longer, or attached lower down than other. Fruits drupes, exocarp succulent, endocarp thick, very hard, either 1-locular and 1-seeded, or obliquely 2-locular with 1 seed per loculus.

72 species Australia and New Zealand; 72 species Australia; 8 species south-eastern Queensland.

Many of these species are commonly called GEEBUNG.

1. Leaves less than 2.5 cm long and <i>ca</i> 0.5 mm wide . . . . .	1. <i>P. tenuifolia</i>	2
Leaves either greater than 2.5 cm long, or greater than 1 mm wide . . . . .	. . . . .	
2. Leaves less than 1 cm long . . . . .	2. <i>P. oxycoccoides</i>	3
Leaves more than 1 cm long . . . . .	. . . . .	
3. Plants prostrate or diffuse . . . . .	3. <i>P. prostrata</i>	4
Plants erect or ascending . . . . .	. . . . .	
4. Leaves pubescent on both surfaces . . . . .	4. <i>P. sericea</i>	5
Leaves glabrous, or pubescent only at base or along margins (young tips often pubescent) . . . . .	. . . . .	
5. Leaves linear to linear-elliptic or linear-obovate; peduncles and perianths glabrous . . . . .	5. <i>P. virgata</i>	6
Leaves narrowly to broadly elliptic, obovate or ovate, or if linear then peduncles and perianths pubescent . . . . .	. . . . .	
6. Ovaries densely greyish pubescent . . . . .	6. <i>P. cornifolia</i>	7
Ovaries glabrous or with few sparse reddish hairs . . . . .	. . . . .	
7. Perianths with subulate points 2–3 mm long . . . . .	6. <i>P. cornifolia</i>	8
Perianths with subulate points 0.25–1.5 mm long . . . . .	. . . . .	
8. Young tips and peduncles glabrous or with scattered coarse reddish hairs; leaves usually narrowly elliptic to narrowly ovate Young tips and peduncles greyish tomentose; leaves usually linear to linear-elliptic . . . . .	7. <i>P. attenuata</i> 8. <i>P. linearis</i>	

##### 1. *Persoonia tenuifolia* R. Br.

Shrub up to 1 m tall but usually smaller, young branchlets puberulent. Leaves sessile, linear, apex acute, 0.65–2.5 cm  $\times$  *ca* 0.05 cm, glabrous, curved ascending to erect, grooved on upper surface. Flowers on peduncles 1.5–3 mm long, glabrous or with scattered hairs; perianth yellow, 8–9 mm long, tipped by subulate points *ca* 0.25 mm long; anthers *ca* 3 mm long on filaments *ca* 1 mm long; ovary on stipe 0.5–1 mm long,

style 4.5–5.5 mm long, all glabrous. Drupes ellipsoid to almost globular, 0.7–1.1 cm × 0.6–0.8 cm, glabrous, tipped by persistent style. **Fig. 1E.**

Coastal districts in sandy wallum or in heathy understorey in eucalypt open forest on sandy soil, and in the Granite Belt area of the Darling Downs district. Flowers spring to autumn.

## 2. *Persoonia oxycoccoides* Sieber ex J. A. & J. H. Schultes

Much-branched shrub up to *ca* 1 m tall, young stems appressed antrorse pubescent. Leaves with petioles 0.5–1.5 mm long; blades oblong-elliptic to ovate or oblong-obovate, apex acute, base cuneate, margin recurved, 3.5–8 mm × 1.5–3.5 mm, thick, glabrous, in dried state at least curved out and down. Flowers on stout peduncles 1–2 mm long, terminal or extreme upper axillary; perianth yellow, *ca* 7–8 mm long, ± glabrous, tipped by subulate points *ca* 0.2 mm long; anthers 4–4.5 mm long on filaments *ca* 0.5 mm long; ovary on stipe *ca* 1 mm long, style *ca* 5–7 mm long, all glabrous. Drupes ellipsoid, 1–1.2 cm × 0.7–0.8 cm, glabrous, tipped by persistent style.

South-western Darling Downs district in sandy soils. Fruits late winter–spring.

This taxon does not match southern specimens of *P. oxycoccoides*, and may represent an undescribed species.

## 3. *Persoonia prostrata* R. Br.

Prostrate or diffuse shrub up to 1 m long, young parts pubescent, eventually becoming glabrous. Leaves with petioles 1–3 mm long; blades elliptic or obovate, apex acute or obtuse, mucronate, base cuneate, margin flat, 1.2–5.2 cm × 0.5–2.5 cm, glabrous, veins other than midrib obscure. Flowers on pubescent peduncles 2–3 mm long; perianth yellow, *ca* 1.2 cm long, pubescent outside, tipped by subulate points *ca* 0.2 mm long; anthers 4.5–5 mm long on filaments 1–1.5 mm long; ovary on stipe *ca* 1 mm long, pubescent, style *ca* 7 mm long, glabrous. Drupes ellipsoid, 1.2–1.5 cm × 0.8–1 cm, glabrous, tipped by persistent style.

Recorded from Fraser I. in the Wide Bay district and on the Granite Belt in the southern Darling Downs district, in sandy soils. Fruits spring.

## 4. *Persoonia sericea* Cunn. ex R. Br.

*Persoonia mitchellii* Meissn.

Shrub up to *ca* 1.5 m tall, rarely taller, ± pubescent. Leaves with petioles (1–)3–5 mm long; blades obovate, occasionally narrowly obovate or narrowly oblong-elliptic, rarely linear-obovate, apex obtuse to truncate, mucronate, or occasionally acute or emarginate, base cuneate to attenuate, margin flat, (0.8–)2.5–5.5 cm × (0.15–)0.35–0.8(–1.4) cm, pubescent on both surfaces. Flowers on pubescent peduncles 4–7(–9) mm long; perianth yellow, 0.9–1.1 cm long, tipped by subulate points *ca* 0.2 mm long, pubescent to villous; anthers *ca* 4–5 mm long on filaments *ca* 0.5 mm long; ovary on pubescent stipe 0.5–1 mm long, densely villous, style 5–6 mm long, pubescent for at least half its length. Drupes green to purplish, 0.8–1.2 cm × 0.5–0.8 cm, pubescent to puberulent, tipped by persistent style.

Throughout the region usually as understorey shrub on sandstone or sandy soil in eucalypt open forest. Flowers mainly spring and autumn, but also summer.

## 5. *Persoonia virgata* R. Br.

Shrub or small tree up to 6 m tall but usually up to 3 m tall, young branchlets pubescent, eventually glabrous. Leaves with obscure petioles 1–3 mm long; blades linear, linear-oblong, linear-obovate, or linear-elliptic, apex acute or obtuse, mucronate, base long attenuate, margin flat, (1–)2.5–6 cm × 0.1–0.3(–0.5) cm, glabrous, veins obscure. Flowers on glabrous peduncles 3–10 mm long; perianth yellow, 0.9–1.2 cm long, tipped by subulate points 0.3–0.5 mm long, glabrous; anthers *ca* 5–5.5 mm long on filaments *ca* 0.5 mm long; ovary on stipe *ca* 1 mm long, style 5.5–7.5 mm long, all glabrous. Drupes purplish when ripe, ellipsoid, 1–1.2 cm × 0.7–0.9 cm, glabrous, tipped by persistent style. **Fig. 1F.**

Coastal districts in wallum or as a constituent of understorey in open forest on sand or sandy soils. Flowers mainly late winter–spring, but also summer.

**6. *Persoonia cornifolia* Cunn. ex R. Br.****BROAD LEAVED GEEBUNG**

Shrub or small tree up to *ca* 6 m tall, young branchlets and tips soft greyish or ferruginous pubescent to tomentose. Leaves with petioles 2.5–6 mm long; blades elliptic, occasionally narrowly so, or obovate, rarely orbicular, apex acuminate, apiculate, base cuneate, margin occasionally ciliate, (2.5–)4–10 cm × (0.9–)1–3.5(–5.4) cm, ± glabrous. Flowers solitary or rarely in short racemes, pedicels 1–3 mm long, densely greyish pubescent; perianth yellow, 1–1.5 cm long, sometimes tipped with subulate points 2–3 mm long, greyish appressed pubescent or rarely glabrous; anthers 4–6 mm long, on filaments *ca* 0.5 mm long; ovary on glabrous stipe 0.75–1.5 mm long, densely greyish appressed pubescent, rarely whitish puberulent or glabrous, style 5.5–8.5 mm long, ± glabrous. Drupes purplish, ± ellipsoid, 1–1.5 cm × 0.7–1 cm, eventually glabrous.

Moreton, Darling Downs and Wide Bay districts, including the offshore islands in sandy or gravelly soils, as understorey in open forest. Flowers late winter to autumn.

A number of taxa are grouped under this species name. In the Darling Downs district the leaves are generally less than 6 cm long and glabrous, and long points are absent from the perianth. Specimens from coastal districts have generally longer leaves and the indumentum at the leaf base and on margins is more persistent. A distinct form found south of Brisbane in the eastern Moreton district has a ± glabrous ovary and subulate points on the perianth 2–3 mm long. **Fig. 1G**. This has at times been referred to as *P. adenantha* Domin. On Mt. Tamborine this form appears to intergrade with *P. attenuata*, as it has long narrow leaves and is found in moist eucalypt forest bordering rainforest.

**7. *Persoonia attenuata* R. Br.**

Shrub or small tree up to *ca* 7 m tall, young branchlets glabrous or very sparsely ferruginous pubescent. Leaves with petioles 2–5 mm long; blades narrowly elliptic to linear-elliptic, narrowly ovate or rarely, occasional leaves narrowly obovate, apex acuminate or acute, base cuneate to attenuate, margin flat or slightly recurved, (2.4–)5–12(–14.2) cm × 0.3–1.5(–2) cm, glabrous. Flowers solitary on peduncles (2–)3–6 mm long, glabrous or with few scattered coarse reddish hairs; perianth yellow, 1–1.3 cm long, ± glabrous, tipped by subulate points 0.5–1.5 mm long; anthers 4–6 mm long on filaments 0.5–1 mm long; ovary glabrous or with scattered appressed reddish hairs on glabrous stipe *ca* 1 mm long, style 5–9 mm long, glabrous. Drupes tinged with purple, ellipsoid, *ca* 1.2–1.5 cm × 0.7–0.9 cm, glabrous.

Generally in cool wet eucalypt forest on rainforest margins or on mountains, e.g. Lamington Plateau, Springbrook, Beechmont, Mt. Glorious near Brisbane, and Coalstoun Lakes area of Burnett district. Flowers much of the year.

There are at least two taxa under this name: one completely glabrous, the other with scattered coarse reddish hairs. In addition to these forms there is a shrubby form with small leaves *ca* 5 cm × 0.5 cm and soft whitish or reddish hairs found on Mt. Barney, Mt. Maroon and Mt. Ernest in the southern Moreton district, growing among boulders in rocky areas towards the top of the mountains. This taxon requires further study. Also see note under *P. cornifolia*.

**8. *Persoonia linearis* Andr.**

Shrub up to *ca* 3 m tall; bark brown; young branchlets pubescent. Leaves with petioles 2–5 mm long; blades linear to very narrowly elliptic, apex acute, mucronate, base attenuate, margin flat or slightly recurved, 2.5–7(–9) cm × 0.1–0.5(–0.9) cm, glabrous or puberulent at base, veins obscure. Flowers on grey pubescent peduncles 2–6 mm long; perianth yellow, *ca* 1.2–1.4 cm long, tipped by subulate points *ca* 0.5 mm long, pubescent; anthers 6.5–7 mm long on filaments *ca* 1 mm long; ovary on stipe *ca* 1 mm long, style 7–8 mm long, all glabrous. Drupes purplish, ovoid, *ca* 8–10 mm long.

Near coastal areas of the Moreton district, including Moreton I., in sand or sandy soil as understorey in open forest. Flowers late spring–summer.

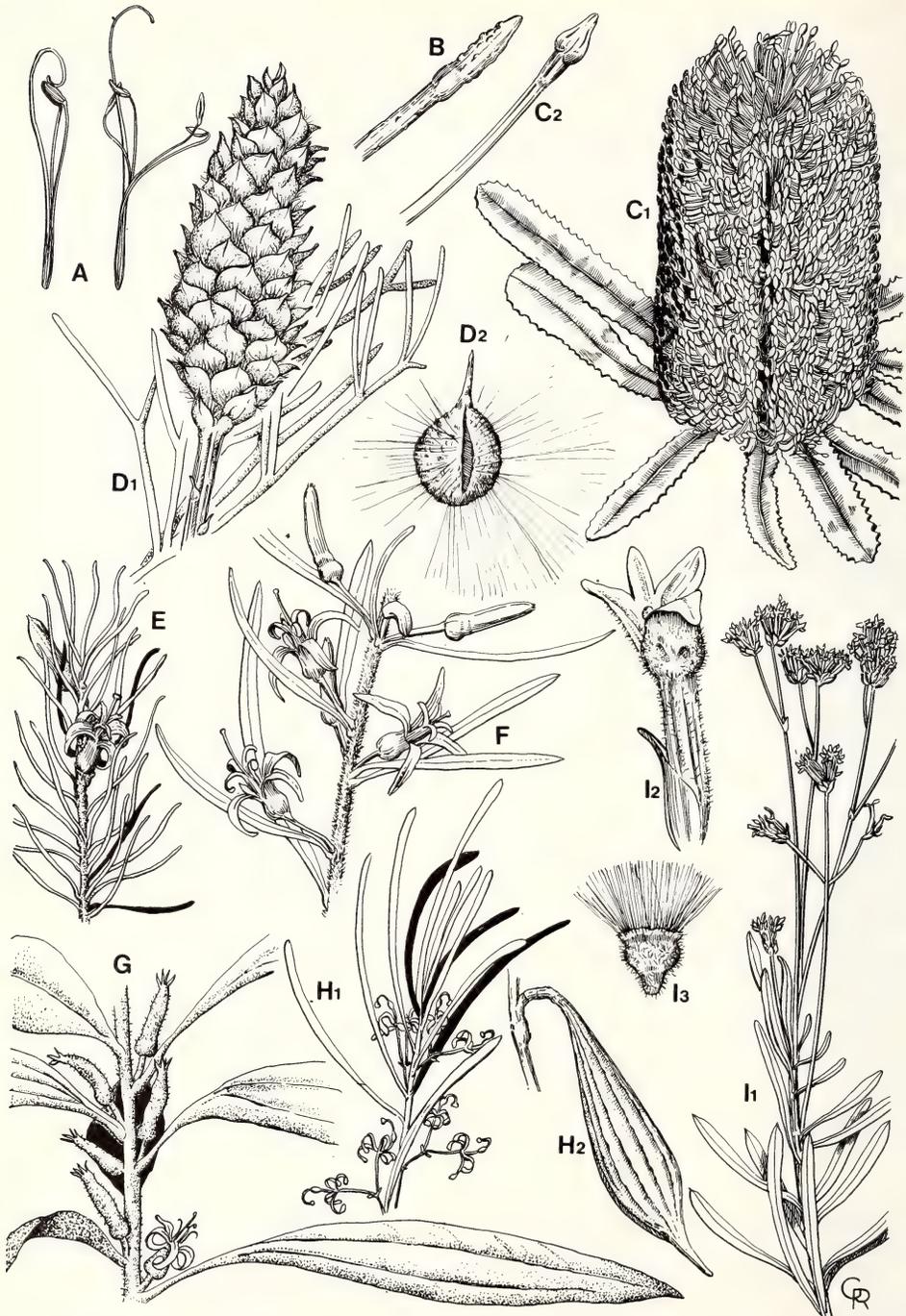


Fig. 1 PROTEACEAE — A-C *Banksia* spp. — A *B. spinulosa*, flowers at and after anthesis showing hooked style x1; B *B. serrata*, style apex x6; C<sub>1</sub>-C<sub>2</sub> *B. aemula*, C<sub>1</sub> inflorescence with subtending leaves x1/2, C<sub>2</sub> style apex x6; D<sub>1</sub>-D<sub>2</sub> *Petrophila shirleyae*, D<sub>1</sub> inflorescence and leaves x1, D<sub>2</sub> fruit x3; E-G *Persoonia* spp. — E *P. tenuifolia*, part of flowering branchlet x1 1/2; F *P. virgata*, part of flowering branchlet x1 1/2; G *P. cornifolia* form, part of flowering branchlet showing perianth lobes with subulate tips x1; H<sub>1</sub>-H<sub>2</sub> *Strangea linearis*, H<sub>1</sub> part of flowering branchlet x1, H<sub>2</sub> fruit x1/2; I<sub>1</sub>-I<sub>3</sub> *Conospermum taxifolium*, I<sub>1</sub> part of flowering branchlet x1, I<sub>2</sub> flower showing 2-lipped perianth x6, I<sub>3</sub> fruit x3.

5. **STRANGEA** Meissn.

Shrubs. Leaves alternate. Flowers solitary or 2 or 3 together, usually pedunculate, axillary or lateral, bisexual; perianth segments  $\pm$  equal, recurved after anthesis; anthers almost sessile, attached below expanded apex of segment; hypogynous scales semi-annular or almost absent; ovary stipitate, style soon deflexed, stigmatic area peltate, oblique,  $\pm$  terminal. Follicles compressed fusiform, 1-seeded, exocarp almost woody, outside striate, endocarp free from exocarp but similar in form, chartaceous, outer side silky, opening along one edge; seed pendulous, flat, free, winged at each end and narrowly along one side.

3 species endemic in Australia; 1 species south-eastern Queensland.

1. ***Strangea linearis*** Meissn.

Shrub up to 1 m tall, but usually much less, glabrous. Leaves ascending; petioles indistinct; blades linear-terete to linear-obovate or linear-spathulate, often somewhat falcate, apex obtuse, usually mucronate, base long attenuate, 1.5–7(–10) cm  $\times$  (0.1–)0.15–0.6(–0.8) cm, stiff, very thick. Flowers 1–3 together on common peduncle 2–6 mm long, rarely 1 or 2 more lower on peduncle, pedicels 6–7 mm long; perianth white, fragrant, 4.5–5.5 mm long, with few scattered hairs, expanded apex slightly clavate, 1–1.5 mm long, apiculate at tip; anthers *ca* 0.75 mm long; ovary with coarse ferruginous hairs on curved glabrous stipe *ca* 2.5 mm long, style *ca* 2 mm long, apex peltate. Follicles pendulous, compressed ellipsoid to compressed obovoid with long beak 3–7 mm long, 3–6.5 cm  $\times$  0.8–1.5 cm; seed glabrous with wing *ca* 3–4 cm long. **Fig. 1H.**

Coastal districts in sand or sandy soils in swampy wallum, or understorey in wallum communities along the coast and offshore sand islands. Flowers spring–summer.

A few specimens from Tin Can Bay and Beerwah areas have linear-terete leaves and appear atypical.

6. **CONSPERMUM** Smith

Shrubs or subshrubs. Leaves entire. Inflorescences of short dense spikes, either sessile in dense compound heads, or solitary, axillary, or in panicles; flowers sessile within broad persistent sheathing bract, bisexual; perianth tubular, lobes all  $\pm$  equal or 2-lipped, upper lobe very broad, lower 3 narrow; stamens inserted in gibbous part of tube or at base of expanded apex, filaments short, thick, uppermost anther perfectly 2-locular, lateral 2 with 1 perfect loculus and 1 abortive, lowermost anther with 2 abortive loculi; ovary obconical, crowned with tuft of hairs, 1-locular, ovule 1, style basally filiform,  $\pm$  thickened and curved at anther level, terminating in oblong, narrow beak with short lateral stigma close to end, elastically turned down towards lower lobe of perianth as limb expands. Fruits small indehiscent  $\pm$  obconical nuts, apex flat or concave, covered with long hairs, sides villous.

35 species endemic in Australia; 2 species south-eastern Queensland.

- |   |                             |
|---|-----------------------------|
| 1. Leaves more than 6 cm long; perianth tube <i>ca</i> as long as lobes | . 1. <i>C. burgessiorum</i> |
| Leaves less than 6 cm long; perianth tube longer than lobes             | . 2. <i>C. taxifolium</i>   |

1. ***Conospermum burgessiorum*** L. A. S. Johnson & McGillivray

Erect to spreading shrub up to 3 m tall. Leaves ascending; petioles 0.4–1.5 cm long; blades linear-elliptic or linear-obovate, often slightly falcate, apex acute, mucronate, base long attenuate, 6.5–25 cm  $\times$  0.25–1 cm, lateral and intramarginal veins visible both surfaces at least when dried. Inflorescences axillary or subterminal spicate panicles shorter than or equal to subtending leaves, peduncles pubescent, floral bracts blue, ovate, acute, 2.5–3 mm long, sheathing, puberulent; perianth white or cream, 2-lipped, tube 3–4 mm long, pubescent or subglabrous, lower lobes 3–4, rarely 5 mm long. Fruits obconical, 2.5 mm long, coma 0.6 mm long.

Granite Belt area of Darling Downs district in shrubby eucalypt open forest. Flowers late spring.

**2. *Conospermum taxifolium* Smith****DEVIL'S RICE**

Erect branched slender shrubs up to *ca* 1.5 m tall. Leaves ascending; petioles 0.5–3 mm long; blades narrowly obovate or occasionally narrowly elliptic, sometimes slightly falcate, apex acute or obtuse, mucronate, base attenuate, 0.7–5.5 cm × 0.1–0.5 cm, upper surface often concave, venation often obscure. Inflorescences axillary or subterminal spicate panicles longer than subtending leaves, peduncles pubescent, floral bracts bluish, ovate, acute, 2.5–3.5 mm long, sheathing, pubescent; perianth white to cream, 2-lipped, pubescent, tube 3–4.5 mm long, lower lobes 2–3 mm long. Fruits obconical, *ca* 1.5–2 mm long, coma *ca* 2–2.5 mm long. **Fig 11.**

Common in sandy soils in wallum or heathy areas in the Moreton and Wide Bay districts, and also in the Granite Belt area of the Darling Downs district. Flowers spring.

**7. OREOCALLIS R. Br.**

Trees. Leaves alternate. Inflorescences of terminal or upper axillary corymbs; flowers bisexual; perianth slightly zygomorphic, ± cylindrical in bud, apically expanded; anthers sessile on perianth limb, connective not produced; hypogynous disc unilateral, fleshy, entire or obscurely 2–3-lobed; ovary stipitate, ovules numerous, ascending, imbricate in 2 series. Follicles coriaceous, subwoody; seeds 2-seriate, imbricate, plano-compressed, winged.

7 species South America, Malaysia, New Guinea, Australia; 2 species endemic in Australia; 1 species south-eastern Queensland.

**1. *Oreocallis pinnata* (Maiden & Betche) Sleumer****TREE WARATAH;****DORRIGO OAK; RED OAK; PINK SILKY OAK; RED SILKY OAK**

*Embothrium wickhamii* F. Muell & W. Hill var. *pinnata* Maiden & Betche; *E. pinnatum* (Maiden & Betche) C. T. White

Tree up to 24 m tall; bark grey-brown, verrucose. Leaves alternate, simple, or pinnate on young leaves; petioles 2.5–10 cm long; simple blades narrowly elliptic, elliptic or rhombic-obovate, apex long acuminate, base attenuate, margin entire, 6–15 cm × 1.2–6 cm, pinnate leaves 3–9-foliolate, leaflet blades narrowly elliptic, sometimes slightly falcate, apex long acuminate, base attenuate, margin entire, 4.5–14.5 cm × 0.9–4 cm, glabrous, dark glossy green above, paler below. Inflorescences terminal corymbs, rachis 4–7 cm long, ferruginous pubescent, pedicels up to 6 cm long; perianth rose pink to crimson, 3.2–4 cm long, glabrous, slightly curved before anthesis, splitting down one side only, becoming revolute, apical section clavate, 4–6 mm long; anthers *ca* 1.5 mm long; pistil 3.2–3.9 cm long, glabrous, style apex expanded into oblong lateral disc *ca* 3 mm long. Follicles ± cylindrical to ellipsoid with long beak, splitting down one side and opening very widely; seeds with wing 3 cm × 1 cm. **Fig. 2A.**

McPherson Ra. in rainforest. Flowers spring to autumn. Timber pinkish-red with a silky sheen, and typical oak figure due to the broad rays, soft, light, used in cabinet and furniture making and ornamental work.

**8. STENOCARPUS R. Br.**

Trees. Leaves alternate or scattered. Inflorescences terminal or upper axillary, umbellate, sometimes several together in an umbel or short raceme, bracts caducous or absent; flowers bisexual; perianth slightly zygomorphic, tube opening along lower side, apex nearly globular and recurved, segments eventually separating; anthers broad, sessile, connective not extended beyond loculi; hypogynous glands united in short disc or cup, or almost obsolete; ovary stipitate, ovules several, laterally attached, or near top, imbricate downwards, 2-seriate, style long, dilated apically into flat oblique disc, stigmatic in centre. Fruits coriaceous follicles; seeds winged at lower end.

25 species Malaysia to New Caledonia, Australia; 4 species Australia; 2 species south-eastern Queensland.

1. Leaf margins entire; flowers white or cream; fruits on stipes *ca* 4–6 cm long . . . . . 1. *S. salignus*  
 Leaf margins undulate, pinnatifid or pinnatisect; flowers red; fruits on stipes *ca* 2 cm long . . . . . 2. *S. sinuatus*

**1. *Stenocarpus salignus* R. Br.** SCRUB BEEFWOOD; RED SILKY OAK  
*Stenocarpus salignus* var. *moorei* Benth.; *S. salignus* var. *concolor* Benth.

Tree up to *ca* 30 m tall; bark dark brown, finely fissured and softly scaly. Leaves simple; petioles 0.2–1.2(–3) cm long; blades narrowly ovate to narrowly elliptic, or occasionally ovate, apex usually obtuse to acute, base attenuate to cuneate, margin entire, 2–13.5(–15) cm × 0.6–4.5(–8) cm, glabrous, ± 3-nerved longitudinally from base or near base. Inflorescences axillary umbels, occasionally few together in panicle, peduncles 1.2–4 cm long, pedicels 0.3–1 cm long; perianth white or cream, fragrant, 6–10 mm long, apical region clavate, 1.5–2 mm long, reflexed at anthesis, splitting out one side, and then into 4 segments; anthers 0.75–1 mm long; ovary ± glabrous or puberulent, on stipe 4–5 mm long, style 4–5 mm long, apical disc 1–1.5 mm long. Follicles ± cylindrical, 4–6.5(–10) cm long, beaked, longitudinally wrinkled, on stipe *ca* 4–6 cm long; seeds thin, oblong, *ca* 1.2 cm long, winged.

McPherson Ra. and adjacent areas of Great Dividing Ra. in rain forest, also in depauperate rain forest in a few areas e.g. Mt. Walsh, near Biggenden. Flowers spring–summer. Timber dark red, durable, somewhat brittle; suitable for furniture, cabinet work, joinery, plywood. Sapwood is susceptible to attack by borers. Occasionally cultivated as an ornamental.

**2. *Stenocarpus sinuatus* Endl.** WHEEL OF FIRE; WHITE BEEFWOOD; TULIP FLOWER; WHITE OAK; WHITE SILKY OAK

Tree up to *ca* 30 m tall; bark grey to greyish brown, wrinkled or sometimes corky. Leaves simple or pinnatifid to pinnatisect on young trees, up to 45 cm × 35 cm; petioles 1.2–2.5 cm long; blades obovate, apex obtuse, base cuneate to attenuate, margin undulate to lobed, lobes obtuse, simple ones 7–25 cm × 2–7.5 cm, pinnatifid larger, or in juveniles pinnatisect and up to 50 cm × 40 cm, glabrous, dark glossy green above, paler beneath, penninerved. Inflorescences terminal or upper axillary umbels, either 2 or more together in compound umbel or several in racemes, peduncles 4–10 cm long, pedicels 1–1.4 cm long; perianths bright red, 3–3.8 cm long, apical region clavate, *ca* 5 mm long, reflexed at anthesis; anthers sessile, *ca* 2.5 mm long; ovary on stipe 1.5–2 cm long, ovary finely ferruginous pubescent, style 1.8–2.3 cm long, apical disc 3.5–4 mm diameter. Follicles dark greyish brown, ± cylindrical to ellipsoid, beaked, 5–10 cm long on stipe *ca* 2 cm long; seeds *ca* 1.2 cm long, winged.

Rainforest of the coastal districts. Flowers summer–autumn. Timber white, moderately hard, durable, somewhat tough, close-grained; suitable for cabinet work, veneers and indoor fittings. Subject to attack by borers. Cultivated as an ornamental tree.

**9. HICKSBEACHIA F. Muell.**

Trees. Flowers bisexual, actinomorphic; stamens inserted on perianth segments, anthers longer than filaments, almost cordate, connective extended, apiculate; hypogynous glands 4; ovary conical, ovules 2, pendulous, style straight, stigmatic region ± ellipsoid. Fruits ovoid, indehiscent, epicarp slightly succulent, endocarp bony; seed solitary.

1 species endemic in Australia, occurring in south-eastern Queensland.

**1. *Hicksbeachia pinnatifolia* F. Muell.** RED BOPPLE NUT; MONKEY NUT; RED NUT

Tree up to *ca* 12 m tall, usually less, often multi-stemmed. Leaves deeply pinnatifid to pinnate, up to *ca* 1 m long, rachis winged on top, wing with coarsely serrate margin; lobes or leaflets usually 16–24, sessile or with petiolules up to 3 mm long, oblong, narrowly ovate or ovate, apex acuminate, base when present subcordate, often oblique, margin undulate, coarsely serrate, serrations tipped with spine, 5–30 cm ×

1.7–6 cm, glabrous, thick and coarse with veins and reticulation prominent, raised below when dry. Inflorescences racemes 15–35 cm long, cauliflorous, rachis pubescent; flowers purplish brown with sickly odour, in pairs on common peduncle 2–3 mm long, pedicel up to 1 mm long; perianth 1.5–1.9 cm long, pubescent, apical expanded region bluntly conical, 2–3 mm long; anthers 1.5–2 mm long; pistil 1.6–1.8 cm long, ovary densely rusty pubescent, style apex conical, 1–1.5 mm long. Fruits red, indehiscent, fleshy,  $\pm$  ellipsoid, 2–5 cm long, glabrous when ripe, grooved on 1 side, style persistent.

Lowland rainforest or wet eucalypt forest as understorey tree in Upper Tallebudgera Ck., Upper Mudgeeraba Ck., and Upper Currumbin Ck. valleys in the Gold Coast hinterland. Flowers late winter–early spring. Kernels edible, but can yield HCN. Leaves also reported to be cyanogenetic but no field cases of poisoning have been noted.

## 10. TRIUNIA L. A. S. Johnson & B. G. Briggs

Leaves often 3–4-verticillate. Inflorescences with buds covered with scales; perianth slightly curved, lower 3 segments coherent longer than upper segment and less revolute.

1 species endemic in Australia, occurring in south-eastern Queensland.

### 1. *Triunia youngiana* (C. Moore & F. Muell.) L.A.S. Johnson & B. G. Briggs

NATIVE HONEYSUCKLE; SPICE BUSH

*Helicia youngiana* C. Moore & F. Muell.; *H. youngiana* var. *typica* C. T. White

Shrub 2.5–4 m tall. Leaves opposite to 3–4-verticillate; petioles 0.3–1 cm long; blades elliptic-oblong, elliptic, to obovate, apex  $\pm$  long acuminate, submucronate with terminal gland, base cuneate, margin entire or occasionally toothed, (4–)6–12(–17) cm  $\times$  1.8–3(–6.4) cm, glabrous above except for ribs, puberulent below with ferruginous hairs, eventually glabrous. Racemes terminal, scaly at base, shortly pedunculate, 3–10 cm long, scales 2–4 mm long, bracts 5–8 mm long, pedicels slender, 1 or 2 together, 2–6 mm long; perianth white or pink, fragrant, cylindrical, lightly curved, (1.4–)1.8–2.3 cm long, ferruginous hirsute, apical region clavate, densely ferruginous hirsute, 3 lower segments coherent longer and less revolute than upper segment; anthers 1 mm long, hypogynous glands all free, distant, oblong; pistil 1.8–2.2 cm long, ovary ferruginous pubescent, ovules 2, anatropous in superior cavities, style pubescent in lower half, apex slightly enlarged,  $\pm$  conical, *ca* 1 mm long. Fruits red, indehiscent, globose or ovoid, 1.2–1.5 cm long, slightly pubescent, suture (groove) prominent, pericarp subfleshy, insides parchment-like. **Fig. 2B.**

Recorded from McPherson Ra. and Gold Coast hinterland, and Eumundi area. Flowers spring to autumn. Fruits very poisonous if eaten.

## 11. MACADAMIA F. Muell.

Trees or tall shrubs. Leaves  $\pm$  in whorls, entire or serrate. Inflorescences simple racemes; flowers pedicellate, in pairs or scattered, pedicels not connate, bracts  $\pm$  deciduous; flowers bisexual,  $\pm$  actinomorphic; staminal filaments very short, connective produced into gland or short appendage; hypogynous glands united in cup or ring around ovary; ovary sessile, ovules 2, style long, straight. Fruits globular; seeds 1 or 2, testa membranous.

10 species Madagascar, Celebes, eastern Australia, New Caledonia; 5–6 species endemic in Australia; 3 species south-eastern Queensland.

1. Leaves in whorls of 4, base obtuse, margin serrate; inflorescences densely pubescent

1. *M. tetraphylla*

- Leaves in whorls of 3, base cuneate, margin entire or serrate; inflorescences sparsely pubescent

2. Leaf blade apices obtuse; perianths white, 0.8–1.2 cm long; fruits 2.5–3.5 cm diameter; seeds 1.8–3 cm diameter  
 Leaf blade apices acuminate; perianths pinkish, 0.6–0.8 cm long; fruits 1.5–2 cm diameter; seeds 1.3–1.7 cm diameter

2. *M. integrifolia*  
 3. *M. ternifolia*

### 1. *Macadamia tetraphylla* L. A. S. Johnson

QUEENSLAND NUT;  
 MACADAMIA NUT

Tree up to 18 m tall, new growth usually pink to red. Leaves in whorls of 4, rarely 3 or 5; petioles 2–4(–8) mm long; blades narrowly oblong-obovate, apex usually acute or acuminate, spine-tipped, or occasionally rounded, margin coarsely serrate, tipped with antrorse spines, 6–20(–30) cm × 2–4(–5) cm, juvenile leaves longest, glabrous. Inflorescences 15–45 cm long, pedicels 2.5–3 mm long; perianth pinkish or white, slender, 6–9 mm long, densely pubescent, or occasionally puberulent at apex, apical region elliptic, 1.5–2 mm long; anthers *ca* 1.5 mm long, apiculate; pistil 0.9–1.2 cm long, ovary and lower half of style villous, style apex ellipsoid, 0.5–0.75 mm long. Fruits greyish green, eventually brownish, ± globular, 2–3.5 cm diameter; seeds spherical to ellipsoid, tuberculate, 2–3.5 cm long. **Fig. 2E.**

Rainforests from Mt. Wongawallan, north of the Coomera R. southwards. Flowers late winter–spring. Cultivated for the edible kernel of seed which is sweet, not cyanogenetic. Timber reddish, hard and tough, prettily marked, but not exploited due to importance of fruit.

The distributions of *M. tetraphylla* and *M. integrifolia* overlap between Mt. Wongawallan area, north of the Coomera R. and Beechmont, and along the Wongawallan, Tamborine, Gounaba and Clagiraba Cks., all tributaries of the Coomera R., intermediates occur which exhibit characters of both species.

### 2. *Macadamia integrifolia* Maiden & Betche

QUEENSLAND NUT;  
 MACADAMIA NUT

*Macadamia ternifolia* F. Muell. var. *integrifolia* (Maiden & Betche) Maiden & Betche  
 Tree up to *ca* 20 m tall, new growth pale green. Leaves mostly in whorls of 3; petioles 1–2 cm long; blades obovate, occasionally oblong-obovate, apex obtuse, base cuneate, margin coarsely serrate in juveniles, eventually ± entire, undulate, 5.5–14(–22.5) cm × 2.5–6 cm, juveniles longest, glabrous. Inflorescences 10–30 cm long, pedicels 2.5–5 mm long; perianth white, slender, 0.8–1.2 cm long, sparsely pubescent, apical section elliptic, 2–3 mm long; anthers *ca* 1.5–2 mm long, prominently apiculate; pistil 1–1.4 cm long, pubescent particularly on ovary, style apex ellipsoid, 1–1.5 mm long. Fruits green, eventually dark brownish, globular, 2.5–3.5 cm diameter; seeds ± spherical, smooth, 1.8–3 cm diameter. **Fig. 2C.**

Mt. Bauple, north of Gympie to Beechmont, in rainforest. Flowers late winter–spring. Cultivated for edible kernel of seed which is sweet, not cyanogenetic.

### 3. *Macadamia ternifolia* F. Muell.

*Helicia ternifolia* (F. Muell.) F. Muell.; *Macadamia minor* F. M. Bailey; *M. lowii* F. M. Bailey

Small tree up to *ca* 6 m tall, new growth pink to red. Leaves mostly in whorls of 3; petioles 0.3–1.3 cm long; blades obovate to elliptic or narrowly so, apex acuminate, base cuneate to attenuate, margin coarsely and irregularly serrate, tipped with short spines, (2.5–) cm × 1–4(–6.5) cm, juvenile longest, glabrous. Inflorescences 4–20 cm long, pedicels 1.5–3.5 mm long; perianth pinkish, slender, 6–8 mm long, puberulent, apex elliptic, 1.5–2 mm long; anthers *ca* 1.5 mm long, apiculate; pistil 0.7–1.1 cm long, ovary pubescent, style apex ellipsoid, 0.5–0.75 mm long. Fruits greyish, eventually brownish, ± compressed globose, pointed, 1.5–2 cm long; seeds pointed at ends, tuberculate, 1.3–1.7 cm long. **Fig. 2D.**

Rainforests from Kin Kin near Gympie south to Pine R. near Brisbane, east of the Great Dividing Ra. Flowers late winter. Kernel of seed cyanogenetic, bitter, not edible.

12. **FLOYDIA** L. A. S. Johnson & B. G. Briggs

Leaves alternate, simple. Inflorescences without floral bracts; flowers straight, not zygomorphic; staminal filaments adnate to perianth segments for most of their length, anthers clavate; hypogynous glands free. Fruits indehiscent, globose, exocarp corky; seed 1, thick, testa not hardened nor papery.

1 species endemic in Australia, occurring in south-eastern Queensland.

1. **Floydia praealta** (F. Muell.) L. A. S. Johnson & B. G. Briggs BALL NUT;  
OPOSSUM NUT; A BEEFWOOD

*Helicia praealta* F. Muell.; *Macadamia praealta* (F. Muell.) F. M. Bailey

Tree up to 20 m tall; bark brown, somewhat rough. Leaves with petioles 0.5–1.5(–2.3) cm long; blades narrowly obovate to very narrowly obovate, apex blunt or obtuse, base cuneate to attenuate, margin entire, undulate, 4.5–16.5(–37) cm × 1–4.6(–5) cm, juvenile leaves longest, glabrous, thick, shiny. Inflorescences raceme-like panicles 5–12 cm long; flowers mostly in pairs on peduncles 3–4.5 mm long, pedicels 1.5–2.5 mm long; perianth cream, 1.5–1.8 cm long, pubescent, apical region ellipsoid, 3.5–4 mm long; anthers *ca* 2.5 mm long, apiculate; pistil 1.5–1.7 cm long, style apex ellipsoid to obovoid with thickened basal ring, *ca* 2 mm long. Fruits brownish, globular, up to 5 cm diameter, woody.

Riverine and lowland rainforest from Gympie southwards, though once recorded from Springbrook. Flowers mostly summer–autumn. Wood similar in appearance to that of SILKY OAK, reddish, close-grained, fairly durable, suitable for cabinet work. Kernels said to be bitter.

13. **HELICIA** Lour.

Trees or tall shrubs. Leaves alternate. Flowers pedicellate in pairs in terminal or axillary racemes, pedicels of each pair ± connate, bracts developed or absent; flowers bisexual, actinomorphic; perianth slender, lobes small, revolute when separating; anthers on short filaments inserted just below expanded apex of perianth, connective produced into short appendage; hypogynous glands equal, separate or united into ring; ovary sessile, ovules 2, anatropous, basally inserted, style long, straight, stigma terminal. Fruits drupes, exocarp fleshy; seeds 1–2, when solitary with cartilaginous endocarp, thick, when 2, flat, winged.

90 species eastern and south-eastern Asia to Australia; *ca* 7 species Australia; 2 species south-eastern Queensland.

- |  |                          |
|--|--------------------------|
| 1. Young growth and inflorescences densely ferruginous pubescent . . . . . | 1. <i>H. ferruginea</i>  |
| Young growth and inflorescences ± glabrous . . . . .                       | 2. <i>H. glabriflora</i> |

1. **Helicia ferruginea** F. Muell. RUSTY OAK; HAIRY HONEYSUCKLE

*Helicia bauerlenii* C. T. White

Shrub or small tree up to *ca* 10 m tall, young parts and inflorescence densely ferruginous pubescent. Leaves alternate; petioles 2–10 mm long; blades elliptic, oblong-elliptic or obovate, apex acute or bluntly acuminate, base cuneate or sometimes rounded, margin serrate or rarely almost entire, 9–31 cm × 2.5–8.5 cm, ± glabrous above except for midrib, puberulent below particularly on veins with dark red hairs, eventually glabrous. Inflorescences axillary racemes, solitary or rarely 2, 5–9 cm long, densely ferruginous pubescent; flowers paired, peduncles *ca* 1.5 mm long, pedicels *ca* 1–1.5 mm long, bracts *ca* 1.5 mm long; perianth 5–6 mm long, apical section clavate, *ca* 2 mm long; anthers *ca* 1.5 mm long; hypogynous glands broadly ovate, free; pistil *ca* 4 mm long, ovary densely ferruginous hirsute, style apex slightly expanded, *ca* 1.5 mm long. Fruits dark blue to black, shiny, 1–1.3 cm × 1 cm.

Rainforest of McPherson Ra., e.g. Springbrook, Lamington Plateau. Flowers spring–summer. Timber brown to pinkish, close-grained, rough and firm with a figure similar to that of other Proteaceae species, suitable for cabinet making.

**2. *Helicia glabriflora*** F. Muell      PALE OAK; LEATHER OAK; BROWN OAK  
*Helicia conjunctiflora* F. Muell.; *H. glabriflora* var. *conjunctiflora* (F. Muell.) Domin  
 Tree up to ca 10 m tall, ± glabrous. Leaves alternate or rarely a couple opposite; petioles 2–7 mm long; blades elliptic to obovate, apex acute to bluntly acuminate, base cuneate, margin entire or occasionally dentate towards apex, 4–12 cm × 1.5–3.5 cm, juveniles sometimes larger and coarsely toothed, glabrous. Inflorescences axillary, usually solitary racemes 5–12 cm long, glabrous; flowers paired, peduncles 0.5–1.5 mm long, pedicels ca 1–1.5 mm long, bracts up to 1 mm long, caducous; perianth white to pale yellowish, 8–10 mm long, apical region clavate, ca 2–2.5 mm long; anthers 1.5–2 mm long; hypogynous glands short, truncate, free; pistil 8–9 mm long, ovary glabrous or with few scattered hairs, style apex slightly expanded, ca 1.5 mm long. Fruits deep purplish blue, ellipsoid or ovoid, 1.2–1.6 cm long.

Rainforest of the coastal districts. Flowers autumn to spring. Succulent part of fruit edible. Timber pale, medium hard and tough.

#### 14. XYLOMELUM Smith

Trees or small shrubs. Leaves opposite, entire or toothed. Inflorescences axillary spikes, or at first forming terminal cluster becoming lateral by elongation of branch, bracts small, caducous; flowers sessile in pairs, lower ones usually bisexual, upper with abortive ovaries; perianth actinomorphic, nearly cylindrical in bud, segments revolute after anthesis, dilated apically into short concave blades; anthers on short filaments inserted a little below blade, connective extended beyond loculi; hypogynous glands 4, small; ovary in fertile flowers shortly stipitate or almost sessile, tapering into filiform style clavate apically, ovules 2, laterally attached below middle. Fruits large, ovoid or tapering above middle, thick and woody, eventually opening along upper side or in 2 valves; seeds flat, obliquely ovate with long terminal or oblique falcate wing.

4 species endemic in Australia; 1 species south-eastern Queensland.

##### 1. *Xylomelum* sp. 1.

WOODY PEAR

*Xylomelum salicinum* (R. Br. ex Meissn.) Cunn. ex Benth.; *X. pyriforme* var. *salicinum* R. Br. ex Meissn.; *X. pyriforme* auct. Qld. non Knight

Small tree up to 11 m tall. Leaves with petioles 1–3 cm long; blades narrowly oblong, narrowly elliptic, narrowly ovate or narrowly oblong-obovate, apex acuminate, base cuneate, margin entire or very coarsely toothed in juveniles, (3.5–)6–17.5 cm × (1–)1.5–4.5(–5.5) cm, dark green above, paler beneath, glabrous, venation reticulate, coarse, prominent. Inflorescences axillary spikes 2.5–8 cm long; perianth creamy white, 7–9 mm long, densely white or grey pubescent with short woolly hairs, apical section clavate, 1.5–2 mm long; anthers on filaments up to 0.5 mm long, anthers ca 1 mm long, apiculate; pistil 7–9 mm long, ovary ± sessile, pubescent, style apex clavate, ca 1 mm long, lower half of style pubescent. Fruits very woody, pear-shaped, ca 7 cm × 4 cm; seeds with terminal wing.

Most of the region as understorey tree in open forest on sandy soils. Flowers summer–autumn. A cyanogenetic glycoside has been recorded in this species but no cases of poisoning have been noted in the literature.

The correct author citation of *X. salicinum* is unclear; a new name has to be given to this taxon.

#### 15. ORITES R. Br.

Shrubs or trees. Leaves alternate. Inflorescences terminal or axillary spikes or spicate racemes; flowers paired within a caducous bract, bisexual, actinomorphic; perianth ± cylindrical in bud, apically dilated; anthers on short filaments inserted below dilated apex, connective not extended beyond loculi; hypogynous glands linear, obtuse; ovary sessile, ovules 2, amphitropous, laterally attached at or below middle. Fruits coriaceous follicles, ± boat-shaped with dorsal suture curved, ventral nearly straight; seeds compressed, winged.

9 species Australia, South America; 8 species Australia; 1 species south-eastern Queensland.

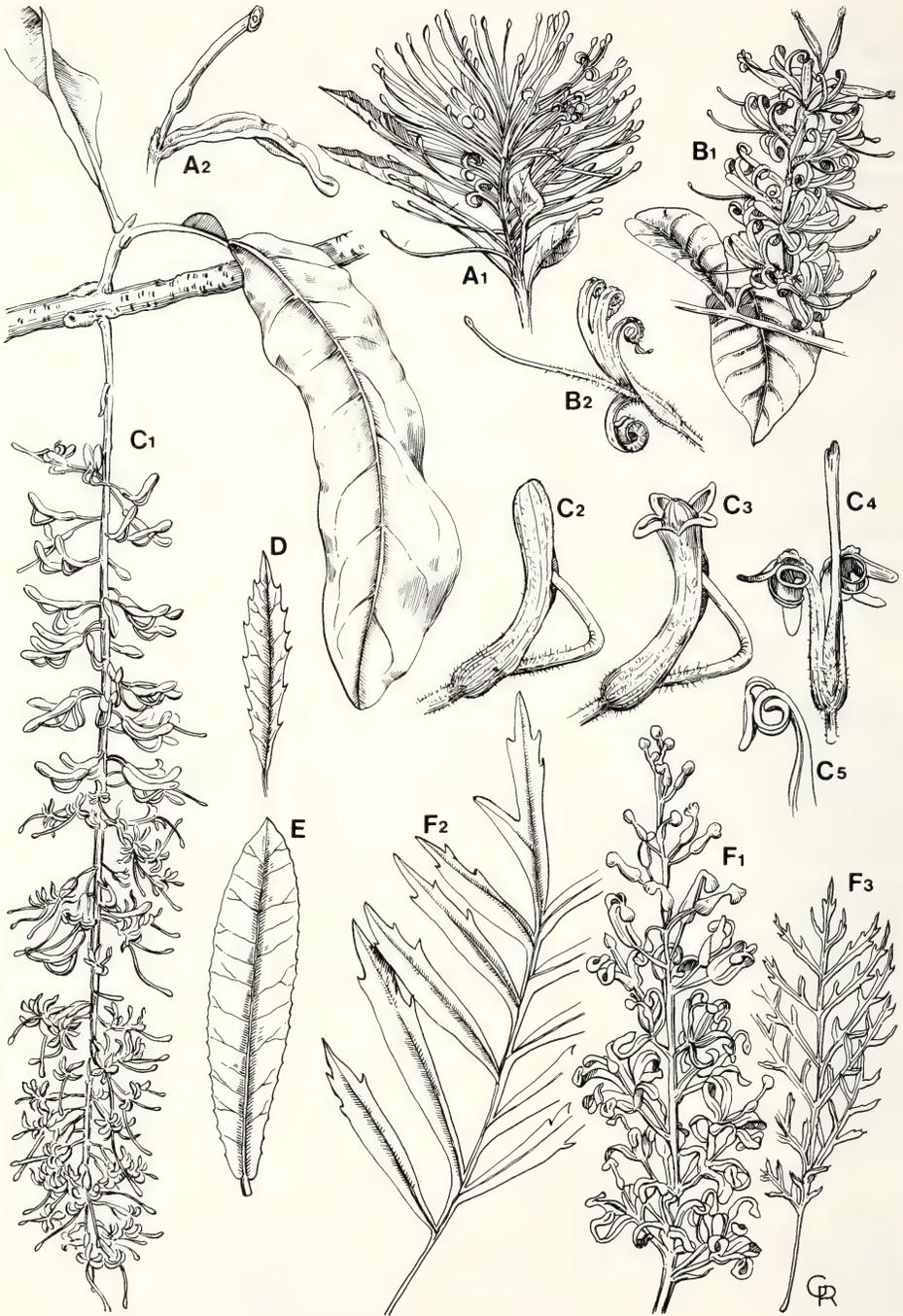


Fig. 2 PROTEACEAE — A<sub>1</sub>–A<sub>2</sub> *Oreocallis pinnata*, A<sub>1</sub> inflorescence  $\times 1/4$ , A<sub>2</sub> flower after anthesis  $\times 1/2$ ; B<sub>1</sub>–B<sub>2</sub> *Triunia youngiana*, B<sub>1</sub> inflorescence and leaves  $\times 1/2$ , B<sub>2</sub> flower after anthesis showing 2-lipped perianth  $\times 1$ ; C–E *Macadamia* spp. — C<sub>1</sub>–C<sub>5</sub> *M. integrifolia*, C<sub>1</sub> inflorescence and leaves  $\times 1$ , C<sub>2</sub>–C<sub>4</sub> flowers at and after anthesis  $\times 3$ , C<sub>5</sub> perianth segment showing revolute apex and stamen  $\times 3$ ; D *M. ternifolia*, leaf  $\times 1/4$ ; E *M. tetraphylla*, leaf  $\times 1/4$ ; F<sub>1</sub>–F<sub>3</sub> *Lomatia silatfolia*, F<sub>1</sub> inflorescence  $\times 1/2$ , F<sub>2</sub>–F<sub>3</sub> leaves showing variation between forms  $\times 1/2$ .

**1. *Orites excelsa* R. Br.** WHITE BEEFWOOD; SILKY OAK; PRICKLY ASH  
Tree up to 30 m tall; bark brown or grey, often minutely scaly and fairly smooth. Leaves alternate, simple or juveniles pinnatisect; petioles (0.7–)1–2.3 cm long; simple blades elliptic, occasionally elliptic-oblong, ovate or oblong, apex acute or obtuse, base cuneate or occasionally attenuate, margin entire or serrate, (4–)6.5–18.5 cm × (1.2–)1.8–4 cm, lobes on pinnatisect leaves narrowly oblong or narrowly elliptic, glabrous, shining above, glaucous or glaucescent below, venation prominent. Inflorescences spikes 5–11 cm long, rachis puberulent, pedicels 0–0.5 mm long; perianth white, fragrant, *ca* 5 mm long, expanded apex only slightly broader than ± cylindrical tube, *ca* 2 mm long; filaments 1–1.5 mm long, anthers 1–1.25 mm long; pistil 4–5 mm long, ovary puberulent, style apex hardly expanded, up to 0.5 mm long.

Rainforest of McPherson Ra. including Mt. Lindesay, and adjacent areas of Great Dividing Ra. Flowers winter–spring. Timber pinkish, moderately hard with an oak figure when cut on the quarter, takes a good polish; suitable for furniture, cabinet making, lining, interior joinery etc.

## 16. LOMATIA R. Br.

Shrubs or trees. Leaves alternate. Inflorescences terminal or axillary, simple or slightly branched racemes; flowers bisexual, paired, pedicellate, bracts usually small, caducous, or absent; perianth zygomorphic, opening along lower side, tapering at top, expanded apex ovoid-globular, recurved, long-cohering; anthers sessile; hypogynous glands 3, broad, truncate, fourth absent; ovary stipitate, ovules several, laterally attached below middle, amphitropous, imbricate upwards on 2 rows, style long, dilated apically into flat oblique disc, stigmatic at centre. Follicles coriaceous; seeds winged, surrounded by marginal raphe.

12 species Australia, South America; 8 species Australia; 2 species south-eastern Queensland.

- |                              |                          |
|------------------------------|--------------------------|
| 1. Leaves simple . . . . .   | 1. <i>L. arborescens</i> |
| Leaves 1–3-pinnate . . . . . | 2. <i>L. silaifolia</i>  |

**1. *Lomatia arborescens* L. Fraser & J. Vickery** TREE LOMATIA  
*Lomatia ilicifolia* auct. non R. Br., F. M. Bailey

Shrub or small tree up to 10 m tall, young tips often ferruginous pubescent. Leaves with petioles 0.6–2.5 cm long; blades narrowly elliptic to elliptic, oblong-elliptic or occasionally ovate, apex acute or obtuse, base cuneate, margin serrate, (3–)5.5–14(–18) cm × (0.9–)1.5–3.5(–6) cm, glabrous, venation conspicuous. Inflorescences axillary racemes 4–16 cm long, pedicels 5–7 mm long; perianth white, 7–10 mm long, puberulent, curved, apical region clavate, *ca* 2 mm long, reflexed at anthesis; anthers *ca* 1 mm long; ovary sparsely hairy, on stipe *ca* 4 mm long, style *ca* 4 mm long, apex disc-like. Follicles very dark brown, ± ovoid but straightish along opposite side to suture, 2.2–3.5 cm × 1–1.2 cm, apex with persistent style and beak; seeds *ca* 10, ± flat, 5–6 mm diameter with wing 0.8–2.4 cm long.

McPherson Ra. including Mt. Lindesay and adjacent areas of Great Dividing Ra., in rainforest but also exposed areas on mountain tops. Flowers summer.

**2. *Lomatia silaifolia* (Smith) R. Br.** CRINKLE BUSH; FERN LEAVED LOMATIA

*Embothrium silaifolium* Smith

Shrub 1–2 m tall. Leaves 1–3-pinnate, 10–30 cm long, lobes acute, sessile and decurrent on rachis, margins of larger lobes serrate, largest segment of 1-pinnate leaf *ca* 2.5 cm wide, others usually less than 1 cm wide, particularly on 2–3-pinnate leaves, glabrous above, usually glabrous but occasionally puberulent to pubescent below. Inflorescences terminal, simple or branched racemes up to 30 cm long, pedicels 0.75–1.3 cm long; perianth white or cream, 1–1.5 cm long, apex clavate, 2.5–3.5 mm long, reflexed at anthesis; anthers 1.5–2 mm long; ovary glabrous on stipe 0.7–1 cm long, style 4–6 mm long, apex disc-like. Follicles dark brown, ± ovoid, but straight along side opposite to suture, beaked, 2.5–4 cm long; seeds several, *ca* 4–5 mm diameter with wing 1–1.5 cm long. **Fig. 2F.**

Three taxa occur in the region:

- |   |   |   |
|---|---|---|
| 1. Leaves pubescent on lower surface . . . . .                  | <i>L. silaifolia</i> var. <i>induta</i>                             | 2 |
| Leaves glabrous on lower surface . . . . .                      |   |   |
| 2. Leaves 1-pinnate, margins toothed or rarely entire . . . . . | <i>L. silaifolia</i> var. <i>silaifolia</i> forma <i>pinnata</i>    |   |
| Leaves 2-3-pinnate, margins ± entire . . . . .                  | <i>L. silaifolia</i> var. <i>silaifolia</i> forma <i>silaifolia</i> |   |

*L. silaifolia* var. *silaifolia* forma *silaifolia* is generally found in rocky areas e.g. Helidon, Crow's Nest, Glasshouse Mts., Warwick and Stanthorpe areas while *L. silaifolia* var. *silaifolia* forma *pinnata* Domin is found in the coastal districts in sandy soil usually in open forest. *L. silaifolia* var. *induta* F. Muell. is widespread. Flowers may be found much of the year but mainly summer-autumn. Parts of flowers and fruits reported to yield HCN, and nectar from flowers reputed to kill flies, but no records of toxicity to stock have been noted in the literature.

The recognition of *L. silaifolia* var. *induta* as a distinct taxon is questionable as the leaves appear to lose their indumentum very quickly.

### 17. HAKEA Schrader

Shrubs or rarely small trees, indumentum usually of closely appressed, medifixed hairs. Leaves alternate, flat or terete. Inflorescences usually short racemes or clusters or rarely long racemes, usually axillary, rarely terminal as well; flowers bisexual; perianth zygomorphic, rarely actinomorphic, tube revolute, curved under apical region, rarely straight, apical region globular, rarely ovoid, often oblique, segments often cohering long after tube has opened; anthers sessile, connective not extended beyond loculi; hypogynous glands united in semi-annular or semicircular, rarely disc-shaped gland occupying upper side of receptacle; ovary stipitate, ovules 2, amphitropous, laterally attached about middle, style long or short, apically dilated into straight, oblique or lateral disc, stigma small, central or apical. Fruits hard woody capsules opening in 2 valves; seeds 2, compressed and collateral, winged at upper end, ± decurrent down upper or both margins, sometimes surrounding seed.

100 species endemic in Australia; 10 species south-eastern Queensland.

- |  |                         |    |
|--|-------------------------|----|
| 1. Leaves terete . . . . .   |                         | 2  |
| Leaves flat . . . . .  |                         | 6  |
| 2. Inflorescences racemes 2.5-10 cm long . . . . .   | 1. <i>H. fraseri</i>    | 3  |
| Inflorescences clusters or on rachis less than 1 cm long . . . . .   |                         |    |
| 3. Pedicels glabrous; fruits 1.2-1.5 cm × 0.5-0.8 cm thick or leaves often bifid or trifid . . . . .   |                         | 4  |
| Pedicels pubescent; fruits 2.5-3.5 cm × 1.8-3.5 cm thick and leaves always simple . . . . .  |                         | 5  |
| 4. Leaves sometimes flat as well as terete on same branch; perianths white, 4.5-6 mm long; fruits 1.2-1.5 cm × 0.5-0.8 cm thick . . . . .                                  | 2. <i>H. microcarpa</i> |    |
| Leaves terete, usually once or twice bifid or trifid, occasionally simple; perianths red to purplish red, 1-1.5 cm long; fruits (2-) 2.5-3 cm × 1.2-1.8 cm thick . . . . . | 3. <i>H. purpurea</i>   |    |
| 5. Pedicels villous; recorded from Mt. Barney, Mt. Maroon in the southern border areas . . . . .   | 4. <i>H. sp. 1.</i>     |    |
| Pedicels appressed pubescent, sometimes sparingly so; recorded from poorly drained lowland areas or coastal wallum . . . . .   | 5. <i>H. sp. 2.</i>     |    |
| 6. Leaves with only 1 prominent midrib, usually penninerved . . . . .  |                         | 7  |
| Leaves with 3-9 ± longitudinal veins with prominent reticulation between them . . . . .  |                         | 10 |
| 7. Leaves without any lateral nerves, only midrib and thickened margins, often also terete . . . . .   | 2. <i>H. microcarpa</i> |    |
| Leaves penninerved, sometimes faintly so, margins not thickened . . . . .  |                         | 8  |

- |   |                           |   |
|---|---------------------------|---|
| 8. Pedicels and perianth pubescent . . . . .  | 6. <i>H. eriantha</i>     |   |
| Pedicels and perianth glabrous . . . . .  |                           | 9 |
| 9. Flowers usually 16–20, rarely 14 per inflorescence; perianths<br>5–8 mm long; fruits ovoid, but not gibbous at base, surface<br>smooth or only slightly verrucose, bumps up to 0.5 mm high . | 7. <i>H. florulenta</i>   |   |
| Flowers usually 4–9 per inflorescence; perianths 3.5–4.5 mm<br>long, fruits gibbous, surface prominently verrucose, bumps<br>(1–)2–2.5 mm high . . . . .  | 8. <i>H. salicifolia</i>  |   |
| 10. Leaves 3-nerved . . . . .   | 9. <i>H. dactyloides</i>  |   |
| Leaves 5–9-nerved . . . . .   | 10. <i>H. plurinervia</i> |   |

### 1. *Hakea fraseri* R. Br.

A CORKWOOD OAK

Tree up to 10 m tall, but usually smaller; bark dark grey, hard, furrowed, young tips appressed pubescent. Leaves terete, apex acute, 12–40(–50) cm × 0.1–0.15(–0.2) cm, glabrous. Inflorescences upper axillary racemes 2.5–10 cm long, rachis appressed pubescent; flowers numerous, perianth cream or whitish, 8–10 mm long, appressed pubescent, apex clavate, 1.5–2.5 mm long, anthers *ca* 1 mm long; ovary glabrous on stipe *ca* 2–3 mm long, style 1.5–2.5 mm long, glabrous, apex broadly cone-shaped. Fruits very woody, ovoid, 3.5–4 cm × 1.7–1.8 cm × 1.2–1.5 cm, verruculose, or eventually surface cracking with age.

Darling Downs and Burnett districts in lighter soils or red earths in open forest. Flowers autumn to spring.

### 2. *Hakea microcarpa* R. Br.

Shrub up to *ca* 2 m tall, young branchlets appressed pubescent, soon glabrous. Leaves terete or flat, terete leaves pungent pointed, (2–)3–12(–15) cm × 0.07–0.15 cm, glabrous, flat leaves pungent pointed, up to 5 mm wide, margins and midrib thickened. Flowers numerous in axillary clusters on short ferruginous pubescent rachis, pedicels 2–5 mm long, glabrous; perianth white, 4.5–6 mm long, glabrous, apex clavate, *ca* 1 mm long; anthers *ca* 0.5 mm long; ovary glabrous on stipe *ca* 0.5 mm long, style 6–9 mm long, glabrous, apex disc-shaped. Fruits woody, ± ovoid to ellipsoid, 1.2–1.5 cm × 0.6–0.7 cm × 0.5–0.8 cm, smooth or wrinkled, often with apical horn *ca* 2 mm long. **Fig. 3A.**

Granite Belt area of the Darling Downs district. Flowers spring.

### 3. *Hakea purpurea* Hook.

Rigid shrub up to 3 m tall, very young shoots pubescent to puberulent, otherwise glabrous. Leaves terete, undivided or usually once or twice bifid or trifid, pungent-pointed, whole leaf 2–10 cm long, segments 1–1.5 mm thick, ± glabrous. Flowers several in clusters on very short hirsute rachis, pedicels 0.8–1(–1.5) cm long, glabrous; perianth red to purplish red or pinkish, 1–1.5 cm long, glabrous, apex clavate, 1.5–2.5 mm long; anthers *ca* 1 mm long; ovary glabrous on stipe 1–2 mm long, style 2.1–3 cm long, glabrous, apex disc-shaped. Fruits ellipsoid to compressed globular, or sometimes ovoid tapering to point, (2–)2.5–3.5 cm × 1.2–2.2 cm × 1.2–1.8 cm, surface wrinkled. **Fig. 3B.**

Northern Darling Downs district in sandy soils in open forest. Flowers spring. Cultivated as an ornamental shrub.

### 4. *Hakea* sp. 1.

Included under *H. gibbosa* (Smith) Cav. in “Qd. Fl.” 4: 1349 (1901)

Shrub or small tree up to 5 m tall, young branchlets spreading pubescent. Leaves terete, rigid, pungent-pointed, (1.5–)3–5.5(–7) cm × 0.07–0.1 cm, ± glabrous, often grooved below near base, young leaves decurrent on stem for up to 1.5 mm. Flowers few to several in clusters on villous rachis, pedicels spreading, 2–3.5 mm long, pubescent to villous; perianth white, 5–6 mm long, glabrous, apex clavate, *ca* 1 mm long; anthers *ca* 0.4 mm long; ovary glabrous on stipe *ca* 0.5 mm long, style 5–6 mm long, glabrous, apex disc-shaped. Fruits very woody, gibbous, narrowed abruptly at

apex into thin lip 8–9 mm wide, 3–3.5 cm × 2–3 cm × 2.5–3.5 cm, surface wrinkled and warty, or smooth, on same plant.

Mt. Barney and Mt. Maroon on McPherson Ra. at altitudes of 300 m or more in poorly drained areas; rarely collected. Flowers late winter.

This may be a more glabrous form of *H. gibbosa* (Smith) Cav.

### 5. *Hakea* sp. 2.

*Hakea gibbosa* auct. non (Smith) Cav., F. M. Bailey

Shrub up to 3 m tall, rarely more, usually much less, branchlets with sparse appressed silky hairs, soon glabrous. Leaves terete, pungent-pointed, (1.6–)2.5–12.5 cm × 0.1–0.125 cm, glabrous. Flowers several in axillary clusters on very short ferruginous pubescent rachis, pedicels 2–2.5 mm long, appressed silky pubescent, sometimes sparsely so; perianth cream or white, 4.5–5.5 mm long, glabrous, apex clavate, *ca* 1 mm long; anthers *ca* 0.5 mm long; ovary glabrous on stipe 0.5–1 mm long, style 5.5–7 mm long, apex disc-shaped. Fruits very woody, ± obovoid but very gibbous, abruptly narrowing to thin lip *ca* 3–6 mm wide at apex, with short stout straight point *ca* 1–1.5 mm long, 2.5–3.5 cm × 1.8–2.2 cm × 1.8–3.5 cm, surface mottled, bumpy or uneven.

Coastal districts, near the coast and on offshore sand islands in wallum or swampy or waterlogged areas or on poorly drained sandy soils. Flowers winter–spring.

This taxon has been called *H. gibbosa* in Queensland, but typical *H. gibbosa* has spreading hirsute hairs on young tips, and is villous on the pedicels, whereas the Queensland taxon has appressed silky hairs, sometimes very few, on the pedicel. The larger fruited specimens have been compared with *H. propinqua* Cunn., but *H. propinqua* has flowers half the size of the Queensland taxon, and a somewhat different indumentum. The flower size and indumentum are similar to those of *H. sericea* Schrader, but *H. sericea* normally has leaves 2–6 cm long.

### 6. *Hakea eriantha* R. Br.

Shrub or small tree up to 4.5 m tall, usually much smaller, young branchlets softly pubescent. Leaves with petioles 0.4–1.2 cm long; blades linear-elliptic to narrowly elliptic, occasionally narrowly obovate, apex acute or occasionally obtuse, mucronate, base attenuate, margin flat, (4.5–)8–17 cm × (0.4–)1–2(–2.5) cm, glabrous, penninerved, only midrib, or sometimes few lateral veins visible. Flowers few to several in axillary clusters on very short glabrous rachis, pedicels 2–4.5 mm long, appressed pubescent; perianth creamy white, 6–8 mm long; appressed pubescent, apical region 1–1.5 mm long; anthers *ca* 0.5 mm long; ovary glabrous, ± sessile, style 5–7 mm long, glabrous, apex disc-shaped. Fruits woody, boat-shaped, upper edge ± straight or concave, with beak up to 3 mm long, 2.5–3 cm × 1.5–1.8 cm × 1.5–2.2 cm, surface uneven.

Granite Belt area of Darling Downs district, and Mt. Barney, Mt. Maroon, Murphy's Ck., near Helidon and Lamington National Park, in the Moreton district in sandy or rocky ground in open forest. Flowers spring.

### 7. *Hakea florulenta* Meissn.

Shrub up to *ca* 3 m tall, but usually *ca* 1 m tall, with lignotuber, young branchlets puberulent with appressed silky hairs, to glabrous. Leaves with petioles 0.3–1.2 cm long; blades elliptic, oblong-obovate or obovate or occasionally narrowly elliptic, apex obtuse, rounded, occasionally ± acute, mucronate, base cuneate, margin flat, 4.3–15 cm × (0.7–)1–2.8 cm, glabrous, sometimes ± glaucous below, penninerved with lateral veins broadly spaced, not prominent. Flowers usually 16–20, rarely 14 in axillary clusters on short reddish pubescent rachis, pedicels 4.5–7 mm long, glabrous; perianth creamy white, 5–8 mm long, glabrous, apex clavate, *ca* 1 mm long; anthers *ca* 0.5 mm long; ovary glabrous on stipe *ca* 1 mm long, style 6–7.5 mm long, glabrous, stigma disc-shaped. Fruits very woody, usually 1 or 2 together in axil, ± ovoid but

with upper surface less curved than lower, 2–2.5 cm × 0.9–1.2 cm × 0.7–1.1 cm, slightly verrucose, warts up to *ca* 0.5 mm high, not gibbous. **Fig. 3D.**

Coastal districts and Granite Belt of Darling Downs district in sandstone or sandy or shallow soils as understorey shrub in open forest or heath. Flowers spring. Occasionally cultivated as an ornamental.

On Mt. Coolum and Mt. Norman, near Wallangarra, there appear to be plants intermediate between *H. florulenta* and *H. salicifolia*. In each case the fruit resembles that of *H. salicifolia*, though not as warty, but the leaves are quite broad and obtuse.

### 8. *Hakea salicifolia* (Vent.) B. L. Burt

WILLOW LEAVED HAKEA

*Embothrium salicifolium* Vent.; *Hakea saligna* Knight

Tall shrub, young branchlets puberulent with appressed silky hairs, to glabrous. Leaves with petioles 2–5 mm long; blades narrowly elliptic to narrowly ovate, to linear-elliptic, apex attenuate, mucronate, occasionally obtuse, base attenuate to cuneate, 5–10.5 cm × 0.6–1.7 cm, glabrous, penninerved, venation obscure. Flowers 4–9 in axillary clusters on ferruginous pubescent rachis, pedicels 3–6 mm long, glabrous, perianth white, 4–5 mm long, glabrous, apex clavate, *ca* 1 mm long; anthers *ca* 0.5 mm long; ovary glabrous on stipe *ca* 0.5 mm long, style *ca* 4–5 mm long, glabrous, stigma disc-shaped. Fruits very woody, usually 1 or 2 together, ± ovoid, gibbous, upper edge ± straight, lower curved upwards to end in upturned beak, 2–2.3 cm × 1.2–1.4 cm × 1.5–2 cm, verrucose, warts (1–)2–2.5 mm high.

Springbrook in eucalypt forest near edge of cliffs in shallow soil. Flowers spring. Cultivated as an ornamental shrub.

The leaves of the Springbrook population are not typical of this species, being somewhat similar to those of *H. florulenta*, but the fruits are typical. See note under *H. florulenta*.

### 9. *Hakea dactyloides* (Gaertn.) Cav.

FINGER HAKEA

*Banksia dactyloides* Gaertn.

Shrub or small tree up to *ca* 4 m tall, usually much smaller, young branchlets softly pubescent, otherwise ± glabrous. Leaves with petioles 2–5 mm long; blades linear-elliptic or linear-obovate, to elliptic or obovate, apex acute, mucronate, base cuneate to attenuate, margin flat, (2.5–)5–12.5 cm × (0.4–)0.7–2(–2.5) cm, with 3 longitudinal veins, 2 lateral from near petiole running ± parallel with midrib, rarely appearing 5-nerved in widest blades, with coarse prominent reticulation between them. Flowers numerous in axillary clusters on very short pubescent rachis, pedicels 3–4 mm long, glabrous; perianth white, 4–5 mm long, glabrous, apex clavate, *ca* 1 mm long; anthers 0.5–0.75 mm long; ovary glabrous on stipe 0.75–1 mm long, style 3.5–4.5 mm long, glabrous, apex cone-shaped. Fruits woody, usually 1–2 per axil, ovoid to ± ellipsoid, often more curved on lower side than upper, beak slightly curved or straight, 2–3 mm long, (2–)2.5–3.5 cm × 1.5–2 cm × (1–)1.2–1.8 cm, surface uneven. **Fig. 3C.**

Granite Belt area of the Darling Downs district and southern border mountains of the Moreton district e.g. McPherson Ra., on trachyte, Mt. Barney and Mt. Maroon in rocky areas or crevices. Flowers spring–summer. Flowers reported to yield HCN.

### 10. *Hakea plurinervia* F. Muell. ex Benth.

Shrub up to *ca* 3 m tall, young branchlets appressed silky pubescent, soon glabrous. Leaves with petioles 3–7 mm long; blades obovate or narrowly obovate to narrowly elliptic, rarely linear-elliptic, often falcate, apex obtuse or acute, mucronate, base attenuate, (7–)10–17(–20) cm × (0.4–)1.3–2.7(–3.5) cm glabrous, 5–9 prominent longitudinal nerves with coarse reticulation between them. Flowers very numerous in axillary clusters on short, white villous rachis up to 8 mm long, pedicels 3–5 mm long, glabrous; perianth cream to white, 3–3.5 mm long, glabrous, apex clavate, *ca* 1 mm long; anthers *ca* 0.5 mm long; ovary glabrous on stipe *ca* 0.5 mm long, style 3–4.5 mm long, glabrous, apex cone-shaped. Fruits very woody, ± ovoid, sometimes apically horned, (2.2–)2.5–3.5 cm × 1.2–1.5 cm × 1.2–1.6 cm, ± smooth or somewhat uneven or wrinkled.

Coastal districts in sandy or stony soils in open forest. Flowers winter–spring.

## 18. GREVILLEA R. Br. ex Salisb.

Shrubs or trees, indumentum usually of appressed medifixed hairs. Leaves alternate. Inflorescences of short umbel-like racemes (clusters) or elongated 1-sided racemes, terminal and/or rarely axillary; flowers bisexual, actinomorphic or zygomorphic; perianth tube usually splitting along one side, remainder usually cohering for some time; anthers sessile, connective not produced beyond locule; hypogynous glands united into semi-annular gland on upper side of torus, rarely annular or absent; ovary stipitate or rarely sessile, ovules 2, amphitropous, laterally attached about middle, style usually long and protruding from slit on lower side of perianth tube before apex is set free from perianth, ultimately straight and erect or rarely remaining hooked, apex dilated into straight, oblique or lateral cone or disc, stigma small in centre of disc or end of cone. Fruits follicles, usually oblique with ventral suture curved, either coriaceous and opening along upper margin or rarely woody and opening  $\pm$  in 2 valves; seeds 1 or 2, flat, orbicular or oblong, surrounded by membranous wing, or narrowly winged at end or outer margin only, or wingless.

About 250 species eastern Malaysia, New Hebrides, New Caledonia, Australia; ca 250 species Australia; ca 14 species south-eastern Queensland.

A number of species of *Grevillea* are cultivated as ornamental shrubs or trees.

1. Leaves simple or shallowly lobed . . . . .	2
Leaves pinnate or pinnatisect . . . . .	13
2. Leaves linear, striate with 7–13 raised longitudinal nerves on undersurface . . . . .	1. <i>G. striata</i>
Leaves with only 1 longitudinal nerve prominent, or penninerved . . . . .	3
3. Leaves glabrous on undersurface . . . . .	4
Leaves pubescent on undersurface . . . . .	6
4. Inflorescences consisting of a solitary terminal flower . . . . .	2. <i>G. singuliflora</i>
Inflorescences consisting of racemes of few–several flowers . . . . .	5
5. Perianths white, 1–1.2 cm long; fruits 2.3–3 cm long; shrubs or small trees of depauperate rainforest or brigalow communities . . . . .	3. <i>G. helmsiae</i>
Perianths lavender-pink, 0.6–0.8 cm long; fruits 0.8–0.9 cm long; sprawling shrubs of wallum heaths or heathy understorey . . . . .	4. <i>G. leiophylla</i>
6. Ovaries and fruits pubescent . . . . .	7
Ovaries and fruits glabrous . . . . .	9
7. Leaves simple, linear, or deeply pinnatisect into linear-acute lobes; perianths sparsely puberulent . . . . .	5. <i>G. longistyla</i>
Leaves simple, oblong-obovate, obtuse, mucronate, or pinnatifid with obtuse pungent pointed lobes; perianths densely pubescent . . . . .	8
8. Prostrate or decumbent shrubs; leaves pinnatifid with obtuse, pungent pointed lobes . . . . .	6. <i>G. scortechinii</i>
Erect or spreading shrubs; leaves not lobed, apex mucronate but not pungent pointed . . . . .	7. <i>G. floribunda</i>
9. Leaves or lobes oblong to oblong-ovate, apex obtuse, mucronate . . . . .	10
Leaves or lobes linear to linear-elliptic, apex acute to attenuate . . . . .	12
10. Leaves simple, entire or pinnatifid to pinnatisect; flowers whitish on pedicels 2–3 mm long . . . . .	8. <i>G. hilliana</i>
Leaves simple, always entire; flowers green with red or pink in apical region or with reddish hairs, on pedicels 2.5–4 mm long . . . . .	11
11. Flowers in terminal racemes ca 1.5–2 cm long . . . . .	9. <i>G. sp. 1.</i>
Flowers in axillary racemes ca 1 cm long . . . . .	10. <i>G. sp. 2.</i>
12. Leaves up to 12.5 cm long, puberulent to glabrous on undersurface; inflorescences short terminal racemes 1–1.5 cm long . . . . .	4. <i>G. leiophylla</i>

- Leaves up to 4 cm long, appressed silky pubescent on undersurface; inflorescences short terminal racemes or  $\pm$  clusters 0.2–0.4 cm long . . . . . 11. *G. linearifolia*
13. Ovaries and fruits glabrous . . . . . 14  
Ovaries and fruits pubescent . . . . . 15
14. Leaves always pinnate with 11–24 sometimes pinnatisect pinnae, occasionally bipinnate; flowers orange-yellow on pedicels 0.8–1.6 cm long . . . . . 12. *G. robusta*  
Leaves simple, entire to pinnatisect; flowers white on pedicels 2–3 mm long . . . . . 8. *G. hilliana*
15. Flowers cream on pedicels 2–4 mm long, perianths *ca* 1.2–1.8 cm long with inrolled apical region 3–4 mm long . . . . . 13. *G. sp. 3.*  
Flowers cream or red on pedicels 5–10 mm long, perianths *ca* 1.8–2.2 cm long with inrolled apical region 2–3 mm long . . . . . 16
16. Leaves pinnatisect or simple, linear; ovaries on stipes 1–2 mm long . . . . . 5. *G. longistyla*  
Leaves pinnatisect, never simple, segments linear-elliptic to narrowly elliptic; ovaries  $\pm$  sessile . . . . . 14. *G. banksii*

### 1. *Grevillea striata* R. Br.

### BEEFWOOD

Tree up to *ca* 15 m tall, usually smaller, young tips ferruginous pubescent. Leaves simple; petioles 0.4–1.4 cm long; blades linear-oblong or linear-elliptic, apex attenuate, base attenuate, margins flat or slightly recurved, 15–50 cm  $\times$  0.3–0.9 cm, green,  $\pm$  smooth and eventually glabrous above, striate with 7–13 appressed pubescent longitudinal veins below. Inflorescences of narrow racemes 7–13 cm long, usually several together in terminal panicle shorter than leaves, rachis pubescent, pedicels 1–2.5 mm long, pubescent; perianth whitish, 3.5–6.5 mm long, curved, appressed pubescent outside, puberulent inside about middle, apical region clavate, recurved, *ca* 0.5 mm long; ovary on stipe 1–1.5 mm long, style 4–5 mm long, all glabrous, stigmatic region conical. Fruits compressed ovoid, shortly beaked, 1.4–1.7 cm  $\times$  1–1.2 cm  $\times$  *ca* 0.3 cm, glabrous.

Darling Downs and Burnett districts in the drier parts. Flowers spring–summer.

### 2. *Grevillea singuliflora* F. Muell.

Shrub up to *ca* 75 cm tall, branchlets appressed puberulent. Leaves simple; petioles 1–2 mm long; blades ovate to oblong-ovate or broadly ovate, apex obtuse, mucronate, base cuneate to  $\pm$  truncate, margin thickened, yellowish when dry, 0.7–1.6 cm  $\times$  0.4–1.5 cm,  $\pm$  glabrous, deep green above, often paler below. Flowers solitary, terminal on glabrous peduncles 1–1.2 cm long; perianth green, sometimes with yellow markings, 1.2–1.5 cm long, glabrous, apical region clavate, incurved, *ca* 1.5 mm long; anthers *ca* 1 mm long; receptacle oblique; ovary on stipe 5–10 mm long; style 9–10 mm long, all glabrous, stigmatic region disc-like. Fruits inflated, ellipsoid or broadly so, 1.2–1.5 cm  $\times$  0.7–0.9 cm  $\times$  *ca* 0.7 cm, glabrous.

Sandy or sandstone areas of the Moreton and Darling Downs districts. Flowers spring.

### 3. *Grevillea helmsiae* F. M. Bailey

Shrub or small tree up to *ca* 13 m tall, very young shoots appressed pubescent, otherwise glabrous. Leaves simple; petioles 0.3–1.1 cm long; blades obovate or elliptic, sometimes narrowly so, apex acute or obtuse, mucronate, base cuneate to attenuate, margin flat or slightly recurved, entire or sometimes irregularly denticulate on longer leaves, 3.5–12(–18) cm  $\times$  0.6–3.9 cm,  $\pm$  glabrous, dark green above, paler beneath, penninerved. Inflorescences terminal racemes 1.2–3 cm long, rachis and pedicels appressed pubescent, pedicels 4–7 mm long; perianth white, 1–1.2 cm long, sparsely pubescent outside, tuft of hairs inside about middle of each segment, apical region clavate, incurved, 1–1.5 mm long; anthers *ca* 0.5 mm long; receptacle not or only slightly oblique; ovary on stipe *ca* 2 mm long, style 1.1–1.4 cm long, all glabrous, stigmatic region disc-shaped. Fruits compressed, upper suture curved more than lower, beaked, style persistent, 2.3–2.9 cm  $\times$  1.2–1.5 cm  $\times$  0.6–0.9 cm.

Depauperate rainforest or brigalow communities of the northern districts of the region. Flowers summer.



**Fig. 3** PROTEACEAE — A–D *Hakea* spp. — A<sub>1</sub>–A<sub>2</sub> *H. microcarpa*, A<sub>1</sub> inflorescences in leaf axils x1, A<sub>2</sub> flower x3; B *H. purpurea*, flowering branchlet x1; C<sub>1</sub>–C<sub>2</sub> *H. dactyloides*, C<sub>1</sub> flowering branchlet x<sup>3</sup>/<sub>4</sub>; C<sub>2</sub> fruit x<sup>3</sup>/<sub>4</sub>; D *H. florulenta*, leaf showing venation x1; E–G *Grevillea* spp. — E *G. leiophylla*, flowering branchlet x1; F *G. floribunda*, flowering branchlet x1; G<sub>1</sub>–G<sub>4</sub> *G. banksii*, G<sub>1</sub> inflorescence x<sup>3</sup>/<sub>4</sub>, G<sub>2</sub> leaf x<sup>3</sup>/<sub>4</sub>, G<sub>3</sub> fruit x1, G<sub>4</sub> seed x1.

**4. *Grevillea leiophylla* F. Muell. ex Benth.**

Sprawling to erect shrub up to *ca* 1 m tall, young branchlets angular, pubescent, soon glabrous. Leaves simple; petioles 1–3 mm long; blades linear to linear-elliptic, apex acute, mucronate, base attenuate, margins recurved, 1–12.5 cm × 0.15–0.4 cm, glabrous green above, with 3 conspicuous longitudinal nerves, appressed silky puberulent to glabrous below. Inflorescences short terminal racemes *ca* 1–1.5 cm long, rachis and pedicels shortly pubescent, pedicels 5–7(–8) mm long; perianth pinkish or lavender, 6–7(–8) mm long, pubescent outside, villous inside about lower third, apical region incurved, clavate, *ca* 2 mm long; anthers *ca* 0.5 mm long; ovary on stipe 0.5–1 mm long, style 0.6–0.8(–1.2) cm long, all glabrous, apical region disc-shaped. Fruits narrowly ovoid, 8–9 mm × 2.5–3.5 mm × 2.5–3.5 mm, tuberculate, style persistent. **Fig. 3E.**

Usually in wallum or heathy areas on sandy soils in the coastal districts. Flowers spring to autumn.

**5. *Grevillea longistyla* Hook.**

Slender shrub up to *ca* 5 m tall, young branchlets shortly ferruginous pubescent, soon glabrous. Leaves simple or very deeply pinnatisect; petioles 5–10 mm long; blades and lobes linear, apex acute, base attenuate, margin revolute often ± to midrib, 5–30 cm × 0.15–0.5 cm, lobed leaves *ca* 30–35 cm long, lobes *ca* 5–7, 2.5–18 cm × 0.1–0.4 cm, green glabrous above, appressed white silky pubescent below. Inflorescences racemes 3–10 cm long with up to 30 flowers, rachis and pedicels pubescent, pedicels 5–10 mm long; perianth red, 1.8–2.4 cm long, sparsely pubescent, apical region inrolled, clavate, *ca* 2 mm long; anthers *ca* 1 mm long; receptacles oblique; ovary pubescent on stipe 1–2 mm long, style 3.2–4.2 cm long, glabrous, stigmatic region disc-shaped. Fruits ± oblong, upper suture ± straight, lower curved, 0.9–1.1 cm × 0.7–0.8 cm × 0.7–0.8 cm, tipped by persistent style.

Darling Downs and Burnett districts in stony soils. Flowers late winter–spring.

**6. *Grevillea scortechinii* (F. Muell. ex F. M. Bailey) F. Muell.**

Prostrate to decumbent shrub up to 30 cm tall, branchlets ferruginous to grey pubescent. Leaves simple; petioles 0.4–1.5 cm long; blades pinnatifid, ± ovate to triangular-ovate, rarely obovate in outline, apex of lobes obtuse to acute, pungent-pointed, base usually cuneate, sometimes truncate, cordate or oblique, margin incised  $\frac{1}{3}$ – $\frac{2}{3}$  way to midrib, 3–8 cm × 1.5–6 cm, dark green eventually ± glabrous above, densely appressed silky pubescent below, coarse reticulation conspicuous above. Inflorescences of terminal racemes *ca* 2–3 cm long; rachis and pedicels densely silky pubescent, pedicels 1–2 mm long; perianth *ca* 1–1.2 cm long, appressed pubescent, apical region incurved, clavate, *ca* 2 mm long; anthers *ca* 1 mm long; ovary on stipe *ca* 1–2 mm long, both pubescent, style 1.5–2.2 cm long, ± glabrous, stigmatic region disc-shaped. Fruits ± ellipsoid, but with upper suture much shorter and less curved than lower, beaked, 1.2–1.4 cm × *ca* 0.7 cm × *ca* 0.7 cm, pubescent.

Stanthorpe area of the southern Darling Downs district. Flowers spring–summer.

**7. *Grevillea floribunda* R. Br.**

Erect or spreading shrub up to 2 m tall, usually much less, young growth and branchlets densely ferruginous pubescent, or sometimes hairs pale. Leaves simple; petioles 1–3 mm long; blades oblong-obovate, sometimes narrowly so, apex obtuse, mucronate, or sometimes ± acute, base cuneate, margin recurved, 1.2–6.2 cm × 0.3–1.4 cm, green eventually glabrous above, densely pubescent below with pale or ferruginous appressed hairs. Inflorescences of small terminal racemes 1–3 cm long, rachis and pedicels densely pubescent, pedicels 4–6 mm long; perianth orange-red or reddish brown, rarely greenish, 1–1.7 cm long, densely pubescent outside, apical region incurved, clavate, 2–3 mm long; anthers 0.75–1.25 mm long; ovary ± sessile, pubescent with short and long ferruginous or white hairs, style robust, 1–1.5 cm long, pubescent for half to all its length, stigmatic region disc-shaped. Fruits oblong to

ovoid, somewhat compressed, 1.1–1.5 cm × 0.6–0.75 cm × 0.4–0.5 cm, densely pubescent, style persistent. **Fig. 3F.**

Mainly drier sandy or sandstone areas of the region e.g. Barakula and Inglewood areas of the Darling Downs district. Flowers winter–spring.

### 8. *Grevillea hilliana* F. Muell.

WHITE YIEL YIEL

Tree up to ca 30 m tall, young branchlets finely appressed ferruginous pubescent, soon glabrous. Leaves entire or pinnatifid to pinnatisect, entire leaves with petioles 0.7–1.8 cm long; blades oblong-obovate, apex obtuse, mucronate, base cuneate to attenuate, margin flat or slightly recurved, 7.5–22 cm × 1.4–6 cm, pinnatisect leaves up to ca 40 cm × 25 cm, lobes oblong or elliptic-oblong, apex acute or obtuse, both dark green above, white silky pubescent below, pinnate venation conspicuous both surfaces. Inflorescences dense, usually axillary racemes 6–20 cm long, rachis and pedicels appressed pubescent, pedicels 2–3 mm long; perianth white, 6–9 mm long, appressed pubescent, apical region incurved, clavate, ca 1.5–2 mm long; anthers ca 0.5 mm long; ovary on stipe 1–1.5 mm long, style 1.1–1.4 cm long, all glabrous, stigmatic region disc-shaped. Fruits compressed, ± ellipsoid, beaked, 2–2.5 cm × 1.3–1.7 cm × 0.6–1.2 cm, style persistent.

Rainforest or depauperate, littoral or riverine rainforest of the coastal districts. Flowers winter to summer. Timber reddish brown, beautifully grained, hard and heavy, could be used for veneers or cabinet work.

### 9. *Grevillea* sp. 1.

Spreading shrub up to 2 m tall, usually much less, branchlets reddish pubescent, eventually glabrous. Leaves simple; petioles 1.5–4 mm long; blades oblong-obovate or narrowly obovate, apex obtuse, mucronate, base attenuate, margin recurved, 1.7–7.2 cm × 0.4–0.8 cm, pubescent with long hairs, denser below. Inflorescences few-flowered terminal racemes ca 1.5–2 cm long, rachis and pedicels reddish pubescent, pedicels 3–4 mm long; perianth green with red or pink in upper half, 1.2–1.4 cm long, pubescent with appressed reddish hairs, apex inrolled, clavate, ca 2 mm long; anthers ca 1 mm long; ovary on stipe 0.5–1 mm long, style ca 1.25 cm long, all glabrous, stigmatic region disc-shaped. Fruits slightly compressed, narrowly ellipsoid, beaked, 1.7–1.8 cm × ca 0.7 cm × 0.4–0.6 cm, style persistent.

Recorded from Mt. Greville and Mt. Maroon from rocky ridges and slopes in eucalypt forest. Flowers intermittently much of the year.

### 10. *Grevillea* sp. 2.

Shrub 1–3 m tall; young branchlets reddish pubescent, eventually greyish. Leaves simple; petioles 2–4 mm long; blades narrowly oblong to oblong elliptic, apex obtuse to blunt, mucronate, base cuneate to attenuate, margin entire, 4.5–8 cm × 0.6–1.2 cm, puberulent becoming glabrous with age, densely pubescent below with appressed whitish hairs and scattered red ones. Inflorescences several-flowered axillary racemes, peduncle and rachis less than 1 cm long, pedicels 2.5–4 mm long, all reddish appressed pubescent; perianth 1.2–1.5 cm long, appressed reddish pubescent, apex clavate, inrolled, ca 2–2.5 mm long; anthers ca 1 mm long; ovary on stipe 2–2.5 mm long, all glabrous, style 1.2–1.5 cm long, minutely pubescent, stigmatic region disc-like with a central tubercle. Fruits ± ellipsoid slightly laterally compressed, beaked with persistent style, 1.8–2 cm × ca 0.6 cm × ca 0.4 cm.

Recorded from Coomanglah State Forest between Monto and Biloela, on sandstone ridges. Flowers spring.

### 11. *Grevillea linearifolia* (Cav.) Druce

Shrub up to 1.5 m tall, young growth appressed pubescent, soon glabrous, young branchlets angular. Leaves simple; petioles 1–2 mm long; blades linear-elliptic, apex acute, base attenuate, margin recurved, 1.2–4 cm × 0.1–0.3 cm, green with 3 longitudinal veins prominent above, appressed silky pubescent below. Inflorescences short terminal racemes or clusters ca 2–4 mm long, rachis and pedicels appressed pubescent, pedicels 5–6 mm long; perianth whitish, 6–7.5 mm long, appressed

pubescent outside, tuft of hairs inside in lower third, apical region incurved, clavate, *ca* 1–1.5 mm long; anthers *ca* 0.5 mm long; ovary on stipe *ca* 1 mm long, style 6–8 mm long, all glabrous, stigmatic region disc-shaped. Fruits narrowly ovoid, 0.9–1.1 cm × 0.3–0.4 cm × 0.3–0.4 cm, tuberculate, style persistent.

Mainly on granite areas near Stanthorpe, Eukey and Wallangarra areas of the Darling Downs district. Flowers spring–summer.

### 12. *Grevillea robusta* Cunn. ex R. Br.

SILKY OAK

Tree up to *ca* 35 m tall; bark hard grey, furrowed or fissured; young branchlets appressed silky pubescent. Leaves pinnate, pinnae 11–24, often pinnatisect, or occasionally bipinnate, 15–30 cm long, lobes usually ovate or elliptic or tapered, apices acute mucronate, green with conspicuous coarse reticulate venation, puberulent to ± glabrous above, densely appressed silky pubescent below. Inflorescences of terminal racemes, 2–several together, 10–15 cm long, rachis and pedicels ± glabrous, pedicels 0.8–1.6 cm long; perianth orange–yellow, 0.9–1.1 cm long, glabrous, apical region incurved, clavate, *ca* 2 mm long; anthers *ca* 1 mm long; ovary on stipe 2–2.5 mm long, style 1.5–2 cm long, all glabrous, stigmatic region cone-shaped. Fruits ± ellipsoid to boat-shaped, 1.5–2 cm long, beaked by persistent style.

Rainforest or depauperate rainforest of the coastal districts as far west as Bunya Mts. in the Darling Downs district. Flowers spring. Flowers and fruits yield HCN but no cases of poisoning have been recorded in the literature. Timber yellow-brown, medium hard with prominent rays, once used for cabinet work and furniture but now relatively rare. Cultivated as an ornamental tree.

### 13. *Grevillea* sp. 3.

Slender shrub or tree up to *ca* 7 m tall, young branchlets pubescent. Leaves pinnate, 10–27 cm long; lobes sessile, linear, sometimes divided into 2, apex acute, margin revolute, 2.5–12.5 cm × 0.1–0.3 cm, green ± glabrous above, densely appressed silky white pubescent below. Inflorescences of terminal racemes 3–15 cm long, rachis and pedicels densely pubescent, pedicels 2–4 mm long; perianth cream, 1.2–1.8 cm long, densely pubescent, apical region incurved, clavate, 3–4 mm long; anthers *ca* 1.5 mm long; ovary ± sessile, pubescent with short and long hairs, style 3.5–4.5 cm long, glabrous, stigmatic region disc-shaped. Fruits compressed, ± ovoid, upper suture longer than lower, 1.4–1.6 cm × 0.8–1.1 cm × 0.5–0.6 cm, shortly pubescent, style persistent.

Recorded from Coochin Hills, Rupari Hill in the Glasshouse Mts. area, Mt. Walsh near Biggenden, and around Mundubbera in the Burnett district. Flowers winter–spring, occasionally autumn. Cultivated as an ornamental.

### 14. *Grevillea banksii* R. Br. RED FLOWERED SILKY OAK; DWARF SILKY OAK

Shrub or tree up to *ca* 6–8 m tall, young tips pubescent. Leaves pinnatisect, 14–25 cm long, lobes linear-elliptic to narrowly elliptic, apex acute, margin recurved, 3.5–17 cm × 0.3–1.6 cm, green glabrous or sparsely pubescent above, densely silky appressed pubescent below, hairs pale or ferruginous. Inflorescences of terminal racemes 6–14 cm long, rachis and pedicels densely pubescent, pedicels 5–9 mm long; perianth red, pinkish-red or cream, 1.8–2.5 cm long, pubescent, apex incurved, clavate, *ca* 2.5–3 mm long; anthers *ca* 1.5 mm long; ovary ± sessile on somewhat oblique receptacle, pubescent, style 4.5–5 cm long, glabrous, stigmatic region disc-shaped. Fruits compressed ovoid, 1.5–2 cm × 1–1.2 cm × 0.3–0.4 cm, pubescent, tipped by persistent style. **Fig. 3G.**

Coastal districts on sandy or stony soils, often in disturbed areas. Flowers winter–spring. Cultivated as an ornamental shrub. Flowers and fruits yield HCN but no cases of poisoning have been noted. Cultivated plants with red flowers have been called var. *Fosteri* or var. *Forsteri* but this designation has no botanical standing.

## 80. CELASTRACEAE

Erect trees, shrubs or climbers. Leaves alternate or opposite; stipules small and caducous or absent; blades simple. Flowers mostly cymose or fasciculate, often bisexual, actinomorphic, small; calyx 4-5-, rarely 3-lobed, imbricate or very rarely valvate; stamens 4-5, rarely more, alternate with petals, inserted on or below margin of disc, anthers 2-locular, opening lengthwise; disc usually present, often fleshy and flat; ovary superior, free or adherent to disc, 1-5-locular, ovules mostly 2, rarely up to 10, from inner angle of loculi, rarely pendulous, style short,  $\pm$  3-lobed. Fruits capsules, drupes, berries, samaras, or rarely divided into carpels; seeds often arillate, mostly with copious fleshy endosperm and rather large straight embryo, cotyledons flat, foliaceous.

55 genera with 850 species tropical and temperate; 16 genera with 38 species Australia; 7 genera with 14 species south-eastern Queensland.

1. Leaves all or mostly opposite . . . . .	2
Leaves alternate . . . . .	4
2. Scandent shrubs or vines . . . . .	1. <i>Loeseneriella</i>
Erect shrubs or trees . . . . .	3
3. Ovaries usually 1-locular or rarely 2-locular; leaves in Queensland species with entire margins . . . . .	2. <i>Pleurostyliia</i>
Ovaries usually 3-locular or rarely 4-5-locular; leaves in Queensland species with crenate denticulate margins, or if $\pm$ entire then very narrow . . . . .	3. <i>Cassine</i>
4. Scandent shrubs or vines . . . . .	4. <i>Celastrus</i>
Erect shrubs or trees . . . . .	5
5. Flowers reddish purple; anthers sessile; capsules 5-locular with 5 valves . . . . .	5. <i>Hedraianthera</i>
Flowers whitish or greenish yellow; stamens with filaments; capsules 3- or rarely 2- or 4-locular with 2-4 valves . . . . .	6
6. Ovules 3-8 per loculus or placenta; capsules dehiscent into 3 or rarely 4 valves . . . . .	6. <i>Denhamia</i>
Ovules 2 per loculus; capsules dehiscent into 2 valves . . . . .	7. <i>Maytenus</i>

## 1. LOESENERIELLA A. C. Smith

Scandent shrubs, glabrous except sometimes flowers; branchlets opposite, slightly thickened at nodes. Leaves opposite or subopposite, petiolate. Inflorescences axillary corymbose panicles, or pseudocymose; flowers often numerous, pedicellate; sepals 5, narrowly imbricate; petals 5, imbricate, somewhat spreading at anthesis, entire, glabrous or pilose within; disc thick, fleshy; stamens 3, filaments ligulate, connate at base; ovary with base immersed in disc, obscurely trigonous, 3-locular, 4-8 ovules per loculus, 2-seriate, style narrow-conical, stigmas obscure. Fruits of 3 distinct carpels, or fewer by abortion, opening along middle into 2 boat-shaped valves; seeds 4-8, compressed, usually winged, basally attached.

About 26 species southern China, south-eastern Asia, Indomalaysia, Australia; 1 species endemic in Australia, occurring in south-eastern Queensland.

1. *Loeseneriella barbata* (F. Muell.) C. T. White

*Hippocratea barbata* F. Muell.; *H. obtusifolia* Roxb. var. *barbata* (F. Muell.) Benth.

Woody glabrous climber. Leaves with petioles 6-10 mm long; blades ovate, elliptic or obovate, apex bluntly acuminate or obtuse, base cuneate to rounded, margin entire, 4-10.2 cm  $\times$  1.4-4.5 cm. Inflorescences of loose axillary cymes; calyx lobes obtuse, *ca* 1 mm long; petals *ca* 4 mm long, apparently bearded inside. Capsules oblong or ovoid, *ca* 2-5.5 cm long, many-seeded; seeds *ca* 8-10 mm long, with wing 2-3 cm long at one end.

Mainly of depauperate rainforests of the region. Flowers spring-summer.

## 2. PLEUROSTYLIA Wight &amp; Arn.

Shrubs or trees. Leaves decussate; stipules small, caducous; blades  $\pm$  coriaceous. Inflorescences of few-flowered cymes in axils of leaves or bracts; flowers bisexual, 5-, rarely 4-merous; calyx lobes imbricate; petals imbricate; stamens inserted outside disc, anthers sub-basifixed, introrse with thick dorsal connective; disc cupular, fleshy; ovary free or slightly basally united with disc, 2- or usually 1-locular by abortion, ovules 2–8 per loculus, erect, style short, terminal, slightly dilated at apex, stigma capitate or slightly peltate. Fruits 1-locular with persistent hardened style on lateral side, exocarp and mesocarp thinly coriaceous, endocarp crustaceous, thin, inside glossy and irregularly ridged, easily separated from mesocarp and exocarp, with several irregular clefts at base around hilum of seed; seeds 1, rarely 2, aril apparently absent.

About 6 species tropical and southern Africa, Madagascar, Mascarenes, India, south-eastern Asia and Australia; 1 species Australia, occurring in south-eastern Queensland.

1. *Pleurostylia opposita* (Wall.) Alston

*Celastrus opposita* Wall.; *Elaeodendron microcarpum* C. T. White & Francis; *Pleurostylia wightii* Wight & Arn. var. *neocaledonica* Loes.

Shrub or small tree up to 15 m tall, glabrous. Leaves with petioles 2–5 mm long; blades ovate to oblong-elliptic, occasionally obovate, apex obtuse or somewhat bluntly acuminate, base cuneate, margin  $\pm$  entire, 2–7.5 cm  $\times$  0.8–4.5 cm, glabrous, dark green above, paler beneath, reticulation visible both surfaces when dry. Inflorescences few-flowered axillary cymes, rarely internodal and opposite, peduncles 3–5 mm long, pedicels 1.5–3 mm long; flowers greenish; calyx lobes obtuse, ca 0.5 mm long; petals 1–1.5 mm long. Fruits yellowish, ellipsoid or sometimes slightly obovoid, 5–7 mm long.

Northern districts of the region in depauperate rainforest or rainforest. Flowers spring–summer.

## 3. CASSINE L.

Shrubs or small trees, usually quite glabrous. Leaves opposite or alternate, entire or crenate. Inflorescences of simple or compound dichasial cymes; flowers often polygamous, 4–5-merous, rarely 3-merous; calyx lobed; petals imbricate; stamens inserted under edge of disc, filaments short, anthers nearly globular; disc thick, ovary partly or not at all immersed in disc, conical, 2–3-, rarely 4–5-locular, ovules 1–2 per loculus, style very short. Drupes very succulent or nearly dry, 1–2- or 3-locular, endocarp hard; seeds 1–3, exarillate.

About 80 species tropical and subtropical; 2 species Australia, occurring in south-eastern Queensland.

- |  |                          |
|--|--------------------------|
| 1. Fruits red, 1–2 cm long; flowers with petals 2–2.5 mm long . . . . .          | 1. <i>C. australis</i>   |
| Fruits shiny black, 1.5–2.5 cm long; flowers with petals 1.5–2 mm long . . . . . | 2. <i>C. melanocarpa</i> |

1. *Cassine australis* (Vent.) Kuntze

*Elaeodendron australe* Vent.; *Cassine australis* var. *pendunculosa* Domin

Dioecious shrub or small tree up to 8 m tall, glabrous. Leaves opposite or occasional ones alternate; petioles 3–10 mm long; blades obovate or occasionally elliptic, or sometimes very narrowly obovate, apex obtuse or occasionally bluntly acuminate or subacute, base cuneate, margin crenate or crenulate at least in upper half, 2.5–15 cm  $\times$  0.5–7 cm, rarely larger or smaller, shiny green above, paler beneath, venation visible when dried but not prominent. Inflorescences few-flowered lateral cymes, peduncles 0.8–1.2 cm long, pedicels 4–7 mm long; flowers yellowish green; calyx lobes 4, 0.5–1 mm long, obtuse; petals 4, obtuse, 2–2.5 mm long. Fruits bright orange to scarlet, ellipsoid or oblong-ovoid, fleshy, 1–2.5 cm long.

Two varieties occur in the region:

- |   |   |
|---|---|
| 1. Leaves less than 4 times as long as broad, usually about twice as long as broad, margin crenate; fruits up to 2.5 cm long          | <i>C. australis</i> var. <i>australis</i>     |
| Leaves more than 4 times as long as broad, often 8–10 times as long as broad, margin crenulate to subentire; fruits up to 1.5 cm long | <i>C. australis</i> var. <i>angustifolius</i> |

*C. australis* var. *australis* (Fig. 4A.) occurs in all districts but mainly in the coastal ones in rainforest or depauperate rainforest, while *C. australis* var. *angustifolius* (Benth.) Jessup (*Elaeodendron australe* var. *angustifolium* Benth.; *E. integrifolium* (Tratt.) G. Don) is found mainly in the drier western districts in depauperate vine forest or brigalow or denser open forest. Flowers mainly spring.

**2. *Cassine melanocarpa* (F. Muell.) Kuntze** OLIVE PLUM  
*Elaeodendron melanocarpum* F. Muell.; *Barringtonia sphaerocarpa* C.A. Gardner;  
*Cassine glauca* auct. non (Rott.) Kuntze, Payens

Dioecious shrub to medium sized tree, glabrous. Leaves opposite; petioles 0.6–2 cm long; blades obovate or occasionally elliptic, apex obtuse or bluntly acuminate, base cuneate or rarely rounded, margin crenate, sometimes crenulate, 4–15 cm × 2–8.5 cm, green, glabrous, venation conspicuous both surfaces when dry. Inflorescences few-to several-flowered glabrous panicles; flowers greenish; calyx lobes 3, occasionally 4, ca 0.5 mm long; petals 3, rarely 4, obtuse, 1.5–2 mm long. Fruits shining black when mature, globose or oblong, 1.5–2.5 cm long.

Northern parts of the Wide Bay district; usually a small tree in closed forest or depauperate rainforest, behind or near beaches. Flowers? spring to autumn.

#### 4. CELASTRUS L.

Scandent, deciduous or rarely evergreen usually dioecious shrubs, branchlets usually lenticellate. Leaves spirally arranged; stipules small, usually caducous. Inflorescences pyramidal or narrow thyrses; flowers few to several, cymose; calyx campanulate, lobes 5, imbricate or valvate; petals 5; stamens 5, inserted on or immediately under margin of disc; staminodes in female flowers much smaller; ovary free from disc or base slightly confluent with it, usually ± 3-lobed, ovules 1–2, attached at inner angle at base, anatropous, style thick, straight, stigma usually obscurely 3-lobed. Capsules usually subglobose, tipped by persistent style, loculicidally 3-valved; seeds 1–6, enveloped by fleshy crimson aril.

30–33 species, tropical and subtropical; 2 species Australia, occurring in south-eastern Queensland.

- |   |                         |
|---|-------------------------|
| 1. Fruits 2–5.5 mm long, inside surface with scattered red dots; sepals 1.5–2 mm long | 1. <i>C. australis</i>  |
| Fruits 7–9.5 mm long, inside surface without scattered red dots; sepals 1–1.5 mm long | 2. <i>C. subspicata</i> |

**1. *Celastrus australis* Harvey & F. Muell.**

*Celastrus subspicata* auct. Aust. non Hook.; *C. paniculata* auct. non Willd., Ding Hou Scandent dioecious shrub, young parts, inflorescence, sepals densely grey pubescent, otherwise ± glabrous, branches conspicuously lenticellate. Stipules 0.8–1.8 mm long; petioles 0.3–1.5 cm long; blades narrowly ovate to elliptic, rarely obovate, apex acute to acuminate, base cuneate to rarely obtuse, margin entire or dentate, 3–9 cm × 1–4 cm, dark green above, paler, somewhat greyish below. Inflorescences terminal panicles, bracts small, pedicels 0.8–2.5 mm long; flowers yellowish green; sepals obtuse, basally connate, 1.5–2 mm long; petals 1.8–3 mm long, ovary 3-locular, 2 ovules per loculus. Capsules light brown drying blackish, ellipsoid to ovoid, 2–5.5 mm long, transversely rugose, inner surface of valves parchment coloured with scattered red dots at maturity; seeds orbicular, 3–4.2 mm long, arils bright orange, completely surrounding seeds.

Usually in the cooler and moister rainforests of the Moreton and eastern Darling Downs district. Flowers spring to late autumn.

**2. *Celastrus subspicata* Hook.***Celastrus paniculata* auct. non Willd., Ding Hou

Scandent dioecious shrub, young parts, inflorescences, sepals densely light brownish pubescent, otherwise  $\pm$  glabrous; branchlets conspicuously lenticellate. Stipules 1.5–4 mm long; petioles 0.3–1.3 cm long; blades narrowly ovate, elliptic, or obovate, apex acute, acuminate or rarely obtuse, base cuneate, rarely rounded, margin entire or dentate, 5–14 cm  $\times$  2–7 cm, dark green above, paler below. Inflorescences terminal panicles, bracts small, pedicels 1.5–5 mm long; flowers yellowish green; sepals obtuse, basally connate, 1–1.5 mm long; petals 2.3–3 mm long; ovary 3-locular, ovules 2 per loculus. Capsules yellow drying brownish, ellipsoid to ovoid, 5–9.5 mm long, transversely rugose, inner surface parchment coloured; seeds orbicular, 4.5–6 mm long, arils yellow-green or bright orange, completely surrounding seeds. **Fig. 4B.**

Usually in the warmer and drier rainforests throughout the region. Flowers mainly spring–summer, rarely autumn.

**5. HEDRAIANTHERA F. Muell.**

Shrubs or trees. Leaves spirally arranged or often distichous on lateral branches; stipules minute. Inflorescences racemose, fasciculate, or flowers solitary, bisexual; calyx 5-lobed, persistent; petals 5, membranous, inserted below disc, entire, ovate, sessile, deciduous, imbricate in bud; stamens 5, opposite calyx lobes, anthers sessile on top of glandular disc, 2-locular, locules divaricate, slits longitudinal, 2-valved; disc annular, crenate; ovary 5-locular, ovules numerous per loculus, stigma orbicular, undivided, sessile. Fruits bony, almost globose, 5-locular; seeds ascending.

1 species endemic in eastern Australia, occurring in south-eastern Queensland.

**1. *Hedraianthera porphyropetala* F. Muell.**

Slender glabrous shrub or small tree up to *ca* 6 m tall. Leaves alternate; petioles 1–5(–9) mm long; blades narrowly ovate, apex acuminate, or occasionally obtuse, base cuneate, margin slightly undulate, 4.5–14(–18) cm  $\times$  1–5(–6.5) cm, glabrous, dark green above, paler below, lateral venation visible when dried, obscure when fresh. Flowers usually solitary, rarely 2, axillary, pedicels 1–2.2 cm long; sepals *ca* 1 mm long; petals rich red to purple, obtuse, *ca* 3–7 mm long. Capsules woody, ovoid, *ca* 1.5–2.5 mm long, 5-valved. **Fig. 4C.**

Rainforest of the coastal districts or in moister eucalypt forest with rainforest elements in understorey. Flowers autumn.

**6. DENHAMIA Meissn.**

Shrubs or small trees, glabrous, often glaucous. Leaves alternate, rigid, entire or toothed. Inflorescences of few-flowered cymes or racemes; calyx 5-lobed; petals 5; stamens 5, inserted on margin of disc, filaments subulate, anthers ovate; disc broadly cupular, thick; ovary perfectly or imperfectly 2–5-locular, ovules 2–10 per loculus. Capsules ovoid or globose, opening in thick woody or bony valves with placentas or dissepiments in their centre; seeds enclosed in fleshy aril.

About 7 species endemic in Australia; 3 species south-eastern Queensland.

- |  |                             |
|--|-----------------------------|
| 1. Capsules 0.6–0.8 cm long; leaves less than 3 cm long, usually less than 2 cm long         | 1. <i>D. parvifolia</i>     |
| Capsules 1–1.7 cm long; leaves more than 3 cm long, usually more than 5 cm long              | 2                           |
| 2. Inflorescences narrow, up to 13 cm long; flowers with styles 2–2.5 mm long; fruits ovoid  | 2. <i>D. celastroides</i>   |
| Inflorescences up to 4 cm long; flowers with styles 1–1.5 mm long; fruits depressed globular | 3. <i>D. pittosporoides</i> |



**3. *Denhamia pittosporoides* F. Muell.**

Shrub or tree up to 7 m tall, sometimes multi-stemmed, glabrous. Leaves with petioles 2–6 mm long; blades narrowly ovate to narrowly elliptic, or narrowly oblong-elliptic, rarely linear-ovate, apex blunt or occasionally acute, base cuneate to attenuate, sometimes oblique, margin serrate, often irregularly and coarsely so, (3–)5–14.5 cm × (0.4–)0.7–2.5 cm, discolourous, lateral venation prominent above, drying light on dark green surface, visible below, ± same colour as pale surface. Inflorescences small cymose panicles up to 4 cm long, pedicels 1–1.5 mm long; flowers creamish; calyx lobes *ca* 1 mm long; petals obtuse, *ca* 2.5 mm long; style 1–1.5 mm long. Capsules yellowish, depressed globular, 3–5-locular, 1.2–1.5 cm × 2–2.5 cm, usually 4-valved.

Depauperate rainforest of the region. Flowers spring–summer.

**7. MAYTENUS Molina**

Shrubs or small trees, young parts sometimes pubescent. Leaves alternate, rarely opposite or in fascicles; stipules small, caducous or absent, spines sometimes present. Inflorescences of axillary cymes, sometimes crowded, or sometimes axillary fascicles; flowers usually bisexual; calyx 5-, rarely 4-lobed; petals 5, rarely 4, spreading or sometimes reflexed after anthesis; stamens 5, inserted ± on margin of disc; disc fleshy, usually flat; ovary partly or rarely entirely immersed in disc, 3- or rarely 2-locular, 2 ovules per loculus, stigmas 3, rarely 2, ovules attached on inner side of septum near base. Capsules subglobose or slightly angular, loculicidally dehiscent, 2–6-seeded; seeds ellipsoid, at least base enveloped by aril.

225 species, tropical; *ca* 7 species endemic in Australia; 4 species south-eastern Queensland.

- |   |                           |   |
|---|---------------------------|---|
| 1. Leaves with margins always dentate, sometimes minutely so, and slightly recurved   |                           | 2 |
| Leaves with entire or slightly undulate margins, not recurved   |                           | 3 |
| 2. Leaves usually falcate towards apex, very narrowly ovate or narrowly obovate; usually more than 4 times as long as broad | 1. <i>M. silvestris</i>   |   |
| Leaves never falcate, ovate or occasionally narrowly ovate to elliptic, usually less than 3 times as long as broad          | 2. <i>M. bilocularis</i>  |   |
| 3. Leaf blades linear to narrowly obovate or oblong-obovate; capsules 0.4–0.6 cm long                                       | 3. <i>M. cunninghamii</i> |   |
| Leaf blades obovate or elliptic; capsules 0.7–1.2 cm long   | 4. <i>M. disperma</i>     |   |

**1. *Maytenus silvestris* N. Lander & L. A. S. Johnson**

Low shrub or shrub up to 4.5 m tall, glabrous except for young parts, young branchlets reddish, minutely lenticellate. Leaves with petioles 1–4 mm long; blades narrowly oblong to narrowly ovate or obovate, apex acute mucronate, often falcate, base cuneate, margin minutely dentate, juveniles often coarsely toothed, 1–8(–10) cm × 0.15–1.3(–1.8) cm, venation reticulate, almost equally prominent both surfaces. Inflorescences of axillary or lateral racemes, clusters or single flowers, pedicels 4–10 mm long; flowers pale green; sepals 5, obtuse, basally connate, *ca* 1 mm long; petals 5, 1.5–2 mm long; ovary 2-locular. Capsules yellow drying brown, spheroid, ellipsoid or obovoid, 4–7 mm long, 2-valved; aril completely surrounding seed. **Fig. 4E.**

Darling Downs district mainly on Granite Belt, and in Moreton district, generally in moister eucalypt forests. Flowers mainly spring–summer.

**2. *Maytenus bilocularis* (F. Muell.) Loes.**

*Celastrus bilocularis* F. Muell.

Shrub or small tree up to *ca* 10 m tall. Leaves with petioles 2–7 mm long; blades ovate to narrowly ovate, occasionally elliptic, apex acute, mucronate, base cuneate, margin dentate with lateral nerves protruding as teeth, rarely denticulate, 2.5–10 cm ×

1–5 cm, glabrous, venation visible both surfaces. Inflorescences short, few–several-flowered axillary or lateral racemes less than 10 cm long, occasionally growing out into leafy shoots; sepals 5, rarely 4, *ca* 0.5 mm long, glabrous; petals pale green or whitish, 5, rarely 4, 1.5–2 mm long. Capsules orange, obovoid, 2-valved, *ca* 4–6 mm long. **Fig. 4G.**

Throughout the region in rainforest, depauperate rainforest or wetter eucalypt forest of the coastal districts. Flowers spring.

### 3. *Maytenus cunninghamii* (Hook.) Loes.

*Catha cunninghamii* Hook.; *Celastrus cunninghamii* (Hook.) F. Muell.; *Celastrus cunninghamii* var. *parvifolia* F.M. Bailey; *Celastrus baileyanus* Domin; *Gymnosporia cunninghamii* (Hook.) Loes.

Shrub or small tree,  $\pm$  glabrous except for young shoots. Leaves with petioles 0.5–2(–4) mm long; blades linear to narrowly obovate or oblong-obovate, apex acute or obtuse, mucronate, base attenuate, margin entire, 1–8.5 cm  $\times$  0.15–1 cm, glabrous, lateral veins very obliquely ascending. Flowers solitary or in very small fascicles or racemes, pedicels 5–10 mm long; sepals 5, 0.5–1 mm long; petals pale greenish or whitish, 5, 1.5–2 mm long. Capsules yellowish, obovoid to orbicular, 2-valved, *ca* 4–6 mm long. **Fig. 4F.**

Drier parts of the region generally west of the Great Dividing Ra. on sandy soils in woodland or brigalow forest or depauperate rainforest, but also recorded from Helidon and Biggenden areas. Flowers spring–summer.

The forms of this species with leaves less than 2.5 cm long and capsules *ca* 4 mm long have been referred to as *Celastrus cunninghamii* var. *parvifolia* F.M. Bailey, but according to Ding Hou in his revision of *Celastrus* in *Annals of Missouri Botanic Gardens* 52 (1955) 215–302, this variety and *Maytenus cunninghamii* are conspecific.

### 4. *Maytenus disperma* (F. Muell.) Loes.

ORANGE BARK

*Celastrus dispermus* F. Muell.

Shrub or small to medium sized tree. Leaves with petioles 0.5–1.5 cm long; blades obovate or elliptic, apex obtuse or bluntly acuminate, rarely acute, base cuneate to attenuate, margin entire or slightly undulate, yellowish when dry, 3–11 cm  $\times$  1–4.5 cm, glabrous, thick, midrib and lateral veins prominent both sides when dry. Inflorescences small slender racemes 1–4 cm long, pedicels 1–3 mm long; sepals 4, obtuse, *ca* 1–1.5 mm long; petals cream to yellowish, 4, 2–3 mm long. Capsules yellow, obovoid or ellipsoid, 2-valved, 0.7–1.2 cm long. **Fig. 4H.**

Mainly northern districts of the region in depauperate rainforest or occasionally eucalypt forest, but also collected from Yarraman area. Flowers summer.

## 81. SIPHONODONTACEAE

Trees or climbing shrubs. Leaves spiral or alternate; stipules minute. Inflorescences axillary, cymose, sometimes 1-flowered; flowers 5-merous; calyx lobes basally united, imbricate; petals imbricate; stamens 5, sometimes alternating with 5 staminodes, closely adpressed to disc, anthers latrorse, connective distinct, broad, separating loculi; pistil half-immersed, adnate to large, hemispherical disc, upper half hollow and with style-like column rising from base, central channel or pit lined with 5 stigmatic lines ending in 5 stigmatic tufts, ovary *ca* 10-locular, each loculus divided horizontally into 2 superposed 1-ovulate loculi, upper ovule ascending, lower pendulous. Fruits large, pyriform to globose,  $\pm$  crustaceous, indehiscent, with  $\pm$  20 radiating bony pyrenes; embryo with large cotyledons in bony endosperm.

1 genus with 5 species south-eastern Asia to Australia; 3 species Australia; 1 species south-eastern Queensland.

1. **SIPHONODON** Griff.

Characters as for family.

1. **Siphonodon australis** Benth.

IVORYWOOD

Tree up to ca 30 m tall. Leaves with petioles 0.5–1.2 cm long; blades oblong-elliptic, elliptic or obovate, occasionally broadly so, apex generally obtuse, base cuneate to narrowly so, 3.4–14 cm × 1.4–6.5 cm, juvenile sometimes larger. Calyx lobes broad, ca 1.5–2 mm long; petals ca 3–5 mm long, deciduous. Fruits globose to ± oblong, 2–5 cm diameter.

Light rainforest or depauperate rainforest of the region, most often in coastal areas. Flowers spring. Timber suitable for wood carvings, inlays, small turnery, flooring; sapwood subject to attack by borers.

82. **STACKHOUSIACEAE**

Small herbs with woody, branched rhizome. Leaves alternate, exstipulate, blades simple, fleshy or leathery. Flowers bisexual, racemose, spicate or fasciculate; calyx tubular, 5-lobed, lobes imbricate; petals 5, perigynous, linear or spatulate, long-clawed, free or claws connate into tube, but free at base, imbricate; stamens 5, erect, alternate with petals, anthers 2-locular; disc lining calyx tube; ovary 2–5-locular, ovule 1 per loculus, basal, erect, styles 2–5, free or connate. Fruits of 2–5 indehiscent 1-seeded cocci.

3 genera with 27 species Malaysia, Australia and New Zealand; 3 genera with ca 25 species Australia; 1 genus with 4 species south-eastern Queensland.

1. **STACKHOUSIA** Smith

Annual or perennial herbs with striate stems. Inflorescences terminal racemes or spikes; flowers in groups in axils of bracts; petals long-clawed, claws connate except at base, rarely free, lobes spreading; stamens inserted on margin of calyx tube, free, usually unequal; ovary usually 3-locular, style usually 3-lobed. Fruits of usually 3, 1-seeded cocci and a columella.

25 species Australia, Malaysia, New Zealand; ca 23 species Australia; 4 species south-eastern Queensland.

- |  |                        |   |
|--|------------------------|---|
| 1. Corolla lobes acute or attenuate . . . . .  | 1. <i>S. viminea</i>   |   |
| Corolla lobes oblong, obtuse . . . . .   |                        | 2 |
| 2. Corolla tubes less than 5 mm long . . . . .   | 2. <i>S. muricata</i>  |   |
| Corolla tubes more than 6 mm long . . . . .  |                        | 3 |
| 3. Leaves generally obovate or spatulate; fruits acutely angled or winged, 2.5–3.5 mm long | 3. <i>S. spatulata</i> |   |
| Leaves generally linear to very narrowly obovate; fruits obtuse, reticulate, 1.5–2 mm long | 4. <i>S. monogyna</i>  |   |

1. **Stackhousia viminea** Smith

Usually erect glabrous herb. Leaves linear-oblong or narrowly obovate to elliptic, apex acute to obtuse, base attenuate, 0.4–4 cm × 0.05–0.65 cm. Flower clusters distant, pedicels up to 1 mm long; corolla yellow or greenish yellow, tube 3–3.5 mm long, lobes 1.5–2 mm long. Cocci strongly reticulate to muricate, 1.5–2.5(–3) mm long. **Fig. 5D.**

Throughout the region in a variety of habitats, from eucalypt open forest, to rocky hillsides to wallum heaths. Flowers late winter–spring to autumn.

This species is extremely variable and there are at least three forms occurring in south-eastern Queensland: one with linear-oblong leaves and reticulate cocci ca 1.5–2 mm long, usually found in open forest situations; another from the Granite belt and other rocky areas which is usually tufted, with narrowly obovate leaves and strongly (raised) reticulate cocci ca 2.5 mm long; and a third mainly found in wallum

or heath areas from Coolum to well north of Bundaberg, which is lax and leafless when in flower, and has strongly muricate cocci *ca* 3 mm long. Further study is required to decide whether the forms are worthy of definite taxonomic rank.

## 2. *Stackhousia muricata* Lindl.

Erect glabrous herb. Leaves linear to very narrowly obovate, apex acute to obtuse, base attenuate, 0.7–3 cm × 0.05–0.3 cm. Inflorescences of distant clusters of flowers, pedicels 0.5–1 mm long; corolla white, tube 3–4 mm long, lobes 1.25–1.5 mm long. Cocci *ca* 2.5 mm long, often tuberculate, otherwise reticulate. **Fig. 5E.**

Usually in drier areas on sandstone or rocky ridges. Flowers spring.

## 3. *Stackhousia spathulata* Sieber ex Sprengel

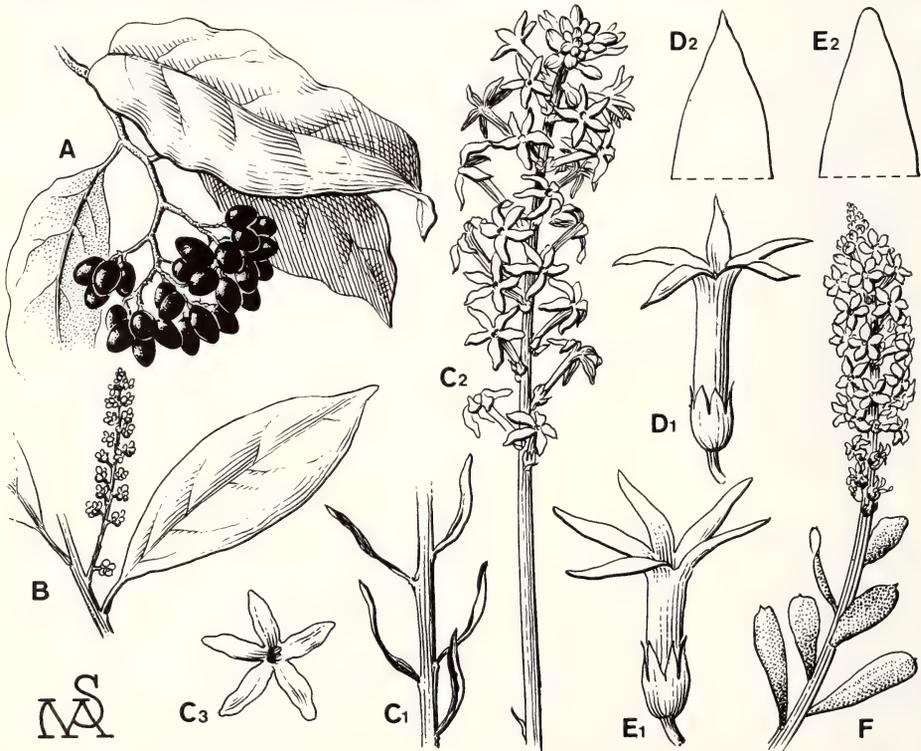
Ascending glabrous tufted herb. Leaves succulent, obovate or narrowly obovate, apex obtuse, mucronate, to acute, base attenuate, 0.6–3.5 cm × 0.25–1.5 cm. Inflorescences dense; flowers with unpleasant odour, pedicels up to 0.5 mm long; corolla whitish, tube 6.5–8 mm long; lobes 2.5–3 mm long. Cocci 2.5–3.5 mm long, narrowly winged or acutely angled. **Fig. 5F.**

Found in sand in coastal wallum heaths. Flowers late winter–spring.

## 4. *Stackhousia monogyna* Labill.

Erect glabrous herb. Leaves linear, linear-elliptic to narrowly obovate, apex acute to obtuse, base attenuate, 0.9–4 cm × 0.05–0.6 cm. Inflorescences dense; flowers on pedicels up to 0.5 mm long; corolla white, tube 6–7 mm long, lobes 3.5–4 mm long. Cocci 1.5–2 mm long, reticulate. **Fig. 5C.**

Scattered throughout the region in open forest or grassland. Flowers spring.



**Fig. 5** A–B ICACINACEAE — A *Pennantia cunninghamii*, fruiting inflorescence  $\times 1/2$ ; B *Citronella moorei*, young inflorescence  $\times 1/2$ ; C–F STACKHOUSIACEAE — *Stackhousia* spp. — C<sub>1</sub>–C<sub>3</sub> *S. monogyna*, C<sub>1</sub> part of stem with leaves  $\times 1$ , C<sub>2</sub> inflorescence  $\times 1$ , C<sub>3</sub> corolla showing obtuse lobes  $\times 2$ ; D<sub>1</sub>–D<sub>2</sub> *S. viminea*, D<sub>1</sub> flower  $\times 6$ , D<sub>2</sub> part of corolla lobe showing acute tip  $\times 25$ ; E<sub>1</sub>–E<sub>2</sub> *S. muricata*, E<sub>1</sub> flower  $\times 6$ , E<sub>2</sub> part of corolla lobe showing obtuse tip  $\times 25$ ; F *S. spathulata*, part of flowering stem  $\times 1/2$ .

## 83. ICACINACEAE

Trees or shrubs. Leaves mostly alternate, exstipulate, simple. Inflorescences usually cymose or thyrsoid; flowers bisexual, rarely unisexual by abortion, actinomorphic; calyx 4–5-lobed, imbricate or rarely valvate; petals 4–5, free or united, valvate, rarely imbricate; stamens 4–5, alternate with petals, anthers 2-locular; ovary superior, primarily 2–5-locular but usually 1-locular by abortion of remainder, ovules 1–2 per loculus, pendulous, style simple with usually 3 stigmas. Fruits 1-locular, usually drupaceous, rarely a samara; seed solitary.

58 genera with 400 species, mainly tropical; 6 genera with 7 species Australia; 2 genera with 2 species south-eastern Queensland.

- |  |                      |
|--|----------------------|
| 1. Inflorescences very narrow raceme-like panicles; petals imbricate . | 1. <i>Citronella</i> |
| Inflorescences corymbose spreading panicles; petals valvate .          | 2. <i>Pennantia</i>  |

### 1. CITRONELLA D. Don

Trees. Leaves coriaceous. Flowers in terminal or axillary narrow panicles, 5-merous; sepals basally connate; petals imbricate in bud, strongly carinate within; anthers cordate; ovules 2. Drupes ovoid to globular, endocarp with hard coriaceous wall, inner side with prominent keel penetrating into deep vertical furrow in seed.

About 30 species Malaysia, tropical Australia, Pacific region, tropical America; 2 species endemic in Australia; 1 species south-eastern Queensland.

#### 1. *Citronella moorei* (F. Muell. ex Benth.) R. A. Howard      CHURNWOOD; SOAP BOX; SILKY BEECH

*Villaresia moorei* F. Muell. ex Benth.; *Chariessa moorei* (F. Muell. ex Benth.) Engl.  
Tree up to 35 m tall. Leaves often drying blackish; petioles 3–10 mm long; blades ovate or elliptic-oblong, apex acuminate, sometimes bluntly so, base cuneate, sometimes oblique, margin entire, 3.5–13 cm × 1.8–6.5 cm, often with small domatia in axils of major veins on undersurface. Inflorescences lateral, rachis up to 16 cm long; flowers greenish, unisexual or polygamous in ± sessile heads on stalks up to 8 mm long; sepals 0.5–1 mm long; petals *ca* 3 mm long, inflexed apically; ovary hirsute. Drupes black, ± oblong, *ca* 2.5 cm long. **Fig. 5B.**

Rainforest of McPherson Ra., Bunya Mts., Mt. Tamborine etc. Flowers spring. Timber pale coloured, with conspicuous rays.

### 2. PENNANTIA J. R. & G. Forster

Trees. Leaves thinly coriaceous. Flowers in terminal corymbose panicles, 5-merous; calyx minute; petals valvate in bud; anthers oblong-sagittate; stigma nearly sessile, ovule 1. Drupes with either hard, or only slightly coriaceous endocarp.

4 species Australia, New Zealand, Norfolk I.; 1 species endemic in eastern Australia, occurring in south-eastern Queensland.

#### 1. *Pennantia cunninghamii* Miers      BROWN BEECH

Tree up to 25 m tall, often crooked, or leaning; twigs sometimes zigzag. Leaves often drying blackish; petioles 0.5–1.5 cm long; blades ovate, oblong-elliptic, or obovate, apex obtuse to bluntly acuminate, base cuneate to rounded, sometimes oblique, margin entire or occasionally toothed on suckers, 6–18 cm × 3–8 cm, domatia in axils of veins on undersurface. Inflorescences spreading panicles, terminal and occasionally also upper axillary; flowers whitish; sepals rudimentary; petals 3.5–4 mm long. Drupes usually ovoid, *ca* 1.2 cm long, fleshy, endocarp thin, coriaceous. **Fig. 5A.**

Rainforest of McPherson Ra., Cunningham's Gap, D'Aguiar Ra. etc. Flowers late spring–summer. Timber suitable for cabinet work, somewhat resembling ENGLISH BEECH. A cyanogenetic glycoside is present in the bark and leaves, and suckers could be dangerous to stock in newly cleared areas.

**84. RHAMNACEAE**

Trees or shrubs, very rarely herbs, sometimes scandent. Leaves alternate or opposite; mostly stipulate; blades simple. Inflorescences mostly of cymes; flowers small, bisexual, rarely polygamous-dioecious; calyx tubular; 4-5-lobed, lobes valvate; petals 4 or 5, small or absent; stamens 4-5, opposite to and often embraced by petals, anthers 2-locular, opening lengthwise; disc mostly present, perigynous, sometimes lining calyx tube; ovary sessile, free or sunk into disc, 2-4-locular, ovules solitary, rarely paired, erect from base, anatropous, style usually shortly lobed. Fruits various, often drupaceous or capsular; seeds mostly with copious endosperm and large straight embryo.

50 genera with 900 species, cosmopolitan; 16 genera with 157 species Australia; 10 genera with 29 species south-eastern Queensland.

- |  |                        |   |
|--|------------------------|---|
| 1. Stems with divaricate axillary spines 1-4 cm long; leaves opposite, caducous  | 1. <i>Discaria</i>     | 2 |
| Stems without spines or leaves alternate . . . . .   | . . . . .              |   |
| 2. Scandent shrubs or vines or trees with intertwined branches; fruits indehiscent winged 1-locular nuts   | 2. <i>Ventilago</i>    | 3 |
| Erect shrubs or trees; fruits 2-3-locular drupes or capsules . . . . .   | . . . . .              |   |
| 3. Leaves 3-5-nerved from base . . . . .   | 3. <i>Ziziphus</i>     | 4 |
| Leaves penninerved, or venation obscure in small leaves . . . . .  | . . . . .              |   |
| 4. Fruits drupes, though usually not fleshy, often seeds persisting on receptacle after pericarp has fallen; ovary superior, or if inferior or partly inferior then disc thick and completely filling calyx tube | . . . . .              | 5 |
| Fruits capsules; disc annular or glandular at base of calyx lobes, relatively inconspicuous . . . . .  | . . . . .              | 7 |
| 5. Inflorescences of dense short racemes or flowers solitary; petals absent . . . . .  | 4. <i>Rhamnus</i>      | 6 |
| Inflorescences of cymes or panicles . . . . .  | . . . . .              |   |
| 6. Ovaries immersed in discs; fruits black . . . . .   | 5. <i>Alphitonia</i>   |   |
| Ovaries superior; fruits yellowish . . . . .   | 6. <i>Emmenosperma</i> |   |
| 7. Flowers in dense terminal heads surrounded by brown imbricate persistent bracts 4-6 mm long   | 7. <i>Stenanthemum</i> |   |
| Flowers in cymes panicles or spikes, or if terminal heads then bracts at base of flowers less than <i>ca</i> 2 mm long . . . . .   | . . . . .              | 8 |
| 8. Flowers solitary or clustered in terminal spikes or heads . . . . .   | 8. <i>Cryptandra</i>   | 9 |
| Flowers in cymes or panicles . . . . .   | . . . . .              |   |
| 9. Staminal filaments longer than petals . . . . .   | 9. <i>Pomaderris</i>   |   |
| Staminal filaments shorter than petals . . . . .   | 10. <i>Trymalium</i>   |   |

**1. DISCARIA Hook.**

Much-branched rigid shrubs; branchlets opposite, often thorny. Leaves small, opposite, sometimes caducous; stipules and bracts small. Flowers axillary; calyx campanulate or tubular above ovary, shortly 4-5-lobed; petals hood-shaped, inserted with stamens at base of calyx lobes, or absent; stamens 4-5, included in petals; disc annular; ovary ± immersed in disc, 3-lobed, 3-locular, style slender, stigma shortly 3-lobed. Fruits 3-lobed coriaceous drupes or capsules, endocarp separating into 3, 2-valved coriaceous cocci; seeds with coriaceous testa.

10 species Australia, New Zealand, South America; 1 species Australia, occurring in south-eastern Queensland.

**1. *Discaria pubescens* (Brongn.) Druce***Colletia pubescens* Brongn.; *Discaria australis* Hook.

Shrub up to 1 m tall; stems usually with divaricate axillary spines 1–4 cm long. Leaves with petioles *ca* 1 mm long; blades oblong to obovate, apex retuse, base cuneate, 0.5–1.4 cm × 0.2–0.5 cm, often absent. Flowers solitary or few together, axillary, pedicels up to 1 cm long; calyx white or cream, *ca* 2 mm long, lobes 4, *ca* as long as tube; petals 4, minute; stamens 4. Fruits 3-lobed capsules *ca* 5–6 mm diameter. **Fig. 6D.**

Uncommon, southern Darling Downs district. Flowers spring.

**2. VENTILAGO Gaertn.**

Climbing shrubs or trees. Leaves alternate. Inflorescences of axillary or terminal panicles, sometimes ± reduced to racemes; flowers small, clustered; calyx 5-lobed, spreading; petals hood-shaped or absent; stamens 5, only slightly longer than petals; disc flat or concave; ovary immersed in disc, 2-locular, style short with 2 short stigmatic lobes. Fruits nuts, globular at base, produced into an oblong or linear coriaceous wing, 1-locular, indehiscent; seeds solitary, globular, testa membranous.

37 species Africa, India, China and Pacific region; 3 species Australia; 2 species south-eastern Queensland.

- |  |                        |
|--|------------------------|
| 1. Leaves very narrowly oblong, very narrowly elliptic or very narrowly ovate; inflorescences glabrous | 1. <i>V. viminalis</i> |
| Leaves ovate; inflorescences pubescent   | 2. <i>V. pubiflora</i> |

**1. *Ventilago viminalis* Hook.**

VINE TREE; SUPPLEJACK

Climber, later becoming tree-like with age; branchlets often glaucous. Leaves pendulous; petioles 0.25–1.4 cm long; blades very narrowly oblong, narrowly elliptic or narrowly ovate, apex obtuse, base cuneate to attenuate, margin entire, 2.5–13 cm × 0.35–1.8 cm, glabrous, venation very oblique, at times almost parallel to midvein. Inflorescences reduced to racemes; flowers yellowish green, clustered at nodes, pedicels 2–3 mm long; calyx *ca* 3 mm long, lobes *ca* 2 mm long; petals absent. Fruits with globose part 3–4 mm diameter, wing 2–4 cm long. **Fig. 6C.**

Dry western areas of the region. Flowers spring.

**2. *Ventilago pubiflora* C. T. White**

Climber. Leaves with petioles 0.5–1.2 cm long; blades ovate, apex obtuse or bluntly acuminate, base cuneate, margin undulate, 5–12 cm × 2–5 cm, glabrous, main lateral veins at *ca* 50°–60° to midvein, with intricate reticulation between them. Inflorescences reduced to racemes or sometimes narrow panicles, pubescent; flowers clustered at nodes, pedicels 2–3 mm long; calyx *ca* 1.5–2 mm long; petals absent. Fruits with globose part *ca* 2 mm diameter, wing 2–2.5 cm long. **Fig. 6B.**

Depauperate rainforest and vine thickets of the northern parts of the region. Flowers spring.

**3. ZIZIPHUS Miller**

Trees or shrubs. Leaves alternate, often distichous and very oblique; stipules usually prickly. Inflorescences of axillary cymes; flowers small; calyx 5-lobed, spreading; petals hood-shaped or rarely absent; stamens 5, shorter or only slightly longer than petals; disc flat; ovary immersed in disc, 2-, rarely 3- or 4-locular, style shortly branched, or styles free, stigmas small. Fruits drupaceous, endocarp woody, 1–4-locular; seeds 1–4, testa smooth, fragile.

100 species tropical America, Africa, Mediterranean, Indomalaysia, Australia; 3 species Australia; 1 species naturalized south-eastern Queensland.

1. \**Ziziphus mauritiana* Lam.

INDIAN JUJUBE; CHINEE APPLE

*Ziziphus jujuba* (L.) Lam. non Miller

Erect shrub or tree with axillary often paired unequal spines, 1 ± straight, other recurved, young parts woolly tomentose. Leaves with petioles 0.2–1.6 cm long; blades ovate, broadly ovate, or elliptic-oblong, apex obtuse, often very rounded, base cuneate to rounded, oblique, margin entire or slightly denticulate towards apex, 2–8 cm × 0.8–5 cm, glabrous above, densely woolly pubescent beneath. Flowers whitish, numerous in axillary cymes or clusters, pedicel and calyx densely pubescent; calyx lobes 1.5–2 mm long; petals 5, 0.5–0.75 mm long. Fruits usually yellowish or reddish when mature, globose to ovoid, oblong, up to ca 2 cm long.

Native of much of tropical Asia; depauperate rainforest or open forest in northern parts of the region, uncommon. Flowers late summer to autumn. Fruits are edible, eaten raw when fully ripe as well as being used for jams and pies.

## 4. RHAMNUS L.

Trees or shrubs, evergreen or deciduous. Leaves opposite or alternate; stipules subulate, caducous. Inflorescences cymose or racemose; flowers perigynous, usually unisexual; calyx 4-, rarely 5-lobed; petals 4, rarely 5 or absent; stamens 4, rarely 5; ovary superior, styles 3–4, stigmas small. Fruits drupes with 2–4 pyrenes.

160 species, cosmopolitan; 1 species naturalized Australia, possibly a garden escape in south-eastern Queensland.

1. \**Rhamnus alaternus* L.

BUCKTHORN

Evergreen unarmed shrub up to ca 5 m tall, young parts and inflorescences ± pubescent. Leaves with puberulent petioles 2.5–6(–10) mm long; blades elliptic, ovate or obovate, apex acute or obtuse, base cuneate, margin usually distantly serrulate, 1–3(–5) cm × 0.7–1.6(–3) cm. Inflorescences dense short racemes or rarely flowers solitary, bracteoles ciliolate, usually caducous; flowers yellow; calyx lobes acute; petals absent. Drupes black, obovoid, not fleshy, 4–6 mm long, pyrenes 3.

Native of southern Europe; reported as a garden escape in Toowoomba area, possibly established in other areas of Darling Downs district. Flowers spring.

## 5. ALPHITONIA Reisseck ex Endl.

Trees. Leaves alternate, penninerved. Inflorescences of many-flowered dichotomous cymes; calyx 5-lobed, spreading; petals involute; stamens 5, included in petals; disc thick, filling calyx tube; ovary immersed in disc, 2- or rarely 3-locular, tapering into shortly lobed style. Drupes globular or broadly ovoid, epicarp dry or corky, endocarp of 2 or 3 hard coriaceous nuts or cocci opening inwards by longitudinal slit; seeds with shining hard testa completely enclosed in membranous brown shining arillus, opening apically, but with edges folded over.

20 species Malaysia, Australia, Polynesia; 5–6 species Australia; 2 species south-eastern Queensland.

- |  |                      |
|--|----------------------|
| 1. Indumentum on young branchlets and leaf veins brownish; calyx lobes 1.5–2 mm long; fruits 0.8–1.2 cm diameter . . . . . | 1. <i>A. excelsa</i> |
| Indumentum on young branchlets and leaf veins reddish; calyx lobes 2–2.5 mm long; fruits 1.2–1.5 cm diameter . . . . .     | 2. <i>A. petriei</i> |

1. *Alphitonia excelsa* (Cunn. ex Fenzl) Reisseck ex Benth. RED ASH; SOAP TREE*Colubrina excelsa* Cunn. ex Fenzl

Tree up to 18 m tall, often smaller or shrubby, young shoots light brown pubescent, smelling or sarsaparilla. Leaves with petioles 0.6–1(–1.5) cm long; blades elliptic to oblong or sometimes ovate, or narrow, apex usually obtuse, sometimes acute or acuminate, base cuneate, margin slightly recurved, 3–12.5(–15) cm × 1.5–4.5(–5.5) cm, dark green, glabrous above, white pubescent beneath with curly

hairs, midrib flat or slightly impressed above, raised beneath, lateral veins and reticulation not raised, with brown curly hairs or glabrous. Inflorescences axillary brown pubescent panicles; flowers cream, pedicels 1.5–3 mm long; calyx pubescent outside with curly white hairs, lobes acute, 1.5–2 mm long; petals hood-shaped, shortly clawed, *ca* 1.5 mm long; ovary apex glabrous to puberulent with brown curly hairs, style shortly 3-lobed. Fruits black, globular, 0.8–1.2 cm diameter.

Two varieties occur in the region:

1. Leaves obtuse, less than 4 times as long as broad . . . . . *A. excelsa* var. *excelsa*  
 Leaves acuminate, more than 4 times as long as broad . . . . . *A. excelsa* var. *acutifolia*

*A. excelsa* var. *excelsa* (Fig. 6J.) occurs throughout the region mainly in depauperate rainforest or open forest while *A. excelsa* var. *acutifolia* Braid is mainly in the coastal districts in depauperate rainforest. Flowers summer to winter, mainly autumn.

In addition to these varieties there are intermediate forms which can be very difficult to place in either variety.

## 2. *Alphitonia petriei* Braid & C. T. White

RED ASH

Tree up to 40 m tall; bark smelling of sarsaparilla; young shoots reddish pubescent. Leaves with petioles 1–1.3 cm long; blades ovate to elliptic, apex acute, mucronate, rarely obtuse, base cuneate or broadly so, sometimes slightly unequal or rounded, margin slightly recurved, (6.5–)9–16 cm × (2.5–)3–7.5(–11) cm, dark green, ± glabrous above, short curly white pubescent beneath with midrib, lateral veins and reticulation conspicuous with short reddish coloured curly hairs, midrib impressed above, midrib and lateral veins raised beneath. Inflorescences upper axillary reddish pubescent panicles; flowers cream, pedicels 3–5 mm long; calyx pubescent outside with curly white hairs, lobes acute, 2–2.5 mm long, scattered reddish hairs or glabrous inside; petals hood-shaped, shortly clawed, enclosing anthers, 1.5–2.5 mm long; ovary apex pubescent with reddish curly hairs, style 3-lobed almost to base. Fruits black, somewhat depressed globose, 1.2–1.5 cm diameter.

Rainforest margins or in wet eucalypt forest with rainforest understorey in the Moreton and Wide Bay district. Flowers spring.

## 6. EMMENOSPERMA F. Muell.

Trees. Leaves opposite or alternate. Inflorescences of trichotomous cymes or panicles; calyx 5-lobed, tube campanulate; petals hood-shaped, inserted with stamens on margin of disc; stamens 5, enclosed in petals; disc thin, lining calyx tube; ovary inserted on disc in bottom of calyx tube, but not immersed, 2-, rarely 3-locular, tapering into shortly 2–3-fid style. Fruits almost capsular, epicarp very thin, almost dry, endocarp separating into 2, rarely 3 cartilaginous cocci, opening along inner face in 2 valves; seeds inserted on turbinate or slightly cup-shaped funicle, often persisting on receptacle after pericarp has fallen, aril absent, testa hard, shining.

4 species Australia, New Caledonia; 3 species endemic in Australia; 2 species south-eastern Queensland.

1. Fruits globose to obovoid, laterally compressed, usually splitting into 2, 0.7–1 cm × 0.7–0.9 cm; petals *ca* 1.5 mm long; style 1.25–2 mm long, 2-fid . . . . . 1. *E. alphitonioides*
- Fruits depressed globose to broadly obovoid, not laterally compressed, usually splitting into 3, 0.8–1 cm × 1–1.3 cm; petals *ca* 1 mm long; style less than 0.5 mm long, 3-fid . . . . . 2. *E. cunninghamii*

### 1. *Emmenosperma alphitonioides* F. Muell.

Tree. Leaves opposite or sub-opposite, rarely alternate; petioles 0.5–1.4 cm long; blades ovate to elliptic, apex obtuse to bluntly acuminate, base broadly cuneate to obtuse, margin entire, 2.5–11.5 cm × 1.2–6.8 cm, glabrous. Inflorescences terminal;

calyx 2.5–3 mm long, lobes *ca* 1.5 mm long; petals white, *ca* 1.5 mm long; style 1.25–2 mm long, 2-fid. Fruits yellowish, globose to obovoid,  $\pm$  laterally compressed, generally splitting into 2, 0.7–1 cm  $\times$  0.7–0.9 cm; seeds reddish to dark brown, up to 7 mm long, attached vertically at base of receptacle, often persistent. **Fig. 6A.**

Rainforest of the coastal districts mainly at higher altitudes. Flowers spring.

## 2. *Emmenosperma cunninghamii* Benth.

Tree. Leaves sub-opposite or occasionally alternate; petioles 0.5–2.2 cm long; blades ovate to elliptic, apex obtuse to bluntly acuminate, rarely acute, base cuneate to obtuse, margin entire, 3.5–11 cm  $\times$  1.8–6.5 cm, rarely larger, glabrous. Inflorescences usually terminal; calyx 2.5–3 mm long, lobes *ca* 1.5 mm long; petals *ca* 1 mm long; style less than 0.5 mm long, 3-fid, stigmas  $\pm$  subsessile. Fruits yellow, usually depressed globose or broadly obovoid, generally splitting into 3, *ca* 0.8–1 cm  $\times$  1–1.3 cm; seeds orange to dark brown, up to 7 mm long, attached vertically at base to receptacle, often persistent.

Rainforest of northern parts of the region often on sandy soils in coastal districts. Flowers ? autumn.

## 7. STENANTHEMUM Reisseck

Shrubs. Inflorescences of heads; flowers sessile, surrounded by persistent imbricate brown bracts; calyx tube basally adherent, free and often deciduous above ovary and disc, apically 5-lobed; petals 5, hood-shaped, enclosing anthers, inserted with stamens at top of calyx tube; disc inconspicuous; ovary wholly inferior, 3-locular, style entire or minutely 3-toothed. Capsules enclosed in base of calyx tube, endocarp separating into 3 membranous or crustaceous cocci opening in 2 valves.

9 species endemic in Australia, sometimes included under *Cryptandra*; 1 species south-eastern Queensland.

### 1. *Stenanthemum scortechinii* (F. Muell.) F. Muell. ex F. M. Bailey

*Cryptandra scortechinii* F. Muell.

Dense shrub up to 2 m tall. Leaves with petioles 1–3 mm long; blades ovate to elliptic, apex acute, mucronate, base cuneate to obtuse, margin recurved, 0.5–1.8 cm  $\times$  0.2–0.6 cm, glabrous above, densely finely pubescent below with short curly hairs, and few long straight ones along midrib. Inflorescences terminal; bracts ovate, margin ciliate, *ca* 5 mm long; calyx *ca* 2.5 mm long, all enveloped in white intricate hairs, lobes *ca* 1 mm long; petals *ca* 1 mm long. Capsules *ca* 2 mm long. **Fig. 6E.**

Restricted to Granite Belt area of the Darling Downs district, near Stanthorpe. Flowers late winter–spring.

## 8. CRYPTANDRA Smith

Shrubs, mostly heath-like or thorny. Leaves small, narrow, often clustered. Inflorescences of clustered terminal spikes or heads, intermingled with leaves, or flowers distinct along branchlets, sessile or shortly pedicellate, mostly surrounded by persistent imbricate brown scales; calyx tube adherent basally, free, campanulate or tubular and persistent above ovary and disc, 5-lobed; petals 5, hooded, enclosing anthers and inserted with stamens at top of calyx tube; disc annular, or often scarcely prominent round top of ovary at base of calyx tube; ovary wholly inferior or slightly prominent at calyx tube, 3-locular, style entire or minutely 3-toothed. Capsules enclosed in base of persistent calyx tube but often partly free within it, endocarp or whole capsule separating into 3 crustaceous or rarely membranous cocci usually opening inwards in 2 valves.

About 40 species endemic in Australia; 6 species south-eastern Queensland.

- |   |                     |   |
|---|---------------------|---|
| 1. Lateral branchlets ending in spinose tips . . . . .  | 1. <i>C. armata</i> |   |
| Lateral branchlets not ending in spinose tips . . . . . |                     | 2 |

- |  |                            |   |
|--|----------------------------|---|
| 2. Calyces covered with long white woolly hairs . . . . .                            | 2. <i>C. lanosiflora</i>   | 3 |
| Calyces covered with very fine or straight hairs, or partly glabrous . . . . .       |                            |   |
| 3. Petals reflexed at maturity, revealing staminal filaments 1–1.5 mm long . . . . . | 3. <i>C. longistaminea</i> | 4 |
| Petals not reflexed at maturity, not revealing staminal filaments . . . . .          |                            |   |
| 4. Calyx tubes pubescent, bracts usually shorter than tube . . . . .                 | 4. <i>C. amara</i>         | 5 |
| Calyx tubes glabrous, bracts ± concealing tube . . . . .                             |                            |   |
| 5. Calyx lobes pubescent with long silky appressed hairs . . . . .                   | 5. <i>C. propinqua</i>     |   |
| Calyx lobes very finely pubescent . . . . .  | 6. <i>C. sp. 1.</i>        |   |

### 1. *Cryptandra armata* C. T. White & Francis

Shrub up to *ca* 1.5 m tall, lateral branchlets ± horizontal, 0.2–2 cm long, ending in spinose tip. Leaves clustered at base of, or scattered along lower part of lateral branchlets; petioles *ca* 0.5 mm long; blades narrowly oblong or narrowly obovate, apex obtuse, base cuneate to truncate, margin revolute, usually concealing midrib, 2–5 mm × 0.5–1.5 mm, glabrous or occasionally with few silky hairs appressed to midrib beneath. Flowers white or creamish, clustered on lateral branchlets; bracts at base of calyx only, up to 1 mm long, very broad, glabrous except for ciliolate margin; calyx tube urceolate, 2.5–3.5 mm long, finely silky pubescent, lobes 1–2 mm long; petals minute, not reflexed. **Fig. 6G.**

Darling Downs district, growing on poor gravelly or sandy soil. Flowers late winter to early spring.

A specimen with flattened glabrous broadly elliptic leaves has been collected from the Granite Belt area of the Darling Downs district and may be referable to this species.

### 2. *Cryptandra lanosiflora* F. Muell.

Shrub up to 1.5 m tall, young branchlets appressed pubescent. Leaves clustered; petioles *ca* 0.5 mm long; blades narrowly oblong, elliptic or ovate, apex acute, base cuneate to truncate, margin revolute, usually completely concealing undersurface, 1.5–5 mm × 0.5–1.5 mm, ± glabrous above, densely pubescent below with longer silky hairs on midrib. Flowers clustered at tips of branchlets; bracts 1–2 mm long, very broad, glabrous except for ciliate margin; calyx tube urceolate, *ca* 3 mm long, lobes 1–1.5 mm long, all densely covered with long white woolly hairs; petals minute, not reflexed. **Fig. 6H.**

Heathy areas between granite outcrops in Girraween National Park. Flowers spring.

### 3. *Cryptandra longistaminea* F. Muell.

Shrub 1 m, rarely up to 1.5 m tall, branchlets slender, stellate pubescent or scurfy, soon glabrous. Leaves clustered; petioles *ca* 0.5 mm long; blades narrowly oblong, narrowly elliptic or narrowly obovate, apex obtuse, base cuneate, margin revolute or recurved, often underside of leaf visible, 1.5–7 mm × 0.5–2.5 mm, glabrous or pubescent on young leaves above, densely finely pubescent below with few long straight silky hairs appressed on midrib beneath. Flowers white, few, clustered together at tips of branchlets; bracts broadly ovate, obtuse, up to 1 mm long, glabrous except for ciliolate margin, concealing half to nearly all calyx tube; calyx tube *ca* 1.5 mm long, glabrous, lobes 1.5–2.5 mm long, finely appressed pubescent; petals reflexed after anthesis, revealing staminal filaments, 1–1.5 mm long; style as long as stamens, stigma 3-lobed.

Stony or poor soil under eucalypt forest or in rocky areas or around cliffs in the region. Flowers spring.

### 4. *Cryptandra amara* Smith

Shrub, often intricately branched. Leaves clustered; petioles up to 0.5 mm long; blades variously shaped, apex obtuse or acute, base cuneate or truncate, margin flat to revolute, 1.5–6 mm × 0.5–2 mm, glabrous above, glabrous or pubescent below. Flowers clustered at ends of branchlets, bracts concealing only base of calyx, up to 1 mm long, broad; calyx tube 1.5–4 mm long, lobes 1–1.5 mm long, whole calyx densely appressed pubescent; petals minute, not reflexed.

Two varieties occur in the region:

1. Leaves oblong, elliptic or obovate, margin flat or recurved, 1.5–4 mm × 0.5–2 mm; flowers few; calyx tube broader at base than apex, 2.5–4 mm long, lobes 1–1.5 mm long, all densely appressed pubescent

*C. amara* var. *longiflora*

- Leaves linear to linear-oblong, margin revolute, 2–6 mm × 0.5–0.75 mm; flowers numerous; calyx tube broader at apex than base, ca 1.5–2 mm long, lobes ca 1 mm long, all densely pubescent with fine hairs and few to numerous long straight silky hairs

*C. amara* var. *floribunda*

Both *C. amara* var. *longiflora* F. Muell. ex Maiden & Betche (Fig. 6F.) and *C. amara* var. *floribunda* Maiden & Betche occur mainly on the Granite Belt and south-western Darling Downs district. Both flower in spring though *C. amara* var. *floribunda* sometimes flowers in late winter as well.

### 5. *Cryptandra propinqua* Cunn. ex Fenzl

*Cryptandra propinqua* var. *grandiflora* Benth.

Small shrub, branchlets slender, appressed pubescent. Leaves clustered; petioles ca 0.5 mm long; blades narrowly oblong or elliptic, apex obtuse, base cuneate, margin revolute, usually concealing midrib, 1.5–3.5 mm × 0.5–0.75 mm, ± glabrous above, pubescent with longer silky hairs on midrib beneath. Flowers white, few, clustered at tips of branchlets, bracts imbricate, very broad, obtuse, concealing calyx tube, glabrous except for ciliate margin, cilia 0.25 mm long; calyx tube 3–3.5 mm long, glabrous, lobes 2–2.5 mm long, pubescent with long silky appressed hairs; petals minute, not reflexed.

Recorded from western Darling Downs district on sandy soils. Flowers late winter to spring.

A form with very pubescent branchlets and cilia 0.5–0.8 mm long on bracts has been recorded from Gurulmundi area and Carnarvon Gorge on sandstone, which on further study may prove distinct.

### 6. *Cryptandra* sp. 1.

Shrub up to 1 m tall with divaricate, rigid, short lateral branchlets, puberulent when young. Leaves clustered; petioles up to 0.5 mm long; blades narrowly oblong, apex ± acute, base cuneate, margin revolute, usually concealing midrib, 2–3 mm × 0.5–1 mm, ± glabrous above, densely finely pubescent beneath. Flowers white, few, clustered at tips of branchlets, bracts ovate, obtuse, margin ciliate, 2–3 mm long, inner as long as or slightly longer than calyx tube; calyx tube ca 2.5 mm long, glabrous, lobes narrowly triangular, 2–2.5 mm long, densely very finely pubescent; petals minute, not reflexed.

Rocky mountain areas near Brisbane, e.g. Glasshouse Mts., Mt. Esk, Mt. Gillies. Flowers spring, also autumn.

## 9. POMADERRIS Labill.

Shrubs, young branches, underside of leaves and inflorescences covered with close stellate tomentum, often mixed with or concealed by longer simple often silky hairs. Leaves alternate, penninerved; stipules brown and scarious, often very deciduous. Inflorescences of small umbel-like cymes, usually forming terminal panicles or corymbs or rarely solitary in leaf axils; flowers pedicellate, bracts brown, scarious, very caducous; calyx tube entirely adnate to ovary, limb divided to base into 5 lobes, usually deciduous or reflexed; petals either concave or nearly flat, not enclosing anthers, or absent; stamens 5, filaments long and usually abruptly incurved and attenuate near apex, anthers oblong or ovoid; disc annular, surrounding ovary at base of calyx lobes, inconspicuous; ovary half inferior or rarely almost entirely inferior, usually 3-locular, style 3-cleft, or rarely almost entire. Capsules protruding above edge of calyx tube, septically 3-valved, endocarp separating into 3 crustaceous or membranous cocci, opening by broad operculum at base of inner face or by separation of whole inner face, or rarely by longitudinal slit.

45 species Australia and New Zealand; 43 species Australia; 12 species south-eastern Queensland.

- |   |                             |    |
|---|-----------------------------|----|
| 1. Leaves pubescent on upper surface  |                             | 2  |
| Leaves glabrous on upper surface or with only midrib pubescent  |                             | 4  |
| 2. Leaves with stellate indumentum  | 1. <i>P. prunifolia</i>     | 3  |
| Leaves with simple, straight or curly indumentum  |                             |    |
| 3. Hairs straight above, curly and straight below; apex acute or tapering to blunt point  | 2. <i>P. lanigera</i>       |    |
| Hairs straight, extremely dense above, curly below; apex rounded obtuse, mucronate  | 3. <i>P. vellea</i>         |    |
| 4. Calyx 3.5–4 mm long when dried   |                             | 5  |
| Calyx less than 3.5 mm long when dried  |                             | 7  |
| 5. Leaves with dense white or silvery appressed hairs or sometimes with rusty coloured hairs along veins  | 4. <i>P. nitidula</i>       |    |
| Leaves with numerous rusty coloured hairs on undersurface other than on veins   |                             | 6  |
| 6. Leaves more than 4 cm × 1.4 cm; flowers in large terminal panicles 5–10 cm diameter  | 5. <i>P. ferruginea</i>     |    |
| Leaves less than 3.5 cm × 1.4 cm; flowers in compact terminal panicles 1–4 cm diameter  | 6. <i>P. andromedifolia</i> |    |
| 7. Leaves less than 1.2 cm × 0.4 cm, only midrib visible beneath  | 7. <i>P. ledifolia</i>      |    |
| Leaves more than 1.2 cm × 0.4 cm, at least midrib and primary lateral venation visible beneath  |                             | 8  |
| 8. Leaves with midrib, primary lateral venation and some reticulation visible beneath   |                             | 9  |
| Leaves with only midrib and primary lateral venation visible beneath  |                             | 10 |
| 9. Inflorescences small terminal and upper axillary cymes less than 2.5 cm diameter   | 8. <i>P. queenslandica</i>  |    |
| Inflorescences generally large terminal panicles  | 9. <i>P. canescens</i>      |    |
| 10. Leaves narrowly elliptic with ± dense ferruginous indumentum beneath; calyx 3–4 mm long, lobes 2.5–3 mm long; petals present, cream   | 6. <i>P. andromedifolia</i> |    |
| Leaves usually ovate or elliptic, grey, whitish or silvery pubescent beneath; calyx 2–3 mm long, lobes 1.2–2.5 mm long; petals absent or very fugacious, or if persistent, yellow                           |                             | 11 |
| 11. Leaves ovate or elliptic, obtuse, usually with close grey or whitish tomentum with few to several straight whitish hairs; calyx 2.5–3 mm long, lobes <i>ca</i> 1.5–2 mm long, petals absent or caducous | 8. <i>P. queenslandica</i>  |    |
| Leaves ovate or elliptic or narrowly so, acute, indumentum various; calyx 2–2.5 mm long, or if 2.5–3 mm long then lobes 2–2.5 mm long and petals present, yellow  |                             | 12 |
| 12. Calyx 2.5–3 mm long, lobes 2–2.5 mm long; petals present, yellow; leaves ovate  | 10. <i>P. sp. 1.</i>        |    |
| Calyx 2–2.5 mm long, lobes 1.2–1.75 mm long; petals absent or very fugacious, leaves elliptic or ovate  |                             | 13 |
| 13. Calyx with only curly grey hairs, lobes 1.2–1.5 mm long   | 11. <i>P. notata</i>        |    |
| Calyx with some straight hairs as well as curly grey hairs, lobes 1.5–1.75 mm long  | 12. <i>P. argyrophylla</i>  |    |

### 1. *Pomaderris prunifolia* Cunn. ex Fenzl

Shrub up to *ca* 3 m tall, young parts densely stellate pubescent. Leaves with petioles 4–8 mm long; blades ovate or sometimes oblong or ± elliptic, apex acute or obtuse, base cuneate or rounded, margin usually crenate-dentate by elongation of lateral veins to margin, 1.3–4.6 cm × 0.8–2.2 cm, coarsely hispid above, densely stellate pubescent below, often some hairs ferruginous, veins impressed above, raised beneath. Flowers in small compact pubescent terminal or upper axillary cymes or cymose panicles,

pedicels 1.5–3 mm long, pubescent; whole calyx 2–3 mm long, densely short pubescent with numerous long silky hairs particularly on tube, lobes 1.5–2 mm long; petals absent. Fruits obovoid, *ca* 3 mm long, valves 3, 1 mm long, pubescent.

Southern Granite Belt in the Darling Downs district, often in open forest. Flowers spring.

## 2. *Pomaderris lanigera* (Andr.) Sims

*Ceanothus laniger* Andr.

Pubescent shrub or small tree up to *ca* 5 m tall. Leaves with petioles 0.5–1.2 cm long; blades ovate, apex acute or tapering to blunt point, base rounded, margin flat or slightly recurved, 3–11 cm × 1.2–4 cm, pubescent with straight hairs above, densely pubescent below with short and long curly usually white hairs, veins often visible with ferruginous hairs. Flowers in dense many-flowered terminal pubescent corymbose panicles, pedicels 2–5 mm long; calyx 3.5–4.5 mm long, densely long silky pubescent, particularly on tube, lobes 2–3 mm long; petals yellow, *ca* 2–2.5 mm long. Fruits ellipsoid to broadly so, *ca* 3–3.5 mm long, valves 3, 1.5–2.5 mm long, densely long grey pubescent. **Fig. 61.**

Mountainous areas of Moreton and Darling Downs district, e.g. Mt. Maroon, Mt. Barney, Crow's Nest, Granite Belt on stony hillsides or understorey in open forest. Flowers spring.

## 3. *Pomaderris vellea* N. A. Wakefield

Pubescent shrub. Leaves with petioles 6–10 mm long; blades oblong to sometimes narrowly ovate, apex obtuse, mucronate, base rounded, margin flat or slightly recurved, 1.5–7.6 cm × 0.9–2.8 cm, densely pubescent both surfaces with curly hairs, ferruginous below, midrib impressed above, raised below, sometimes lateral veins visible below. Flowers in very dense pubescent cymes or cymose terminal panicles, pedicels 3–4 mm long, pubescent; calyx 4–4.5 mm long, densely shaggy pubescent, lobes 2–3 mm long; petals *ca* 1.5–2 mm long. Fruits not seen.

Recorded from southern Granite Belt in the Darling Downs district. Flowers spring.

## 4. *Pomaderris nitidula* (Benth.) N. A. Wakefield

*Pomaderris phillyraeoides* Sieber ex DC. var. *nitidula* Benth.

Shrub or small tree up to *ca* 5 m tall, young branchlets silky pubescent, eventually glabrous. Leaves with silky pubescent petioles (0.3–)0.6–1.4 cm long; blades elliptic, rarely ovate-elliptic, apex acute to acuminate, rarely obtuse, base cuneate, margin slightly recurved, (1.6–)3–6.5 cm × (0.7–)1.4–2.5(–3.5) cm, ± glabrous above, densely silky appressed white pubescent below, midrib and lateral veins often raised below, covered with ferruginous silky hairs. Flowers in dense terminal silky pubescent corymbose clusters, pedicels 4–6 mm long; calyx 3.5–4 mm long, silky pubescent, lobes 2–2.5 mm long; petals creamy yellow, usually persistent. Fruits not seen.

Recorded from Mt. Lindesay and southern Granite Belt, around cliffs or rocky areas. Flowers winter–spring.

## 5. *Pomaderris ferruginea* Sieber ex Fenzl

Shrub up to *ca* 3 m tall, young branchlets pubescent with spreading ferruginous hairs. Leaves with petioles 0.6–1.7 cm long; blades ovate or occasionally ovate-oblong, apex acute or obtuse mucronate, base rounded or cuneate, margin ± flat, 4–10 cm × 1.4–3.5 cm, glabrous above with midrib slightly impressed, densely pubescent below with small curly hairs and spreading, somewhat ferruginous hairs, veins raised below. Flowers in compound dense many-flowered terminal and upper axillary pubescent cymose panicles, pedicels 3–5 mm long; calyx 3.5–4 mm long, indumentum long, dense, denser on tube; petals yellowish, *ca* 2 mm long. Fruits ellipsoid, *ca* 3.5–4 mm long, long hairy, valves 3, *ca* 2–2.5 mm long.

Usually on stony hillsides of Moreton district, e.g. Mt. Coot-tha, Taylor Ra., Springbrook. Flowers spring.



**Fig. 6** RHAMNACEAE — A *Emmenosperma alphonitoides*, flower x6; B–C *Ventilago* spp. — B<sub>1</sub>–B<sub>2</sub> *V. pubiflora*, B<sub>1</sub> leaf x1 with enlargement of reticulate venation x6, B<sub>2</sub> fruit x1; C *V. viminalis*, leaf x1; D *Discaria pubescens*, part of flowering inflorescence x1; E *Stenanthemum scortechinii*, flowering branchlet with large involucre bracts surrounding inflorescence x1; F–H *Cryptandra* spp. — F<sub>1</sub>–F<sub>2</sub> *C. amara* var. *longiflora*, F<sub>1</sub> part of flowering branchlet x1, F<sub>2</sub> flower x6; G *C. armata*, part of flowering branchlet x1; H *C. lanosiflora*, flower showing woolly calyx x6; I<sub>1</sub>–I<sub>2</sub> *Pomaderris lanigera*, I<sub>1</sub> part of flowering branchlet x1, I<sub>2</sub> flower x3; J<sub>1</sub>–J<sub>2</sub> *Alphitonia excelsa* var. *excelsa*, J<sub>1</sub> part of flowering branchlet x1, J<sub>2</sub> flower showing ovary immersed in large disc x6; K<sub>1</sub>–K<sub>2</sub> *Trymalium minutiflorum*, K<sub>1</sub> part of fertile branchlet x1, K<sub>2</sub> flower x12.

**6. *Pomaderris andromedifolia* Cunn.**

*Pomaderris phillyraeoides* Sieber ex DC.

Shrub up to *ca* 1 m tall, young branchlets ferruginous pubescent, eventually glabrous. Leaves with ferruginous pubescent petioles 0.4–0.6(–0.7) mm long; blades oblong-elliptic to elliptic, apex acute or obtuse, mucronate, base cuneate to rounded, margin slightly recurved, 1.5–3.1(–3.5) cm × 0.4–1.1(–1.4) cm long, ± glabrous above, below with dense short crinkly hairs and numerous long silky mostly ferruginous hairs, midrib impressed above, raised below with lateral nerves raised, visible. Flowers in small dense terminal pubescent corymbose clusters, pedicels *ca* 2.5–4 mm long; calyx 3–4 mm long, silky pubescent outside at base, lobes 2.5–3 mm long; short pubescent with some silky hairs also; petals cream, 1.5–2 mm long, usually persistent. Fruits not seen.

Possibly occurring from mountain peaks or rocky areas of the southernmost parts of Darling Downs and Moreton districts. Flowers mainly spring.

**7. *Pomaderris ledifolia* Cunn.**

*Pomaderris calvertiana* F. Muell.

Shrub, young parts pubescent. Leaves with petioles 1–2.5 mm long; blades oblong or elliptic, sometimes somewhat obovate, apex obtuse, sometimes mucronate, base rounded, margin recurved, 2–10 mm × 1.5–3 mm, glabrous above, densely silky pubescent below, midrib impressed above, raised below, other venation obscure. Flowers in small dense compact terminal pubescent cymes, pedicels *ca* 2 mm long; calyx 2.5–3 mm long, pubescent with dense silky hairs on receptacle, fewer on lobes, lobes 2–2.5 mm long; petals yellowish, ± linear, cucullate, *ca* 1.5–2 mm long. Fruits not seen.

Recorded from summit of Mt. Barney in the Moreton district. Flowers spring.

**8. *Pomaderris queenslandica* C. T. White**

Shrub 2–3 m tall, young branchlets ferruginous pubescent, ± glabrous with age. Leaves with pubescent petioles 0.3–1.1 cm long; blades elliptic to ovate, apex obtuse to acute, base rounded, rarely cuneate, margin flat or undulate, 1.2–6 cm × 0.8–3 cm, ± glabrous above, pubescent below with rather loose crinkly white to grey hairs and few straight ferruginous ones, midrib, lateral veins and usually reticulation visible. Flowers in small terminal panicles of dense corymbose clusters, pedicels 2–5 mm long; calyx 2.5–3 mm long, densely curly pubescent with numerous long silky hairs at base, lobes *ca* 1.5–2 mm long; petals absent, or sometimes present in buds, very caducous. Fruits not seen.

Throughout the region mostly in depauperate rainforest or shrubby areas. Flowers spring.

**9. *Pomaderris canescens* (Benth.) N. A. Wakefield**

*Pomaderris ferruginea* Sieber ex Fenzl var. *canescens* Benth.

Shrub up to *ca* 3 m tall, young parts shortly pubescent. Leaves with petioles 0.5–1.2 cm long; blades ovate to ovate-elliptic or oblong, apex generally acute or obtuse, mucronate, base cuneate, margin usually recurved, 2.7–10 cm × 1.1–4 cm, glabrous above, densely white pubescent beneath with short and long curly white hairs, midrib impressed and lateral veins visible above, all raised below, reticulation visible, usually raised between veins. Flowers in large dense terminal pubescent panicles, pedicels 3–6 mm long; calyx 2.5–3 mm long, densely pubescent with long or short hairs, denser on tube, lobes 2–2.5 mm long; petals *ca* 2 mm long. Fruits ± globose to obovoid, *ca* 3–4 mm long, shortly pubescent, valves 3, *ca* 2–2.5 mm long.

Northern Darling Downs and Burnett districts. Flowers autumn–winter.

A form without petals has also been recorded from the region.

**10. *Pomaderris* sp. 1.**

Shrub up to *ca* 3 m tall, young parts shortly pubescent. Leaves with petioles 3–9 mm long; blades ovate, rarely smallest oblong, apex tapering to blunt mucronate point, base rounded, margin recurved, 1.3–5.3 cm × 0.7–2 cm, glabrous above, densely pubescent with very short curly grey hairs and few straight ones, midrib and some lateral veins impressed above, raised beneath. Flowers in large dense pubescent

terminal cymose panicles, pedicels 2–3 mm long; calyx 2.5–3 mm long, densely pubescent with short curly hairs, and numerous long hairs on tube, few on lobes, lobes 2–2.5 mm long; petals yellow, not auriculate, *ca* 1.5 mm long. Fruits not seen.

Stanthorpe area of the Darling Downs district. Flowers spring.

This species is closely related to ***Pomaderris queenslandica***.

### 11. *Pomaderris notata* S. T. Blake

Shrub up to 3 m tall; bark whitish; young branchlets shortly pubescent. Leaves with pubescent petioles 0.7–1.1 cm long; blades elliptic to ovate, apex acute, base cuneate, margin slightly recurved, 2–6 cm × 0.8–2.1 cm glabrous or young leaves with minute scattered hairs above, densely shortly white to grey curly hairy below, midrib and lateral veins lightly impressed above, raised below. Flowers creamish, scented, in usually large comparatively loose pubescent terminal inflorescences, pedicels 1.5–3 mm long; calyx 2–2.5 mm long, densely short pubescent, lobes 1.2–1.5 mm long; petals absent. Fruits not seen.

McPherson Ra. in depauperate rainforest or in shrubby rocky areas in Lamington National Park area of southern Moreton district. Flowers spring–summer.

### 12. *Pomaderris argyrophylla* N. A. Wakefield

Shrub or small tree up to 5 m tall, young branchlets silvery pubescent. Leaves with petioles 1–1.6 cm long; blades narrowly ovate, apex acuminate to attenuate, base cuneate, tapered, margin slightly recurved, 3.5–13 cm × 0.9–3.3 cm, glabrous above, densely short curly silvery hairy beneath, midrib impressed above, raised beneath, lateral veins looping, parallel, visible beneath, usually with few straight hairs on them. Flowers in large pubescent terminal panicles, pedicels 2.5–4 mm long; calyx 2–2.5 mm long, receptacle with dense long hairs, lobes 1.5–1.75 mm long; petals very caducous. Fruits ellipsoid, *ca* 3 mm long, valves 3, *ca* 2 mm long.

Rocky or mountainous parts of the region, mainly in the coastal districts, e.g. Glasshouse Mts., Mt. Greville, Crow's Nest, as an understorey shrub. Flowers spring.

In the typical form this species has very few or no straight silky hairs on the underside of the leaf blades, but forms which have been included under this name have few to numerous long hairs, sometimes densely covering the lower surface. On further study, these forms may be worthy of formal taxonomic rank.

## 10. TRYMALIUM Fenzl

Shrubs. Leaves alternate; stipules and bracts deciduous. Inflorescences of slender narrow panicles or few-flowered cymes; flowers small, pedicellate; calyx tube adnate to ovary, lobes 5, deciduous or spreading; petals 5, hood-shaped, entire or 3-lobed, usually not enclosing anthers; stamens 5, filaments short, incurved, anthers ovoid; disc annular or divided into 5 glands, surrounding ovary at base of calyx lobes; ovary half or ± entirely inferior, 3-, rarely 2-locular, style 3-, rarely 2-lobed. Fruits capsules, usually protruding above calyx tube, endocarp separating into cocci, indehiscent or opening internally in 2 valves.

6 species endemic in Australia; 1 species south-eastern Queensland.

### 1. *Trymalium minutiflorum* E. Ross

Shrub, young parts tomentose. Leaves with petioles 0.5–0.75 mm long; blades obovate, apex obtuse to truncate or retuse, base cuneate, margin entire, 2–4.5 mm × 1.5–2.5 mm, very finely stellate pubescent above, longer stellate pubescent below, sometimes with few long simple hairs as well. Flowers in small tomentose terminal and upper axillary cymes or cymose panicles, up to 1.2 cm long; pedicels *ca* 1 mm long; calyx tube broadly obconical, *ca* 0.5 mm long, lobes triangular-ovate, *ca* 0.5 mm long; petals entire, margin undulate, *ca* 0.25 mm long, glabrous; ovary inferior, 2-locular, densely pubescent, style 2-lobed. Fruits not seen. **Fig. 6K.**

Recorded from near Kingaroy in open forest with dense understorey on a rocky plateau. Flowers spring.

## 85. VITACEAE

Mostly climbing shrubs or herbs, with tendrils, rarely small trees, nodose or jointed, often with watery juice. Leaves alternate, or lower sometimes opposite; stipules petiolar or absent; blades simple or variously compound, often pellucid dotted. Flowers bisexual or unisexual, actinomorphic, small, in leaf-opposed spikes, racemes, panicles, or cymes, tendrilled; calyx small, entire or 4-5-toothed or -lobed; petals 4-5, free or united, caducous, valvate; stamens 4-5, opposite petals, inserted at base of disc, anthers free or connate, 2-locular, opening lengthwise; disc intrastaminal, mostly very distinct; ovary 2-6-locular, loculi 2-ovuled, style short, stigma capitate or discoid, rarely 4-lobed. Fruits baccate, often watery, 1-6-locular; seeds with copious sometimes ruminant endosperm and small embryo.

12 genera with 700 species, mostly tropical and subtropical; 5 genera with 24 species Australia; 3 genera with 10 species south-eastern Queensland.

- |   |                       |
|---|-----------------------|
| 1. Leaves simple or digitately 5-foliolate in south-eastern Queensland species, rarely occasional leaves 3-foliolate, then glaucous or with domatia beneath | 1. <i>Cissus</i>      |
| Leaves 3-foliolate or pedately 5-foliolate in south-eastern Queensland species, never glaucous nor with domatia   | 2                     |
| 2. Leaves 3-foliolate, leaflets ± entire or shallowly serrate, teeth ending in mucro; stigmas 4-lobed   | 2. <i>Tetrastigma</i> |
| Leaves pedately compound, or if 3-foliolate, not the above combination of characters; stigma not 4-lobed, style simple                                      | 3. <i>Cayratia</i>    |

### 1. CISSUS L.

Tendrils simple, or bifid at apex, not ending in adhesive disc. Leaves simple or compound, dentate, teeth often reduced to mucro. Inflorescences cymose, leaf-opposed or placed next to leaves, their main branches umbellate approximate; flowers 4-merous, rarely 5-merous; calyx subtruncate; petals free, spreading or reflexed, apex hood-shaped; disc cupular, adnate to base of ovary, 4-lobed, usually with thick margins, connective on inner side, sometimes broadened and thickened; ovary 2-locular, locules 2-ovuled, style thin, stigma small. Berries 1-, rarely 2-seeded.

350 species mainly tropical; 10 species Australia; 6 species south-eastern Queensland.

- |  |                             |
|--|-----------------------------|
| 1. Leaves simple   | 2                           |
| Leaves compound  | 4                           |
| 2. Leaves with domatia in axils of veins beneath   | 3                           |
| Leaves without domatia in axils of veins beneath   | 1. <i>C. repens</i>         |
| 3. Leaves with domatia only in basal vein axils; leaf margins entire   | 2. <i>C. oblonga</i>        |
| Leaves with domatia in most primary vein axils, often in secondary as well; leaf margins usually serrate, sometimes teeth reduced to mucro | 3. <i>C. antarctica</i>     |
| 4. Leaflets with well-defined petioles, leaf base rounded, obtuse  | 4. <i>C. hypoglauca</i>     |
| Leaflets with cuneate or attenuate bases tapering into usually obscure petioles  | 5                           |
| 5. Leaflets with domatia in axils beneath  | 5. <i>C. sterculiifolia</i> |
| Leaflets without domatia   | 6. <i>C. opaca</i>          |

#### 1. *Cissus repens* Lam.

*Vitis cordata* Wall.

Glabrous vine, young stems succulent, sometimes winged. Leaves with petioles 1-6 cm long; blades broadly ovate, apex obtuse to bluntly acuminate, base subcordate to cordate, margin entire or distantly serrulate, 5.5-12 cm × 4-10 cm. Inflorescences compact; flowers deep crimson; calyx truncate, 0.5 mm long; petals 2-2.5 mm long. Fruits globular to obovoid, ca 5-8 mm diameter.

Recorded from near Eidsvold and Bundaberg. Flowers spring-summer.

**2. *Cissus oblonga* (Benth.) Planchon***Vitis oblonga* Benth.; *Cissus antarctica* (Benth.) Vent. var. *integerrima* Domin

Often scandent shrub without tendrils, ? later climber, glabrous or growing tips ferruginous pubescent. Leaves with petioles 1–2 cm long; blades oblong-ovate, apex obtuse, base obtuse to truncate, margin entire, 4–10 cm × 1.8–5.5 cm, domatia present in axils of lowermost primary veins only. Inflorescences compact, small, pubescent; calyx undulate, *ca* 0.75 mm long; petals *ca* 1.5–2 mm long. Fruits purplish, globose or obovoid, fleshy, *ca* 1 cm diameter.

Depauperate rainforest of northern parts of the region. Flowers mainly summer.

**3. *Cissus antarctica* Vent.***Vitis antarctica* (Vent.) Benth.; *Cissus antarctica* var. *pubescens* Domin

Vine; young shoots ferruginous pubescent, glabrous with age. Leaves with petioles (0.5–)1–3 cm long; blades ovate, sometimes ovate-oblong, apex acuminate, often bluntly so, base obtuse, rarely cordate, margin distantly serrate or serrulate, (3.5–)5.5–13 cm × (1.8–)3.5–6.5 cm. Inflorescences compact, small, pubescent; calyx lobed, 0.75–1 mm long; petals *ca* 2 mm long. Fruits purplish, globose, fleshy, *ca* 1.5 cm diameter. **Fig. 7B.**

Rainforest or wet eucalypt forest of the region. Flowers ? summer.

**4. *Cissus hypoglauca* A. Gray***Vitis hypoglauca* (A. Gray) F. Muell.

Vine; young parts, inflorescences densely ferruginous pubescent. Leaves digitately compound; petioles 1.6–4 cm long; leaflets usually 5, petiolules 0.5–4 cm long; leaflet blades elliptic to obovate, apex acuminate, base obtuse, margin serrate, or entire on older leaflets, 3–10 cm × 1.5–4 cm, laterals smaller than central, glaucous or pale beneath. Inflorescences large, compact; flowers bright yellow; calyx truncate to undulate, *ca* 0.5 mm long; petals 2–3 mm long. Fruits purplish, globose to obovoid, fleshy, *ca* 8–10 mm diameter. **Fig. 7A.**

Rainforest margins or eucalypt forest in wetter parts of the region. Flowers summer.

**5. *Cissus sterculiifolia* (F. Muell. ex Benth.) Planchon***Vitis sterculiifolia* F. Muell. ex Benth.

Glabrous vine. Leaves digitately compound; petioles 2–8 cm long; leaflets 5, sometimes 3, petiolules 0.5–2.3 cm long; leaflet blades narrowly elliptic, elliptic, or obovate, apex acuminate, often bluntly so, base cuneate, margin entire, 5–16 cm × 1.8–8.5 cm. Inflorescences large, compact; calyx undulate to obtusely lobed, *ca* 0.5 mm long; petals *ca* 1.5–2 mm long. Fruits globose to obovoid, *ca* 1.5 cm diameter.

Rainforest of the region. Flowers ? mainly summer.

**6. *Cissus opaca* F. Muell.***Vitis opaca* (F. Muell.) F. Muell. ex Benth.

Vine with large underground tubers. Leaves digitately compound; petioles 0.7–4.5 cm long; leaflets usually 5, sometimes 3 or 4, petiolules 0–6 mm long; leaflet blades very narrowly obovate to obovate or elliptic-oblong, apex acute or obtuse, base attenuate, margin entire or serrate, 1.5–7.5 cm × 0.2–2.5 cm, pale or glaucous beneath. Inflorescences compact; flowers yellowish; calyx lobed, 0.5–1 mm long; petals 5, 2–3 mm long. Fruits purplish, ± globose, fleshy, *ca* 1.5 cm diameter.

Usually in open forest, rocky hillsides or in sandy areas. Flowers summer.

**2. TETRASTIGMA (Miq.) Planchon**

Tendrils entire or bifid, without adhesive discs. Leaves palmately 1–3-foliolate or pedately 4–6-foliolate. Flowers in axillary or leaf-opposed cymes, unisexual, 4-merous; calyx lobed, dentate or truncate; petals free, apex saccate, sometimes corniculate, disc distinct or obscure; in males stamens inserted under disc, rudimentary ovary present or absent; in females staminodes with minute sterile

anthers, ovary 2-locular, locules 2-ovuled, style short and thick or absent, stigma broad, usually 4-lobed. Berries 1-4-seeded, seeds transversely wrinkled, ventrally with filiform raphe, dorsally with linear or orbicular chalaza.

90 species south-eastern Asia, Indomalaysia, Australia, 1 species endemic in eastern Australia, occurring in south-eastern Queensland.

### 1. *Tetrastigma nitens* (F. Muell.) Planchon

*Vitis nitens* F. Muell.

Glabrous vine. Leaves with petioles 1-6 cm long; leaflets 3, with petiolules 0.2-2 cm long, terminal longest; leaflet blades obovate to broadly elliptic, apex acute to acuminate, base cuneate, margin coarsely and irregularly serrate, or teeth reduced to mucro, 4.5-16 cm × 3-7 cm, shining above. Inflorescences small, compact; flowers greenish; calyx 4-lobed; petals 2-3 mm long. Fruits blackish, ellipsoid to obovoid, 1.5-2 cm long. **Fig. 7C.**

Mainly dry closed forest or rainforest in rocky areas. Flowers summer.

### 3. CAYRATIA Juss.

Tendrils 1-3 times forked, sometimes ending in adhesive discs. Leaves digitately or pedately compound; leaflets 3-12, dentate, crenate or serrate. Flowers bisexual in axillary leaf-opposed, or seemingly terminal long-peduncled corymbiform cymes, not congested into umbellules, 4-merous; calyx subtruncate; petals free, spreading or reflexed; disc cupular, adnate to ovary base, thin margined; ovary 2-locular, locules 2-ovuled, style terete, stigma small. Berries 2-4-seeded, dorsally with linear chalaza, ventrally with 1-2 deep cavities.

45 species Africa, Madagascar, Indomalaysia, Australia, New Caledonia, Pacific region; 8-10 species Australia, mainly tropical; 3 species south-eastern Queensland.

- |   |                         |   |
|---|-------------------------|---|
| 1. Leaves trifoliolate . . . . .                                | 1. <i>C. acris</i>      |   |
| Leaves pedately compound . . . . .                              |                         | 2 |
| 2. Leaves deeply serrate, ovate to elliptic . . . . .           | 2. <i>C. clematidea</i> |   |
| Leaves shallowly crenate, obovate or elliptic-obovate . . . . . | 3. <i>C. euryneina</i>  |   |

#### 1. *Cayratia acris* (F. Muell.) Domin

*Vitis acris* F. Muell.

Softly pubescent vine. Leaves trifoliolate; petioles 3.5-8(-11) cm long; petiolules 1-2.5(-6) cm long, terminal longest; leaflet blades broadly ovate to broadly elliptic, apex acuminate, base subcordate to cordate, laterals usually slightly oblique, margin crenate, 4-11(-14) cm × 2.5-8.5(-11.5) cm. Inflorescences spreading, peduncles slightly shorter than leaves; calyx truncate to undulate, *ca* 0.5 mm long; petals greenish, *ca* 2.5-3 mm long. Fruits depressed globose, *ca* 8 mm diameter.

Mainly in depauperate rainforest or wet open forest areas. Flowers ? mainly summer.

#### 2. *Cayratia clematidea* (F. Muell.) Domin

*Vitis clematidea* F. Muell.

Pubescent or glabrous vine, underground stem forming small tubers. Leaves pedately compound; petioles 1.8-9 cm long; leaflets usually 5, petiolules 0.4-3.5 cm long; leaflet blades ovate or elliptic, apex acute to acuminate, base cuneate to obtuse, margin deeply serrate, 1-8.5 cm × 0.5-4.5 cm, terminal largest. Inflorescences pubescent divaricate cymes on peduncles ± longer than leaves; calyx truncate, *ca* 0.5 mm long; petals greenish, *ca* 2.5 mm long. Fruits globose, 5-7 mm diameter. **Fig. 7D.**

Rainforest margins or open forest, sometimes in rocky or sandy areas. Flowers ? mainly summer. Sometimes a pest in farmland or plantations derived from forested areas.



Fig. 7 VITACEAE — A–B *Cissus* spp. — A *C. hypoglauca*, part of branchlet  $\times 1/2$ ; B *C. antarctica*, underside of leaf showing domatia in vein axils  $\times 1$ ; C *Tetrastigma nitens*, part of flowering branchlet  $\times 1/4$ ; D *Cayratia clematidea*, part of branchlet  $\times 1$ .

A form with larger leaflets has been recorded from Mt. Glorious, near Brisbane. On further study, it may prove to be distinct.

### 3. *Cayratia eurynema* B. L. Burt

Sparsely scabrous-pubescent vine, glabrous with age; tendrils several times forked, with adhesive discs. Leaves pedately compound; petioles 6–11 cm long; leaflets 5, petiolules 0.4–5 cm long, terminal longest; leaflet blades obovate or elliptic-obovate, apex acuminate, base cuneate or particularly in lateral leaflets oblique, margin shallowly crenate, often tipped with mucro, 6–13 cm  $\times$  3–7 cm. Inflorescences pubescent loose panicles subtended by small leaves, peduncle long; calyx *ca* 0.25 mm long; petals greenish, *ca* 3.5 mm long. Fruits *ca* 5–7 mm diameter, slightly compressed.

Rainforest of coastal districts. Flowers summer.

## 86. ELAEOCARPACEAE

Trees and shrubs. Leaves alternate or opposite, stipulate. Inflorescences of racemes, panicles or dichasia; flowers actinomorphic, bisexual; calyx 4–5, free or united, valvate; petals 4–5, rarely united, often absent, petals often much divided at apices, valvate or imbricate, never contorted; disc usually present; stamens numerous, free, attached on disc which is sometimes developed as an androphore, anthers 2-locular, usually opening by 2 pores at apex, sometimes confluent; ovary superior, sessile, 2–many-, rarely 1-locular, ovules numerous or 2 per locule, anatropous, pendulous with ventral raphe, style simple, sometimes apically lobed. Fruits capsular or drupaceous; embryo straight in abundant endosperm.

12 genera with 350 species, tropical and subtropical; 3 genera with 29 species Australia; 2–3 genera with 8–9 species south-eastern Queensland.

- |  |                       |   |
|--|-----------------------|---|
| 1. Fruits capsular, dry, covered with rigid bristles and opening in 2-4 valves . . . . . | 1. <i>Sloanea</i>     |   |
| Fruits berries, ± succulent and indehiscent, endocarp hard, often rugose . . . . .       |                       | 2 |
| 2. Leaves alternate; inflorescences racemes . . . . .                                    | 2. <i>Elaeocarpus</i> |   |
| Leaves ± opposite; flowers solitary . . . . .  | 3. <i>Aristotelia</i> |   |

**1. SLOANEA L.**

Trees. Leaves entire or sinuate-dentate, veins pinnate. Inflorescences of axillary, 1-flowered peduncles, solitary or clustered or forming into terminal panicles; petals 0-4, ± imbricate; stamens free, completely covering broad pitted disc, anthers opening by apical slits; ovary 3-4-locular, ovules several per loculus, style subulate. Capsules thickly coriaceous or woody, densely echinate or covered with setae, 3-4-locular or 1-locular by abortion, opening by 3-4 valves; seeds several or solitary, pendulous, ovoid, testa hard.

120 species tropical Asia and America; 4 species eastern Australia; 3 species south-eastern Queensland.

- |   |                        |   |
|---|------------------------|---|
| 1. Leaves truncate at base; flowers with large petals; fruits covered with setae . . . . .  | 1. <i>S. australis</i> |   |
| Leaves obtuse or acute at base, but not truncate; flowers without petals; fruits echinate . . . . .   |                        | 2 |
| 2. Leaf margins dentate, domatia often present in primary vein axils beneath; sepals minutely greyish velvety pubescent on both sides . . . . .               | 2. <i>S. woollsii</i>  |   |
| Leaf margins ± entire to distantly sinuate-crenate, domatia absent; sepals glabrous outside except for minute felty hairs at base and along margins . . . . . | 3. <i>S. macbrydei</i> |   |

**1. *Sloanea australis* (Benth.) F. Muell.**

MAIDEN'S BLUSH; CUDGERIE; BLUSH CARROBEAN; BLUSH ALDER

*Echinocarpus australis* Benth.

Tree up to 30 m tall; stems often crooked; branchlets ferruginous pubescent. Leaves with petioles 0.5-2.7 cm long, obliquely attached to blades; blades narrowly obovate to obovate, apex obtuse to bluntly acuminate, base truncate to subcordate, margin ± sinuate-dentate, 6.5-30 cm × 3-13 cm, domatia absent or rarely present, minute, ± hairless. Flowering peduncles 3-5 cm long; sepals 0.8-1.2 cm long, pubescent; petals white, 1.5-2 cm long; anthers 4-5 mm long. Capsules ovoid, 1.5-2 cm long, opening by 3-5 valves, valves covered with setae; seeds black, shining, ovoid, enveloped in scarlet aril. **Fig. 8A.**

Rainforest or fringing areas along creeks of the coastal districts. Flowers spring. Timber suitable for furniture, joinery, plywood, flooring etc.; sapwood susceptible to attack by borers.

**2. *Sloanea woollsii* F. Muell.**

CARRABIN; CARABEEN; YELLOW CARRABEEN; GREY CAROBEAN

*Sloanea austroqueenslandica* Domin

Tree up to 45 m tall; stems buttressed; young parts finely pubescent. Leaves with petioles 1-4.5 cm long, obliquely attached to blade; blades narrowly ovate, narrowly elliptic or elliptic, apex subacute to bluntly acuminate, base cuneate or obtuse, margin dentate, 5.5-18 cm × 1.5-6.5 cm, conspicuous hairy domatia often present in primary vein axils beneath. Flowering peduncles 2-3 cm long; sepals 6-8 mm long, velvety pubescent both sides; petals absent; anthers with sterile tips, 2-3 mm long. Capsules ovoid, ca 1-1.5 cm long, opening usually by 2 valves, valves echinate; seeds narrowly ellipsoid, covered except at apex in reddish brown aril. **Fig. 8B.**

Rainforest, often at higher altitudes, e.g. Mc Pherson Ra., Great Dividing Ra. but also Kin Kin area and Dawes Ra. Flowers spring. Timber uses similar to *S. australis*.

**3. *Sloanea macbrydei* F. Muell.**

**NORTHERN YELLOW CARABEEN**

Tree up to 30 m tall; stems buttressed; young parts finely pubescent. Leaves with petioles 0.4–1.5(–2.3) cm long; blades obovate, sometimes obovate-oblong or elliptic, apex obtuse or bluntly acuminate, base cuneate, margin ± entire to distantly sinuate-crenate, 4.5–11(–14) cm × 2–4(–6) cm, domatia absent. Inflorescences of sparse racemes of up to 7 flowers, or flowers solitary, rachis 2–6 cm long, pedicels 1.2–4 cm long, elongating up to 7.5 cm long in fruit; sepals 6–9 mm long, glabrous outside except for minute felty hairs near base and on margins, felty over most of inside; petals absent; anthers with sterile tips, 3–4 mm long. Capsules ovoid, *ca* 2–2.5 cm long, opening by 2 valves, valves echinate.

Dawes Ra. in northern Burnett district. Flowers spring. Timber useful if first treated against borers, uses similar to *S. australis*.

**2. ELAEOCARPUS L.**

Leaves alternate, or rarely opposite, entire or serrate. Inflorescences of axillary racemes; flowers sometimes polygamous; petals apically fringed, lobed or rarely entire, inserted around base of torus, induplicate-valvate, embracing some outer stamens in bud; stamens numerous, inserted on torus within glandular ring, anthers oblong or linear, opening apically in 2 valves; ovary 2–5-locular with 2 or more ovules per loculus, style subulate. Fruits drupes with hard often bony endocarp, 2–5-locular or 1-locular by abortion; seeds solitary per loculus, pendulous, testa hard.

200 species eastern Asia, Indomalaysia, Australia, Pacific region; *ca* 20 species Australia; 5 species south-eastern Queensland.

- |  |                          |
|--|--------------------------|
| 1. Leaf bases generally attenuate; inflorescences borne amongst leaves of current years growth . . . . .                                     | 2                        |
| Leaf bases cuneate to obtuse; inflorescences borne on older wood below leaves . . . . .  | 3                        |
| 2. Leaf margins closely serrulate, venation areolate, prominent and raised when dried; sepals 6–7 mm long . . . . .                          | 1. <i>E. reticulatus</i> |
| Leaf margins irregularly crenate, venation reticulate, not prominent nor raised when dried; sepals <i>ca</i> 3–4 mm long . . . . .           | 2. <i>E. obovatus</i>    |
| 3. Leaf venation areolate, prominent and raised when dried; sepals 4–5 mm long . . . . .   | 3. <i>E. kirtonii</i>    |
| Leaf venation reticulate, not prominent nor raised when dried; sepals 1–1.3 cm long . . . . .  | 4                        |
| 4. Leaf blades with margins entire or irregularly serrulate in upper half; flower pedicels 5–8 mm long; fruits brownish, ellipsoid . . . . . | 4. <i>E. eumundi</i>     |
| Leaf blades with crenulate margins; flower pedicels 1–1.5 cm long; fruits blue, globular . . . . .   | 5. <i>E. grandis</i>     |

**1. *Elaeocarpus reticulatus* Smith**

**A BLUEBERRY ASH**

*Elaeocarpus cyaneus* Aiton

Shrub or small tree up to 15 m tall, glabrous, old leaves often reddish. Leaves with petioles 0.5–2 cm long; blades very narrowly elliptic, narrowly elliptic, or narrowly obovate, apex acuminate, sometimes bluntly so, base cuneate to attenuate, margin serrulate, 4–12.5 cm × 1–3.5 cm, domatia often present in primary axils below. Inflorescences borne amongst leaves, racemes slender, up to 7 cm, rarely 9 cm long, pedicels *ca* 5–8 mm long; sepals 6–7 mm long, sparsely pubescent; petals white or occasionally pink, 7–8 mm long. Fruits bright blue, globular to ellipsoid, *ca* 0.8–1.2 cm long, endocarp rugose. **Fig. 8C.**

Light rainforest or open forest of the coastal districts, also on Granite Belt and on sandy soils on the offshore islands. Flowers spring to autumn. Cultivated as an ornamental.

**2. *Elaeocarpus obovatus* G. Don**BLUEBERRY ASH; GREY CAROBEAN;  
HARD QUANDONG

Tree up to 40 m tall; stems often buttressed. Leaves with petioles 0.5–1.5 cm long; blades narrowly obovate to obovate, occasionally elliptic, apex obtuse or bluntly acuminate, base attenuate, margin irregularly crenulate, usually in upper half, 4.5–12 cm × 1.2–4.5 cm, domatia sometimes present in primary axils beneath. Inflorescences borne amongst leaves, racemes slender, up to 7 cm, rarely 10 cm long, pedicels 3–5 mm long; sepals glabrous, *ca* 3–4 mm long; petals white, *ca* 4–5 mm long, apically fringed. Fruits blue, ovoid, 8–10 mm long, endocarp rugose. **Fig. 8F.**

Fringing rainforests often along creeks, or in depauperate rainforests of the coastal districts. Flowers spring. Timber light coloured and lightweight, suitable for furniture, joinery, plywood, flooring, lining etc.; sapwood susceptible to attack by borers.

**3. *Elaeocarpus kirtonii* F. Muell. ex F. M. Bailey**

WHITWOOD;

MOWBULLAN WHITWOOD; WHITE BEECH; WHITE QUANDONG; SILVER  
QUANDONG; PIGEONBERRY ASH*Elaeocarpus longifolius* C. Moore; *E. bauerlenii* Maiden & R. T. Baker

Tree up to 35 m tall; stems buttressed; young parts pubescent. Leaves with petioles 1.5–6 cm long; blades very narrowly ovate to very narrowly oblong-elliptic, or sometimes very narrowly obovate, apex acute to acuminate, 6–21 cm × 1.7–4 cm, often domatia present in vein axils beneath. Inflorescences on old twigs below leaves, racemes up to *ca* 12 cm long, pedicels 1 cm long; sepals glabrous, 4–5 mm long; petals white, 5–6 mm long, apically fringed. Fruits ovoid, 1–1.5 cm long, endocarp rugose.

High altitude rainforest of mountain ranges of the region, e.g. McPherson Ra., Great Dividing Ra. Flowers summer–autumn. Timber used in similar ways to *E. obovatus*.

**4. *Elaeocarpus eumundi* F. M. Bailey**

Large tree, young parts silky pubescent. Leaves with petioles 1.5–5.5 cm long; blades narrowly obovate or narrowly elliptic, apex acuminate, usually bluntly so, base cuneate, margin entire or irregularly shallowly serrulate in ± upper half, 4–12(–17) cm × 1.5–5 cm. Inflorescences on old twigs below leaves, racemes *ca* 6 cm, rarely 10 cm long, pubescent, pedicels 5–8 mm long; sepals 1–1.2 cm long, pubescent; petals white, *ca* 1.3 cm long, apically fringed. Fruits brown, ellipsoid, *ca* 2 cm long, endocarp deeply verrucose. **Fig. 8E.**

Lowland rainforest of the coastal districts as far south as Eumundi, e.g. near Kin Kin, Fraser I., etc. Flowers summer.

**5. *Elaeocarpus grandis* F. Muell.**QUANDONG; BLUE QUANDONG; BLUE  
FIG; COOLOON; WHITE QUANDONG; SILVER QUANDONG

Tree up to 40 m tall; stems buttressed; young parts pubescent, old leaves often reddish. Leaves with petioles 1–2.5 cm long; blades narrowly obovate to narrowly oblong-elliptic, apex obtuse or very shortly bluntly acuminate, base cuneate, margin shallowly crenulate, 6–19 cm × 1.5–5 cm, domatia usually present in axils beneath. Inflorescences on old twigs below leaves, racemes up to 10 cm long, pedicels 1–1.5 cm long; sepals 1–1.3 cm long, puberulent; petals white, 1.2–1.6 cm long, apically fringed. Fruits blue, globular, 2–3 cm diameter, endocarp deeply wrinkled. **Fig. 8D.**

Mainly fringing rainforest along creeks of coastal districts. Flowers winter–spring. Timber useful for general indoor work, light, pale and fairly soft. Cultivated as an ornamental.

**3. ARISTOTELIA L'Hérit.**

Shrubs. Leaves mostly ± opposite, entire or dentate. Flowers axillary or lateral, racemose or solitary, 2 or 3 together, often polygamous; petals imbricate, 3-lobed, toothed or entire, inserted around base of thickened torus; stamens numerous, inserted on torus within glandular ring, anthers linear, loculi opening apically in short confluent slits; ovary 2–4-locular, 2 ovules per loculus, style subulate. Fruits berries; seeds few, ascending or pendulous, testa hard.

6 species eastern Australia, New Zealand, Peru to Chile; 4–5 species eastern temperate Australia; possibly 1 species south-eastern Queensland.



Fig. 8 A-F ELAEOCARPACEAE — A-B *Sloanea* spp. — A<sub>1</sub>-A<sub>3</sub> *S. australis*, A<sub>1</sub> part leaf showing truncate base x1, A<sub>2</sub> flower with petals x1, A<sub>3</sub> fruit showing setae on outside x2/3; B. *S. woollsii*, fruit showing prickles on outside x1; C-F *Elaeocarpus* spp. — C<sub>1</sub>-C<sub>3</sub> *E. reticulatus*, C<sub>1</sub> flowering branchlet x2/3, C<sub>2</sub> part of leaf showing reticulation x6, C<sub>3</sub> flower showing fringed petals x2; D<sub>1</sub>-D<sub>3</sub> *E. grandis*, D<sub>1</sub> leaf x1/2, D<sub>2</sub> part of underside of leaf showing domatia in vein axils x1, D<sub>3</sub> fruit x1; E *E. eumundi*, leaf x1; F *E. obovatus*, leaf x1; G-L TILIACEAE — G-J *Corchorus* spp. — G<sub>1</sub>-G<sub>3</sub> *C. cunninghamii*, G<sub>1</sub> leaf x1/3, G<sub>2</sub> fruit x1, G<sub>3</sub> one valve of fruit showing inner surface x1; H<sub>1</sub>-H<sub>2</sub> *C. hygrophilus*, H<sub>1</sub> fruit x1, H<sub>2</sub> one valve of fruit showing inner surface x1; I *C. trilocularis*, fruit x1; J<sub>1</sub>-J<sub>2</sub> *C. olitorius*, J<sub>1</sub> leaf showing enlarged lowermost marginal teeth x1/2, J<sub>2</sub> fruit x1; K<sub>1</sub>-K<sub>3</sub> *Triumfetta rhomboidea*, K<sub>1</sub> part of flowering stem x1, K<sub>2</sub> leaf x1/2, K<sub>3</sub> fruit x2; L<sub>1</sub>-L<sub>3</sub> *Grewia latifolia*, L<sub>1</sub> leaf x1/2, L<sub>2</sub> petal x6, L<sub>3</sub> fruit x1.

**1. *Aristolelia australasica* F. Muell.**

Leaves with petioles 0.3–5 cm long; blades ovate or oblong-ovate, apex acuminate, base obtuse, sometimes ± truncate, margin serrate, 3–12-cm × 1.5–5 cm, silky puberulent at least on veins beneath. Flowers solitary, axillary on peduncles 1–2 cm long; sepals 5, *ca* 4 mm long, puberulent; petals white, 5, 3-lobed apically, *ca* 7 mm long. Berries globular, 8–10 mm diameter.

Recorded from high altitude areas in Dorrigo State Forest and *Nothofagus moorei* forests in New South Wales; possibly in similar situations in McPherson Ra. Flowers spring.

**87. TILIACEAE**

Trees or shrubs, rarely herbs. Leaves alternate, often in 2-ranked arrangement; stipulate; blades simple, often asymmetrical. Inflorescences cymose, often very complex; flowers actinomorphic, usually bisexual, sometimes with epicalyx; calyx 5-partite, free or united, valvate; petals 5, rarely absent, often glandular at base; stamens usually numerous, free or united in groups, inserted at base of petals or on androphore, anthers 2-locular; ovary superior, 2–many-locular with 1–many ovules in each, ovules usually ascending, ± anatropous, style simple, stigma capitate or lobed. Fruits usually capsules or schizocarps.

50 genera with 450 species, tropical and temperate, chiefly south-eastern Asia and Brazil; 6 genera with 58 species Australia; 3 genera with 8 species south-eastern Queensland.

- |  |                      |
|--|----------------------|
| 1. Fruits in Queensland species echinate, ± globose . . . . .  | 1. <i>Triumfetta</i> |
| Fruits in Queensland species glabrous, pubescent, tuberculate or muricate, but not echinate . . . . .        | 2                    |
| 2. Fruits smooth drupes, entire or 2–4-lobed; petals with thickened cavity at base . . . . .                 | 2. <i>Grewia</i>     |
| Fruits smooth or rough capsules, often elongated, angular; petals without thickened cavity at base . . . . . | 3. <i>Corchorus</i>  |

**1. TRIUMFETTA L.**

Herbs, undershrubs or shrubs, stellate pubescent. Leaves spirally arranged or distichous, serrate, entire or 3–5-lobed. Flowers in small pedunculate or almost sessile cymes or clusters, usually leaf-opposed or lateral, rarely axillary, often collected into terminal interrupted spicate inflorescences, cymules 3-flowered; sepals free, usually concave or apiculate; petals thickened and globular, or basally thickened, inserted around base of torus, rarely absent; stamens numerous, rarely 5 or 10, free, anther-loculi opening longitudinally; ovary 2–5-locular, 2 collateral ovules per loculus, style filiform, stigma 2–5-toothed. Fruits ± globular, echinate, indehiscent or (extra-Australia) separating into cocci; seed 1 per loculus, or if 2 separated by vertical dissepiment, pendulous.

150 species, tropical; 17–18 species Australia; 2 species south-eastern Queensland.

- |  |                         |
|--|-------------------------|
| 1. Spines on fruit <i>ca</i> 2 mm long, glabrous . . . . .             | 1. <i>T. rhomboidea</i> |
| Spines on fruit at least 6 mm long, bristly at least at base . . . . . | 2. <i>T. pilosa</i>     |

**1. *Triumfetta rhomboidea* Jacq.****CHINESE BURR**

*Triumfetta bartramia* (L.) Merr.

Stellate pubescent shrub. Leaves with petioles 0.2–9 cm long; blades narrowly ovate to broadly ovate, 3-lobed, or obovate, apex acute to acuminate, base cuneate to obtuse or subcordate, margin serrate, often with sunken glands on upper surface of lowermost serrations, 1.5–14 cm × 0.5–10.5 cm, stellate puberulent above, ± stellate pubescent below. Inflorescences on peduncles *ca* 4 mm long; sepals linear, apiculate, *ca* 5–6 mm long; petals yellow, 4–6 mm long; stamens 10. Fruits ± globose, *ca* 6 mm diameter including spines, densely pubescent, spines glabrous, apically hooked, *ca* 2 mm long. **Fig. 8K.**

Cosmopolitan weed occurring in a range of habitats in the coastal districts of the region. Flowers spring to autumn.

This is an extremely variable species as regards leaf shape, size, and density of tomentum, and the only constant characters are those of the fruit. However, in the past those plants with usually obovate leaves with a dense velvety stellate tomentum on the underside have been called *T. velutina* Vahl, and there is considerable difference of opinion in the literature as to whether this form is worthy of specific rank.

## 2. *Triumfetta pilosa* Roth

*Triumfetta nigricans* F. M. Bailey

Shrub, with simple and stellate indumentum, often sparse. Leaves with petioles 0.4–8 cm long; blades ovate, broadly ovate or obovate, apex acuminate, base cuneate to obtuse, margin serrate, 1.5–11 cm × 1–9 cm. Inflorescences on peduncles up to 10 mm long; sepals linear, apiculate, 7–9 mm long; petals yellow, slightly shorter. Fruits tuberculate, spines arising from tubercules, glabrous or sparsely pubescent, 1.5–2.5 cm diameter including spines, spines 7–10 mm long, apically hooked, sparsely bristly on lower half.

Rare, recorded from Darling Downs district, more common in tropics. Flowers autumn.

## 2. GREWIA L.

Trees or shrubs, indumentum stellate. Leaves distichous; stipules narrow, deciduous; blades entire or serrate, 3–7-nerved. Inflorescences of axillary or terminal cymes, flowers unisexual or bisexual; sepals free; petals with thickened basal cavity, usually shorter than calyx; ovary 2-, or apparently 4-locular, 2 or more ovules per loculus, style subulate, stigma minutely toothed or lobed. Fruits drupes containing 1–4 pyrenes or nuts, entire or 2–4-lobed, nuts either 1-seeded or 2- or more-seeded and then divided by transverse partitions between seeds.

150 species Africa, Asia, Australia, mainly tropical; 12 species Australia; 1 species south-eastern Queensland.

### 1. *Grewia latifolia* F. Muell. ex Benth. DYSENTERY PLANT; DOG'S BALLS

Leaves with petioles 0.5–2 cm long; blades broadly ovate, occasionally obscurely 3-lobed, apex obtuse to subacute, base cordate, margin irregularly serrate, 3–15 cm × 2.5–13 cm, puberulent to glabrous above, pubescent beneath. Inflorescences of axillary cymes; sepals narrow, 1–1.5 cm long, pubescent outside; petals *ca* 4 mm long; ovary covered with long simple hairs. Fruits usually 4-lobed, depressed, *ca* 1.5 cm diameter. **Fig. 8L.**

Lowland rainforest or usually depauperate rainforests of the region. Flowers summer.

## 3. CORCHORUS L.

Herbs or shrubs with simple or stellate hairs. Leaves spirally arranged or distichous, serrate, 1 or 2 lowest teeth often enlarged, subulate. Inflorescences lateral or leaf-opposed, very shortly peduncled, 1–several-flowered cymes; sepals 5, rarely 4; petals 5, rarely 4; anther loculi opening longitudinally; ovary 2–5-locular, ovules several per loculus, style short, simple. Capsules either long and smooth or short, globular and ± verrucose, muricate or (extra-Queensland species) echinate, opening longitudinally in 2–5 valves, seeds several per loculus, rarely separated by transverse partitions.

100 species tropical or warm temperate; *ca* 25 species tropical or subtropical Australia; 5 species south-eastern Queensland.

- |  |                          |   |
|--|--------------------------|---|
| 1. Capsules stellate tomentose, somewhat constricted between seeds . . . . . | 1. <i>C. tomentellus</i> |   |
| Capsules glabrous or scabrous, not constricted between seeds . . . . .       |                          | 2 |
| 2. Capsules with transverse partitions between seeds . . . . .               |                          | 3 |
| Capsules without transverse partitions between seeds . . . . .               |                          | 4 |

- |   |                           |
|---|---------------------------|
| 3. Capsules 2–2.5 mm wide, opening in 3, rarely 4 valves . . . . .    | 2. <i>C. trilocularis</i> |
| Capsules <i>ca</i> 5 mm wide, opening in 5, rarely 4 valves . . . . . | 3. <i>C. olitorius</i>    |
| 4. Capsules narrowly oblong, apex long acute . . . . .                | 4. <i>C. cunninghamii</i> |
| Capsules oblong or globular, apex obtuse . . . . .                    | 5. <i>C. hygrophilus</i>  |

### 1. *Corchorus tomentellus* F. Muell.

Diffuse subshrub. Leaves with petioles 2–5 mm long; blades oblong to ovate, apex acute to obtuse, base obtuse, margin serrate, 0.8–2 cm × 0.5–1 cm, stellate puberulent above, loosely stellate tomentose below. Flowers in clusters on peduncles 0–2 mm long, pedicels 3–7 mm long; sepals densely stellate pubescent outside, 6–7 mm long; petals 6–7 mm long. Capsules 2–4 cm long, few-seeded, restricted somewhat between seeds, opening in 2, rarely 3 valves, stellate tomentose.

Recorded from near Mundubbera. Flowers summer.

### 2. *Corchorus trilocularis* L.

Erect or decumbent shrub. Leaves with petioles 0.6–1.5 cm long; blades very narrowly ovate to oblong, apex obtuse, margin coarsely serrate-crenate, occasionally lowermost teeth enlarged, 2–6 cm × 0.6–2.5 cm, glabrous or simply pubescent on veins beneath. Flowers solitary or paired on peduncles 2–4 mm long; sepals 4–5 mm long; petals yellow, 4–5 mm long. Capsules puberulent to glabrous, 4–7 cm × 0.2–0.25 cm, opening in 3, rarely 4 valves, puberulent to glabrous; seeds separated by transverse partitions. **Fig. 8I.**

Uncommon weed mainly of the Lockyer Valley, Kalbar and Grandchester areas of the Moreton district, common in northern parts of the state. Flowers summer–autumn.

### 3. \**Corchorus olitorius* L.

JUTE

Subglabrous herb or shrub. Leaves with petioles 0.5–6 cm long; blades ovate, apex acute to acuminate, base broadly cuneate or obtuse, margin serrate, lowest teeth enlarged, 4–14 cm × 1.2–5 cm. Flowers solitary or paired on peduncles 2–3 mm long; sepals 7–8 mm long, petals yellow, 7–8 mm long. Capsules 2.5–8 cm × 0.5 cm, ± smooth, opening by 5, rarely 4 valves, glabrous; seeds separated by transverse partitions. **Fig. 8J.**

Native of India; weed often of cultivation or disturbed areas of the region. Flowers summer. Possibly toxic to stock under certain conditions.

### 4. *Corchorus cunninghamii* F. Muell.

Glabrous herb. Leaves with petioles 1–2.5 cm long; blades ovate, apex acuminate to attenuate, base obtuse, margin unevenly serrate, 4–16 cm × 1–6 cm. Inflorescences several-flowered on peduncles 1–10 mm long, pedicels 1–1.5 cm long; sepals 0.8–1.2 cm long; petals yellow, 0.7–1.2 cm long. Capsules narrowly oblong, apex long acute, 2–3.5 cm long, opening in 3–4 valves; transverse partitions absent. **Fig. 8G.**

Recorded from near Brisbane, in rainforest fringes or margins in areas now largely Brisbane suburbs. Flowers mainly summer.

### 5. *Corchorus hygrophilus* Cunn. ex Benth.

Erect glabrous herb. Leaves with petioles 0.5–1.7 cm long; blades ovate or narrowly so, apex acuminate to attenuate, base obtuse, margin serrate, 3–10 cm × 1–3.5 cm. Inflorescences few- to several-flowered on peduncles 6–8 mm long, pedicels 1–1.1 cm long; sepals 5–6 mm long; petals 5–6 mm long. Capsules oblong or globular, only slightly tuberculate outside, *ca* 10 mm long, opening by 2–3 valves, transverse partitions absent. **Fig. 8H.**

Recorded from near Eidsvold in the Burnett district. Flowers ? summer–autumn.

## 88. MALVACEAE

Herbs or shrubs, rarely trees, with mucilaginous sap, often with fibrous stems; indumentum usually stellate or lepidote. Leaves alternate; stipulate; blades entire or

variously lobed or toothed, often palmately nerved. Inflorescences various; flowers actinomorphic, bisexual, rarely dioecious or polygamous; sepals 3–5, ± united, valvate, sometimes subtended by an involucl of bracteoles (epicalyx), often glandular within the base; petals 5, free from each other but usually adnate to base of staminal column, contorted or imbricate; stamens numerous, hypogynous, monadelphous, staminal column bearing up to or just below its apex, 1-locular anthers (by division of filaments), opening lengthwise, column sometimes lobed and corona-like at apex, pollen spinulose; ovary 2–many-locular, often 5-locular, rarely 1 carpel, or carpels ± spiral in a cluster, style branches same number as, rarely double, number of carpels, style rarely clavate or with connivent stigmas, ovules 1 or more from inner angle of locule, erect to pendulous. Fruits dry, rarely baccate, capsules or schizocarps; seeds with usually some endosperm and straight or curved embryo.

75 genera with 1,000 species, tropical and temperate; 16 genera with 144 species Australia; 11 genera with 43 species south-eastern Queensland.

1. Epicalyces present, though sometimes caducous . . . . .	2
Epicalyces absent . . . . .	9
2. Style branches or stigmas twice number of carpels . . . . .	3
Style branches same number as carpels . . . . .	4
3. Leaves with gland on vein on undersurface at base; fruits covered with bristles . . . . .	1. <i>Urena</i>
Leaves without gland on vein on undersurface; fruits with only 1–3 bristles on back of each mature carpel . . . . .	2. <i>Pavonia</i>
4. Staminal columns 5-toothed or truncate at apex; fruits capsules, 5-valved or dehiscent, carpels remaining attached to each other and central axis . . . . .	5
Staminal columns divided at apex into numerous filaments; fruits schizocarps, carpels usually separating from each other and persistent axis . . . . .	7
5. Calyces ± truncate; fruits woody, indehiscent; seeds obovoid . . . . .	3. <i>Thespesia</i>
Calyces 5-lobed or 5-toothed, or spatheaceous, split to base on one side; fruits dehiscing by 5 valves; seeds reniform . . . . .	6
6. Calyces 5-lobed or 5-toothed, persistent . . . . .	4. <i>Hibiscus</i>
Calyces spatheaceous, split to base on one side, deciduous . . . . .	5. <i>Abelmoschus</i>
7. Ovules 2 per loculus; fruits transversely septate between seeds . . . . .	6. <i>Modiola</i>
Ovules solitary per loculus; fruits not septate between seeds . . . . .	8
8. Style branches filiform or clavate, stigmas apical . . . . .	7. <i>Malvastrum</i>
Style branches filiform, stigmatose along inner surface . . . . .	8. <i>Malva</i>
9. Indumentum simple, mature carpels broadly stellate verticillate . . . . .	9. <i>Anoda</i>
Indumentum stellate, as well as sometimes simple; mature carpels rounded, in a ring . . . . .	10
10. Ovules 1 per loculus . . . . .	10. <i>Sida</i>
Ovules 2 or more per loculus . . . . .	11. <i>Abutilon</i>

1. URENA L.

Herbs or shrubs. Leaves angular or lobed with gland at base of midrib on undersurface. Flowers small, sessile or shortly stalked, often clustered, bracteoles united into 5-fid epicalyx adnate to calyx tube; calyx 5-fid or 5-toothed; petals 5, connate below and united to staminal tube; staminal column with subsessile anthers below truncate or 5-toothed apex; ovary 5-locular, ovule 1 per loculus, style branches 10 with capitate stigmas. Ripe carpels separating from axis, indehiscent, covered with glochidiate spines; seeds ascending.

6 species tropical and subtropical; 3 species Australia; 1 species south-eastern Queensland.

**1. *Urena lobata* L.** URENA WEED; PINK FLOWERED CHINESE BURR;  
URENA BURR

Erect shrub up to 2 m tall. Leaves with petioles 0.5–8(–15) cm long; blades broadly ovate, shallowly lobed, apices of lobes acute, base truncate to cordate, margin serrulate, 2–7(–9.5) cm × 2–8(–12) cm, stellate puberulent above, usually tomentose below with long and short stellate hairs, 1 or more glands on main veins below. Flowers clustered or solitary on axillary peduncles or sometimes pseudoterminal racemes; epicalyx 5–8 mm long, lobes triangular, closely enveloping calyx; calyx 3–6 mm long, deeply lobed, lobes triangular; petals mauve or pinkish, 1.8–2.5 cm long. Fruits globose or depressed globose, *ca* 1 cm diameter, spines 1.5–2 mm long, tipped with a recurved stellate hair. **Fig. 9A.**

Cosmopolitan weed of disturbed area, roadsides, sometimes introduced into properties as an impurity in seed. Flowers mainly autumn.

**2. PAVONIA Cav.**

Shrubs or herbs, tomentose, hispid or glabrescent. Leaves often angular or lobed. Flowers often congested at ends of branches; epicalyx of 5 or more bracteoles, free or connate with each other and calyx tube; calyx 5-lobed or 5-toothed; petals spreading or connivent; staminal column truncate or 5-toothed below apex, filaments numerous; ovary 5-locular, ovules 1 per loculus, style branches 10, stigmas capitate. Mature carpels separating from axis, rounded to truncate at apex, back with 1–3 bristles or beaks, sometimes with 2 membranous wings.

200 species tropical and subtropical; 1 species Australia, occurring in south-eastern Queensland.

**1. \**Pavonia hastata* Cav.**

Shrub up to 1.5 m tall. Leaves with petioles 0.4–2 cm long; blades narrowly triangular to ovate, sometimes broadly ovate, apex acute to obtuse, base cordate-hastate, margin serrate to crenate, 0.9–5.6 cm × 0.8–2.5 cm, finely stellate puberulent above, stellate pubescent to tomentose below. Flowers solitary on axillary peduncles 2–3.5 cm long, bracteoles elliptic to obovate, basally connate, 6–8 mm long, stellate pubescent; calyx 0.9–1.1 cm long, deeply lobed; petals pinkish to mauve with dark purple basal spot, 2.5–3 cm long. Fruits depressed globose, apex rounded, dorsally ridged, not winged, surface reticulate, with simple hairs. **Fig. 9B.**

Possibly an introduction since native also of South America; weed of disturbed sites, roadsides, wasteland etc. Flowers mainly summer–autumn.

**3. THESPESIA Solander ex Corr.**

Trees or tall herbs. Leaves entire or angular-lobate. Flowers mostly showy, yellow; epicalyx of 5–3 bracteoles, small or deciduous; calyx truncate, minutely or setaceously dentate, rarely 5-fid; staminal column dentate below apex, filaments numerous; ovary 5-locular, few ovules per loculus, style clavate, apically 5-grooved or subdivided into short erect clavate branches. Capsules woody coriaceous, loculicidally 5-valved or ± indehiscent; seeds obovoid.

15 species tropical; 3 species Australia; 1 species south-eastern Queensland.

**1. *Thespesia populnea* (L.) Solander ex Corr.**

*Hibiscus populneus* L.

Usually small tree, brown lepidote, scales scattered. Stipules linear-ovate, up to 1 cm long; petioles 3–10 cm long; blades broadly ovate, apex acuminate, base cordate, usually with deep narrow basal sinus, margin entire, 5–17 cm × 4–11.5 cm. Flowers on pedicels (1–)2–3(–5) cm long, with 2 scale-like bracts and articulation near base, ± erect; epicalyx of 3 bracteoles *ca* 8 mm long, caducous; calyx ± truncate, up to 1 cm long; petals lemon yellow with maroon base, 5–6 cm long, buds and young fruit exuding yellow gum when cut. Mature fruits depressed globose, ± indehiscent, up to 5 cm diameter; seeds several per loculus, appressed ferruginous pubescent. **Fig. 9C.**

Recorded from Goat I. in Moreton Bay, common strand tree in tropics. Flowers summer to winter.

## 4. HIBISCUS L.

Trees, shrubs or herbs, indumentum various. Leaves often divided. Flowers mostly showy; epicalyx persistent or caducous, of numerous or few bracteoles; calyx 5-lobed or 5-toothed, persistent; petals often marked with different colour spot at base; staminal column divided below truncate or 5-toothed apex into numerous filaments; ovary 5-locular, 3 or more ovules per loculus, style-branches 5, spreading or rarely erect and subconnate, sometimes very short, divided apically into capitate or spatheate stigmas. Capsules loculicidally 5-valved, endocarp rarely membranous or produced into spurious dissepiments; seeds reniform, subglobose.

300 species tropical and subtropical; 40 species Australia; 10 species south-eastern Queensland.

- |  |                              |
|--|------------------------------|
| 1. Foliar glands present at bases of midribs on underside of leaves . . . . .  | 2                            |
| Foliar glands absent . . . . .   | 5                            |
| 2. Calyx lobes attenuate, without stellate hairs . . . . .   | 3                            |
| Calyx lobes acute, always with at least a few stellate hairs . . . . .   | 4                            |
| 3. Calyx lobes glabrous except for scattered tubercular-based hairs on ribs . . . . .  | 1. <i>H. meraukensis</i>     |
| Calyx lobes usually densely pubescent, always some tubercular-based hairs between ribs . . . . .   | 2. <i>H. diversifolius</i>   |
| 4. Calyces usually 1.5–2.5 cm long, with coarse simple tubercular-based hairs as well as stellate ones, lobes 1.3–1.8 cm long . . . . .                                | 3. <i>H. divaricatus</i>     |
| Calyces usually 2.5–3 cm long, with only stellate hairs, lobes 2–2.5 cm long . . . . .   | 4. <i>H. heterophyllus</i>   |
| 5. Epicalyx bracteoles united into an involucre with broad ovate lobes . . . . .   | 6                            |
| Epicalyx bracteoles free, linear . . . . .   | 7                            |
| 6. Trees with ovate obtuse stipules 2.5–4 cm long; only found on seashores or saline estuaries, often cultivated . . . . .   | 5. <i>H. tiliaceus</i>       |
| Shrubs less than 1 m tall with very small stipules; usually found in eucalypt forest, never near the sea . . . . .   | 6. <i>H. sturtii</i>         |
| 7. Calyces membranous, inflated, with 3–5 raised green or purple veins per lobe . . . . .  | 7. <i>H. trionum</i>         |
| Calyces herbaceous, not inflated, usually with 1 green vein per lobe . . . . .   | 8                            |
| 8. Calyces 2.5–3 cm long, densely long stellate pubescent . . . . .  | 8. <i>H. splendens</i>       |
| Calyces 1–1.5 cm long, puberulent with simple and stellate hairs . . . . .   | 9                            |
| 9. Flowers solitary, axillary on peduncles 5–19 cm long; petals pinkish or purplish . . . . .  | 9. <i>H. brachysiphonius</i> |
| Flowers solitary, axillary on peduncles 1.5–4 cm long but often appearing to form short dense leafy terminal racemes; petals pale yellow with red basal spot . . . . . | 10. <i>H. vitifolius</i>     |

1. *Hibiscus meraukensis* Hochr.

## MERAUKE HIBISCUS

*Brockmania membranacea* W. V. Fitzg.; *Hibiscus radiatus* auct. non Cav., F. Muell.; *H. cannabinus* auct. non L., Gardner

Erect annual herb or shrub 0.5–3 m tall; stems glabrous or prickly, rarely pubescent. Leaf shape and size variable; lower leaves with petioles up to 9.5 cm long, blades shallowly to deeply palmately 3–5-, rarely 7-lobed, 4–18 cm × 4–18 cm; upper leaves with petioles reducing to ca 2 mm long; blades 1–3-lobed, each linear to narrowly ovate, apex acute, base attenuate to cuneate, margin serrate, 5–14.5 cm × 0.3–3.5 cm, with conspicuous nectary 2–8 mm long at base of midrib on lower surface, sometimes on 2 lateral ribs, bounded by an elliptic raised thickened, straw-coloured border. Flowers axillary, solitary, erect, or rarely pendulous, peduncles 0.5–4.2 cm long, enlarging up to ca 6 cm rarely 10 cm in fruit; epicalyx bracteoles 8–10, rarely 12, linear, flattened, 0.6–2.2 cm long, glabrous or with scattered tubercular-based hairs;

calyx shorter than or equal to epicalyx at anthesis, exceeding it in fruit, tubular for about  $\frac{1}{3}$  of its length, lobes long acuminate, 1.2–3 cm long, with tubercular-based hairs along ribs, generally glabrous and translucent between ribs; petals white with pink margin or light pink throughout with thin red horizontal stripe or small red spot at base, broadly ovate, up to 6 cm long. Capsules broadly ovoid, 1–1.7 cm long with beak 1–3 mm long, glabrous or rarely with few hairs at apex.

Northern areas of the Wide Bay district, in open forest. Flowers mainly autumn–winter.

## 2. *Hibiscus diversifolius* Jacq.

### SWAMP HIBISCUS

Spreading or sprawling prickly shrub up to 2 m tall; stems with simple and stellate hairs as well as prickles. Leaves with petioles 1.5–13 cm long; blades broadly ovate, or shallowly 3-lobed, to occasionally narrowly ovate or linear amongst the flowers, apex acute to obtuse, base cuneate to rounded, truncate or cordate, margin irregularly crenate, 2–10 cm  $\times$  (0.4–)2.5–11.5 cm, sparsely simple pubescent with occasional stellate hairs, foliar gland present on midrib at base of blade beneath. Flowers axillary towards top of stem, appearing to form narrow terminal racemes when leaves fall, peduncles 3–6 mm long, enlarging up to 10 mm long in fruit; epicalyx bracteoles *ca* 8–10, 0.7–1.4 cm long, puberulent with coarse simple tubercular-based hairs; calyx deeply lobed, 1.4–2.5 cm long, lobes attenuate, 1–2 cm long, pubescent with stiff simple tubercular-based hairs; petals light yellow with dark reddish purple basal spot, 3–5 cm long. Capsules ovate, 1.8–2.5 cm long, densely appressed pubescent with coarse hairs.

Coastal districts in swampy or boggy areas close to the coast. Flowers much of the year, mainly spring and autumn.

## 3. *Hibiscus divaricatus* Graham

Shrub up to 2.5 m tall; stems prickly, otherwise glabrous. Leaves with petioles 0.3–1.3(–2) cm long; blades very narrowly obovate, oblong-obovate or ovate, rarely 3-lobed, apex acute, base attenuate to obtuse, margin serrate, 3.5–12.5 cm  $\times$  0.2–3(–4) cm, prickly along midrib and major veins, otherwise  $\pm$  glabrous, foliar gland present towards base of midrib below. Flowers solitary axillary on prickly peduncles *ca* 1 cm long, enlarging up to 2 cm long in fruit; epicalyx bracteoles 9–11, linear, 1.2–1.7 cm long, with coarse tubercular-based hairs; calyx usually 1.5–2.5 cm long, deeply lobed, lobes acute, usually 1.3–1.8 cm long, with coarse simple tubercular-based hairs and some stellate ones; petals white with pink margin and dark red base, rarely yellow, 5–7.5 cm long. Capsules ovate, 1.5–2 cm long with beak 2–4 mm long, densely appressed pubescent with coarse straw coloured hairs.

Northern parts of Wide Bay district. Flowers late winter–spring.

## 4. *Hibiscus heterophyllus* Vent.

Erect shrub or small tree up to *ca* 6 m tall; stems with few prickles, and stellate hairs on young parts. Leaves with petioles 0.5–4.5(–6) cm long; blades ovate, elliptic, obovate or narrowly so towards top of plant, sometimes deeply 3-lobed, lobes oblong, apex acute, base cuneate to attenuate, margin serrulate to serrate, 5–20 cm  $\times$  0.5–8(–11) cm, puberulent or  $\pm$  glabrous above, puberulent with stellate hairs and some simple ones below, or almost glabrous, foliar gland present at base of midrib below. Flowers solitary axillary on peduncles 1–1.5 cm long, enlarging up to 2 cm long in fruit; epicalyx bracteoles *ca* 10, linear-subulate, 1.2–2 cm long, sparsely stellate pubescent; calyx usually 2.5–3 cm long, deeply lobed, lobes acute, 2–2.5 cm long, sparsely to densely stellate pubescent; petals white with pink margin, pink, or yellow, with thin stripe or purplish red basal spot, up to 7 cm long. Capsules ovate, *ca* 1.5–2 cm long, beak 1–2 mm long, covered with long straight appressed hairs.

Two subspecies occur in the region:

- |  |   |
|--|---|
| 1. Calyces densely stellate pubescent . . . . .    | <i>H. heterophyllus</i> subsp. <i>heterophyllus</i> |
| Calyces only sparsely stellate pubescent . . . . . | <i>H. heterophyllus</i> subsp. <i>luteus</i>        |

**H. heterophyllus** subsp. **heterophyllus** is usually found in the coastal districts, while **H. heterophyllus** subsp. **luteus** (Hochr.) F. D. Wilson (*H. divaricatus* Graham var. *luteus* Hochr.) is usually found in the more western districts. Both occur in eucalypt open forest, and both flower in spring.

### 5. *Hibiscus tiliaceus* L.

### COTTON TREE

Spreading tree up to *ca* 9 m tall, young branchlets whitish with few stellate hairs and scurf, soon glabrous. Stipules ovate, obtuse, 2.5–4 cm long, densely pubescent outside, caducous; petioles 1–14 cm long; blades broadly ovate, apex abruptly acuminate, base cordate, margin crenate to  $\pm$  entire or undulate, 5–20 cm  $\times$  4.5–18 cm, upper surface dark green, puberulent with short stellate hairs, lower surface whitish, densely pubescent with long and short stellate hairs. Flowers axillary on peduncles 1.2–2.5 cm long, often appearing to form terminal racemes when leaves and stipules fall; epicalyx bracteoles united to form involucre 8–10 mm long, with 10–12 acute lobes 3–5 mm long, very shortly stellate pubescent; calyx 1.5–2 cm long, deeply lobed, lobes acute, *ca* 1–1.3 cm long, densely short stellate pubescent; petals yellow with dark purple basal spot, *ca* 6–7 cm long. Capsules oblong to  $\pm$  globose, 2–2.5 cm long, densely pubescent with coarse simple appressed hairs. **Fig. 9E.**

Sheltered sea shores and saline estuaries on sand, and sometimes behind mangroves. Flowers late spring to autumn. Widely cultivated for ornament and shade.

### 6. *Hibiscus sturtii* Hook.

Procumbent or ascending rigid subshrub less than 1 m tall, branchlets stellate pubescent. Leaves with petioles 0.3–1.6(–2.5) cm long; blades ovate or oblong-ovate, apex obtuse, base broadly cuneate, margin coarsely crenate, 2–4.5(–6) cm  $\times$  1–2.5(–4) cm, densely short stellate pubescent. Flowers solitary axillary on peduncles 1.2–5 cm long; epicalyx bracteoles united into stellate pubescent involucre 6–9 mm long, lobes ovate, apiculate or obtuse, 3–6 mm long; calyx 7–10 mm long, stellate pubescent, lobes acute, 3–5 mm long; petals purple to pink, occasionally white, 1.5–3 cm long. Capsules  $\pm$  globose to ovoid, *ca* 8–10 mm long, densely pubescent with long appressed hairs, surrounded by enlarged involucre up to 2 cm long.

Dry areas of the Darling Downs and Burnett districts though once recorded from the Moreton district, in eucalypt open forest. Flowers spring to autumn, probably in response to rainfall.

### 7. *Hibiscus trionum* L.

### BLADDER KETMIA

Small erect annual or short-lived perennial up to *ca* 1 m tall, branchlets stellate puberulent. Leaves with petioles 1–5 cm long; blades deeply 3–5-lobed, or sometimes ovate just below flowers, some appearing 3-foliolate with sessile leaflets, lobes pinnatifid to pinnatisect, apex obtuse, base attenuate, margin crenate, whole blade 2–7 cm  $\times$  1.5–5.5 cm, sparsely stellate pubescent, pellucid dotted. Flowers solitary axillary on peduncles 0.5–2 cm long, elongating up to 4 cm long in fruit; epicalyx bracteoles 9–11, linear, 6–8 mm long, puberulent with coarse hairs; calyx membranous, inflated, with 3–5 raised green or purple veins per lobe, 1–1.5 cm long enlarging up to *ca* 2 cm long in fruit; lobes *ca* 0.7–1 cm long, coarsely pubescent on veins; petals white turning pink, or cream to yellow, with purple basal spot, 2.5–3 cm long. Capsules  $\pm$  globose, *ca* 1.2–1.5 cm long, coarsely puberulent, surrounded by enlarged calyx. **Fig. 9D.**

Weed of cultivation, found on more fertile soils of the region. Flowers summer–autumn.

### 8. *Hibiscus splendens* C. Fraser ex Graham

Large shrub or small tree up to 7 m tall, branchlets densely pubescent with long spreading stellate hairs, and few coarse tubercular-based bristles or prickles. Leaves with petioles 0.5–5(–9) cm long; blades deeply 3–5-lobed, broadly ovate or uppermost narrowly ovate, apex acuminate to obtuse, base cuneate to rounded or sometimes cordate, margin serrate, 5–18 cm  $\times$  1.5–11(–15) cm, densely pubescent with long stellate hairs. Flowers solitary axillary on peduncles 2–5 cm long; epicalyx bracteoles 11–12, linear, *ca* 1.5–2.5 cm long, densely pubescent with stellate hairs and long bristles; calyx 2.5–3 cm long, elongating up to 4 cm long in fruit, lobes acute, 2–2.5 cm long, densely long stellate pubescent; petals pink with reddish basal stripe, 5–9 cm

long. Capsules ovoid, *ca* 2.5–3 cm long, densely pubescent with long appressed straw coloured hairs.

Coastal districts of the region but occasionally in wetter areas on Great Dividing Ra., in eucalypt forest on more fertile soils. Flowers winter to summer, but mainly spring. Cultivated for ornament.

### 9. *Hibiscus brachysiphonius* F. Muell.

Prostrate ascending or erect woody herb or subshrub, branches with stellate hairs. Leaves with petioles 1–3 cm long; blades of lower leaves broadly ovate, obtuse, with lobed and irregularly serrate margins, 1–2.7 cm × 1–2.7 cm; upper blades usually 3-, rarely 4–5-foliolate, leaflets sessile, obovate or narrowly so, apex obtuse, base attenuate, margin serrate or shallowly lobed, 0.6–4 cm × 0.2–1.5 cm, all stellate puberulent with occasional simple often curved hairs as well, pellucid dotted. Flowers solitary on axillary peduncles 5–19 cm long; epicalyx bracteoles *ca* 8–10, linear, 6–10 mm long, with few hairs; calyx 1.2–1.5 cm long, lobes acute, 0.8–1.2 cm long with few stiff hairs; petals purplish or pinkish, 1–1.8 cm long. Capsules globose to ovoid, 1–1.3 cm long, glabrous.

Western Darling Downs district. Flowers mainly summer–autumn.

### 10. *Hibiscus vitifolius* L.

Coarse herb or shrub up to *ca* 1.5 m tall, branchlets pubescent with coarse stellate and/or simple or glandular hairs. Leaves with petioles 0.5–6 cm long; blades 3–5-lobed often becoming simple ovate towards top of plant, apex acute, base cordate, margin coarsely crenate to serrate, 1.5–15 cm × 0.6–18 cm, densely pubescent with both coarse and fine long stellate hairs. Flowers solitary axillary on peduncles 1.5–4 cm long, often appearing to form short dense leafy racemes towards apex of stem; epicalyx bracteoles 7–10, linear, *ca* 4–10 mm long, pubescent with simple and few stellate hairs; calyx 1–1.5 cm long, lobes acute, 0.6–1.2 cm long, enlarging in fruit, pubescent with simple and stellate hairs; petals pale yellow with dark red basal spot, 2.5–3 cm long. Capsules depressed globose, *ca* 1 cm long with beak 2–3 mm long, the 5 angles produced into transversely veined, hirsute wings.

Recorded from the Gayndah area. Flowers summer–autumn.

## 5. ABELMOSCHUS Medik.

Annual or perennial herbs. Leaves with linear or filiform caducous stipules; blades entire, triangular and hastate, or palmately lobed, lobes toothed. Flowers solitary axillary or in terminal racemes; epicalyx of several or numerous, mostly caducous bracteoles; calyx spathaceous, split to base on one side, lobed or toothed apically, falling with petals and staminal column; staminal column divided below truncate or 5-toothed apex into numerous filaments, bearing anthers to base, anthers 1-locular; ovary 5-locular, many-ovuled, style with 5 sessile or subsessile cushion-like stigmas. Capsules oblong or cylindrical, beaked or mucronate, dehiscent by 5 valves; seeds numerous, subreniform, closely pustular, striate or pubescent

15 species, tropical Africa, Asia, Australia; *ca* 3 species Australia; 2 species south-eastern Queensland.

- |  |  |
|--|--|
| 1. Epicalyx bracteoles 5–6, 0.4–1.2 cm long, usually falling before anthesis | 1. <i>A. ficulneus</i>                         |
| Epicalyx bracteoles 9–10, 1–2(–2.5) cm long, persistent                      | 2. <i>A. moschatus</i> subsp. <i>tuberosus</i> |

### 1. *Abelmoschus ficulneus* (L.) Wight & Arn. ex Wight

NATIVE ROSELLA

*Hibiscus ficulneus* L.

Shrub up to 1.5 m tall. Leaves with petioles 1–20 cm long; blades broadly ovate to orbicular in outline, usually lobed or palmatisect, lobes often obovate, apex obtuse, base broadly cuneate, truncate to cordate, margin crenate to serrate, 1.8–14 cm × 2–15 cm, puberulent with coarse simple hairs above and below, and also 2–3-armed hairs below. Flowers solitary on axillary peduncles 1–1.5 cm long, elongating in fruit, but often appearing to form terminal racemes by decreasing size or absence of leaves;

epicalyx bracteoles 5–6, 0.4–1.2 cm long, hirsute, usually falling before anthesis; calyx 1.2–1.5 cm long, lobes 5, linear, small; petals white eventually pink with dark purple base, 2–3 cm long. Capsules ovoid, 5-angular, obtuse or shortly acuminate, 2.5–3.5 cm × 1.3–2 cm, tomentose, eventually ± glabrous.

Recorded as a weed in cultivation in coastal districts; rare, probably introduced as a seed impurity, more common in tropical areas. Flowers ? spring to autumn.

**2. *Abelmoschus moschatus* Medik. subsp. *tuberosus* (Span.) Borssum Waalkes**  
*Hibiscus longifolius* Willd. var. *tuberosus* Span.; *H. rhodopetalus* (F. Muell.) F. Muell. ex Benth.; *H. abelmoschus* L.

Erect or decumbent herb up to 75 cm tall; tap root tuberous; stems petioles and pedicels usually densely pubescent with spreading simple hairs. Leaves with petioles 1–15 cm long; blades narrowly ovate, hastate, to broadly ovate, palmatisect with oblong or narrowly obovate lobes, apex subacute to obtuse, base cordate or hastate or sometimes ± truncate, margin crenate to coarsely serrate, 3.5–15 cm × 1.2–16 cm, pubescent with long simple hairs above, simple and 3-armed hairs below. Flowers solitary axillary on peduncles 3–12 cm long; epicalyx bracteoles 9–10, linear, 1–2(–2.5) cm long, persistent, spreading or reflexed; calyx *ca* 1.5–2 cm long; petals white or pink with darker base, sometimes red, 2.5–7 cm long. Capsules ovoid, 3–5 cm × 1.5–2.5 cm, pubescent with long stiff hairs, often shorter hairs as well. **Fig. 9F.**

Weed of disturbed sites or cultivation or in open forest; rare. Flowers spring to autumn.

## 6. MODIOLA Moench

Prostrate herbs rooting at base, rootstock tuberous. Leaves with persistent stipules; blades deeply digitately divided. Flowers axillary, pedicellate, small; epicalyx bracteoles 3, free; calyx 5-lobed; petals 5; staminal column divided apically into numerous filaments; ovary with numerous loculi, each with 3 or 2 ovules, style branches as many as loculi, filiform, apically capitate stigmatose. Mature carpels separating from axis with 2 crests at back, 3-valved, transversely septate between seeds, setose-pilose; seeds reniform.

1 species America, introduced into Australia, occurring in south-eastern Queensland.

**1. \**Modiola caroliniana* (L.) G. Don**

RED FLOWERED MALLOW;  
CAROLINA MALLOW

*Malva caroliniana* L.; *Modiola multifida* Moench

Diffuse herb often rooting at lower nodes. Leaves with petioles 1–8.5 cm long; blades broadly ovate, palmatifid to palmatisect, apex obtuse, base truncate to cordate, margin crenate, 2–5 cm × 1.8–6 cm. Flowers solitary on peduncles 1–2.5 cm long; epicalyx bracteoles 4–6 mm long; calyx 6–7 mm long, puberulent with long simple weak hairs and sometimes some stellate ones; petals reddish, 7–9 mm long. Fruits disciform, 3–4 mm high, *ca* 7–8 mm diameter, each carpel with 2 ridges along back, each ridge ending in 2 diverging spines 1–1.5 mm long, pubescent or puberulent with long weak hairs. **Fig. 9G.**

Native of tropical and warm temperate North America; weed of disturbed sites. Flowers mainly spring. Suspected of being poisonous but no definite evidence of toxicity.

## 7. MALVASTRUM A. Gray

Herbs or small shrubs. Leaves entire, cordate or deeply divided. Inflorescences of terminal spikes or axillary flowers; flowers golden yellow or red; epicalyx bracteoles 0–3; calyx 5-fid; petals 5; staminal column divided apically into numerous filaments; ovary 5- or more-locular, 1-ovulate, style branches as many as loculi, filiform or clavate, truncate or capitate stigmatose at apex. Mature carpels separating from axis, indehiscent or 2-valved, muticous at apex or produced into long beak, sometimes shortly 2-spinose on back; seeds reniform.

12 species tropical and subtropical America; 2–3 species naturalized Australia; 2 species south-eastern Queensland.

1. Stems petioles and nerves on lower leaf surfaces  $\pm$  tomentose with minute appressed stellate hairs with 5–10 radial rays; flowers in dense spikes subtended by bracts  
 Stems petioles and nerves on lower leaf surfaces striate with appressed coarse usually 4-rayed hairs; flowers axillary, solitary or in clusters without subtending bracts

1. *M. americanum*  
 2. *M. coromandelianum*

1. \***Malvastrum americanum** (L.) Torrey

SPIKED MALVASTRUM

*Malva americana* L.; *Malvastrum spicatum* (L.) A. Gray

Shrub up to 1.5 m tall. Leaves with petioles 0.4–3.7 cm long; blades narrowly ovate to ovate, sometimes oblong to broadly elliptic, apex acute to obtuse, base cuneate, obtuse, truncate or cordate, margin coarsely serrate, 1–6.4 cm  $\times$  0.5–3.5 cm, puberulent to pubescent above, pubescent to tomentose below with small stellate hairs. Inflorescences usually short dense terminal or axillary spikes, bracts ovate, 4–6 mm long, bifid to bipartite; epicalyx bracteoles linear to narrowly ovate, acuminate, 8–10 mm long, with long simple and fine stellate hairs; calyx 5–6 mm long, slightly accrescent in fruit, lobes triangular; petals yellow, 6–8 mm long. Capsules *ca* 4–5 mm diameter with 10–15 obtuse awnless mericarps, finely stellate pubescent.

Native of tropical America; weed of mainly disturbed sites or drier areas. Flowers spring to autumn, occasionally winter. Suspected of being poisonous but no definite evidence of toxicity.

2. \***Malvastrum coromandelianum** (L.) Garcke

PRICKLY MALVASTRUM

*Malva coromandeliana* L.; *Malvastrum tricuspidatum* (R. Br.) A. Gray

Erect shrub up to 1 m tall. Leaves with petioles 0.5–3.2 cm long; blades ovate or oblong, rarely broadly ovate, apex acute or obtuse, margin serrate, 1.2–6.5 cm  $\times$  0.8–5 cm, simple hairs above, sparse simple to 4-armed hairs below, particularly on nerves. Flowers solitary axillary, or sometimes on short axillary branches, appearing clustered, peduncles 2–5 mm long, elongating to *ca* 8 mm long in fruit; epicalyx bracteoles linear to narrowly ovate, 5–7 mm long; calyx 7–10 mm long, slightly accrescent in fruit, pubescent with 4-rayed hairs; petals yellow, 6–9 mm long. Capsules *ca* 7 mm diameter with 10–14 mericarps, central axis terminating in awns *ca* 1 mm long, upper dorsal sides terminating in 2 awns *ca* 0.5 mm long, upper part with long simple hairs. **Fig. 9H.**

Possibly native of America, now a cosmopolitan tropical weed; weed of disturbed sites or dry forest areas. Flowers mainly summer–autumn but may be found throughout the year.

8. MALVA L.

Glabrous or pubescent herbs, erect or procumbent. Leaves toothed, lobed or dissected. Flowers solitary or fasciculate in leaf axils, rarely in terminal racemes; epicalyx bracteoles 3, free; calyx 5-fid; petals rose or white, never yellow, widely emarginate or very rarely denticulate; staminal column divided apically into numerous filaments; ovary loculi numerous, 1-ovulate, style branches as many as loculi, filiform, stigmatose along inner surface. Carpels radially arranged, beakless, indehiscent, separating from axis, 1-seeded.

40 species Europe, Asia, Africa, northern temperate America; 4 species naturalized Australia; 2 species south-eastern Queensland.

1. Petals 5–6 mm long, only slightly longer than calyx; epicalyx bracteoles narrow, acute  
 Petals 1.5–3 cm long, much longer than calyx; epicalyx bracteoles ovate, obtuse

1. *M. parviflora*  
 2. *M. sylvestris*



**Fig. 9** MALVACEAE — A<sub>1</sub>-A<sub>3</sub> *Urena lobata*, A<sub>1</sub> part of flowering stem x1, A<sub>2</sub> flower x2, A<sub>3</sub> gland on underside of leaf base x2; B *Pavonia hastata*, flowering branchlet x1; C<sub>1</sub>-C<sub>2</sub> *Thespesia populnea*, C<sub>1</sub> flower bud showing calyx and 1 remaining bracteole of epicalyx x1, C<sub>2</sub> fruit x1/2; D-E *Hibiscus* spp. — D *H. trionum*, part of fruiting branchlet x1; E<sub>1</sub>-E<sub>2</sub> *H. tiliaceus*, E<sub>1</sub> fruiting calyx x1, E<sub>2</sub> stipules x1; F *Abelmoschus moschatus* subsp. *tuberosus*, flower bud showing calyx split down one side only x1; G *Modiola caroliniana*, part of fruiting branchlet x1; H<sub>1</sub>-H<sub>3</sub> *Malvastrum coromandelianum*, H<sub>1</sub> part of fruiting branchlet x1, H<sub>2</sub> flower with petals removed to show central column x3, H<sub>3</sub> stellate hairs x6; I<sub>1</sub>-I<sub>2</sub> *Malva parviflora*, I<sub>1</sub> leaf x1, I<sub>2</sub> fruit x1; J *Anoda cristata*, part of fruiting branchlet x1.

1. \**Malva parviflora* L. SMALL FLOWERED MALLOW; MARSHMALLOW  
Prostrate or ascending herb up to 50 cm tall. Leaves with petioles 2.5–24 cm long; blades broadly ovate, apex obtuse, base cordate, margin shallowly lobed, crenate, 1.7–8.5 cm × 2–10 cm. Flowers clustered in axils on peduncles 0.7–2.2 cm long; epicalyx bracteoles narrow, acute, 3–4 mm long; calyx 4–5 mm long, ciliate on margin of lobes, strongly accrescent in fruit; petals whitish or pale mauve, slightly longer than calyx, emarginate. Capsules 2–3 mm high, *ca* 7–8 mm diameter, contained in enlarged persistent calyx, eventually lobes recurved, mericarp surfaces reticulate. **Fig. 9I.**

Native of Europe; weed of disturbed sites, cultivation. Flowers autumn to spring. Can cause “staggers” in sheep horses and cattle under certain conditions.

2. \**Malva sylvestris* L. TALL MALLOW; COMMON MALLOW  
Erect herb up to 1 m tall. Leaves with pubescent petioles 2.5–12 cm long; blades broadly ovate to reniform, usually shallowly lobed, apex acute, base broadly cuneate, truncate or cordate, margin crenate, 2.5–7 cm × 3–10 cm, ± glabrous. Flowers several in axillary clusters, peduncles 0.5–1.7 cm long; epicalyx bracteoles ovate, obtuse, 2.5–4 mm long; calyx 4–6 mm long, puberulent, lobes ciliate on margins; petals purplish, 1.5–3 cm long, emarginate or lobed apically. Capsules 2–3 mm high, *ca* 5–7 mm diameter, enclosed in persistent enlarged calyx, mericarp surfaces reticulate.

Native of Europe and temperate Asia; cultivated, now naturalized on mainly disturbed sites. Flowers late winter–spring.

## 9. ANODA Cav.

Hispid to glabrescent herbs. Stipules filiform; leaf blades entire, hastately 3-lobed or rarely dissected. Inflorescences terminal racemes, or flowers axillary; epicalyx absent; calyx 5-lobed; petals violet or yellow, 5; staminal column divided apically into numerous filaments; ovary loculi numerous, 1-ovulate, style branches as many as loculi, filiform, capitate or truncate, stigmatose at apex. Mature carpels broadly stellate-verticillate, separating from axis, opening at sides by septa disappearing; seed pendulous or horizontal.

10 species tropical America; 1 species naturalized Australia, occurring in south-eastern Queensland.

1. \**Anoda cristata* (L.) Schlechtendal ANODA WEED  
Hispid herb up to *ca* 80 cm tall. Leaves with petioles 2.3–8.5 cm long; blades lobed, middle lobe largest, apex acute, base broadly cuneate to ± truncate, margin irregularly serrate, 3.5–10 cm × 2.8–9.5 cm. Flowers solitary axillary on peduncles 2–6 cm long; calyx 0.8–1.1 cm long, pubescent, deeply, acutely lobed; petals purplish, *ca* 0.8–1.2 cm long. Capsules 1.5–2 cm diameter, dorsally ridged, ending in diverging spine 1.5–2 mm long, pubescent with long hairs, seated on enlarged flattened calyx 2.5–3.5 cm diameter. **Fig. 9J.**

Native of tropical America; weed of disturbed sites, cultivation etc. Flowers summer–autumn.

## 10. SIDA L.

Mostly pubescent shrubs or herbs. Leaves dentate or lobed. Inflorescences of terminal spikes or heads or flowers solitary; epicalyx absent or bracteoles distant from calyx; calyx 5-dentate or 5-fid; petals yellow, orange or white, rarely purple, 5; staminal column divided apically into numerous filaments; ovary loculi 5 or more, 1-ovulate, style branches as many as loculi, filiform or clavate, truncate or capitate apically. Mature carpels separating from axis, sometimes produced into beak or bristle, indehiscent or 2-valved.

200 species warm regions throughout the world especially America; *ca* 40 species Australia; *ca* 12 species south-eastern Queensland.

1. Calyces basally 10-ribbed, or 5-angled and 5-ribbed on sides . . . . .	2
Calyces neither angled nor ribbed . . . . .	6
2. Flowers on axillary peduncles 1–3 cm long, elongating in fruit, almost always solitary . . . . .	3
Flowers on axillary peduncles 0.2–0.6 cm long, elongating in fruit, in dense clusters, 2–5 together, or sometimes solitary . . . . .	4
3. Flowering calyces 5–6 mm long, mericarps with apical points 0.5–1 mm long . . . . .	1. <i>S. rhombifolia</i>
Flowering calyces 7–9 mm long; mericarps with apical points 4–5 mm long . . . . .	2. <i>S. rohlenae</i>
4. Flowering calyces ± glabrous or occasionally with few simple hairs along margins of lobes; mericarps with apical points <i>ca</i> 0.5 mm long; one stipule of each pair linear-triangular to narrowly ovate . . . . .	3. <i>S. acuta</i>
Flowering calyces finely stellate tomentose, sometimes intermingled with simple hairs; mericarps with apical points 1–3.5 mm long; stipules always filiform . . . . .	5
5. Flowering calyces 4–5 mm long; mericarps 3–5 per fruit with apical point <i>ca</i> 1 mm long . . . . .	4. <i>S. spinosa</i>
Flowering calyces 6–7 mm long; mericarps 8–10 per fruit with apical point 2.5–3.5 mm long . . . . .	5. <i>S. cordifolia</i>
6. Inflorescences racemes or narrow panicles . . . . .	6. <i>S. cunninghamii</i>
Inflorescences spikes clusters or flowers solitary . . . . .	7
7. Flowers in dense spikes or clusters of 2–several per axil . . . . .	8
Flowers solitary, or rarely 2 together in <i>S. corrugata</i> with calyx 4–5 mm long . . . . .	10
8. Peduncles 5–7 mm long; mericarps 7–10 per fruit . . . . .	7. <i>S. pleiantha</i>
Peduncles 0.5–3.5 mm long; mericarps 4–5 per fruit . . . . .	9
9. Peduncles 0.5–1 mm long; flowers few–several, often forming irregular terminal spike . . . . .	8. <i>S. subspicata</i>
Peduncles 2.5–3.5 mm long; flowers 2–4 per axil . . . . .	9. <i>S. sp.1.</i>
10. Most leaf blades linear to narrowly oblong, base rounded . . . . .	10. <i>S. trichopoda</i>
Leaf blades ovate, ovate-oblong to orbicular, base cordate or occasionally truncate . . . . .	11
11. Peduncles 0.3–0.5 mm thick; fruits 6–9 mm diameter . . . . .	11. <i>S. corrugata</i>
Peduncles 0.25–0.3 mm thick; fruits 4–6 mm diameter . . . . .	12. <i>S. filiformis</i> sens. lat.

### 1. *Sida rhombifolia* L.

### COMMON SIDA

Erect or ascending woody herb or subshrub; stems finely stellate pubescent, at length glabrous. Stipules filiform; petioles 0.3–1 cm long; blades rhombic, occasionally ± oblong, apex obtuse, base cuneate, margin ± entire towards base, crenate-serrate towards apex, 1.5–8.5 cm × 0.6–4 cm, very finely stellate puberulent above, usually densely so below, midrib and lateral veins slightly raised below. Flowers axillary, mostly solitary on peduncles 1–2.5 cm long; calyx basally 10-ribbed, 5–6 mm long, stellate puberulent, lobes acuminate, *ca* as long as tube; petals yellow to pale orange, 6–8 mm long. Fruits 2.5–3 mm high, 5–6 mm diameter, with 9–12 carpels, glabrous with reticulate back, apex acute with 2 points usually 0.5–1 mm long. **Fig. 10K.**

Cosmopolitan weed mainly in waste areas. Flowers spring to autumn.

### 2. *Sida rohlenae* Domin

Woody-based herb or shrub up to 1 m tall, indumentum of dense fine stellate hairs. Stipules filiform; petioles 0.5–1.5 cm long; blades oblong to ovate-oblong, apex obtuse, occasionally acute, base rounded, margin serrate, 1.5–5.5 cm × 0.5–1.8 cm, finely stellate pubescent above, denser below sometimes with few simple hairs as well, midrib impressed above, midrib and lateral veins raised below. Flowers axillary, solitary on peduncles 1–3 cm long; calyx basally 10-ribbed, 7–9 mm long, densely

stellate pubescent, lobes acuminate, *ca* as long as tube; petals yellow to orange, 1–1.2 cm long. Fruits 3–4 mm high, 5–7 mm diameter, with 8–10 carpels,  $\pm$  glabrous, back reticulate, apex with 2 retrorsely barbed spines 4–5 mm long. **Fig. 10N.**

Darling Downs district. Flowers spring–summer.

### 3. *Sida acuta* N. L. Burm.

#### SPINYHEAD SIDA

Erect or ascending herb or shrub up to 1 m tall, indumentum sparsely stellate to  $\pm$  glabrous. Stipules of each pair dissimilar, one linear-triangular to narrowly ovate, acuminate, up to 1.1 cm  $\times$  0.15 cm, other filiform, smaller; petioles 3–7 mm long; blades linear-ovate to narrowly ovate or occasionally elliptic; apex acute, base rounded, truncate to subcordate, margin serrate, 1.7–8 cm  $\times$  0.25–2.5 cm,  $\pm$  glabrous or with few simple hairs. Flowers axillary, usually solitary or 2–3 together on peduncles 2–5 mm long, elongating slightly in fruit; calyx basally 10-ribbed, 6–8 mm long,  $\pm$  glabrous or few hairs on margins of lobes, lobes abruptly acuminate, *ca* as long as tube; petals pale yellow or rarely whitish, 7–8 mm long. Fruits 3–4 mm high, 4.5–6 mm diameter, with 6–10 carpels, glabrous, reticulate on back, apex acute with 2 points *ca* 0.5 mm long. **Fig. 10J.**

Uncommon weed of coastal districts. Flowers autumn.

### 4. *Sida spinosa* L.

#### SPINY SIDA

Erect subshrub up to 1 m tall, indumentum stellate pubescent; stems eventually glabrous. Stipules linear; petioles 0.4–1.5 cm long; blades ovate to triangular-ovate, apex acute or tapered into blunt point, base rounded to subcordate, margin serrate, 1.5–5 cm  $\times$  0.4–1.5 cm, discolourous, green and finely stellate puberulent above, pale densely tomentose below, midrib and lateral veins usually raised below. Flowers axillary, solitary or 2–5 together on peduncles 3–6 mm long, elongating up to *ca* 1.5 cm long in fruit; calyx basally 10-ribbed, *ca* 4–5 mm long, finely stellate tomentose, lobes acuminate, *ca* as long as tube; petals yellow, 5–7 mm long. Fruits 3–4 mm high, 4–5 mm diameter, with 5 rarely 3 carpels, stellate pubescent towards top, back reticulate, apex acute with 2 points *ca* 1 mm long.

Weed mainly in the coastal districts, often on sandy soil. Flowers summer–autumn.

### 5. *Sida cordifolia* L.

#### FLANNEL WEED

Erect branched subshrub up to *ca* 1 m tall, usually stellate tomentose with few to numerous spreading hairs. Stipules filiform; petioles 1–4.5(–6) cm long; blades ovate to broadly ovate, apex obtuse or tapering to blunt point, base  $\pm$  truncate to cordate, margin serrate, 1.5–7 cm  $\times$  1–4.5(–6) cm, shortly stellate pubescent above, denser below, midrib and lateral veins impressed above, raised below. Flowers in dense terminal or upper axillary clusters, peduncles 2–4 mm long, elongating up to 2 cm long in fruit; calyx basally 10-ribbed, 6–7 mm long, stellate tomentose with numerous simple hairs intermingled, lobes acuminate, *ca* as long as tube; petals orange to pale yellow, *ca* 8–10 mm long. Fruits *ca* 3 mm high, 6–8 mm diameter, with 8–10 carpels, hirsute on top of carpels, back reticulate, apex acute with 2 retrorsely barbed points 2.5–3.5 mm long. **Fig. 10H.**

Widespread weed. Flowers much of the year.

### 6. *Sida cunninghamii* C. T. White

*Sida pedunculata* auct. non Domin, Cunn. ex Benth.

Procumbent spreading or ascending subshrub up to *ca* 30 cm tall, indumentum densely stellate. Stipules filiform; petioles 1–4.5(–8) cm long; blades triangular to oblong, apex obtuse, base truncate to cordate, margin serrate, 1.2–6.5(–9.5) cm  $\times$  0.7–3(–5) cm, densely stellate pubescent, midrib and lateral veins impressed above, raised beneath but often obscured by indumentum. Inflorescences racemes or narrow panicles 6–25(–40) cm long, pedicels 2–3 mm long, elongating in fruit, subtended by bract and 2 subulate bracteoles at base, flowers rarely solitary in upper axils; calyx not ribbed, 5–6 mm long, stellate pubescent, lobes acute, *ca* as long as tube; petals yellow,

1–1.2 cm long. Fruits 3–4 mm high, 6–8 mm diameter, with 8–11 carpels, densely stellate pubescent, back rugose, apex rounded, points projecting inwards. **Fig. 10I.**

Darling Downs district in sandy or red loam. Flowers summer.

**7. *Sida pleiantha* F. Muell. ex Benth.**

Procumbent or spreading subshrub, indumentum of large and small stellate hairs. Stipules linear; petioles 0.6–4.7 cm long; blades ovate-oblong to orbicular, apex obtuse, base rounded to subcordate, margin serrate, 0.8–4.3 cm × 0.9–2.8 cm, finely stellate pubescent above, stellate tomentose with fine and coarse hairs below, midrib and lateral veins impressed above, raised below. Flowers axillary, in clusters of 3–7 on peduncles 5–7 mm long; calyx not ribbed, 3–4 mm long, stellate pubescent, lobes *ca* as long as tube; petals deep yellow to orange, 4–5 mm long. Fruits 2–2.5 mm high, 5–6 mm diameter, with 7–10 carpels, densely stellate pubescent, back not rugose, apex rounded. **Fig. 10M.**

Darling Downs district. Flowers summer–autumn.

**8. *Sida subspicata* F. Muell. ex Benth.**

**SPIKED SIDA**

Ascending or spreading shrub up to 2 m tall, indumentum densely stellate. Stipules linear; petioles 0.2–2.7 cm long; blades ovate, ovate-oblong or triangular-ovate, apex acute or occasionally obtuse, base rounded to cordate, margin serrate, 1.5–10 cm × 0.4–4 cm, stellate tomentose above and below, denser and paler below, midrib and lateral veins impressed above, raised as well as reticulation below. Flowers axillary, few–several clustered together, uppermost forming an irregular terminal spike interspersed with few floral leaves, peduncles 0.5–1 mm long; calyx not ribbed, 2.5–4 mm long, stellate tomentose, lobes acute, slightly longer than tube; petals yellow to orange, *ca* 4–5 mm long. Fruits *ca* 2 mm high, 3–4 mm diameter, with 4–5 carpels, stellate puberulent to glabrous with age, back reticulate, apex rounded. **Fig. 10O.**

Weed throughout the region. Flowers summer–autumn.

**9. *Sida* sp. 1.**

Woody herb or subshrub *ca* 30–50 cm tall, indumentum sparsely stellate. Stipules linear-subulate; petioles 4.5–10 mm long; blades narrowly ovate, apex acute or blunt, base truncate to subcordate, margin serrate, 1.8–3.7 cm × 0.6–1.3 cm, puberulent with long stellate and simple hairs. Flowers axillary in clusters of 2–4, peduncles 2–3.5 mm long; calyx not ribbed, 2.5–3 mm long, stellate pubescent, lobes acute, *ca* as long as tube; petals yellowish, 3.5–4.5 mm long; ovary *ca* 5-parted, densely short stellate pubescent, apex acute. Fruits not seen.

Recorded from northern Burnett district. Flowers summer.

**10. *Sida trichopoda* F. Muell.**

**HIGH SIDA**

*Sida corrugata* Lindl. var. *trichopoda* (F. Muell.) Benth.

Erect woody-based herb or subshrub, indumentum stellate, sometimes sparsely so. Stipules linear; petioles 0.1–1.2 cm long; blades linear to narrowly oblong, apex obtuse, base rounded, margin serrate, often coarsely so, 1.5–6.5 cm × 0.1–0.8(–1.2) cm, occasionally few broader ovate ones scattered amongst narrow blades particularly towards base, pubescent to ± glabrous above and below, midrib raised below, lateral veins visible on wider leaves. Flowers axillary, solitary on peduncles 1.5–3.5 cm long; calyx not ribbed, 3.5–5.5 mm long, stellate pubescent, lobes acute, *ca* as long as tube; petals yellow to orange, bifid to retuse apically, 0.9–1.5 cm long. Fruits *ca* 2 mm high, 6–7 mm diameter, with 6–9 carpels, stellate pubescent to ± glabrous, back reticulate, apex rounded.

Darling Downs district. Flowers spring to autumn.

This is a very variable species. A number of forms, including a ± glabrous one, a pubescent one, and one with petals 1.2–1.5 cm long, called BUTTERCUP SIDA, occur in the region. The group is in need of revision.



Fig. 10 MALVACEAE — A–G *Abutilon* spp. — A<sub>1</sub>–A<sub>2</sub> *A. auritum*, A<sub>1</sub> part of fruiting stem x1, A<sub>2</sub> flower x1; B<sub>1</sub>–B<sub>2</sub> *A. micropetalum*, B<sub>1</sub> part of flowering stem x1, B<sub>2</sub> fruit x1; C *A. tubulosum*, flower x1; D<sub>1</sub>–D<sub>2</sub> *A. malvifolium*, D<sub>1</sub> flowering stem x1, D<sub>2</sub> fruit x1; E *A. otocarpum*, flower bud showing keeled calyx lobes x1; F *A. oxycarpum* var. *oxycarpum* forma *oxycarpum*, fruit showing short calyx x1; G *A. fraseri*, fruit showing long ribbed calyx x1; H–O *Sida* spp. — H<sub>1</sub>–H<sub>2</sub> *S. cordifolia*, H<sub>1</sub> part of fertile stem x1, H<sub>2</sub> flower x2; I<sub>1</sub>–I<sub>2</sub> *S. cunninghamii*, I<sub>1</sub> part of flowering stem to show inflorescence x1, I<sub>2</sub> fruit x3; J<sub>1</sub>–J<sub>2</sub> *S. acuta*, J<sub>1</sub> part of fertile stem showing stipules x1, J<sub>2</sub> fruit x3; K<sub>1</sub>–K<sub>2</sub> *S. rhombifolia*, K<sub>1</sub> part of fertile stem x1, K<sub>2</sub> fruit x3; L *S. corrugata*, fruit x3; M *S. pleiantha*, fruit x3; N *S. rohlenae*, fruit x3; O *S. subspicata*, fruit x3.

**11. *Sida corrugata* Lindl.****CORRUGATED SIDA**

Decumbent or spreading herb with woody rootstock, indumentum stellate. Stipules filiform; petioles 0.2–3 cm long; blades oblong, ovate or orbicular, apex obtuse, base truncate to cordate, margin coarsely serrate to crenulate, 1–4 cm × 0.6–3 cm, stellate pubescent above, denser below, midrib and lateral veins raised below. Flowers axillary, solitary or 2 together on peduncles (0.2–)1–3.5 cm long, 0.3–0.5 mm thick; calyx not ribbed, 4–5 mm long, lobes abruptly acuminate, *ca* as long as tube; petals yellow, 6–8 mm long. Fruits *ca* 2.5 mm high, 6–9 mm diameter, with 6–10 carpels, stellate tomentose, back corrugated, apex rounded. **Fig. 10L.**

Western districts of the region. Flowers summer–autumn.

This is a very variable species and there are a number of forms included under this name. The more common forms have pubescent leaves with coarsely serrate margins and flowers and fruits on peduncles 1–3.5 cm long. Another form has densely tomentose leaves with crenulate margins and flowers on very short peduncles 2–5 mm long while the corrugate back of the carpels is not as distinct due to the dense tomentum. This latter form may prove distinct when studied closely.

**12. *Sida filiformis* Cunn. sens. lat.**

Straggly to ascending woody-based herb or subshrub, indumentum stellate, sometimes coarsely or densely so. Stipules filiform; petioles 0.1–1(–1.5) cm long; blades ovate or ovate-oblong, apex acute or obtuse, base cordate, margin crenulate to crenate-serrate, 0.8–4 cm × 0.4–2.3 cm, stellate tomentose, denser below and rarely floccose. Flowers axillary, solitary on filiform peduncles 1.5–4.5 cm long, 0.25–0.3 mm thick; calyx not ribbed, 3.5–4.5 mm long, stellate tomentose, lobes acute, *ca* as long as tube; petals yellow, 7–10 mm long. Fruits *ca* 2 mm high, 4–6 mm diameter, with 9–11 carpels, glabrous or occasionally very finely pubescent, back rugose, apex blunt but carpels forming a raised part in centre of fruit.

Darling Downs district. Flowers summer.

This taxon has been referred to as one of the forms of *S. filiformis* and has been reported to be a good match for the type. However there are a number of other forms under this name. Further study is necessary to determine the correct identity of these taxa.

*Sida platycalyx* F. Muell. ex Benth. has been reported from the Darling Downs district as a contaminant of wool, but its normal distribution is far western Queensland. It can be readily distinguished from other species of *Sida* by the fruits which consist of *ca* 24 echinate stellate tomentose carpels arranged in a somewhat flattened ring 2–3 cm diameter, covered by the inflated, membranous calyx. It is commonly called **LIFESAVER BURR.**

**11. ABUTILON Miller**

Trees shrubs or herbs, indumentum often soft. Leaves often cordate, angular or lobed, rarely narrow. Flowers mostly axillary; epicalyx bracteoles absent; calyx 5-lobed; petals mostly yellow, 5; staminal column divided apically into numerous filaments; ovary 5- or more-locular, verticillate, 9–3 ovules per loculus, style branches as many as loculi, filiform to clavate, stigmatose only at apex. Mature carpels connate basally or free, rounded above with divergent beak, or angular, 2-valved; seeds subreniform.

100 or more species tropical and subtropical; *ca* 30 species Australia; 10 species south-eastern Queensland.

- |  |                          |   |
|--|--------------------------|---|
| 1. Shrubs with indumentum of stellate and viscid hairs . . . . . | 1. <i>A. subviscosum</i> | 2 |
| Shrubs or herbs, never with viscid hairs . . . . .               |                          |   |
| 2. Stipules auriculate . . . . .                                 | 2. <i>A. auritum</i>     | 3 |
| Stipules linear-subulate to narrowly ovate . . . . .             |                          |   |

3. Stipules narrowly ovate; flowers often in few- to several-flowered panicles	3. <i>A. grandifolium</i>	4
Stipules linear-subulate; flowers always solitary		
4. Calyx lobes much shorter than tubes		5
Calyx lobes as long as or longer than tubes		7
5. Petals absent or much shorter than calyx	4. <i>A. micropetalum</i>	6
Petals at least as long as calyx		
6. Stipules 0.3–0.5 cm long; petals basally coherent for <i>ca</i> $\frac{1}{3}$ their length; carpels much shorter than calyx tube	5. <i>A. tubulosum</i>	
Stipules 0.6–1.2(–2) cm long; petals basally coherent for <i>ca</i> $\frac{1}{5}$ their length; carpels <i>ca</i> as long as calyx tube	6. <i>A. calliphylllum</i>	
7. Calyces prominently 5-angled at sutures, and calyx lobes keeled	7. <i>A. otocarpum</i>	8
Calyces not prominently 5-angled at sutures, lobes not keeled		
8. Ovaries and fruits 5–7-parted	8. <i>A. malvifolium</i>	9
Ovaries and fruits <i>ca</i> 10-parted		
9. Petals up to <i>ca</i> 1 cm long	9. <i>A. oxycarpum</i>	
Petals 1.8–2.7 cm long	10. <i>A. fraseri</i>	

### 1. *Abutilon subviscosum* Benth.

Shrub, densely pubescent with stellate and viscid hairs. Stipules linear-subulate; petioles 0.8–3 cm long; blades ovate, apex acuminate, base deeply cordate, margin crenulate, 3–10 cm  $\times$  2–6 cm, stellate pubescent above, stellate tomentose and pale below, lateral veins and midrib impressed above, visible below. Flowers axillary, solitary on peduncles 5–8 mm long; calyx 1.2–1.5 cm long, densely stellate pubescent, deeply 5-lobed, lobes acuminate; petals not seen, apparently longer than calyx. Fruits 1–1.3 cm long, number of carpels variable.

Recorded from Gayndah area. Fruits autumn.

### 2. *Abutilon auritum* (Wall. ex Link) Sweet

*Sida aurita* Wall. ex Link

Large shrub or small tree 1.5–3 m tall, densely velvety pubescent. Stipules auriculate, apex acute, margin undulate, 1–2 cm long; petioles 1.5–15 cm long; blades broadly ovate, apex acuminate, base deeply cordate, margin dentate with irregularly sized teeth, 2–17 cm  $\times$  1.8–15 cm, dark above, lower surface densely pubescent, lax reticulation visible. Flowers in almost leafless terminal branching racemes or panicles, pedicels usually 0.5–1 cm long, occasionally *ca* 3 cm long, subtended by caducous stipule-like bract; calyx 0.8–1.2 cm long, somewhat angled, densely softly pubescent, very deeply lobed; petals yellowish, sometimes reddish in bud, 1–1.5 cm long; staminal column basally dendritic pubescent. Fruits blackish, *ca* 1.3–1.7 cm long, 10-parted, each  $\pm$  truncate with apical spreading point *ca* 2 mm long on outer edge, hirsute. **Fig. 10A.**

Mainly coastal districts in rainforest or depauperate rainforest, occasionally in eucalypt forest. Flowers autumn to spring.

### 3. \**Abutilon grandifolium* (Willd.) Sweet

*Sida grandifolia* Willd.; *Abutilon mollissimum* auct. non (Cav.) Sweet

Large spreading shrub 2–3 m tall, puberulent with very short stellate hairs and numerous long spreading simple ones. Stipules narrowly ovate, acuminate, 0.9–1.2 cm long; petioles 1–10.5 cm long; blades ovate to broadly ovate, apex acuminate, base deeply cordate, margin crenate to serrate, 3–18 cm  $\times$  2–12 cm, stellate pubescent above, densely so below. Inflorescences of few–several-flowered panicles or flowers solitary, peduncles 3–7 cm long, pedicels 1–4 cm long; calyx angled at sutures, 1.2–2 cm long, densely stellate pubescent with some simple hairs, deeply lobed, lobes acuminate; petals yellowish to orange, 1.5–2 cm long, basally united with staminal column, few hairs at junction. Fruits *ca* as long as calyx, 10-parted,  $\pm$  truncate to

acute with points *ca* 1 mm long on outer edge, pubescent with long simple hairs on sutures, stellate hairs elsewhere.

Native of South America; garden escape, mainly around Brisbane or larger centres of population. Flowers late winter–spring.

#### 4. *Abutilon micropetalum* Benth.

Spreading soft-wooded shrub up to 3.5 m tall, densely stellate pubescent. Stipules linear-subulate; petioles 0.6–10.5 cm long; blades broadly ovate, apex long acuminate, base deeply cordate, margin crenate to serrate, 2.5–15 cm × 1.8–11.5 cm, green or grey-green above, whitish below, densely short stellate pubescent. Flowers axillary on peduncles 0.5–2 cm long; calyx rose-pink, 1–1.5 cm long, 5-angled with 10 ribs, stellate pubescent, very shallowly lobed; petals absent or very small, much shorter than calyx; staminal column red, often twice as long as calyx, glabrous. Fruits *ca* 1–1.3 cm long, 10-parted, acute with ± erect points *ca* 1 mm long, stellate pubescent.

#### Fig. 10B.

Northern parts of Wide Bay district in depauperate rainforest. Flowers autumn to spring.

#### 5. *Abutilon tubulosum* Hook.

Straggly shrub up to 2 m tall, velvety stellate tomentose. Stipules linear-subulate; petioles 0.7–2.3 cm long; blades ovate, apex acute or blunt, base cordate, margin crenate to crenulate, 2.5–6 cm × 1.2–4 cm, greyish green, venation impressed above, lower surface paler, reticulation visible and veins raised below. Flowers axillary, peduncles 0.6–2.6 cm long; calyx 1.5–3.5 cm long, 10-ribbed, densely stellate pubescent, lobes *ca* 1/3 length of tube; petals yellow, *ca* 3.5–5 cm long, coherent into tube for *ca* 1/3 their length with glabrous staminal column. Fruits *ca* 1 cm long, *ca* 10-parted, ± acute with points up to 2 mm long on outer edge. Fig. 10C.

Darling Downs district. Flowers autumn–early winter, and spring.

#### 6. *Abutilon calliphyllum* Domin

Erect shrub up to 2 m tall, velvety white tomentose. Stipules linear-subulate; petioles 1.5–10(–13.5) cm long; blades ovate to broadly ovate, apex acuminate, sometimes bluntly so, base deeply cordate, margin crenate to serrate, 2.5–11(–14.5) cm × 2–9.5(–13) cm, densely velvety pubescent both surfaces, lateral veins and reticulation visible below. Flowers axillary on peduncles 1.5–3.5 cm long; calyx 1.5–2.3 cm long, 10-ribbed, densely pubescent, shortly 5-lobed; petals yellow, *ca* 3–4 cm long, basally adnate for *ca* 6 mm, villous; staminal column hirsute. Fruits *ca* 1.5 cm long, 10-parted, apex acute, densely shortly stellate pubescent.

Drier parts of Darling Downs district. Flowers may be found most months of the year, depending on seasonal conditions.

#### 7. *Abutilon otocarpum* F. Muell.

Erect or spreading subshrub up to *ca* 60 cm tall, densely stellate pubescent with occasional longer simple hairs. Stipules linear-subulate; petioles 0.5–7.5 cm long; blades ovate to broadly ovate, apex obtuse or occasionally bluntly acuminate, base cordate, margin serrate or crenate, 1–9 cm × 0.6–9 cm, greyish, densely stellate pubescent above and below, veins impressed above, visible below. Flowers axillary on peduncles (0.5–)1–3 cm long; calyx 0.5–1.8 cm long, prominently 5-angled, deeply lobed, lobes concave, keeled, acuminate, petals yellow, 0.7–2 cm long, with few simple hairs on margin at base; staminal column ± glabrous. Fruits *ca* 0.6–1 cm long, *ca* 10-parted, rounded to acute with points *ca* 0.5 mm long on outer edge, pubescent particularly on ribs. Fig. 10E.

Darling Downs district in drier areas. Flowers mainly summer–autumn.

#### 8. *Abutilon malvifolium* (Benth.) J. M. Black      BASTARD MARSHMALLOW *Abutilon oxycarpum* F. Muell. var. (?) *malvaefolium* Benth.

Spreading trailing or erect woody-based herb or subshrub up to 30 cm tall, trailing branches up to 70 cm long, pubescent with stellate and long simple hairs. Stipules linear-subulate; petioles 0.5–7.5 cm long; blades sinuate lobed, ovate to broadly ovate

in outline, apex obtuse to retuse, base cordate, margin crenate, 0.7–6.5 cm × 0.6–6 cm, puberulent above and below with short stellate hairs and below with long simple hairs also. Flowers axillary on slender peduncles 1.5–4.5 cm long; calyx 5–7 mm long, with stellate and simple hairs, lobed from 1/2 to 2/3 length of calyx; petals yellow, ca 7–8 mm long, pubescent along margins at base; staminal column subglabrous. Fruits ca 7–9 mm long, 5–7-parted, acute with long diverging or recurved points 3–4 mm long on outside edge. **Fig. 10D.**

Western Darling Downs district in brigalow forests. Flowers mainly spring and autumn.

**9. *Abutilon oxycarpum* (F. Muell.) F. Muell. ex Benth. FLANNEL WEED**  
*Sida oxycarpa* F. Muell.

Procumbent to erect herb or subshrub, or shrub up to 2.5 m tall, densely short or long stellate pubescent. Stipules linear-subulate; petioles 0.1–6.5(–10) cm long; blades very narrowly ovate to ovate or oblong-ovate, apex acute to long acuminate, sometimes obtuse, base deeply or shallowly cordate, rarely ± truncate, margin crenate to serrate, 0.4–12(–18) cm × 0.4–6.5(–10.5) cm, greenish above, pale below, densely stellate pubescent both surfaces, occasionally some long simple hairs as well. Flowers axillary on very slender peduncles 1–3.5(–4.5) cm long; calyx 4–5 mm long, stellate pubescent, deeply divided; petals yellow to orange, (3.5–)6–10 mm long, simple hairs on margins at base where united with staminal column. Fruits 5.5–8 mm long, ca 10-parted, stellate pubescent, apex with diverging points (0.5–)1–2(–3) mm long.

Three varieties and forms occur in the region:

- 1. Petals ca 3.5 mm long; leaf blades generally oblong-ovate with somewhat sagittate base . . . . . *A. oxycarpum* var. *subsagittatum*
- Petals 6–10 mm long; leaf blades narrowly to broadly ovate with cordate base . . . . . 2
- 2. Leaf blades obtuse or blunt at apex; apex of fruits with points 2–3 mm long . . . . . *A. oxycarpum* var. *oxycarpum* forma *oxycarpum*
- Leaf blades long acuminate at apex; apex of fruits with points 0.5–1.5 mm long . . . . . *A. oxycarpum* var. *oxycarpum* forma *acutatum*

*A. oxycarpum* var. *oxycarpum* forma *acutatum* Benth. occurs mainly in the coastal districts as a large shrub in depauperate rainforest or wet eucalypt forest, while both *A. oxycarpum* var. *oxycarpum* forma *oxycarpum* (Fig. 10F.) and *A. oxycarpum* var. *subsagittatum* Domin are found in the western districts in dry country in open forest or brigalow forest. Flowers spring to autumn.

**10. *Abutilon fraseri* (Hook.) Hook. ex Walp. DWARF LANTERN FLOWER**  
*Sida fraseri* Hook.

Usually small shrub but up to 1.2 m tall, shortly pubescent, occasionally with longer hairs intermixed. Stipules linear-subulate; petioles 0.4–6 cm long; blades ovate to broadly ovate, apex acuminate to obtuse, base cordate, margin crenate to serrate, 0.8–7 cm × 0.5–5 cm, stellate pubescent above and below, venation visible below. Flowers axillary on peduncles 1–3.5 cm long; calyx 6–10 mm long, stellate pubescent, often with longer simple hairs intermixed, mid to deeply lobed, lobes ribbed, but not prominently so; petals yellow, 1.8–2.7 cm long, shortly basally united, basally hirsute; staminal column hirsute. Fruits 8–10 mm long, 10-parted, apex ± truncate with horizontal extruding points on outer edge. **Fig. 10G.**

Drier parts of Darling Downs district often in sandy or clay soils, in open forests or woodlands. Flowers autumn to spring.

**89. STERCULIACEAE**

Trees or shrubs with mostly soft wood, rarely herbs, indumentum mostly stellate. Leaves alternate or rarely opposite; usually stipulate; blades simple or digitately lobed or foliolate. Inflorescences various, usually axillary; flowers unisexual or bisexual, actinomorphic; calyx 5–3-lobed, rarely free, valvate; petals 5 or 0, contorted or

imbricate, free or adnate basally to staminal tube, often persistent; stamens free or connate, sometimes into narrow tube (androgynophore), sometimes with staminodes, anthers 2-locular, opening lengthwise by slits or rarely by pores; ovary superior, of 5–2 united or free carpels, rarely 12–10 or reduced to 1, ovules 2–many, rarely 1 per loculus, inserted on inner angle, ascending or horizontal, style simple or lobed, rarely styles free. Fruits dry or rarely baccate, dehiscent or indehiscent, sometimes carpels free in fruit and spreading stellately; seeds with fleshy, thin or no endosperm, embryo straight or curved.

70 genera with 1200 species, chiefly tropical; 23 genera with 176 species Australia; 11 genera with 26 species south-eastern Queensland.

- |  |                         |    |
|--|-------------------------|----|
| 1. Flowers with petals absent or minute though calyx may appear petaloid   |                         | 2  |
| Flowers with sepals and petals conspicuous   |                         | 7  |
| 2. Flowers unisexual; stamens united in androphore; fruits samaras or follicles  |                         | 3  |
| Flowers bisexual; stamens not united into androphore; fruits capsules  |                         | 5  |
| 3. Fruits winged, indehiscent  | 1. <i>Argyrodendron</i> | 4  |
| Fruits not winged, dehiscent   |                         |    |
| 4. Calyces 5–6-lobed; fruits black or brown, stipitate, villous inside; seeds enveloped by honeycomb-like compartments of endocarp | 2. <i>Brachychiton</i>  |    |
| Calyces 4-lobed in Queensland species; fruits red, sessile, glabrous inside; seeds not enveloped in compartments of endocarp       | 3. <i>Sterculia</i>     |    |
| 5. Anthers opening by apical pores; carpels not distinct at maturity, capsules opening loculicidally                               | 4. <i>Lasiopetalum</i>  |    |
| Anthers opening longitudinally; mature carpels distinct, free  |                         | 6  |
| 6. Calyces enlarged, membranous and usually coloured after flowering; stamens 5, staminodes usually absent                         | 5. <i>Keraudrenia</i>   |    |
| Calyces not enlarged nor coloured after flowering; stamens 5 alternating with 5 staminodes   | 6. <i>Seringia</i>      |    |
| 7. Petals concave with broad base, ligulate above  |                         | 8  |
| Petals not as above  |                         | 9  |
| 8. Staminodes undivided  | 7. <i>Rulingia</i>      |    |
| Staminodes 3-lobed   | 8. <i>Commersonia</i>   |    |
| 9. Stamens 5, staminodes absent  | 9. <i>Melochia</i>      |    |
| Stamens 5, staminodes 5 or 15  |                         | 10 |
| 10. Stipules present; flowers solitary or paired; staminodes 5   | 10. <i>Melhania</i>     |    |
| Stipules absent; flowers few ± in racemes; staminodes 15   | 11. <i>Hannafordia</i>  |    |

### 1. ARGYRODENDRON F. Muell.

Buttressed trees. Leaves digitately compound, usually with 3–9 leaflets, rarely 1–2. Inflorescences of loose axillary panicles; flowers unisexual; calyx 5-lobed; petals absent; stamens 10–20 on androgynophore; carpels in females 5–3, sessile, styles short, cohering. Fruiting carpels free, indehiscent, samaroid, consisting of ellipsoid to globose nut with woody endocarp, expanded above into flat wing.

4 species south-eastern Asia, eastern Australia; 4 species Australia; 2 species south-eastern Queensland.

- |  |                            |
|--|----------------------------|
| 1. Leaves with 5–9, rarely 3 leaflets, undersurface ± glabrous                                 | 1. <i>A. actinophyllum</i> |
| Leaves with 3, rarely 1–2 leaflets, undersurface covered by silvery or coppery coloured scales | 2. <i>A. trifoliolatum</i> |

**1. *Argyrodendron actinophyllum* (F. M. Bailey) Edlin** BLACK JACK; BLUSH TULIP OAK; TULIP OAK

*Tarrietia actinophylla* F. M. Bailey; *Heritiera actinophylla* (F. M. Bailey) Kosterm.  
 Tree up to 45 m tall, young leaves and branches with few scales, soon glabrous. Leaves digitately 5-9-, rarely 3-foliolate; petioles 2.5-20(-34) cm long, petiolules 0.4-3 cm long; leaflet blades narrowly obovate to narrowly elliptic, apex bluntly acuminate, base cuneate to attenuate, margin ± crisped, 4.5-25 cm × 1.2-8 cm, often domatia present in primary vein axils beneath, otherwise ± glabrous. Inflorescences loose axillary panicles up to 30 cm long, with scattered scales; calyx ca 3-5 mm long, densely scaly; anthers 10 or more; carpels 3-5. Fruits 3-5 cm long, wing obovate, up to 2.5 cm wide.

Mainly high altitude rainforest of McPherson Ra. and adjacent areas, but also D'Aguilar Ra., Blackall Ra., as far north as Imbil near Gympie. Flowers late summer-autumn.

**2. *Argyrodendron trifoliolatum* F. Muell.** BOOYONG; HICKORY; CROW'S FOOT ELM; STAVE WOOD; SILKY ELM; BROWN OAK

*Tarrietia argyrodendron* Benth.; *Heritiera trifoliolata* (F. Muell.) Kosterm.  
 Tree up to 45 m tall, young branchlets scaly, soon glabrous. Leaves digitately 3-, rarely 1-foliolate; petioles 0.5-10 cm long, petiolules 0.3-2 cm long; leaflet blades elliptic or occasionally obovate or ovate, apex acuminate or blunt, base cuneate, 4-19 cm × 1-5.5 cm, domatia absent, densely scaly beneath. Inflorescences loose axillary panicles up to 15 cm long, scaly; calyx ca 4-5 mm long, lobes 1.5-2 mm long; anthers ca 15; carpels 3-5. Fruits 3-4 cm long, wing obovate, 1.5-2 cm wide. **Fig. 11A.**

Common in rainforests of the coastal districts. Flowers mainly winter-spring.

Specimens have been collected from trees particularly in the Imbil area which appear to be intermediate between this species and *A. polyandrum* L. S. Smith, a northern species. The flowers are up to 7 mm diameter, the size of *A. trifoliolatum* (*A. polyandrum* has flowers 1.3-1.5 cm diameter), but have the same shape and anther arrangement on the androgynophore as that of *A. polyandrum*. The number of anthers is that of *A. trifoliolatum* (*A. polyandrum* usually has ca 20).

**2. BRACHYCHITON Schott & Endl.**

Trees, rarely shrubs, sometimes with swollen trunks, often deciduous while flowering. Leaves simple, entire or lobed, some juvenile leaves digitate. Inflorescences of axillary panicles; flowers unisexual; calyx campanulate, petaloid, ± 5-, rarely 6-lobed, valvate or induplicate-valvate; petals absent; anthers 10-30, subsessile on androgynophore, 2-locular; carpels 5, free, raised on short gynophore, staminodes 10-30 at base of carpels, styles cohering initially, later separating, stigmas ligulate, radiate. Follicles 5 or fewer by abortion, stipitate, stellate hirsute inside; seeds numerous, 2-seriate, each surrounded by honeycomb-like compartments (exotesta).

31 species Australia; Papua New Guinea; 30 species endemic in Australia; 6 species south-eastern Queensland.

- |   |                          |   |
|---|--------------------------|---|
| 1. Leaves pubescent at least on undersurface; flowers with nectaries inside towards base                                |                          | 2 |
| Leaves glabrous; flowers without nectaries  |                          | 3 |
| 2. Trees up to 30 m tall; leaves whitish tomentose below; flowers tomentose inside                                      | 1. <i>B. discolor</i>    |   |
| Shrubs up to 4 m tall; leaves densely ferruginous tomentose below; flowers ± glabrous inside                            | 2. <i>B. bidwillii</i>   |   |
| 3. Leaf blades 12-20 cm long, not glaucous below; flowers bright red in panicles 15-40 cm long                          | 3. <i>B. acerifolius</i> |   |
| Leaf blades 6-12 cm long, or if longer then glaucous below; flowers white, pale green or cream blotched with red inside |                          | 4 |

- |   |                        |   |
|---|------------------------|---|
| 4. Leaves 5-, rarely 7-lobed; flowers white; follicles with stout stipes 0.4–1.2 cm long                                  | 4. <i>B. australis</i> |   |
| Leaves entire or 3-lobed; flowers pale green or cream blotched with red inside; follicles with slender stipes 1–5 cm long |                        | 5 |
| 5. Trees with cylindrical or tapering trunks; flowers pale green, ± glabrous inside                                       | 5. <i>B. populneus</i> |   |
| Trees with bulbous trunks; flowers cream blotched with red inside, densely pubescent inside                               | 6. <i>B. rupestris</i> |   |

### 1. *Brachychiton discolor* F. Muell.

SCRUB BOTTLETREE; WHITE  
KURRAJONG

*Sterculia discolor* (F. Muell.) Benth.; *Brachychiton luridus* C. Moore ex F. Muell.; *S. lurida* (C. Moore ex F. Muell.) Benth.

Tree up to 30 m tall, deciduous when flowering. Leaves with petioles 4.5–13 cm long; blades 3–5-, rarely 7-lobed, deeply and sinuately in juveniles, shallowly in adults or sometimes ± entire, broadly ovate, apex acute, base cordate, 7–16 cm × 8–21 cm, glabrous to puberulent above, puberulent in juveniles to whitish stellate tomentose in adults beneath. Flowers ± sessile in dense panicles; calyx red or pink, *ca* 4–6 cm long, stellate pubescent, nectaries present inside towards base. Follicles 6–20 cm × 2–5 cm, pubescent inside and outside. **Fig. 11B.**

Rainforest and depauperate rainforest of the coastal districts. Flowers summer–autumn.

This species hybridizes with **B. acerifolius**.

### 2. *Brachychiton bidwillii* Hook.

*Sterculia bidwillii* (Hook.) Hook.

Shrub up to 4 m tall, deciduous when flowering. Leaves with petioles 3.5–13 cm long; blades ovate to broadly ovate, palmatifid to palmatisect with *ca* 5 sinuate lobes, apex acute to acuminate, base truncate to broadly cordate, 5.5–25 cm × 5.5–23 cm, sparsely stellate pubescent above, densely ferruginous pubescent beneath. Flowers ± sessile in clusters; calyx red or crimson, sometimes tube yellowish or cream inside, 2–3.5 cm long, finely stellate pubescent, nectaries present inside towards base. Follicles 8–12 cm long, ferruginous stellate pubescent.

Woodland or depauperate closed forest of the coastal district and Eidsvold-Monto areas, often around bases of cliffs. Flowers mainly spring–summer.

### 3. *Brachychiton acerifolius* Cunn. ex F. Muell.

FLAME TREE; FLAME  
KURRAJONG

*Sterculia acerifolia* Cunn. ex G. Don

Tree up to 35 m tall, deciduous when flowering. Leaves with petioles 2–24 cm long; blades simple ovate, or palmatifid, broadly ovate, apex obtuse to subacute, base truncate, cordate or obtuse, 9–25 cm × 4–25 cm, glabrous. Flowers with distinct pedicels 5–10 mm long; calyx bright red, 5–6-lobed, 1.5–2 cm long, glabrous or with scattered stellate hairs, nectaries absent. Follicles *ca* 10–12 cm × *ca* 4 cm, eventually glabrous.

Rainforest of the coastal districts and Great Dividing Ra. Flowers mainly spring, into summer.

This species hybridizes with **B. discolor**.

### 4. *Brachychiton australis* (Schott & Endl.) A. Terracc.

BROAD LEAVED  
BOTTLETREE

*Trichosiphon australe* Schott & Endl.; *Sterculia trichosiphon* Benth.

Tree, deciduous when flowering; trunk eventually bottle shaped. Leaves with petioles 6–12 cm long; blades broadly ovate, palmately 5–7-lobed, apex acute to attenuate, base cordate or sometimes truncate, margin sometimes undulate, thick, yellowish or translucent, 10–24 cm × 8–23 cm, glabrous. Flowers ± sessile in narrow panicles or racemes; calyx white, 2–2.5 cm long, stellately ferruginous pubescent outside, lobes narrow, nectaries absent. Follicles 7–8 cm × 3–4 cm, eventually glabrous outside.

Depauperate rainforest on rocky outcrops of mainly northern parts of the region. Flowers mainly winter.

**5. *Brachychiton populneus* (Schott & Endl.) R. Br. KURRAJONG***Paecilodermis populnea* Schott & Endl.; *Sterculia diversifolia* G. Don

Tree up to 20 m tall. Leaves with petioles 1.5–8 cm long; blades entire or lobed, sometimes deeply so, ovate to broadly ovate, apex attenuate, aristate, base cuneate, often broadly so, margin thick, yellowish when dry, crenulate or irregular, 4–14 cm × 1.5–8(–12.5 on lobed blades) cm, glabrous. Flowers shortly pedicellate; calyx pale green, 0.8–1.5 cm long, glabrous inside, ± pubescent outside, nectaries absent. Follicles 4–10 cm long, glabrous.

Depauperate closed forest or open forest. Flowers mainly summer. Seeds toxic to stock.

Specimens with deeply 3-lobed leaves may represent an infraspecific taxon.

**6. *Brachychiton rupestris* (Mitchell ex Lindl.) K. Schum. QUEENSLAND BOTTLETREE; BOTTLETREE; NARROW LEAVED BOTTLETREE**

*Delabechea rupestris* Mitchell ex Lindl.; *Sterculia rupestris* (Mitchell ex Lindl.) Benth. Large tree; trunk becoming bottle shaped. Leaves with petioles 0.3–3 cm long; blades very narrowly ovate to narrowly ovate, base obtuse to subcordate, apex acute to aristate, 6.5–12.5 cm × 0.3–3 cm; juveniles with petioles up to 8.5 cm long, palmatisect with 5–7 ± linear-oblong leaflets, reducing to 1. Flowers shortly pedicellate; calyx creamy blotched with red inside, ca 6–8 mm long, stellate pubescent, nectaries absent. Follicles 2–3 cm × 1.5–2 cm thin walled, glabrous.

Depauperate closed forests or woodland in drier parts of region. Flowers mainly spring–summer. Pulp from the trunk can sometimes poison cattle. Cultivated for ornament and shade.

**3. STERCULIA L.**

Trees. Leaves entire, lobed or digitately foliolate. Inflorescences paniculate or racemose; flowers unisexual or bisexual, terminal mostly female and more precocious; calyx 5-, rarely 4-lobed, often petaloid; petals absent; staminal column with 15–10 anthers arranged irregularly at apex; carpels 5, partly free, 2- or more-ovulate, style united under peltate or lobed stigma. Fruiting carpels free, spreading stellately, soon dehiscent; seeds and interior of carpel glabrous.

300 species tropical; 4 species Australia; 1 species south-eastern Queensland.

**1. *Sterculia quadrifida* R. Br. PEANUT TREE**

Tree up to 20 m tall. Leaves with petioles 1.7–6 cm long; blades broadly oblong-ovate, apex bluntly acuminate, base truncate to shallowly cordate, margin entire, 6–23 cm × 3.5–14 cm. Inflorescences of axillary racemes, stellate pubescent; calyx yellowish or brownish, ca 8–10 mm long, lobes 4, 4–5 mm long; anthers ca 10. Follicles bright red, ovoid, up to 7 cm long; seeds black, 1.5–2 cm long. **Fig. 11C.**

Mainly light rainforest or along creek banks of the coastal districts. Flowers spring–summer.

**4. LASIOPETALUM Smith**

Stellate tomentose shrubs. Leaves alternate, pseudo-verticillate or rarely truly opposite; usually exstipulate; blades entire, dentate, sinuate or rarely lobed. Inflorescences of small axillary or leaf-opposed cymes, or apparently simple racemes; flowers bisexual, bracteoles 3 or fewer; calyx deeply 5-lobed; petals absent or minute, scale like; stamens 5, free or shortly connate basally, alternating with sepals, staminodes absent, anthers opening by terminal pores or short slits; ovary 5–3-locular, 2–many ovules per loculus, style simple. Capsules shorter than calyces, tomentose, loculicidally dehiscent.

37 species endemic in Australia; 2 species south-eastern Queensland.

- |   |                           |
|---|---------------------------|
| 1. Calyx lobes stellate tomentose both sides . . . . .              | 1. <i>L. ferrugineum</i>  |
| Calyx lobes stellate tomentose outside, glabrous except for margins |                           |
| inside . . . . .  | 2. <i>L. macrophyllum</i> |

**1. *Lasiopetalum ferrugineum* Smith**

Leaves with petioles 4–10 mm long; blades narrowly ovate to ovate, apex obtuse, base truncate, lobed or cordate, margin sinuate, 2.5–8 cm × 0.5–1.8 cm, ± glabrous above, stellate tomentose below. Inflorescences of small several-flowered cymes; calyx creamish, *ca* 5 mm long, lobes ovate, stellate tomentose; ovary densely stellate pubescent. Fruits ovoid, *ca* 4 mm high, tipped by persistent style.

Two varieties occur in the region:

- |  |   |
|--|---|
| 1. Leaves narrowly ovate, base truncate or lobed . . . . . | <i>L. ferrugineum</i> var. <i>ferrugineum</i> |
| Leaves ovate, base cordate . . . . .                       | <i>L. ferrugineum</i> var. <i>cordatum</i>    |

*L. ferrugineum* var. *ferrugineum* (Fig. 11D.) has been recorded from rocky areas of the Glasshouse Mts. and Mt. Cooroora area near Pomona, while *L. ferrugineum* var. *cordatum* Benth. has been recorded from Mt. Walsh near Biggenden. Flowers spring.

**2. *Lasiopetalum macrophyllum* Graham**

*Lasiopetalum dasyphyllum* Sieber ex Steetz

Erect shrub. Leaves with petioles 0.5–2 cm long; blades narrowly ovate to ovate, apex acute, base obtuse to subcordate, margin entire or almost so, 2.5–8 cm × 0.8–3 cm, stellate tomentose beneath. Inflorescences dense several-many-flowered cymes, densely ferruginous tomentose; calyx pinkish, 5–8 mm long, lobes narrowly ovate to ovate, stellate tomentose outside, glabrous except for margins inside, ovary densely pubescent. Fruits ± ovoid, *ca* 4 mm high, tipped by persistent style.

Recorded from near Proston in the Burnett district. Flowers spring.

**5. KERAUDRENIA Gay**

Shrubs. Inflorescences of terminal cymes, or flowers solitary; calyx deeply 5-lobed, at length membranous and dilated, coloured or hyaline; petals absent; stamens 5, alternate with calyx lobes, staminodes absent or rarely alternating with stamens, anthers 2-locular, opening by longitudinal slits; ovary 5–3-locular, 3–many ovules per loculus, style coherent at apex. Mature carpels distinct or solitary by abortion, mostly with soft bristles, calyx persistent; seeds reniform with curved embryo.

7 species Australia, Madagascar, New Guinea; 7 species Australia; 3 species south-eastern Queensland.

- |   |                        |   |
|---|------------------------|---|
| 1. Leaves with obtuse or retuse apices . . . . .  | 1. <i>K. collina</i>   | 2 |
| Leaves with acute apices . . . . .  |                        |   |
| 2. Leaves with upper surfaces smooth, only midrib impressed; calyx<br>1–1.2 cm long in flower . . . . .   | 2. <i>K. hillii</i>    |   |
| Leaves with upper surfaces impressed with all major primary<br>veins, often also reticulation impressed; calyx 0.5–0.7 cm long<br>in flower . . . . . | 3. <i>K. corollata</i> |   |

**1. *Keraudrenia collina* Domin**

Shrub. Leaves with petioles 5–10 mm long; blades oblong, occasionally ovate-oblong, apex obtuse or occasionally retuse, mucronate, base obtuse, margin ± entire, 2–7 cm × 0.5–2 cm, nerves usually impressed above, finely stellate pubescent above, stellate tomentose beneath. Inflorescences 1–several-flowered, leaf-opposed; calyx mauve or bluish, 7–10 mm long, lobes usually acute. Fruiting calyces enlarged, fruits 1.2–1.5 cm diameter, tomentose, with setae 1.5–2 mm long.

Western Darling Downs district in deep red sandy country. Flowers spring.

**2. *Keraudrenia hillii* F. Muell. ex Benth.**

Shrub. Leaves with petioles 0.4–1.3 cm long; blades linear-ovate to narrowly ovate, apex acute, base obtuse, margin entire, occasionally recurved or serrulate-denticulate, 1.8–12.5 cm × 0.4–3.5 cm, smooth above with midrib and rarely few veins impressed, finely stellate tomentose beneath. Inflorescences usually leaf-opposed, of 1–few

flowers; calyx mauve occasionally white, 1–1.2 cm long. Fruits *ca* 1.5–1.8 cm diameter, stellate tomentose, setae present but usually obscured by hairs.

Two varieties occur in the region:

- |  |                                       |
|--|---------------------------------------|
| 1. Leaves with entire, occasionally recurved margins, up to 2.5 cm broad, $\pm$ glabrous above . . . . .                     | <i>K. hillii</i> var. <i>hillii</i>   |
| Leaves with serrulate-denticulate margins, up to 3.5 cm broad, velvety above with distinct numerous stellate hairs . . . . . | <i>K. hillii</i> var. <i>velutina</i> |

*K. hillii* var. *hillii* (Fig. 11E.) is usually found on rocky outcrops or at the foot of cliffs, e.g. Granite Belt, Glasshouse Mts., Mt. Barney in southern districts of the region, while *K. hillii* var. *velutina* C. T. White has been recorded from the Glasshouse Mts. Flowers mainly spring to autumn.

### 3. *Keraudrenia corollata* (Steetz) Druce

*Seringia corollata* Steetz; *Keraudrenia hookerana* Walp.

Shrub. Leaves with petioles 1.5–1.8 cm long; blades ovate to narrowly ovate, apex acute, usually mucronate, base obtuse to occasionally cordate, margin usually serrulate, dentate or entire, recurved, 2–12 cm  $\times$  0.3–4 cm, all major veins impressed above, pubescent, stellate tomentose beneath. Inflorescences usually leaf-opposed cymes of 1–few flowers; calyx mauve or white to flesh coloured, 5–7 mm long. Fruits depressed globose, 1–1.5 cm diameter, with stellate pubescent setae 2–5 mm long.

Two varieties occur in the region:

- |   |   |
|---|---|
| 1. Leaves with serrulate or entire margins, up to 9.5 cm $\times$ 3 cm; calyx mauve . . . . .                           | <i>K. corollata</i> var. <i>corollata</i>   |
| Leaves with coarsely denticulate to dentate margins, up to 12 cm $\times$ 4 cm; calyx white to flesh coloured . . . . . | <i>K. corollata</i> var. <i>denticulata</i> |

*K. corollata* var. *corollata* occurs in sandy or sandstone areas of the region, often as an understorey plant in open forest, while *K. corollata* var. *denticulata* C. T. White has been recorded from the Brisbane area. Flowers mainly spring.

## 6. SERINGIA Gay

Tall shrubs. Leaves dentate. Inflorescences of dense leaf-opposed or terminal cymes; calyx deeply 5-lobed, slightly enlarged after flowering; petals absent; stamens 5, alternate with calyx lobes, alternating and basally united with 5 subulate staminodes, anthers 2-locular, opening by dorsal slits; ovary 5–7-locular, loculi 2–3-ovuled, styles cohering from summit for part of length. Fruiting carpels distinct, at length gaping along back, winged dorsally; seeds ellipsoid, strophiolate.

1 species eastern Australia and New Guinea, occurring in south-eastern Queensland.

### 1. *Seringia arborescens* (Aiton) Druce

*Lasiopetalum arborescens* Aiton; *Seringia platyphylla* Gay

Branchlets stellate pubescent. Leaves with petioles 5–10 mm long; blades ovate, apex acuminate, base obtuse to subcordate, occasionally oblique, margin irregularly dentate, 3–15 cm  $\times$  1.4–6 cm, very sparsely stellate pubescent above, stellate tomentose below. Inflorescences several-flowered; calyx 4–5 mm long, ferruginous stellate pubescent outside, sparsely so inside. Fruiting carpels oblong, somewhat compressed, *ca* 5 mm long. Fig. 11F.

Light rainforest or wet eucalypt forest of the coastal districts of the region. Flowers spring and autumn.

## 7. RULINGIA R. Br.

Shrubs or shrublets with stellate indumentum. Leaves entire, dentate or lobed. Inflorescences of axillary leaf-opposed or rarely terminal cymes; flowers bisexual; calyx 5-lobed; petals 5, concave with broad base, ligulate above; stamens 5, opposite petals, staminodes 5, alternate and basally connate with stamens, anthers 2-locular,

parallel; ovary sessile, 5-locular, 2 ovules per loculus, styles partly connate. Capsules smooth or echinate, carpels separating, 2-valved, 1-seeded; seeds strophiolate.

About 25 species Australia, Madagascar; ca 20 species endemic in Australia; 4 species south-eastern Queensland.

- |   |                             |
|---|-----------------------------|
| 1. Fruits covered with rigid $\pm$ glabrous bristles 4–5 mm long; leaf margins serrate  | 1. <i>R. dasyphylla</i>     |
| Fruits with glabrous or pubescent bristles less than 4 mm long; leaf margins entire, crenulate, serrulate or irregularly lobed, but not serrate | 2                           |
| 2. Fruits with pubescent bristles ca 3 mm long; leaf margins irregularly lobed or pinnatifid  | 2. <i>R. sp. 1.</i>         |
| Fruits with $\pm$ glabrous bristles up to 1.5 mm long; leaf margins entire or occasionally serrulate or crenulate                               | 3                           |
| 3. Leaves finely stellate pubescent; calyx 4–6 mm long; fruits with bristles ca 1.5 mm long   | 3. <i>R. salviifolia</i>    |
| Leaves hirsute; calyx 4–5 mm long; fruits with bristles less than 1 mm long   | 4. <i>R. hermanniifolia</i> |

### 1. *Rulingia dasyphylla* (Andr.) Sweet

*Commersonia dasyphylla* Andr.; *Rulingia pannosa* R. Br.

Shrub. Leaves with petioles 3–8 mm long; blades ovate to narrowly ovate, apex acute or subacute, base obtuse to subcordate, margin serrate, 2–13 cm  $\times$  0.7–5 cm, densely hirsute. Inflorescences of leaf-opposed cymes 2–4 cm long; calyx 3–4 mm long; petals white, 3–3.5 mm long; stamens united with staminodes for their length. Fruits  $\pm$  globose, ca 5 mm diameter, covered with rigid,  $\pm$  glabrous bristles 4–5 mm long.

Mainly open forest or near creeks in the coastal districts of the region. Flowers spring.

### 2. *Rulingia* sp. 1.

Prostrate to semi-erect sprawling shrub. Leaves with petioles 0.1–2.3 cm long; blades oblong, ovate or broadly ovate, apex obtuse to acute, base broadly cuneate to shallowly cordate, sometimes oblique, margin pinnatifid to irregularly lobed, 0.7–6 cm  $\times$  0.2–4 cm. Inflorescences compact, leaf-opposed, 1–2.5 cm long; calyx pinkish, often with maroon stripe inside, 4–8 mm long; petals 2.5–4 mm long; stamens and staminodes united for about  $\frac{1}{3}$  their length. Fruits depressed globose, 4–6 mm diameter, densely pubescent with stellate pubescent bristles ca 3 mm long. **Fig. 11G.**

Red sand or hard gravelly areas of mainly Darling Downs district, e.g. Moonie, Miles and Gurulmundi areas, but also Mt. French in the Moreton district. Flowers mainly spring but sometimes summer and autumn.

### 3. *Rulingia salviifolia* (Hook. ex Steetz) Benth.

*Thomasia salviifolia* Hook. ex Steetz

Shrub. Leaves with petioles 3–10 mm long; blades narrowly ovate, sometimes basally lobed, apex acute, base obtuse to subcordate, margin entire, or crenulate in larger leaves, 3–12 cm  $\times$  0.3–1.6 cm, finely stellate pubescent above, stellate tomentose below. Inflorescences of leaf-opposed cymes ca 2–4 cm long; flowers white or cream; calyx 4–6 mm long, pubescent; petals ca 3–3.5 mm long; stamens and staminodes shortly basally united. Fruits  $\pm$  globose, ca 3–4 mm diameter, covered with stiff  $\pm$  glabrous bristles ca 1.5 mm long.

McPherson Ra. and adjacent areas, generally in open forests with a well defined understorey layer. Flowers spring.

### 4. *Rulingia hermanniifolia* (Gay ex DC.) Steetz

*Buettneria hermanniifolia* Gay ex DC.

Shrub. Leaves with petioles 2–5 mm long; blades ovate to elliptic-oblong, sometimes basally lobed, apex acute to subacute, base obtuse, margin entire to serrulate, 1.3–4 cm  $\times$  0.4–1.5 cm, densely hirsute. Inflorescences of mainly leaf-opposed cymes; flowers pinkish; calyx 4–5 mm long; petals ca 3–4 mm long; stamens and staminodes shortly basally united. Fruits depressed globose, ca 3–3.5 mm diameter, with bristles ca 0.5 mm long tipped with a stellate hair.

Granite Belt near Stanthorpe, growing in eucalypt open forest in rocky areas. Flowers spring.



Fig. 11 STERCULIACEAE — A<sub>1</sub>–A<sub>2</sub> *Argyrodendron trifoliolatum*, A<sub>1</sub> leaf and inflorescence x1, A<sub>2</sub> fruit x1; B *Brachyhton discolor*, leaf and inflorescence x1/2; C<sub>1</sub>–C<sub>2</sub> *Sterculia quadrifida*, C<sub>1</sub> leaf x1/2, C<sub>2</sub> fruit x1/2; D<sub>1</sub>–D<sub>3</sub> *Lasiopetalum ferrugineum* var. *ferrugineum*, D<sub>1</sub> leaf and inflorescence x1, D<sub>2</sub> flower x3, D<sub>3</sub> anther showing apical pore x6; E *Keraudrenia hillii* var. *hillii*, part of fertile branchlet x1; F *Seringia arborescens*, flower showing stamens and staminodes x6; G<sub>1</sub>–G<sub>2</sub> *Rulingia* sp. 1., G<sub>1</sub> broad leaf x1, G<sub>2</sub> narrow leaf x1; H<sub>1</sub>–H<sub>2</sub> *Commersonia fraseri*, H<sub>1</sub> leaves and inflorescence x1, H<sub>2</sub> flower showing 3-lobed staminodes and concave petals x4; I *Melhantha oblongifolia*, flower with 1 petal removed x1; J *Melochia pyramidata*, part of fruiting branchlet x1.

8. **COMMERSONIA** J. R. & G. Forster

Trees or shrubs, branchlets stellate tomentose. Leaves simple, often oblique. Inflorescences of axillary leaf-opposed or rarely terminal cymes; flowers bisexual; calyx 5-lobed, stellate tomentose; petals 5, concave from broad base, ligulate above; stamens 5, united basally into short cup, opposite petals, staminodes 5, alternating with stamens, usually deeply 3-lobed, anthers 2-locular, loculi divaricate; ovary 5-locular, 6–2 ovules per loculus, styles 5, free or partly united. Capsules loculicidally 5-valved, echinate.

About 14 species tropical south-eastern Asia, Australia, Pacific Is.; 14 species Australia; 4 species south-eastern Queensland.

- |   |                        |   |
|---|------------------------|---|
| 1. Staminodes stellate pubescent, lateral lobes very short, central smaller than petals . . . . .                           | 1. <i>C. bartramia</i> | 2 |
| Staminodes glabrous, ± as long as petals . . . . .  |                        |   |
| 2. Indumentum with spreading hairs tipped with red glands particularly on young growth, as well as stellate hairs . . . . . | 2. <i>C. sp. 1.</i>    | 3 |
| Indumentum without gland tipped hairs, only stellate ones . . . . .   |                        |   |
| 3. Indumentum on upper leaf surface of sparse stellate hairs, lower with dense coarse and fine stellate hairs . . . . .     | 3. <i>C. fraseri</i>   |   |
| Indumentum on both surfaces dense, with fine stellate hairs only . . . . .  | 4. <i>C. sp. 2.</i>    |   |

1. ***Commersonia bartramia* (L.) Merr.**

*Muntingia bartramia* L.; *Commersonia echinata* J. R. & G. Forster

Shrub or tree up to 12 m tall, branchlets finely stellate pubescent. Leaves with petioles 1–2, rarely –5 cm long; blades ovate to broadly ovate, apex acuminate, base ± truncate to subcordate, often oblique, margin irregularly bluntly dentate, 7–17 cm × 3.5–13 cm, finely stellate pubescent. Inflorescences chiefly leaf-opposed; flowers white; calyx *ca* 3 mm long; petals *ca* 3 mm long; staminodes shorter than petals, stellate tomentose, 3-lobed, central lobe triangular, lateral lobes very small, filiform. Fruits ± globose, *ca* 1.5–2 cm diameter, densely covered with stellate pubescent setae.

Usually light rainforest, fringing forest along creeks or in wet gullies or sometimes littoral closed forest; common regrowth shrub after rainforest areas have been cleared. Flowers mainly summer. Leaves and green parts readily eaten by cattle.

2. ***Commersonia* sp. 1.**

Small to tall slender shrub up to 5 m tall, branchlets, young growth and inflorescences with long spreading hairs tipped with red glands as well as coarse and fine stellate ones. Leaves with petioles 0.6–3.5 cm long; blades ovate, apex acute, base subcordate to cordate, sometimes slightly oblique, margin irregularly dentate, 4–16 cm × 1.4–9 cm, dark green and pubescent above with coarse and fine stellate hairs and scattered glandular ones, lower surface paler, densely stellate pubescent with very few or no glandular hairs. Inflorescences usually terminal or axillary; flowers white; calyx 3.5–5 mm long; petals 4–6 mm long; staminodes glabrous, *ca* as long as petals, each deeply 3-lobed, lobes linear-spathulate, central one slightly wider. Fruits ± globose, *ca* 1.5–2 cm diameter, densely covered with coarsely stellate pubescent setae.

Recorded from Mt. Tinbeerwah near Cooroy, and Woowoonga Ra. and Mt. Walsh, both near Biggenden. Flowers spring to autumn.

3. ***Commersonia fraseri* Gay**

Tall shrub, branchlets pubescent with stellate hairs. Leaves with petioles 0.5–2 cm long; blades ovate, occasionally 3-lobed or narrowly ovate, apex acuminate, base truncate to subcordate or oblique, margin irregularly bluntly dentate, 3.2–15 cm × 1.2–7.5 cm, juveniles sometimes larger, green, sparsely and very finely stellate pubescent above, lower surface pale with dense coarse and fine stellate indumentum. Inflorescences chiefly leaf-opposed; flowers white, perfumed; calyx 3–5 mm long; petals *ca* 4 mm long; staminodes glabrous, as long as petals, each deeply 3-lobed, lobes

linear-spathulate, central one slightly wider. Fruits  $\pm$  globose, ca 2.5 cm diameter, densely covered with stellate pubescent setae. **Fig. 11H.**

Locally common on rocky slopes or in light rainforest of Glasshouse Mts., McPherson Ra. and other southern peaks of the coastal districts. Flowers much of the year, mainly summer. Sometimes cultivated but suckers badly.

#### 4. *Commersonia* sp. 2.

Shrub up to 2.5 m tall but usually smaller. Leaves with petioles 3–7 mm long; blades ovate, apex acute or blunt, base oblique, margin irregularly serrulate, 3–9 cm  $\times$  1.4–4.2 cm, pale to mid green above, paler below, very densely finely stellate pubescent above and below. Inflorescences usually terminal and axillary; flowers white; calyx 3–3.5 mm long; petals ca 4 mm long; staminodes glabrous, ca as long as petals, each deeply 3-lobed, lobes linear-spathulate, central one slightly wider. Fruits not seen.

Recorded from north of Chinchilla on stony ridges in eucalypt forest. Flowers summer.

### 9. MELOCHIA L.

Trees, shrubs or herbs, indumentum of simple or stellate hairs. Leaves serrate. Inflorescences of clusters, cymes or panicles; flowers small, bisexual; calyx 5-dentate, sometimes inflated; petals 5, withering-persistent; stamens 5, opposite petals, connate up to middle, staminodes absent or minute, anther loculi parallel; ovary 5-locular, 2 ovules per loculus, styles 5, free or basally united. Capsules loculicidally dehiscent, 5-valved, each loculus 1-seeded.

54 species tropical, especially America; 2 species Australia; 1 species south-eastern Queensland.

#### 1. *Melochia pyramidata* L.

Herb, sometimes woody-based, with scattered simple hairs. Leaves with petioles 0.5–1.8 cm long; blades ovate, apex acuminate, base broadly cuneate to truncate, margin serrate, 1.7–4.5 cm  $\times$  1–2.2 cm. Inflorescences loose few-flowered cymes; flowers purplish; calyx ca 4 mm long, lobes as long as tube; petals ca 5–6 mm long; ovary sparsely pubescent. Fruits pyramid shaped with very prominent angles, each valve rhomboid, ca 0.8 cm  $\times$  1.2 cm. **Fig. 11J.**

Recorded from near Gayndah in the Burnett district; cosmopolitan weed. Flowers spring to autumn, mainly summer.

### 10. MELHANIA Forssk.

Shrubs or herbs. Leaves various, serrate-crenate. Flowers axillary, usually solitary, bracteoles 3, often longer than sepals, persistent; calyx 5-partite; petals 5, withering-persistent around ovary; stamens 5, staminodes 5, ligulate, alternate with stamens and basally connate with them; ovary 5-locular, 1–many ovules per loculus, style branches 5, subulate. Capsules loculicidally dehiscent.

60 species warm Africa, Madagascar, India, Australia; 1–2 species Australia; 1 species south-eastern Queensland.

#### 1. *Melhania oblongifolia* F. Muell.

*Melhania incana* auct. non Heyne ex Wight & Arn., J. M. Black

Shrub, young parts stellate pubescent. Leaves with petioles 0.3–1(–1.5) cm long; blades ovate, broadly ovate or broadly elliptic, apex obtuse, base obtuse to subcordate, margin serrate, 1.5–6(–8) cm  $\times$  0.7–3.3 cm, stellate pubescent, denser beneath. Flowers solitary or paired on peduncles 1–3.5 cm long, pedicels 0.5–1.2 cm long; calyx 0.7–1.5 cm long, very deeply lobed; petals yellow, 1–2 cm long; staminodes twice as long as stamens; ovary densely tomentose. Fruiting capsules globose to ovoid, shorter than calyx. **Fig. 11I.**

Drier areas of the region, widespread. Flowers spring to autumn.

This is a very variable species and further research may reveal a number of different taxa.

**11. HANNAFORDIA** F. Muell.

Shrubs. Leaves cordate. Inflorescences of short few-flowered racemes; calyx 5-lobed, lobes 3-ribbed after flowering; petals 5, shorter than calyx; stamens 5, alternate with calyx lobes, staminodes 5 or more, or few; ovary sessile, 4-3-locular, loculi few-ovuled, style undivided. Capsules globose, loculicidally dehiscent; seeds with laciniate strophiole.

3 species endemic in Australia; 1 species south-eastern Queensland.

**1. Hannafordia shanesii** F. Muell.

Shrub up to 2 m tall. Leaves with petioles 0.6-1.5 cm long; blades ovate or narrowly ovate, apex acute, base subcordate to cordate, margin entire or irregularly crenate, recurved, 3-10 cm × 1-3 cm, stellate pubescent, pale brownish below from dense tomentum, usually some veins impressed above. Inflorescences of few-flowered racemes; calyx reddish purple, lobes recurved, acute, 1.5-2.5 cm long; petals narrow, acuminate, *ca* 1-1.5 cm long; staminodes 15 in 5 groups of 3, alternating with stamens. Capsules *ca* 1.5 cm diameter, densely pubescent with stellate hairs.

Recorded from the Burnett and northern Darling Downs districts. Flowers spring.

**90. THYMELAEACEAE**

Trees, shrubs, rarely herbs, with very strongly developed and layered fibrous tough bark. Leaves opposite or alternate, exstipulate, simple. Flowers in usually terminal bracteate or ebracteate heads spikes or racemes, rarely solitary, bisexual or unisexual, actinomorphic or slightly zygomorphic; perianth hypogynous, tubular, sometimes petaloid, often swollen below, lobes 4-5, imbricate, sometimes scales inserted at mouth or within perianth tube; stamens 1-many, usually same number as perianth lobes and opposite them or second series alternating with them, anthers 2-locular, introrse; disc hypogynous, annular, cupular or of separate scales or absent; ovary superior, 1-2-locular, ovules 1 per loculus, style often excentric, stigma ± capitate. Fruits indehiscent.

50 genera with 500 species temperate and tropical, especially Africa; 3 genera with 92 species Australia; 3 genera with 12 species south-eastern Queensland.

- |  |                       |
|--|-----------------------|
| 1. Stamens 2; perianth lobes 4 . . . . .                             | 1. <i>Pimelea</i>     |
| Stamens twice as many as perianth lobes . . . . .                    | 2                     |
| 2. Flowers in short dense racemes, involucre bracts absent . . . . . | 2. <i>Wikstroemia</i> |
| Flowers in heads surrounded by an involucre of 4 bracts . . . . .    | 3. <i>Phaleria</i>    |

**1. PIMELEA** Banks & Solander ex Gaertn.

Herbs, shrubs or undershrubs. Inflorescences terminal or axillary heads spikes or clusters, usually surrounded by 4 involucre bracts; perianth tubular, lobes 4, spreading, rarely erect, without scales but throat often slightly thickened or folded; stamens 2, inserted in throat opposite 2 outer perianth lobes; hypogynous scales usually absent; ovary 1-locular, ovule pendulous, style elongated, attached to side of ovary immediately below apex. Fruits small drupes, epicarp membranous or succulent, endocarp crustaceous.

80 species Philippine Is., Lesser Sunda Is., New Guinea, Australia, New Zealand; *ca* 80 species Australia; 10 species south-eastern Queensland.

A full list of synonyms is given in "The genus *Pimelea* (Thymelaeaceae) in eastern mainland Australia" by S. Threlfall, *Brunonia* 5(2) 1983.

- |   |   |
|---|---|
| 1. Stems glabrous, rarely <i>P. ligustrina</i> with few scattered hairs on internodes below inflorescence . . . . . | 2 |
| Stems pubescent . . . . .   | 6 |

- |   |  |
|---|--|
| 2. Perianth tubes 0.7–1.7 cm long, unisexual female flowers sometimes slightly shorter but always much longer than ovary, circumscissile after flowering . . . . .          | 3  |
| Perianth tubes up to 6.5 mm long in males, in female flowers only 2–3 mm long, only slightly longer than ovary, not circumscissile . . . . .                                | 5  |
| 3. Leaves glaucous; perianth tubes ± glabrous for lowest 5 mm . . . . .   | 1. <i>P. glauca</i>                            |
| Leaves green or blue-green at least above; perianth tubes silky pubescent all over . . . . .  | 4  |
| 4. Involucral bracts 4–6, pubescent inside and sometimes margins ciliate; leaves 1–2.5 cm broad, rarely less . . . . .  | 2. <i>P. ligustrina</i>                        |
| Involucral bracts 4, glabrous; leaves less than 9 mm broad . . . . .  | 3. <i>P. linifolia</i>                         |
| 5. Perianth tubes pubescent outside with short crinkly hairs; male flowers up to 100 per inflorescence . . . . .  | 4. <i>P. microcephala</i>                      |
| Perianth tubes ± glabrous outside; male flowers up to 24 per inflorescence . . . . .  | 5. <i>P. neo-anglica</i>                       |
| 6. Leaves densely silky appressed pubescent on both surfaces . . . . .  | 6. <i>P. penicillaris</i>                      |
| Leaves at most densely pubescent on lower surface, sometimes puberulent above but not silky . . . . .   | 7  |
| 7. Flowers in spikes elongating with maturity . . . . .   | 7. <i>P. trichostachya</i>                     |
| Flowers in sessile or pedunculate heads . . . . .   | 8  |
| 8. Leaves mostly alternate; inflorescences distinctly pedunculate, peduncle usually 1–3 mm long; involucral bracts absent . . . . .   | 8. <i>P. strigosa</i>                          |
| Leaves mostly opposite, inflorescences usually ± sessile or peduncles less than 1 cm long; involucral bracts usually 2 . . . . .  | 9  |
| 9. Leaves usually glabrous above, appressed pubescent below, less than 2.5 cm long; flowers greenish or greenish yellow . . . . .   | 9. <i>P. curviflora</i> subsp. <i>gracilis</i> |
| Leaves usually puberulent above, pubescent below with spreading slightly tangled hairs or if straight appressed hairs then most leaves 4–9 cm long; flowers white . . . . . | 10. <i>P. latifolia</i>                        |

### 1. *Pimelea glauca* R. Br.

### SMOOTH RICEFLOWER

Erect, much-branched shrub usually *ca* 30 cm tall. Leaves opposite; petioles up to 1 mm long; blades ovate to elliptic, occasionally obovate, apex acute to obtuse, base cuneate to subcordate, margin often incurved, 0.6–2.2 cm × 0.15–0.7 cm, glabrous, glaucous. Inflorescences terminal; flowers numerous, bisexual, involucral bracts usually 4, broad, ciliate on margins; perianth white, tube slender, 0.9–1.5 cm long, densely villous except for lowest 5 mm, glabrous at base, lobes obtuse, 2–3 mm long. Fruits enclosed in glabrous lower 5 mm of perianth, upper part circumscissile, green, ovoid, *ca* 4 mm long.

Drier hillsides or rocky parts of the region. Flowers spring–summer. Suspected of poisoning sheep and cattle.

### 2. *Pimelea ligustrina* Labill.

Compact dense shrub 1–2 m tall, rarely taller. Leaves opposite; petioles 1–2.5 mm long; blades usually obovate, sometimes elliptic or ovate, apex obtuse to subacute, base cuneate to truncate, 2–7 cm × (0.6–)1–2.5 cm, glabrous, glaucous below, penninerved. Inflorescences large terminal heads; flowers numerous, bisexual or female, involucral bracts 4–6, large, broad, pubescent on upper surface; perianth white, ± silky pubescent, tube 0.7–1.3 cm long, lobes obtuse, 2.5–5 mm long; anthers conspicuous, orange; female flowers sometimes smaller. Fruits enclosed in base of circumscissile perianth tube, green, ovoid, *ca* 4 mm long.

Springbrook, in rainforest. Flowers mainly spring–summer.

### 3. *Pimelea linifolia* Smith

### QUEEN OF THE BUSH; FLAXLEAF RICEFLOWER; SLENDER RICEFLOWER

Shrub up to *ca* 1 m tall, rarely more. Leaves ± opposite; petioles 0.5–1 mm long; blades narrowly elliptic, oblong or obovate, apex acute to obtuse, mucronate, base

cuneate to contracted, 0.5–3(–4.5) cm × 0.1–0.9 cm, glabrous. Inflorescences terminal; flowers numerous, bisexual or female, involucre bracts 4, broad, ovate; perianth white or pink, appressed silky pubescent, tube 0.8–1.7 cm long, lobes obtuse, 2–5.5 mm long; anthers conspicuous, orange; female flowers sometimes smaller. Fruits enclosed in lower third of circumscissile tube, green, ovoid, 3–4 mm long.

Two subspecies occur in the region:

1. Leaves and bracts without conspicuous veins other than midrib . . . . . *P. linifolia* subsp. *linifolia*
- Leaves and bracts with conspicuous intramarginal veins and lateral veins as well as midrib . . . . . *P. linifolia* subsp. *collina*

***P. linifolia* subsp. *linifolia*** (Fig. 12A.) is common on sandy wallum flats along the coast or in sandy or granite areas further inland. Flowers may be found most of the year. ***P. linifolia* subsp. *collina*** (R. Br.) Threlfall (*P. collina* R. Br.) occurs mainly on granite areas. Flowers mainly spring. ***P. linifolia*** has been suspected of being poisonous to stock. Cultivated as an ornamental shrub.

#### 4. *Pimelea microcephala* R. Br. SCRUB KURRAJONG; SMALL HEADED RICEFLOWER

Shrub up to 2 m tall. Leaves ± opposite; petioles *ca* 1 mm long; blades very narrowly elliptic or narrowly ovate, apex acute to attenuate, base cuneate to obtuse, 0.8–4.5 cm × 0.1–0.5 cm, glabrous, often glaucous. Inflorescences terminal, several-flowered, involucre bracts 2–4, caducous, pedicels pubescent, *ca* 0.5 mm long; perianth yellowish, pubescent with crinkly hairs outside, males with very slender tube 3–6.5 mm long, lobes obtuse, 1–2 mm long, females with tube *ca* 2 mm long, lobes obtuse, *ca* 0.5 mm long. Fruits reddish, ovoid, *ca* 5 mm long, somewhat succulent.

Western Darling Downs district. Flowers winter to summer. Has been suspected to poisoning sheep.

#### 5. *Pimelea neo-anglica* Threlfall SCRUB KURRAJONG; POISON PIMELEA; SCANTY RICEFLOWER

*Pimelea pauciflora* auct. non R. Br., F. M. Bailey

Dioecious shrub up to 3 m tall. Leaves opposite; petioles *ca* 1 mm long; blades linear-elliptic to narrowly elliptic, rarely narrowly ovate or narrowly obovate, apex attenuate, base cuneate to attenuate, 0.6–3.5 cm × 0.1–0.4 cm, glabrous. Inflorescences terminal, usually few-flowered, involucre bracts 2, rarely 4, small, deciduous; perianth greenish or yellowish, glabrous, males with tube 2.5–3.5 mm long, broad at apex, lobes obtuse, 1–2 mm long, females 2–3 mm long, lobes 0.5–1 mm long. Fruits orange-red, ovoid, 3.5–5 mm long, succulent. **Fig. 12B.**

Throughout the region from the drier edges of rainforest on the McPherson Ra. and the Great Dividing Ra. to open forest situations. Flowers most of the year. Poisonous to stock.

#### 6. *Pimelea penicillaris* F. Muell.

*Pimelea dioica* C. T. White

Erect much-branched dioecious shrub up to 2 m tall; stems softly white pubescent, eventually glabrescent. Leaves alternate; petioles 0.5–1 mm long; blades obovate to elliptic, sometimes narrowly so, apex acute or obtuse, base cuneate, margin entire, 0.4–1.9 cm × 0.25–0.6 cm, densely silky appressed pubescent on both surfaces. Inflorescences terminal heads; flowers numerous, unisexual, involucre bracts absent; perianth yellow, males with perianth tubes 5.5–7 mm long, pubescent outside with long fine white spreading to antrorse hairs, lobes obtuse, 2.5–4 mm long with short fine dense spreading indumentum, females with perianth tubes 5.5–8 mm long, densely pubescent outside with fine antrorse hairs as long as tube, circumscissile above ovary after flowering, lobes ovate, acute, 1–2 mm long, densely covered outside with short fine hairs. Fruits enclosed in base of perianth tube, green, ovoid, 4.5–5 mm long.

Far western Darling Downs district on sandy soils. Flowers winter.

#### 7. *Pimelea trichostachya* Lindl. FLAXWEED; SPIKED RICEFLOWER

Small shrub up to *ca* 50 cm tall, young parts sparsely appressed silky puberulent. Leaves alternate; petioles up to 1 mm long; blades concave, oblong to oblong-elliptic, apex obtuse, base obtuse, 0.5–1.5 cm × 0.1–0.25 cm, glabrous or very sparsely

pubescent. Inflorescences terminal spikes up to 15 cm long, only few flowers present at any time, rachis  $\pm$  silky pubescent, involucrel bracts absent; perianth sessile on stem or on pedicel up to 1 mm long, yellow, spreading silky pubescent, tube 2.5–4 mm long, lobes obtuse, *ca* 0.5–1 mm long. Fruits contained in perianth tube, lobes circumscissile, green with purplish tinge, ovoid, *ca* 3–4 mm long.

Darling Downs district. Flowers late winter to summer. This species has been proved toxic to both sheep and cattle, causing "St. George disease" in cattle.

### 8. *Pimelea strigosa* Gandoger

*Pimelea curviflora* R. Br. var. *pedunculata* Benth.

Small shrub up to *ca* 50 cm tall, young parts with long spreading silky hairs. Leaves mostly alternate, occasionally opposite; petioles up to 2 mm long; blades elliptic, oblong or obovate, apex acute to obtuse, base cuneate, 0.7–3.5 cm  $\times$  0.2–0.9 cm, puberulent above, pubescent below with long silky hairs. Inflorescences terminal or lateral on peduncles usually up to 3 cm long; flowers bisexual or female, involucrel bracts absent; perianth yellowish, densely silky pubescent, tube 3.5–5.5 mm long, lobes obtuse, 1.5–2.5 mm long, unequal. Fruits enclosed in lower half of circumscissile tube, green, ovoid, *ca* 3–4.5 mm long.

Darling Downs district. Flowers spring.

### 9. *Pimelea curviflora* R. Br. subsp. *gracilis* (R. Br.) Threlfall TOUGH BARKED RICEFLOWER

*Pimelea gracilis* R. Br.

Usually small much-branched shrub but up to *ca* 1.5 m tall, branches wiry, ascending or erect,  $\pm$  silky pubescent. Leaves opposite or alternate; petioles up to 1 mm long; blades elliptic to obovate, apex acute to obtuse, base cuneate, 0.7–2.4 cm  $\times$  0.2–0.85 cm, usually glabrous above,  $\pm$  silky puberulent below. Inflorescences terminal; flowers few–several, bisexual or female, involucrel bracts usually 2, small; perianth greenish to greenish yellow, sometimes with dark red lobes, shortly pubescent, tube slender, usually curved below middle, 3.5–9 mm long, lobes acute, 1.5–3.5 mm long. Fruits enclosed in lower part of circumscissile tube, ovoid, *ca* 3.5 mm long.

Three varieties occur in the region:

- |   |   |   |
|---|---|---|
| 1. Stems, lower leaf surfaces and margins covered with long sparse spreading hairs  | <i>P. curviflora</i> subsp. <i>gracilis</i> var. <i>divergens</i> |   |
| Stems, lower leaf surfaces and margins covered with appressed or loosely appressed hairs  |   | 2 |
| 2. Pedicels covered with long antrorse hairs; perianth lightly covered outside with short usually fine antrorse hairs; fruits occasionally curved       | <i>P. curviflora</i> subsp. <i>gracilis</i> var. <i>gracilis</i>  |   |
| Pedicels covered with short appressed hairs; perianth lightly covered outside with short coarse appressed hairs (may be finer on tube); fruits straight | <i>P. curviflora</i> subsp. <i>gracilis</i> var. <i>sericea</i>   |   |

*P. curviflora* subsp. *gracilis* var. *gracilis* (Fig. 12C.), *P. curviflora* subsp. *gracilis* var. *divergens* Threlfall and *P. curviflora* subsp. *gracilis* var. *sericea* Benth. all occur in grassy eucalypt forests or on rocky slopes. Flowers mainly spring and autumn. The species has been suspected of poisoning stock.

### 10. *Pimelea latifolia* R. Br.

Shrub 0.5–2 m tall, rarely more, young parts silky pubescent. Leaves usually opposite; petioles 1–4 mm long; blades oblong, elliptic or obovate, apex acute or obtuse, mucronate, base cuneate to contracted, margin recurved, ciliate, 0.7–9 cm  $\times$  0.3–2.5 cm, puberulent above, pubescent below, with usually appressed silky hairs, dark green above, paler below. Inflorescences terminal few–several-flowered heads, sometimes slightly elongated; perianth white, silky appressed puberulent, tube 0.6–1.2 cm long, lobes  $\pm$  acute, *ca* 1–2 mm long. Fruits enclosed in lower third of circumscissile perianth tube, ovoid, *ca* 4–5 mm long.

Three taxa occur in the region:

- |   |   |   |
|---|---|---|
| 1. Leaves up to 9 cm long, hairs appressed, straight . . . . .        | <i>P. latifolia</i> subsp. <i>latifolia</i>                     |   |
| Leaves up to 4.5 cm long, hairs spreading, slightly tangled . . . . . |   | 2 |
| 2. Perianth tube 0.8–1.2 cm long . . . . .                            | <i>P. latifolia</i> subsp. <i>altior</i> var. <i>altior</i>     |   |
| Perianth tube less than 0.8 cm long . . . . .                         | <i>P. latifolia</i> subsp. <i>altior</i> var. <i>parvifolia</i> |   |

*P. latifolia* subsp. *latifolia* (*P. altior* F. Muell. var. *longifolia* Domin), *P. latifolia* subsp. *altior* (F. Muell.) Threlfall var. *altior* (*P. altior* F. Muell.; *Banksia altior* (F. Muell.) Kuntze; *P. altior* var. *typica* Domin) and *P. latifolia* subsp. *altior* (F. Muell.) Threlfall var. *parvifolia* (Domin) Threlfall (*P. altior* F. Muell. var. *parvifolia* Domin) all occur in rainforest or wet eucalypt forest. All flower mainly late winter–spring, sometimes through to autumn.

*Pimelea cornucopiae* Vahl, a northern species, may be found in the region. It can be readily distinguished from all the others by the involucre bracts surrounding the terminal inflorescence being partly united to form a hollow receptacle 5–10 mm deep.

## 2. WIKSTROEMIA Endl.

Shrubs or trees. Leaves opposite, occasional ones alternate. Flowers in short terminal or axillary racemes spikes or heads, ebracteate; perianth tubular, 4-lobed, without scales in throat; stamens 8, anthers sessile; hypogynous scales 4, free or ± united in pairs; ovary 1-locular, style very short. Fruits berry-like drupes, epicarp succulent, thin, endocarp coriaceous or crustaceous.

70 species southern China, Indo-China, Australia and Pacific region; 1 species Australia, occurring in south-eastern Queensland.

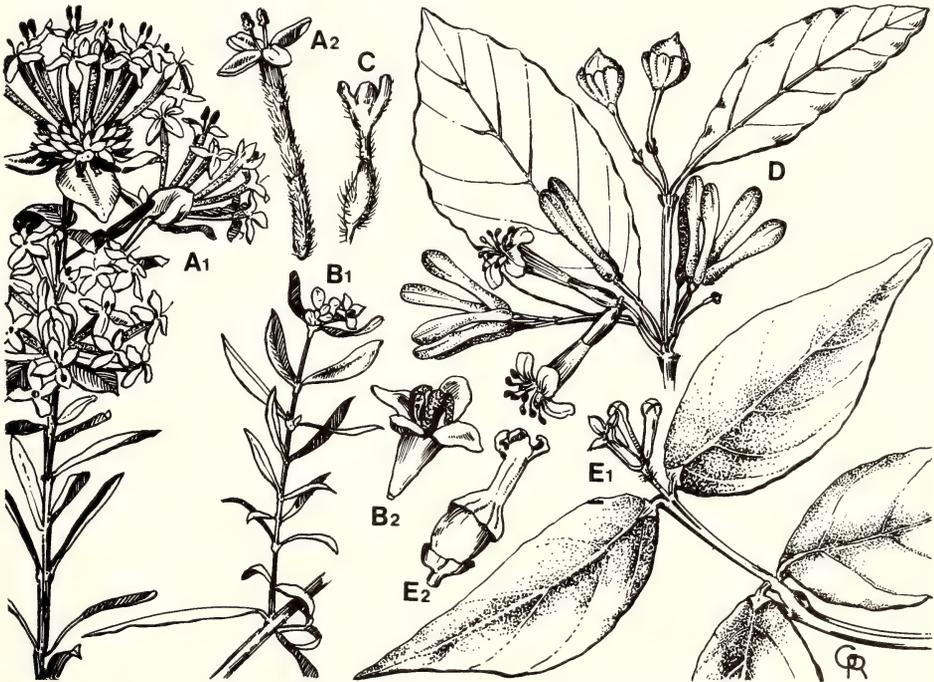


Fig. 12 THYMELAEACEAE — A–C *Pimelea* spp. — A<sub>1</sub>–A<sub>2</sub> *P. linifolia* subsp. *linifolia*, A<sub>1</sub> flowering stem x1, A<sub>2</sub> flower x2; B<sub>1</sub>–B<sub>2</sub> *P. neo-anglica*, B<sub>1</sub> flowering stem x1, B<sub>2</sub> flower x3; C *P. curviflora* subsp. *gracilis* var. *gracilis*, flower showing circumscissile perianth tube x1 1/2; D *Phaleria chermsideana*, fertile branchlet x1; E<sub>1</sub>–E<sub>2</sub> *Wikstroemia indica*, E<sub>1</sub> flowering branchlet x1, E<sub>2</sub> developing fruit showing circumscissile perianth tube x2.

**1. *Wikstroemia indica* (L.) C. A. Meyer**

TIE BUSH

*Daphne indica* L.

Shrub up to 1.5 m tall; bark reddish; young stems and inflorescence ferruginous puberulent. Leaves with petioles 1–3 mm long; blades ovate to elliptic, apex acute, mucronate, base obtuse or cuneate, 1.5–6.5 cm × 0.5–2.5 cm, glabrous, dark green above, paler below. Inflorescences up to 2.5 cm long including peduncle 1 cm long; perianth pale to greenish yellow, 7–10 mm long, lobes 1–2 mm long. Fruits bright red, succulent, ovoid or ellipsoid, ca 6–8 mm long. **Fig. 12E.**

Throughout the region but commonest in the coastal districts in margins of rainforest or in open forest in sandy sometimes rocky soils. Flowers spring to autumn. Toxic to stock, the fruits being more poisonous than the leaves.

**3. PHALERIA Jack**

Shrubs or trees. Leaves opposite, petiolate. Flowers several together in lateral or terminal sessile or pedunculate heads, surrounded by involucre of 4 bracts shorter than perianth tube; perianth 4-, rarely 5–6-lobed, without scales in throat; stamens twice as many as lobes, 2-seriate; hypogynous scales united in short sinuate or lobed cup; ovary 2-locular, style terminal, elongated. Fruits drupes, epicarp succulent, endocarp coriaceous or hard, 2-locular or 1-locular by abortion.

20 species Ceylon, south-eastern Asia, Indomalaysia, Australia, Pacific Is.; 3 species Australia; 1 species south-eastern Queensland.

**1. *Phaleria chermsideana* (F. M. Bailey) C. T. White***Leucosmia chermsideana* F. M. Bailey

Shrub or small tree, branchlets glabrous. Leaves with petioles 3–6 mm long; blades elliptic, rarely ovate or obovate, apex acuminate, base cuneate, 3–10 cm × 1–4.5 cm, glabrous. Inflorescences axillary or terminal heads on peduncles 5–10 mm long, bracts broad, 5 mm long, caducous; perianth white or pink tinged, pubescent, tube 1–1.7 cm long, lobes 3–5 mm long. Fruits ovoid, ca 1.5 cm long, succulent. **Fig. 12D.**

Rainforest of mainly eastern parts of the region. Flowers spring.

**91. ELAEAGNACEAE**

Trees or shrubs, often dioecious, indumentum lepidote or stellate. Leaves alternate, rarely opposite, exstipulate, simple. Flowers bisexual or unisexual, solitary, fasciculate, spicate or racemose; perianth tubular, hypogynous, constricted around ovary, 2–4-lobed, rarely truncate, valvate; stamens inserted in perianth tube or at base in males, 4 alternate with lobes, or 8 alternate and opposite, filaments free, anthers 2-locular, staminodes absent in females; ovary sessile at base of perianth, 1-locular, ovule solitary, erect, style terminal, linear, stigma lateral. Fruits enclosed by persistent fleshy perianth; seeds erect.

3 genera with 50 species, north temperate, tropical Asia to Australia; 1 genus with 1 species Australia, occurring in south-eastern Queensland.

**1. ELAEAGNUS L.**

Leaves alternate. Flowers bisexual; perianth 4-lobed; stamens 4, inserted at top of perianth tube; style elongated, recurved apically, stigma lateral.

45 species Europe, North America; 1 species Australia, occurring in south-eastern Queensland.

**1. *Elaeagnus triflora* Roxb.***Elaeagnus latifolia* auct. Aust. non L.

Scandent shrub or vine, young parts ferruginous lepidote. Leaves with petioles 0.4–1.2 cm long; blades ovate or narrowly ovate, apex acuminate, base obtuse or cuneate, margin slightly recurved, irregular, 2.5–11.5 cm × 1–5.5 cm, upper surface green, with few scales, lower surface densely silvery to ferruginous lepidote. Flowers clustered or in racemes up to 1.5 cm long, lepidote, scented, pedicels 3–5 mm long; perianth tube with constricted part 2–2.5 mm long, expanded part *ca* 3 mm long, lobes creamy or yellowish inside, *ca* 3 mm long. Fruits orange, ellipsoid, 1.5–2 cm long, fleshy, upper part of perianth usually deciduous.

Rainforest of coastal districts north of Brisbane. Flowers winter–spring. Fruits edible.

**92. FLACOURTIACEAE**

Trees or shrubs. Leaves alternate, spirally arranged or distichous, simple. Flowers in short axillary racemes or cymes or in glomerules or fascicles or solitary, bisexual or unisexual, actinomorphic; sepals 3–several, sometimes not distinguishable from petals; petals sometimes absent; stamens 5–many, anther connective sometimes with short appendage, glands and staminodia sometimes present in ring around ovary; ovary superior or half-inferior, unilocular, sometimes incompletely 2–10-locular, styles 1–10, free or connate. Fruits fleshy or dry berries or capsules; seeds with fleshy endosperm.

About 89 genera with *ca* 1300 species mainly from tropical areas of the world; 8 genera with 17 species Australia; 5 genera with 6 species south-eastern Queensland.

- |  |                          |
|--|--------------------------|
| 1. Petals present . . . . .  | 2                        |
| Petals absent . . . . .  | 4                        |
| 2. Flowers solitary in axils; climbers or scandent shrubs . . . . .          | 1. <i>Streptothamnus</i> |
| Flowers in spikes or racemes; shrubs or trees . . . . .                      | 3                        |
| 3. Stamens opposite petals, solitary or in groups; fruits capsules . . . . . | 2. <i>Homalium</i>       |
| Stamens in uniform ring around ovary; fruits berries . . . . .               | 3. <i>Scolopia</i>       |
| 4. Flowers bisexual . . . . .  | 4. <i>Casearia</i>       |
| Flowers unisexual . . . . .  | 5. <i>Xylosma</i>        |

**1. STREPTOTHAMNUS F. Muell.**

Climbers or rambling shrubs. Leaves alternate, exstipulate, entire. Flowers axillary, solitary, bisexual; sepals 5, caducous or persistent; petals 5, alternate with and much larger than sepals, caducous; stamens many, anthers basifixed, apiculate by elongated connective; ovary sessile, style short, ± persistent, stigma peltate. Fruits berries, many-seeded; seeds embedded in scanty pulp.

2 species endemic in north-eastern New South Wales and south-eastern Queensland.

- |  |                       |
|--|-----------------------|
| 1. Leaf blades 1.5–2 times as long as broad, much paler below; hair tuft domatia usually present on undersurface in axils of basal pair of secondary veins . . . . . | 1. <i>S. beckleri</i> |
| Leaf blades 1–1.3 times as long as broad, scarcely paler below; hair tuft domatia absent . . . . .   | 2. <i>S. moorei</i>   |

**1. *Streptothamnus beckleri* F. Muell.**

Rambling shrub or climber, glabrous. Leaves with petioles 1–3 cm long; blades chartaceous, ovate, apex gradually acuminate-acute, base rounded to subcordate, 3–9 cm × 1.8–4.5 cm, 3–5-nerved at base, green above, much paler to almost whitish below. Peduncle 1.5–2.5 cm long; sepals pink, ovate, 1–4 cm long, outer slightly smaller than inner; petals whitish pink, oblong, 7–8 mm × 5–6 mm; stamens 12–13,

filaments scarcely 1 mm long, anthers *ca* 3 mm long; disc annular, indented. Berries broadly ovoid to ellipsoid, *ca* 8 mm long; seeds *ca* 3 mm long.

Rainforest of the McPherson Ra. Flowers spring–summer.

## 2. *Streptothamnus moorei* F. Muell.

Climber, glabrous. Leaves with petioles 2–5 cm long; blades subcoriaceous, broadly ovate to elliptic-ovate, apex  $\pm$  abruptly acuminate, base rounded or slightly cordate, 5–12 cm  $\times$  4–10 cm, 3-nerved. Peduncles 1.5–4.5 cm long; sepals triangular-ovate, *ca* 2 mm long, persistent; petals pink to cream,  $\pm$  ovate, obtuse, 5–7 mm long; stamens numerous, filaments 2–2.5 mm long, anthers *ca* 1.5 mm long; disc absent. Berries ellipsoid-globular, *ca* 2–2.5 cm long; seeds *ca* 3 mm long.

Ranges near the border with New South Wales.

## 2. HOMALIUM Jacq.

Trees or shrubs. Leaves alternate; stipules absent or minute to large; leaf blades entire or glandular-serrate-crenate. Flowers in axillary or subterminal spikes, racemes or panicles, solitary or fasciculate along rachis, bisexual; sepals 5–10; petals as many as sepals, alternating with them; stamens epipetalous; hairy glands opposite each sepal; ovary half-inferior, styles 2–4, rarely –7, free or connate. Fruits capsules, coriaceous or woody; seeds 1–few.

About 200 species throughout the tropics; 3 species Australia; 1 species south-eastern Queensland.

### 1. *Homalium alnifolium* Thwaites & F. Muell. ex F. Muell.

*Homalium vitiense* auct. non Benth., Benth.

Tree up to 13 m tall, glabrous except for inflorescence or rarely few hairs on underside of leaves. Leaves with petioles 1–2 cm long; blades broadly ovate, apex obtuse or obtusely acuminate, margin irregularly and often obscurely sinuate-crenate or undulate, 4.5–15 cm  $\times$  2.5–7 cm. Spikes 4–10 cm long, dense or interrupted, rachis and flowers  $\pm$  pubescent; sepals *ca* 3 mm long; petals *ca* 3 mm long. Fruits not seen.

Rare in south-eastern Queensland, known from a few scattered localities in the Moreton, Burnett and Wide Bay districts. Flowers spring–summer.

## 3. SCOLOPIA Schreber

Small trees or shrubs, sometimes with spiny trunks and/or branches. Leaves alternate; stipules minute, caducous; blades entire or shallowly serrate or crenate. Flowers small, bisexual, in axillary racemes, sometimes reduced to few-flowered fascicles or a solitary flower, bisexual, small; sepals 4–6,  $\pm$  connate at base; petals as many as sepals; stamens numerous, exceeding petals, anthers dorsifixed, connective often produced into apicular appendage; style rather long. Fruits berries.

About 37 species from tropical and subtropical parts of the world; 1 species endemic in Australia, occurring in south-eastern Queensland.

### 1. *Scolopia braunii* (Klotzsch) Sleumer

*Adenogyrus braunii* Klotzsch; *Scolopia brownii* F. Muell.

Shrub or small tree or occasionally up to *ca* 30 m tall,  $\pm$  glabrous, young shoots may have axillary thorns. Leaves with petioles 0.4–1 cm long; blades narrowly ovate to rhombic-ovate, narrowed at both ends, apex subacute or blunt, margin entire or undulate-crenate, juveniles sinuate-dentate, 3.5–12 cm  $\times$  1.5–5 cm. Racemes few–many-flowered, 2–4 cm long; flowers greenish cream, scented; pedicels 2–5 mm long; sepals 4, *ca* 1.3 mm long; petals similar to sepals but *ca* 1.5 mm long; stamens *ca* 40, *ca* twice as long as petals. Berries dark red turning black, ovoid-globose, *ca* 1.2 cm across; seeds 1 or few, embedded in pulp. **Fig. 13A.**

Moreton and Wide Bay districts in or near rainforest. Flowers spring.

## 4. CASEARIA Jacq.

Shrubs or small trees. Leaves alternate, distichous; stipules mostly small and caducous; blades entire or crenate, usually pellucid punctate and/or striate. Flowers clustered in few-flowered axillary fascicles or glomerules, bisexual, small, pedicels articulate, surrounded by several scale-like bracts; calyx deeply 5-lobed; petals absent; stamens 8–10, filaments alternating with hairy staminodes and uniting with them at base; style short, stigma capitate. Capsules succulent and subcoriaceous, 2–3-valved; seeds enveloped in membranous aril.

About 160 species from tropical parts of the world; *ca* 7 species Australia; 1 species south-eastern Queensland.

1. *Casearia multinervosa* C. T. White & Sleumer ex Sleumer

*Casearia esculenta* auct. non Roxb., Benth.

Shrub or tree up to *ca* 5 m tall, glabrous except in floral region, branchlets with dense pale  $\pm$  elliptic lenticels. Leaves with petioles 5–8 mm long; blades oblong or elliptic, attenuate at both ends, margin entire, 4–11 cm  $\times$  2–5 cm, reticulation dense, fine, prominent on both surfaces, distinctly to indistinctly pellucid punctate especially against strong light. Fascicles few-flowered, pedicels *ca* 3–4 mm long, shortly hairy; sepals suborbicular, *ca* 2 mm long, shortly hairy inside and outside; stamens 8; stigma sessile. Capsules  $\pm$  3-sided, *ca* 8 mm long, glabrous.

Mostly in depauperate rainforest of the ranges, from the McPherson Ra. north to about Bundaberg and west to Killarney and the Bunya Mts. Flowers spring–summer.

## 5. XYLOSMA G. Forster

Dioecious shrubs or trees, often thorny. Leaves alternate, exstipulate, blades entire or shallowly subglandular-crenate. Flowers in axillary clusters or short racemes and/or sometimes also found on leafless older wood, unisexual, small; sepals 4–6,  $\pm$  connate at base, imbricate; petals absent; disc fleshy, 4–8-lobed or entire; male flowers with numerous mostly exerted stamens, filaments filiform; female flowers with sessile ovary, stigmas 2–3, mostly bilobed, sessile or style short. Fruits dry berries; seeds usually few.

About 100 species from tropical and subtropical regions of the world; 2 species Australia; 1 species south-eastern Queensland.

1. *Xylosma terraereginae* C. T. White & Sleumer

Tree up to *ca* 15 m tall; stem diameter up to *ca* 30 cm. Leaves with petioles *ca* 5–7 mm long; blades coriaceous, elliptic-oblong, apex bluntly acuminate, rarely almost rounded, base cuneate, margins slightly revolute, entire or almost so, 5–11 cm  $\times$  2–5.5 cm. Flowers small; pedicels 2–4 mm long; sepals ovate, minute, margins ciliate. Fruits ovoid-globular, *ca* 5 mm long.

Rarely collected, known from around Yarraman in the Moreton district, Biggenden and Oakview in the Wide Bay district and Coalstoun Lakes in the Burnett district. Flowers summer.

## 93. VIOLACEAE

Herbaceous perennials or shrubs, rarely annuals. Leaves alternate, rarely opposite; stipules leafy or small; blades simple. Flowers solitary or in panicles, bisexual, actinomorphic or zygomorphic; sepals 5, persistent; petals 5, mostly unequal, lowermost often larger and spurred; stamens 5, hypogynous,  $\pm$  connivent in ring around ovary; ovary superior, 1-locular, style simple, rarely split. Fruits capsules or berries.

About 29 genera with 900 species, cosmopolitan; 4 genera with *ca* 26 species Australia; 3 genera with 5 species south-eastern Queensland.

- |  |                        |
|--|------------------------|
| 1. Lowest petal much longer than others . . . . .  | 1. <i>Hybanthus</i>    |
| Lowest petal scarcely longer than others . . . . . | . . . . . 2            |
| 2. Herbs; fruits capsules . . . . .                | 2. <i>Viola</i>        |
| Shrubs; fruits berries . . . . .                   | 3. <i>Hymenanthera</i> |

1. **HYBANTHUS** Jacq.

Herbaceous perennials, sometimes flowering the first year, with slender wiry stems. Leaves alternate or clustered, occasionally opposite. Inflorescences axillary, cymose, racemose or flowers solitary; flowers zygomorphic; corolla of 5 free petals, lower petal distinctly spurred and prominently clawed between lamina and spur, lateral petals of two dissimilar pairs, 2 outer petals linear, prominently 1–3-nerved, 2 inner petals broader, narrowly ovate or ovate.

150 species from tropical and subtropical regions of the world; 11 species Australia; 2 species south-eastern Queensland.

- |                               |                           |
|-------------------------------|---------------------------|
| 1. Flowers solitary . . . . . | 1. <i>H. enneaspermus</i> |
| Flowers in racemes . . . . .  | 2. <i>H. monopetalus</i>  |

1. **Hybanthus enneaspermus** (L.) F. Muell.

SPADE FLOWER

*Viola enneaspermus* L.; *Ionidium suffruticosum* (L.) Ging.-Lass.; *Hybanthus suffruticosus* (L.) Baillon

Perennial herb or compact shrub up to *ca* 60 cm tall. Leaves alternate, sessile, stipules linear to subulate; blades linear to narrowly ovate, margins entire to crenulate to sparsely serrate, 0.5–6 cm × 0.1–0.4 cm. Flowers solitary; sepals narrowly ovate, acute, 3–4 mm long; lower petal 0.8–1.5 cm long, 2 outer petals 3–4 mm long, 2 inner petals 4.5–5.5 mm long. Capsules 4–5 mm long; seeds ovoid-ellipsoid, 2–3 mm long.

Two subspecies occur in the region:

- |  |  |
|--|--|
| 1. Leaf margins revolute, occasionally flat, ± pubescent with spreading hairs; stipules up to 4 mm long, spreading; flowers blue . . . . . | <i>H. enneaspermus</i> subsp. <i>enneaspermus</i>  |
| Leaf margins recurved or flat, ± pubescent with antrorse hairs; stipules <i>ca</i> 1 mm long, appressed to stem; flowers yellow . . . . .  | <i>H. enneaspermus</i> subsp. <i>stellarioides</i> |

**H. enneaspermus** subsp. **enneaspermus** (*H. enneaspermus* forma *angustifolia* Domin; *H. enneaspermus* var. *banksianus* (Ging.-Lass.) Domin) is rare in the region, recorded from the Darling Downs and Moreton districts. **H. enneaspermus** subsp. **stellarioides** (Domin) E. Bennett (*H. enneaspermus* var. *stellarioides* Domin; *H. enneaspermus* forma *flavus* Domin; *H. enneaspermus* forma *pubescens* Domin) is known from the Moreton and Wide Bay districts. Both subspecies flower most of the year with the main flush in spring–summer.

2. **Hybanthus monopetalus** (J. A. Schultes) Domin

LADY'S SLIPPER

*Ionidium monopetalum* J. A. Schultes; *Ionidium filiforme* (DC.) F. Muell.; *H. monopetalus* var. *normalis* Domin; *H. monopetalus* var. *abbreviatus* Domin

Perennial herbs up to *ca* 60 cm tall. Leaves alternate below, ± opposite above, stipules linear to deltoid; blades linear to oblong, 0.5–9 cm × 0.1–0.4 cm; inflorescences axillary, racemose, up to *ca* 20 cm long; petals blue, lower petal 0.5–2 cm long, other petals inconspicuous. Capsules *ca* 6 mm long. **Fig. 13G.**

Widespread and moderately common in south-eastern Queensland, mainly in sandy soils. Flowers found most of the year with the main period spring–summer.

2. **VIOLA** L.

Herbaceous perennials. Stipules usually foliaceous and persistent. Flowers solitary, pedunculate; sepals with small appendage overlapping peduncle; petals ± equal, lowest often widest, spurred or pouched at base; anthers nearly sessile, connective flat and produced into membranous appendage beyond locules; style 1, thickened at top, stigma terminal. Capsules opening elastically in 3 valves.

About 500 species, cosmopolitan; *ca* 8 species native and naturalized Australia; 2 species south-eastern Queensland.

- |   |                            |
|---|----------------------------|
| 1. Leaf blades longer than wide . . . . .           | 1. <i>V. betonicifolia</i> |
| Leaf blades as wide as or wider than long . . . . . | 2. <i>V. hederacea</i>     |

**1. *Viola betonicifolia* Smith****PURPLE VIOLET**

Stemless and without stolons. Leaves radical; petioles up to *ca* 12 cm long, usually  $\pm$  dilated at top making line of demarcation between blade and petiole indistinct; blades narrowly ovate to ovate, acute or obtuse, base truncate, 2–7.5 cm  $\times$  0.5–3 cm, longer than broad. Peduncles up to *ca* 20 cm long; sepals narrowly ovate, acute, 5–6 mm long, with short rounded basal appendages; petals violet, lowest with white markings, occasionally all petals white, 1–1.3 cm long, lateral petals with few hairs on inside towards base. **Fig. 13E.**

Widespread in the Moreton and Wide Bay districts and in the eastern Darling Downs and Burnett districts, usually in moist areas in open forests or woodlands. Flowers spring–summer.

**2. *Viola hederacea* Labill.****IVY LEAVED VIOLET**

Leaves tufted along numerous creeping stolons; petioles 2–6 cm long; blades reniform to orbicular, sharply differentiated from petiole, margins entire or irregularly toothed, 0.8–3 cm  $\times$  1–3.5 cm, glabrous or with few appressed hairs especially below. Flowers on peduncles 2–4 cm long; sepals narrowly ovate, acute, *ca* 4 mm long, basal appendages rounded, very small; petals *ca* 9 mm long, glabrous or lateral ones with few hairs inside.

Two subspecies occur in the region:

- |  |   |
|--|---|
| 1. Corolla discolourous, white or pale blue with darker blotches in centre | <i>V. hederacea</i> subsp. <i>hederacea</i>     |
| Corolla $\pm$ concolourous, white or pale blue                             | <i>V. hederacea</i> subsp. <i>perreniformis</i> |

Both *V. hederacea* subsp. *hederacea* (*V. hederacea* var. *genuina* Domin) (**Fig. 13F.**) and *V. hederacea* subsp. *perreniformis* L. Adams are widespread in the region in damp places. Both subspecies flower mainly spring–summer with some flowers found all year round.

**3. HYMENANTHERA R. Br.**

Shrubs. Leaves alternate or clustered; stipules minute. Flowers solitary or clustered, bisexual or unisexual, slightly zygomorphic; sepals shortly united at base; petals  $\pm$  equal; anthers with dentate connective appendage; stigma 2–3-lobed. Fruits berries.

10 species Australia, New Zealand and Norfolk I.; 1 species Australia, occurring in south-eastern Queensland.

**1. *Hymenanchera dentata* R. Br. ex DC.***Hymenanchera angustifolia* R. Br. ex DC.

Shrub up to 4 m tall, branchlets often spinescent. Leaves  $\pm$  sessile, linear to narrowly elliptic or narrowly obovate, apex obtuse, base narrowed, margin serrate or  $\pm$  entire, 0.8–4.5 cm  $\times$  0.2–1(–1.5) cm. Peduncles recurved, 2–5 mm long; sepals *ca* 1.5 mm long; petals pale yellow, recurved at tip, 3–5 mm long. Berries purple-black,  $\pm$  globular, 4–5 mm diameter.

Recorded from the Sundown National Park near Stanthorpe. Flowers spring.

**94. PASSIFLORACEAE**

Erect trees or shrubs or climbers with tendrils. Leaves alternate; stipules usually small, deciduous; blades entire or lobed, often with glands on petiole. Flowers bisexual or unisexual; sepals 5, persistent, free or partially united; petals 5, rarely absent, free or shortly united; corona of one or more rows of thread-like filaments or scales; stamens 5 or more, shortly united in bundles; ovary superior, 1-locular, styles free or united. Fruits capsules or berries, indehiscent or loculicidally 3-valved; seeds surrounded by pulpy aril.

About 12 genera with 600 species from tropical and warm temperate areas; 2 genera with 17 species Australia; 1 genus with 6 species south-eastern Queensland.



Fig. 13 A FLACOURTIACEAE — A<sub>1</sub>-A<sub>2</sub> *Scolopia braunii*, A<sub>1</sub> inflorescence and leaf x<sup>2</sup>/<sub>3</sub>, A<sub>2</sub> flower x<sub>3</sub>; B ELATINACEAE — B<sub>1</sub>-B<sub>2</sub> *Elatine gratioloides*, B<sub>1</sub> portion of submerged plant x<sub>1</sub>, B<sub>2</sub> flower x<sub>8</sub>; C-D PASSIFLORACEAE — C-D *Passiflora* spp. — C *P. foetida*, fruit x<sup>2</sup>/<sub>3</sub>; D *P. herbertiana*, portion of flowering stem x<sup>2</sup>/<sub>3</sub>; E-G VIOLACEAE — E-F *Viola* spp. — E *V. betonicifolia*, habit x<sup>2</sup>/<sub>3</sub>; F. *V. hederacea* subsp. *hederacea* habit x<sup>2</sup>/<sub>3</sub>; G. *Hybanthus monopetalus*, habit x<sub>1</sub>.

## 1. PASSIFLORA L.

Climbers with axillary tendrils. Leaves entire or palmately lobed or divided. Flowers usually bisexual; calyx tube short, calyx lobes usually coloured inside like petals; corona of 1–several rings of coloured filaments or appendages; stamens 5, united with ovary-gynophore, ovary on long gynophore, styles 3, stigmas large capitate.

About 500 species chiefly from tropical areas of the world; *ca* 15 species native and naturalized Australia; 6 species native and naturalized south-eastern Queensland.

The key below is to the native and naturalized species in south-eastern Queensland. At the end of the treatment of the native and naturalized species are short treatments of another 3 species commonly cultivated and sometimes found as garden escapes but not naturalized; these species are not included in the key.

- |  |                          |
|--|--------------------------|
| 1. Leaf outlines not lobed, undivided . . . . .  | 2                        |
| Leaf outlines lobed or divided . . . . .   | 3                        |
| 2. Stipules linear; flowers 1–2 cm diameter . . . . .  | 1. <i>P. suberosa</i>    |
| Stipules pinnatisect, with filiform gland-tipped segments; flowers 3–5 cm diameter . . . . . | 2. <i>P. foetida</i>     |
| 3. Leaves 5-lobed . . . . .  | 3. <i>P. caerulea</i>    |
| Leaves 3-lobed . . . . .   | 4                        |
| 4. Stipules prominent, broad and entire or divided into filiform segments . . . . .          | 5                        |
| Stipules not prominent, linear-subulate, or absent . . . . .                                 | 6                        |
| 5. Stipules asymmetrically ovate, 1.5–4 cm long . . . . .                                    | 4. <i>P. subpeltata</i>  |
| Stipules pinnatisect with filiform gland-tipped segments, 0.5–1 cm long . . . . .            | 2. <i>P. foetida</i>     |
| 6. Sepals up to 1 cm long; petals absent . . . . .   | 1. <i>P. suberosa</i>    |
| Sepals 2 cm long or longer; petals present . . . . .   | 7                        |
| 7. Flowers <i>ca</i> 6 cm diameter . . . . .   | 5. <i>P. herbertiana</i> |
| Flowers 8–10 cm diameter . . . . .   | 6. <i>P. aurantia</i>    |

1. \**Passiflora suberosa* L.

## CORKY PASSION FLOWER; SMALL PASSION FLOWER

*Passiflora suberosa* var. *minima* Masters

Climber or creeper, glabrous; stems up to *ca* 6 m long,  $\pm$  angular, corky when older, glabrous or sparsely to densely hairy. Stipules linear, 5–8 mm long; petioles 0.5–4 cm long with two glands about middle; blades entire or usually 3-lobed up to  $\frac{4}{5}$  of their length, base rounded or cordate, 4–11 cm  $\times$  4–12 cm, lobes acute to acuminate, margins entire, glands usually absent. Peduncles 0.5–3 cm long, jointed about halfway; bracts caducous, 1 mm long; flowers pale greenish yellow, 1–2 cm diameter; sepals ovate or narrowly ovate, subobtusely, 5–10 mm long; petals absent. Fruits berries, purple-black, 0.8–1.5 cm diameter, glabrous.

Native of tropical America; naturalized in the Moreton and Wide Bay districts. Flowers found most of the year.

2. \**Passiflora foetida* L.

## STINKING PASSION FLOWER; MOSSY PASSION FLOWER; LOVE IN A MIST PASSION FLOWER

Climber with stems up to *ca* 4 m long, subglabrous or with sparse to dense whitish or yellowish hairs, ill-odoured. Stipules 0.5–1 cm long, deeply cleft into filiform gland-tipped segments; petioles 1–6 cm long; blades entire or usually 3-, rarely 5-lobed up to half way, 3–10 cm  $\times$  3–10 cm, lobes acute-acuminate, margins usually with coarse gland-tipped hairs. Peduncles 2–6 cm long; bracts and bracteoles 2–4 cm long, deeply 2–4-pinnatisect, with filiform gland-tipped segments, forming involucre enveloping flower; flowers pinkish lilac or sometimes whitish, usually 3–5 cm diameter; sepals 1.3–2 cm long; petals slightly shorter than sepals; ovary glabrous or

with sparse spreading hairs. Fruits dry berries, 1.5–3 cm diameter, glabrous or with few spreading hairs. **Fig. 13C.**

Native of tropical America, naturalized and widespread in south-eastern Queensland, especially in disturbed places. Flowers found most of the year.

A number of varieties have been described, but a review of Australian material is required to ascertain which of the varieties if any occur here.

### 3. \**Passiflora caerulea* L.

Climber with stems 2–3 m long, glabrous. Leaves with petioles 1–3 cm long with 2 glands about middle; blades palmately 5-lobed, 2 lower lobes sometimes 2-lobed, whole blade 4–10 cm × 5–12 cm, lobe margins entire, usually with gland on either side towards base. Flowers 7–10 cm diameter; sepals and petals mainly green and white though sometimes pinkish, rays of corona blue at tip, white in middle and purple at base. Fruits yellow, subglobose, *ca* 5 cm diameter.

Native of Brazil, cultivated and sometimes found naturalized around towns in the region. Flowers spring to autumn.

### 4. \**Passiflora subpeltata* Ort.

#### WHITE PASSION FLOWER

*Passiflora alba* Link & Otto

Climber or creeper, stems up to 5 m long, ± glabrous. Stipules ovate-oblong, tip mucronulate, base obliquely cordate, 1.5–4 cm long; petioles 3–6 cm long, with 2–5 conspicuous glands; blades 3-lobed *ca* half length, base rounded, truncate or cordate, 4–10 cm × 4–11 cm, lobes obtuse to acute, mucronulate, margins entire but with few glands near lobe sinuses. Peduncles 3–6 cm long; bracts and bracteoles ovate, 1–1.5 cm long, entire; flowers white, 4–5.5 cm diameter; sepals 2–2.5 cm long with subapical horn 0.5–1 cm long; petals 1.5–2 cm long. Fruits leathery berries, yellowish when mature, ellipsoid or subglobose, 1.5–2 cm long.

Native of tropical America; naturalized in the region. Flowers spring–summer.

### 5. *Passiflora herbertiana* Ker-Gawl.

#### NATIVE PASSION FLOWER

Climber, ± pubescent. Stipules linear-subulate, 1–3 mm long; petiole 1.5–5(–7) cm long, with pair of glands just below blade; blades 3-lobed for one third to one half their length, base rounded or truncate, 4–10 cm × 4–11 cm, lobes acute at tip, margins entire, nerves raised below. Peduncles 2–3.5 cm long, with *ca* 3 short filiform bracts in lower half; flowers creamy yellow turning red, *ca* 6 cm diameter; calyx lobes *ca* 3.5 cm long; petals *ca* 2 cm long. Fruits green when ripe, ellipsoid, obscurely 3-sided, *ca* 4–7 cm long. **Fig. 13D.**

Widespread in the Moreton district and is also known from the Wide Bay district and the Bunya Mts., found mainly in rainforest. Flowers mostly spring to autumn.

### 6. *Passiflora aurantia* G. Forster

#### RED PASSION FLOWER

*Passiflora brachystephanea* F. Muell.; *P. aurantia* var. *banksii* (Benth.) F. M. Bailey

Climber with stems several metres long. Leaves with petioles 1–4 cm long, usually with 2 glands towards top; blades broad, 3-lobed, with 1–6 glands scattered along either side of midvein, 2–9 cm × 2–10 cm; lobes rounded at tip. Peduncles 1–3 cm long; flowers 8–10 cm diameter, creamy white at first, darkening to orange-red with age; calyx lobes 2–5 cm long; petals 1.5–2.5 cm long. Fruits purplish when mature, ellipsoid, *ca* 3–4 cm × 2 cm.

Two varieties occur in the region:

- |                                       |           |  |
|---------------------------------------|-----------|--|
| 1. Ovary glabrous; leaves ± glabrous  | . . . . . | <i>P. aurantia</i> var. <i>aurantia</i>  |
| Ovary densely hairy; leaves pubescent | . . . . . | <i>P. aurantia</i> var. <i>pubescens</i> |

*P. aurantia* var. *aurantia* is widespread in the region, often in depauperate rainforest. *P. aurantia* var. *pubescens* F. M. Bailey (*P. aurantia* forma *pubescens* (F. M. Bailey) P. Green; *P. baileyana* Domin) is rare, and is known only from a few scattered localities in the region. Both varieties flower most of the year.

A number of other species of **Passiflora** are cultivated in south-eastern Queensland and some may sometimes be seen growing around rubbish tips or persisting in old gardens but are probably not naturalized. The cultivated **Passiflora** species which may sometimes appear to be naturalized are briefly dealt with below.

\***Passiflora edulis** Sims, COMMON PASSION FRUIT, is characterised by its 3-lobed leaf with regular serrate margins and flowers about 6 cm diameter which are white tinged with purple. The fruit is purple when ripe and *ca* 4 cm diameter.

This is the commonly cultivated edible PASSION FRUIT.

\***Passiflora mollissima** (H. B. Kunth) L. H. Bailey, BANANA PASSION FRUIT, is characterised by its deeply 3-lobed leaves with serrate margins. Its flowers are 6–7 cm diameter and are pink. The fruits are about 6–7 cm long, yellow and edible.

This species is cultivated for its edible fruits.

\***Passiflora quadrangularis** L., LARGE GRANADILLA, is characterised by its 4-angled winged stems and entire ovate leaves which can be up to *ca* 15 cm long. It has large fragrant flowers up to 11 cm across, the petals are rosy pink and the corona violet.

It is cultivated for its showy flowers.

## 95. TAMARICACEAE

Shrubs or trees with slender branches and small scale-like alternate leaves. Flowers in slender spikes or racemes, usually bisexual, actinomorphic; sepals 4–6, free; petals as many as sepals, free; stamens 4–10, hypogynous, free or connate at base; ovary superior, 1-locular, styles 3–4, free or united at base. Fruits capsules.

4 genera with 120 species from mainly arid or semi-arid temperate or subtropical regions; 1 genus with 1 species apparently naturalized Australia, occurring in south-eastern Queensland.

### 1. TAMARIX L.

Deciduous or evergreen trees or shrubs. Scale leaves with salt-secreting glands. Stamens 4–5, rarely more, free or slightly connate at base. Seeds many per capsule each with tuft of hairs at apex.

54 species, western Europe, Mediterranean region to India and northern China; 1 species apparently naturalized Australia, occurring in south-eastern Queensland.

#### 1. \***Tamarix aphylla** (L.) Karsten

ATHEL TREE

*Thuja aphylla* L.

Evergreen shrub or small tree up to *ca* 12 m tall, often multi-stemmed, branchlets and foliage glaucous. Racemes on current year's growth, up to *ca* 6 cm long; flowers pale pink to whitish, 5-merous, caducous.

Native of Asia; cultivated in drier parts of the region, often as a windbreak, apparently naturalized in some parts of the Burnett district and possibly also the Darling Downs district.

This species is vegetatively similar in appearance to **Casuarina** spp. but is easily distinguishable by its alternate scale-leaves. **Casuarina** spp. have whorls of a number of leaf scales.

## 96. ELATINACEAE

Herbs or low shrubs. Leaves opposite or verticillate; stipulate; blades simple. Flowers axillary, solitary or cymose, bisexual, actinomorphic; sepals 3–5, rarely 2, free, imbricate; petals as many as sepals, hypogynous, imbricate; stamens as many as to twice as many as petals, hypogynous, free; ovary superior, 3–5-locular; styles 3–5, free. Fruits septicial capsules.

2 genera with 40 species from tropical and temperate parts of the world; 2 genera with *ca* 6 species Australia; 1 genus with 1 species south-eastern Queensland.

### 1. ELATINE L.

Small herbs, either aquatic or creeping on mud. Leaves opposite or verticillate. Flowers minute, usually solitary; sepals 3–4, rarely 2, membranous; petals 3–4, rarely 2. Capsules membranous.

About 20 species from tropical and temperate areas of the world; 1–2 species Australia; 1 species south-eastern Queensland.

#### 1. *Elatine gratioloides* Cunn.

WATERWORT

*Elatine americana* Arn. var. *australiensis* Benth.

Small glabrous annual, prostrate and creeping over mud in dense tufts, forming mat 3–30 cm diameter. Stipules minute and deciduous; leaf blades ovate, obovate or oblong, apex obtuse, base rounded to cuneate, 0.3–1.5 cm × 0.15–0.6 cm, thin, pale green. Flowers minute, sessile, solitary, 3-merous. Capsules depressed globular, up to *ca* 2 mm diameter. **Fig. 13B.**

Creeping on mud or sometimes submerged in fresh water, known from eastern parts of Moreton and Wide Bay districts.

## 97. CUCURBITACEAE

Monoecious or dioecious, mostly climbers or trailers. Tendrils usually present, usually 1 per node, simple or branched; leaves alternate, petiolate, blades simple or compound. Calyx tube short or elongated, 5-, rarely 3-lobed, petals 5, rarely 3, free or united; stamens basically 5 but often modified in one or more ways and often appearing as 3; ovary usually inferior, ovules 1–many, style 1 with usually 3 bilobed stigmas or styles 3, rarely 2 with 1 bilobed stigma per style. Fruits dry or fleshy capsules, berries or hard-shelled pepos, indehiscent or dehiscent.

About 120 genera with *ca* 830 species mainly tropical, poorly represented in temperate regions; *ca* 18 genera with *ca* 44 species Australia; 13 genera with 18 species south-eastern Queensland.

- |   |                          |
|---|--------------------------|
| 1. Ovaries with single ovule; fruits 1-seeded . . . . .   | 2                        |
| Ovaries with several–many ovules; fruits several-seeded . . . . .   | 3                        |
| 2. Fruits fleshy, 10 cm or more long, sparsely to moderately densely echinate . . . . .                                 | 1. <i>Sechium</i>        |
| Fruits dry, <i>ca</i> 1 cm long, with dense barbed spines . . . . .   | 2. <i>Sicyos</i>         |
| 3. Fruits coming away from peduncle and forcibly expelling seeds through opening so formed; tendrils absent . . . . .   | 3. <i>Ecballium</i>      |
| Fruits not coming away from peduncle, seeds not forcibly expelled; tendrils present . . . . .                           | 4                        |
| 4. Fruits 3-valved, at least at apex . . . . .  | 5                        |
| Fruits indehiscent . . . . .  | 6                        |
| 5. Fruits ornamented with fleshy tubercles or spines; in south-eastern Queensland leaves simple but 3–7-lobed . . . . . | 4. <i>Momordica</i>      |
| Fruits without spines or tubercles; in south-eastern Queensland leaves 3-foliolate . . . . .                            | 5. <i>Nothoalsomitra</i> |
| 6. Fruits less than 3 cm long . . . . .   | 7                        |
| Fruits 3 cm or more long . . . . .  | 10                       |

7. Fruits 1.5 cm or more long . . . . .		8
Fruits less than 1.5 cm long . . . . .		9
8. Ripe fruits red with white longitudinal markings . . . . .	6. <i>Diplocyclos</i>	
Ripe fruits not as above . . . . .	7. <i>Cucumis</i>	
9. Fruits usually solitary and pedunculate; female flowers with 3 staminodes . . . . .	8. <i>Zehneria</i>	
Fruits 1–7 together, subsessile; female flowers without staminodes . . . . .	9. <i>Mukia</i>	
10. Fruits from sparse to dense spines, tubercules or pustules each of which ends in broad-based hyaline bristle . . . . .	7. <i>Cucumis</i>	
Fruits smooth or tubercules without bristles . . . . .		11
11. Lobes of corolla fringed . . . . .	10. <i>Trichosanthes</i>	
Lobes of corolla not fringed . . . . .		12
12. Stamens with anthers united in oblong heads . . . . .	11. <i>Cucurbita</i>	
Stamens with anthers free . . . . .		13
13. Flowers yellow . . . . .	12. <i>Citrullus</i>	
Flowers white . . . . .	13. <i>Lagenaria</i>	

### 1. SECHIUM P. Browne

Stout monoecious perennial climber; roots often tuberous. Tendrils 2–5-fid; leaf blades simple, angled or slightly lobed. Male flowers in small pedunculate racemes, calyx 5-lobed, densely pubescent, corolla rotate, 5-lobed, pubescent, stamens 3, filaments connate; female flowers solitary or in clusters next to males, staminodes absent, ovary with single ovule. Fruits pear shaped, longitudinally grooved, often echinate, fleshy; seed flat, white, germinating on plant.

1 species from central America, widely cultivated throughout the world for its edible fruits; naturalized in Australia, occurring in south-eastern Queensland.

#### 1. \**Sechium edule* (Jaques) Swartz

CHOKO

*Sicyos edulis* Jaques

Roots often tuberous; stems usually annual, up to 12 m long, sparsely hairy. Leaves with petioles 2.5–15 cm long; blades orbicular-ovate, apex acute, base deeply cordate, 7–25 cm × 7–25 cm, clothed with rough short hairs, 5–7-nerved, usually paler green below. Male racemes on peduncles 1.5–4 cm long, corolla creamy green, 1.5–3 cm across; female flowers creamy green, up to ca 3.5 cm across. Fruits whitish or green, 10–20 cm × 5–10 cm; seeds flat, white, 3–5 cm long.

In south-eastern Queensland it is apparently naturalized in a few places, mainly around habitation. Flowers most of the year, except mid-winter.

### 2. SICYOS L.

Monoecious annual climbing or trailing herbs. Tendrils 2–5-fid; leaf blades simple, palmately lobed. Male flowers few–many in racemes, petals 5, rarely 3–4, united at very base, stamens 3, rarely 2 or 5; female flowers solitary and long pedunculate, or few–many subsessile at apex of peduncle. Fruits rather small, ovoid, usually spiny, dry and coriaceous or woody; seed one per fruit.

About 50 species mainly from the Americas, the Hawaiian Is. and the south-western Pacific region; 1 species Australia, occurring in south-eastern Queensland.

#### 1. *Sicyos australis* Endl.

*Sicyos angulata* auct. non L., Benth.

Stems slender, several metres long, glabrous to scabrous. Leaves with petioles 2–10 cm long; blades thin, almost membranous, broadly ovate to reniform, usually 3–5-lobed, sometimes shallowly so, apex acute, base cordate, 6–12 cm × 6–12 cm, sparsely hairy.

Male and female flowers often in same axil, white; male flowers in racemes 1–2 cm long on peduncles mostly 4–6 cm long, corolla *ca* 6 mm diameter; female flowers in dense clusters on peduncles up to *ca* 1 cm long, corolla smaller than males. Fruits ovoid, apex acute, up to *ca* 10 mm long, densely covered with barbed prickles.

Widespread in the region, in or near rainforest. Flowers spring-summer.

### 3. ECBALLIUM A. Rich.

Prostrate hispid tuberous rooted perennial. Tendrils absent. Calyx shortly campanulate, 5-lobed; corolla almost rotate, deeply 5-lobed; male flowers in axillary racemes, stamens 3; female flowers single, axillary, staminodes 3, ovary minutely tuberculate, hispid. Fruits glaucous green, oblong-ellipsoid, hispid, at maturity coming away from peduncle and forcibly expelling seeds through opening so formed.

1 species from the Mediterranean region, naturalized in Australia, occurring in south-eastern Queensland.

#### 1. \**Ecballium elaterium* (L.) A. Rich.

#### SQUIRTING CUCUMBER

*Momordica elaterium* L.

Stems stout, up to *ca* 60 cm long. Leaves with petioles up to *ca* 15 cm long; blades somewhat coriaceous, broadly ovate-triangular, base cordate, margins entire or denticulate or shallowly lobed, 4–14.5 cm × 3.5–17 cm, deep green and scabrous above, pale green and hispid below. Male flowers in racemes up to 35 cm long, petals 1.5–2 cm long; female flowers often co-axillary with males, petals 0.6–1.5 cm long. Fruits pendulous, 3–5 cm long.

Occasionally cultivated as a curiosity. It has been reported as apparently naturalized in the Darling Downs district, the most recent report being in 1931.

### 4. MOMORDICA L.

Monoecious or dioecious climbers or trailers. Tendrils simple or bifid; leaf blades simple or compound. Male flowers solitary umbellate, racemose or fasciculate, often subtended by prominent sessile suborbicular sheathing bract, petals 5, free, stamens 3, 2 anthers 1-locular, 1 anther 1-locular, or 2, 1 anther 3-locular and 1 anther 2-locular; female flowers solitary. Fruits fleshy, dehiscent or indehiscent.

About 45 species from Asia, Africa and Australia, the majority from Africa; 3 species Australia; 1 species south-eastern Queensland.

#### 1. *Momordica charantia* L.

#### BALSAM PEAR

Annual; stems glabrous or hairy, up to 5 m long. Tendrils simple, petioles 1.4–7 cm long; blades broadly ovate-reniform or orbicular in outline, base cordate, deeply palmately 3-, 5- or 7-lobed, lobes acute and apiculate, narrowed towards base, whole leaf 2.5–10 cm × 3–12.5 cm, glabrous or pubescent especially on nerves. Male flowers solitary, peduncle 0.5–2.8 cm long with broad suborbicular bract at apex 0.3–1.5 cm long, pedicel 1.8–5.5 cm long, petals yellow, 1–2.2 cm long, stamens 3, anthers coherent in centre of flower; female flowers with peduncle 0.2–5 cm long, with broadly ovate or suborbicular bract at apex 0.1–1.2 cm long, pedicel 1–10 cm long, petals 0.7–1.2 cm long. Fruits reddish orange, pendulous, on stalk 3.5–15 cm long, broadly ovoid and beaked to attenuate-ellipsoid, 3.5–11 cm × 2–4 cm, up to 30 cm long in cultivated forms, tuberculate, splitting into 3 valves; seeds sheathed in sticky red pulp.

Probably native of India and Africa but now widespread in tropical regions of the world, naturalized in a few widespread areas of south-eastern Queensland. It is cultivated in many parts of the world for its edible fruits. Flowers spring to autumn.

A second species, *Momordica balsamina* L., BALSAM APPLE, occurs in northern Queensland and may also be found in south-eastern Queensland. The two species can be separated using the following key.

- |  |                     |
|--|---------------------|
| 1. Male peduncle 0.5–2.8 cm long, pedicel 1.8–5.5 cm long, bract at apex of peduncle thus appearing remote from flower . . . . . | <i>M. charantia</i> |
| Male peduncle 1.7–3.5 cm long, pedicel 4.5 mm long, bract at apex of peduncle thus closely subtending flower . . . . .           | <i>M. balsamina</i> |

## 5. NOTHOALSOMITRA Telford

Climbing perennial herbs, woody at base. Tendrils 2-fid; leaf blades 3-foliolate. Male flowers in axillary racemes, corolla deeply 5-lobed, stamens 3, anthers connivent, connective broad, 2 anthers 2-locular, 1 anther 1-locular. Female flowers solitary, perianth similar to males but usually larger, staminodes 5, style thick, stigmas 3. Fruits fleshy, firm skinned; seeds many.

1 species, endemic in south-eastern Queensland.

### 1. *Nothoalsomitra suberosa* (F. M. Bailey) Telford

*Alsomitra suberosa* F. M. Bailey; *Neoalsomitra suberosa* (F. M. Bailey) Hutch.

Plant dioecious; stems climbing to great heights in trees, lower woody part furnished with corky flanges up to *ca* 2.5 cm wide. Leaves with petiole 2.5–4 cm long; blades 3-foliolate; petiolules up to *ca* 1 cm long; leaflet blades ovate, apex acute to acuminate, lateral ones oblique at base, usually with lobe on outer edge near base, up to *ca* 10 cm long, with hairy tufts in axils. Male flowers crowded in pedunculate racemose panicles up to *ca* 4 cm long, corolla pale yellow, 1–2.5 cm diameter when expanded, white tomentose outside; female flowers solitary on long peduncles, staminodes 5. Fruits on peduncles up to *ca* 8 cm long, oblong-ovoid, 7.5–13 cm × *ca* 5 cm. **Fig. 14A.**

Known from the edges of rainforest and from wet eucalypt forest of the Moreton and Wide Bay districts. Flowers mainly spring-summer.

## 6. DIPLOCYCLOS (Endl.) von Post & Kuntze

Perennial climbers, stems herbaceous. Tendrils bifid or occasionally unbranched; leaf blades simple, palmately lobed. Male flowers in sessile or racemose clusters, often co-axillary with female flowers, corolla 5-lobed, stamens 3, 2 anthers 2-locular, 1 anther 1-locular, free, filaments inserted on corolla tube; female flowers solitary or clustered, subsessile. Fruits red with white longitudinal stripes or markings when ripe, solitary or clustered, subsessile, thin walled and fleshy, indehiscent.

4–5 species, 1 widespread in the tropics, including Australia, the others confined to Africa; 1 species south-eastern Queensland.

### 1. *Diplocyclos palmatus* (L.) C. Jeffrey

NATIVE BRYONY

*Bryonia palmata* L.; *Bryonopsis laciniosa* var. *erythrocarpa* (F. Muell.) Domin; *Bryonia laciniosa* auct. non L., Benth.; *Bryonopsis laciniosa* auct. non (L.) Naudin, Cogn. & Harms

Rootstock fleshy; stems up to 6 m long, glabrous, becoming thickened and white dotted with age. Leaves with petioles 1.5–8 cm long, often armed with few stout forward curving prickly hairs; blades broadly ovate-cordate in outline, gland-dotted at base, palmately 5-, rarely 3- or 7-lobed, lobes linear-ovate to long elliptic, apex obtuse to acute and apiculate, margin subserrate with apiculate teeth, whole leaf 3.5–14 cm × 4–14.5 cm, scabrous. Male flowers 2–8 in non pedunculate clusters intermixed with 0–4 female flowers, pedicels 0.7–1.5 cm long, corolla white, cream or pale greenish yellow, lobes 6–9 mm long; female flowers 1–5 together mixed with 0–8 male flowers, pedicels 1–5 mm long, corolla lobes ± 5 mm long. Fruits solitary or in clusters of 2–5 with peduncles 1–5 mm long, subglobose or ovoid-ellipsoid, 1.5–2.2 cm long. **Fig. 14B.**

Known from the Moreton and Darling Downs districts but probably to be found elsewhere in the region. Flowers mainly summer. Fruits have been suspected of poisoning children and stock.

## 7. CUCUMIS L.

Monoecious rarely dioecious climbing or trailing hispid or scabrous herbs, at least stems annual. Tendrils simple; leaf blades palmately lobed. Flowers yellow; male flowers solitary or in few-flowered sessile or pedunculate groups, petals united below, stamens 3, 2 anthers 2-locular, 1 anther 1-locular, filaments inserted about middle of tube, connective apically produced; female flowers usually solitary, staminodes often present, ovary hairy. Fruits fleshy,  $\pm$  firm walled, indehiscent, smooth and glabrous or  $\pm$  uniformly pubescent or with sparse to dense spines, pustules or tubercules, each of which ends in broad-based hyaline bristle.

About 28 species mainly from Africa and Asia; *ca* 7 species Australia, 1 native; 6 species, 1 native, in south-eastern Queensland.

A number of forms of various species are also cultivated in Australia.

- |   |  |
|---|--|
| 1. Fruits smooth and glabrous or pubescent . . . . .                                | 1. <i>C. melo</i> subsp. <i>agrestis</i> |
| Fruits spiny, tuberculate or bristly . . . . .                                      | 2  |
| 2. Fruits <i>ca</i> 2 cm long, globular . . . . .                                   | 2. <i>C. myriocarpus</i>                 |
| Fruits 4 cm or more long, ellipsoid, ovoid or subglobular . . . . .                 | 3  |
| 3. Spines of fruit stout; fruits orange-red when ripe . . . . .                     | 3. <i>C. metuliferus</i>                 |
| Spines of fruit slender; fruits not orange-red when ripe, often yellowish . . . . . | 4  |
| 4. Leaves deeply palmately 5-lobed . . . . .  | 4. <i>C. anguria</i>                     |
| Leaves not lobed or shallowly 3-lobed . . . . .                                     | 5  |
| 5. Leaf lobes or tips rounded; fruits densely and softly spiny . . . . .            | 5. <i>C. dipsaceus</i>                   |
| Leaf lobes or tips pointed; fruits sparsely spiny . . . . .                         | 6. <i>C. sativus</i>                     |

1. *Cucumis melo* L. subsp. *agrestis* (Naudin) Grebensec.PADDYMELON;  
WILD CUCUMBER

*Cucumis melo* var. *agrestis* Naudin; *C. trigonus* auct. non Roxb., Benth.

Slender creeper or climber; stems up to 2.5 m long, hispid or scabrous. Leaves with petioles 2–10 cm long; blades ovate-cordate in outline, often broadly so,  $\pm$  entire or 3-, 5- or 7-lobed, 2–10 cm  $\times$  3–10 cm, often broader than long, lobes rounded at apex, usually scabrous, margin of lobes often toothed. Flowers solitary or few together on slender peduncles up to *ca* 3 cm long; male flowers with corolla mostly *ca* 6 mm long; female flowers with corolla up to *ca* 1.5 cm long though mostly *ca* 1 cm long, ovary densely hairy. Fruits globular or ovoid, 1.5–4.5 cm long, smooth, glabrous or hairy.

Known from the western Darling Downs district but not common. Flowers mainly summer. The fruits are edible to humans and stock but unpalatable.

2. \**Cucumis myriocarpus* Naudin

PRICKLY PADDYMELON

Vine sprawling on ground; stems 1–2 m long, scabrous. Leaves with petioles 1.5–8 cm long; blades  $\pm$  ovate-cordate in outline, deeply palmately 5-lobed, central lobe itself 3-lobed, lobes with rounded apices, margin toothed, whole blade 1.5–8 cm  $\times$  1.5–8 cm, sparsely scabrous above, more densely so below. Male flowers 2–4 in axils, corolla *ca* 4 mm long; female flowers with corolla 5–8 mm long, ovary covered with bristles. Fruits yellowish when ripe, globular, 1.5–2.5 cm diameter, with coarse bristles or spines.

Native of southern Africa, naturalized in the Burnett and Darling Downs districts, usually found as a weed of disturbed areas. Flowers mainly spring–summer. The fruits are apparently poisonous to stock and humans.

**3. \**Cucumis metuliferus* Naudin**

Trailing or climbing; stems hispid with spreading hairs. Leaves with petioles 3–10 cm long; blades broadly ovate-cordate in outline, not lobed or palmately 3–5-lobed, apices of lobes or leaf acute or rounded, margin toothed, 3–9 cm × 4–10 cm, hispid hairy especially below. Male flowers 1–4 together, groups sessile or on peduncles 2–6 cm long; female flowers with ovary with large fleshy bristle-tipped spines. Fruits grey-green becoming orange-red, ellipsoid-cylindrical, 6–11 cm long, with broad-based fleshy spines each tipped with broad-based bristle.

Native of tropical Africa, apparently naturalized in the Wide Bay district but seldom collected. Flowers mainly spring–summer.

**4. \**Cucumis anguria* L.**

Trailing or climbing; stems up to *ca* 2.5 m long, hispid or scabrous pubescent. Leaves with petioles 4–12 cm long; blades broadly ovate-cordate in outline, deeply palmately 5-lobed, lobe apices rounded, margin toothed, whole blade 4–9 cm × 5–9 cm, scabrid hairy especially on nerves below. Male flowers 1–10 together, peduncle absent or up to 2.6 cm long, pedicels 0.4–3 cm long, corolla 5–6 mm long; female flowers on peduncles 1–9.5 cm long, corolla 5–6 mm long, ovary densely bristly. Fruits ripening yellow, ellipsoid or subglobose, 3–4.5 cm long, bristly especially near stalk.

Native of southern and eastern Africa, apparently naturalized in the Moreton and Wide Bay districts. Flowers mainly spring–summer. It is edible, having a flavour similar to cucumber.

**5. \**Cucumis dipsaceus* Spach**

Climbing or trailing herb; stems hispid with stiff bristly spreading hairs. Leaves with petioles 1.5–11.5 cm long; blades broadly ovate-cordate, not lobed or shallowly 3-lobed, leaf or lobe apices rounded, margin toothed, 1.5–9.5 cm × 2.5–10 cm, scabrid hairy above and below. Male flowers 1–4, pedicels 0.7–1.3 cm long, corolla 5–10 mm long; female flowers on peduncles 5–10 mm long, corolla 0.6–1.5 cm long, ovary densely bristly. Fruits yellow when ripe, ellipsoid, 4–6.5 cm long, densely and softly spiny, each spine ending in soft bristle.

Native of tropical Africa; naturalized in the Moreton, Burnett and Wide Bay districts but it is seldom collected. Flowers apparently spring–summer.

**6. \**Cucumis sativus* L.****CUCUMBER**

Trailing or climbing herbs; stems up to *ca* 4 m long with hispid hairs. Leaves with petioles 5–15 cm long; blades triangular-ovate, shallowly 3–5-angled or -lobed, leaf and lobe apices acute, margin irregularly toothed, 7–18 cm × 7–15 cm, hispid especially along margins, scabrous on both surfaces. Male flowers in clusters of 3–7; female flowers solitary, corolla up to *ca* 4 cm long, ovary with scattered hairs with tuberculate bases. Fruits variable in shape and size, from nearly globular to cylindrical with scattered spinous tubercles and warts, particularly when young.

This is the common cultivated edible CUCUMBER. Thought to be native of India but now widely cultivated in many forms throughout the world. Probably not naturalized in south-eastern Queensland but occasionally found growing on rubbish dumps, disturbed areas near picnic sites etc. Flowers mainly spring–summer.

**8. ZEHNERIA Endl.**

Monoecious or dioecious, small to medium sized climbers; stems herbaceous, sometimes becoming thickened and woody with age. Tendrils simple; leaf blades simple. Male flowers solitary or in racemes, umbels or clusters, stamens 3, rarely 2 or 4, all with 2-locular anthers; female flowers solitary or rarely few together, staminodes 3, styles short, ovary glabrous or with few crisped hairs. Fruits berries, mostly globular.

About 35 species mainly from tropical Africa and Asia to Australia; 2 species Australia; 1 species south-eastern Queensland.

**1. *Zehneria cunninghamii* F. Muell.**

*Melothria cunninghamii* (F. Muell.) F. Muell ex Benth.; *M. cunninghamii* var. *major* Domin

Stems very slender. Leaf blades thin, broadly triangular or hastate, irregularly but not deeply toothed or rarely obscurely 3- or 5-lobed, 2.5–8 cm × 2–6 cm. Male flowers small, *ca* 6 together in umbels or racemes, peduncles slender, 5 mm or more long, in one specimen seen 6 cm long, individual flowers 1–2 mm diameter; female flowers usually solitary in axils on filiform peduncles up to *ca* 5 cm long, each flower *ca* 4 mm diameter. Fruits globular, 6–8 mm diameter, smooth.

Moderately common around the edges of rainforest of the region. Flowers mainly spring–summer.

**9. MUKIA Arn.**

Monoecious medium sized climbers or trailers; stems herbaceous, hispid. Tendrils simple; leaf blades simple. Flowers small; male flowers in non pedunculate clusters, each flower shortly pedicellate, stamens 3, 2 anthers 2-locular, 1 anther 1-locular; female flowers in non pedunculate clusters, sometimes solitary, pedicels very short, sometimes co-axillary with males, staminodes usually absent, ovary ± hispid hairy. Fruits berries, subsessile.

About 10 species from the tropics of Asia and Africa to Australia; *ca* 7 species Australia, 6 endemic; 1 species south-eastern Queensland.

**1. *Mukia maderaspatana* (L.) M. Roemer**

*Cucumis maderaspatanus* L.; *Mukia scabella* (L.) Arn.; *Melothria maderaspatana* (L.) Cogn.

Climber or trailer from perennial woody rootstock; stems up to 2.5 m long. Leaves with petioles 0.3–8 cm long; blades sagittate, hastate, triangular, ovate or broadly ovate in outline, not lobed or 3- or 5-lobed, margin toothed, 1.2–11 cm × 1.4–11 cm, scabrid hairy. Male flowers on pedicels 1–3 mm long, petals yellow, 1.5–2 mm long; female flowers on pedicels 1–3 mm long, petals ± 1 mm long, ovary bristly with dark forward pointing hairs. Fruits red, subsessile in axillary clusters of 1–7, subglobose, 0.6–1.1 cm diameter, glabrous.

Widespread but not common in the region, in a variety of habitats. Flowers mainly spring–summer.

**10. TRICHOSANTHES L.**

Monoecious or dioecious, annual or perennial climbers. Tendrils simple or 2–5-fid; leaf blades simple or compound. Flowers with corolla lobes 5, white or greenish white, fimbriate with long filiform hairs; male flowers usually in racemes, rarely solitary, stamens 5, anthers free or united; female flowers usually solitary, rarely racemose, staminodes absent. Fruits mostly hard walled, fleshy, indehiscent.

About 40 species from southern Asia to Australia; *ca* 6 species Australia; 1 species south-eastern Queensland.

**1. *Trichosanthes subvelutina* F. Muell. ex Cogn.**

*Trichosanthes palmata* auct. non Roxb., Benth.

Tall climber forming large heavy underground tubers, principal stems often exceeding 2.5 cm diameter, leafy stems usually 5-ribbed and velvety pubescent. Tendrils 3–5-branched; petioles 2–7 cm long; blades broadly ovate or suborbicular in outline, palmately 5–7-lobed, sometimes deeply so, lobes acuminate, margin minutely denticulate, whole blade 6–17 cm × 6–17 cm, upper surface dark green, covered with short erect hairs, undersurface clothed with dense soft grey hairs. Flowers up to 15 cm long; petals *ca* 2.5 cm long with fringe up to 2.5 cm long. Fruits green, on peduncles up to *ca* 7.5 cm long, oblong-globose, often more than 10 cm long and 7.5 cm in diameter; seeds numerous, embedded in white pulp.

Widespread in the Moreton and Wide Bay districts, usually in or near rainforest. Flowers mainly spring–summer.

F. M. Bailey, "Qd. Fl." 2: 692 (1900) cites the Brisbane River as a locality for *Trichosanthes pentaphylla* F. Muell. The Queensland Herbarium has no specimens of this species from south-eastern Queensland and it is doubtful that it does occur in the region. This species is distinctive in having a palmately or pedately compound leaf of 5 leaflets.

## 11. CUCURBITA L.

Trailing or climbing or some cultivars short-stemmed, prostrate or  $\pm$  erect herbs. Tendrils 3–7-branched or in some cultivars much reduced or absent. Flowers solitary, yellow; stamens with anthers united into oblong head. Fruits often large, firm walled, fleshy, indehiscent, very variable in size, shape, colour and ornamentation.

About 25 species all from the Americas; 4 species widely cultivated for their edible fruits, at least 1 of which is naturalized in Australia, occurring in south-eastern Queensland.

### 1. \**Cucurbita maxima* Duchesne ex Lam. PUMPKIN

Annual long running vine, slightly harsh to touch. Tendrils 2–3-fid; petioles 10–25 cm long,  $\pm$  erect; blades occasionally white blotched, usually reniform, serrate, not lobed or shallowly 5-lobed, base cordate with deep sinuses, whole blade up to 30 cm across, scabrous. Male and female flowers often co-axillary; corolla up to 8 cm long; male flowers on peduncles 10–15 cm long; female flowers on peduncles *ca* 3 cm long. Fruits up to 30 cm in diameter; seeds numerous.

Probably native of south America, now cultivated in many forms throughout the world mostly for its edible fruits; found naturalized around habitation, often along creek or river banks. Flowers mainly spring–summer.

## 12. CITRULLUS Schrader

Monoecious annual or tuberous rooted perennial, trailing or climbing. Tendrils simple, 2–4-fid or absent; leaf blades simple, usually deeply  $\pm$  pinnately lobed. Male flowers yellow, solitary, campanulate, petals 5, united below middle, stamens 3, 2 anthers 2-locular, 1 anther 1-locular, inserted on tube, connectives broad; female flowers yellow, solitary, ovary hairy, subglobose or ellipsoid, staminodes present, stigmas 3-lobed. Fruits large, subglobular or ovoid, firm walled, fleshy inside, indehiscent; seeds many, usually ovate in outline, compressed, smooth or slightly rough.

3 species from Africa and Asia; 2 species naturalized Australia; 1 species south-eastern Queensland.

### 1. \**Citrullus lanatus* (Thunb.) Matsumura & Nakai WILD MELON; BITTER MELON; BASTARD MELON; WATERMELON; PIEMELON *Momordica lanata* Thunb.; *Citrullus vulgaris* Schrader

Annual climber or trailer; stems herbaceous, up to *ca* 3 m long, with rather soft long hairs. Tendrils usually 2-fid; leaf blades ovate or narrowly ovate in outline, usually palmately deeply 3–7-lobed, lobes narrowly ovate in outline, each lobe usually lobulate, central lobe longer than lateral lobes; whole blade 3–20 cm  $\times$  2.5–19 cm,  $\pm$  long hairy on nerves, especially below, otherwise scabrid-punctate especially below. Male flowers on peduncles 1.2–4 cm long, petals yellow, 0.7–1.6 cm long; female flowers on peduncles 0.3–3.5 cm long; petals yellow, *ca* 1.1 cm long. Fruits green mottled with pale green or yellowish irregular longitudinal stripes, 10–30 cm diameter. **Fig. 14C.**

Native of southern and tropical Africa. Both bitter and sweet forms are found naturalized throughout south-eastern Queensland. Flowers mainly spring–summer.



Fig. 14 CUCURBITACEAE — A<sub>1</sub>–A<sub>2</sub> *Nothoalsomitra suberosa*, A<sub>1</sub> portion of flowering stem with male flowers x1, A<sub>2</sub> stamens x6; B<sub>1</sub>–B<sub>2</sub> *Diplocyclos palmatus*, B<sub>1</sub> portion of fruiting stem x1, B<sub>2</sub> flower x6; C *Citrullus lanatus*, portion of flowering stem x2/3.

The edible WATERMELONS and the PIEMELONS used in jam making belong to this species. Bitter forms known as WILD MELONS, BITTER MELONS or BASTARD MELONS usually have fruit with white pulp that is intensely bitter to the taste. Bitter forms may arise spontaneously amongst cultivated forms. The bitter forms are capable of producing diarrhoea in humans and have been suspected of poisoning stock.

### 13. LAGENARIA Ser.

Monoecious or dioecious annual climbers or trailers. Tendrils bifid or sometimes simple; petioles with pair of apical lateral glands; blades simple. Flowers large, white, opening in evenings; male flowers solitary or racemose, petals 5, free, stamens 3, 2 anthers 2-locular, 1 anther 1-locular; female flowers solitary, ovary hairy. Fruits large, greenish, hard shelled, fleshy, indehiscent.

6 species, 1 pantropical, 1 Africa and Madagasca, the rest confined to tropical Africa; 1 species apparently naturalized Australia, occurring in south-eastern Queensland.

#### 1. \**Lagenaria siceraria* (Molina) Standley

#### BOTTLE GOURD

*Cucurbita siceraria* Molina; *Lagenaria vulgaris* Ser.

Climber or trailer; stems up to 4.5 m long, densely hairy. Leaves with petioles 3–20 cm long; blades broadly ovate-reniform to suborbicular in outline, apex apiculate, base cordate, margin toothed, not lobed or shortly 3–7-lobed, 3–30 cm × 4–30 cm, hairy beneath and usually also above. Flowers solitary, short-lived, 2–5 cm long; male flowers on peduncles 5–30 cm long; female flowers on peduncles 2–7 cm long, ovary with white woolly hairs. Fruits very variable in shape and size, flattened, globular or club-shaped, often crook necked, 10–100 cm long; seeds many.

Probably native of Africa and India but now pantropical. In Australia it is sometimes cultivated as a curiosity. It has been reported as apparently naturalized in the Moreton district. Flowers mainly spring–summer. Cultivated in some parts of the world for the gourds which are used as domestic utensils.

## 98. LYTHRACEAE

Herbs. Leaves opposite or whorled, rarely alternate; usually exstipulate. Flowers solitary or in cymes, racemes or panicles, bisexual, actinomorphic or zygomorphic; hypanthium present, resembling fused calyx; sepals inserted on summit of hypanthium, often alternating with exterior lobes or appendages; petals present or absent, inserted at top of hypanthium; stamens few–many, inserted below petals in hypanthium tube; ovary superior, 2–6-locular, sometimes imperfectly so.

About 25 genera with 550 species, almost cosmopolitan; ca 7 genera with 25 species Australia; 5 genera with 8 species south-eastern Queensland.

- |   |                    |   |
|---|--------------------|---|
| 1. Hypanthiums zygomorphic; stem hairs viscid . . . . .   | 1. <i>Cuphea</i>   | 2 |
| Hypanthiums actinomorphic; stem hairs not viscid . . . . .  |                    |   |
| 2. Hypanthiums elongated, cylindrical or tubular; petals pink, blue or purple and usually conspicuous                         | 2. <i>Lythrum</i>  |   |
| Hypanthiums campanulate or turbinate, becoming hemispherical or globose; petals if conspicuous not of above colours . . . . . |                    | 3 |
| 3. Flowers in cymes or umbels or crowded into bracteate heads . . . . .   | 3. <i>Ammannia</i> |   |
| Flowers solitary . . . . .  |                    | 4 |
| 4. Exterior appendages of hypanthium horn-like; flowers usually conspicuous . . . . .   | 4. <i>Heimia</i>   |   |
| Exterior appendages of hypanthium absent or not horn-like; flowers usually inconspicuous . . . . .                            | 5. <i>Rotala</i>   |   |

## 1. CUPHEA P. Browne

Annual or perennial herbs or shrubs. Leaves opposite; stipules setose. Flowers solitary or in cymes, bisexual, zygomorphic; hypanthium tubular, ribbed; calyx lobes 6; petals 6; stamens 11, included, 2 posterior inserted lower in hypanthium than 9 anterior; ovary 2-locular towards base, 1-locular above.

250 species North and South America; 1 species naturalized Australia, occurring in south-eastern Queensland.

1. \**Cuphea carthagenensis* (Jacq.) Macbride

*Lythrum carthagenensis* Jacq.

Erect or spreading herbs, up to *ca* 70 cm tall. Stipules minute; petioles 0.2–0.8 mm long; blades narrowly ovate to ovate or elliptic, 1–5.5 cm × 0.5–2 cm, both surfaces scabrous. Hypanthium shortly spurred at base, *ca* 5 mm long; petals violet to purple, 1.2–2 mm long.

Native of the Americas; recorded apparently naturalized from near Bundaberg in the Wide Bay district. Flowers summer–autumn.

## 2. LYTHRUM L.

Annual or perennial herbs. Leaves sessile, alternate, opposite or whorled. Flowers axillary, solitary or few together, sometimes forming leafy spikes or racemes; hypanthium tubular, ribbed; sepals 4–6, alternating with 4–6 external appendages; petals 4–6; stamens as many as or twice as many as petals, when twice as many then usually filaments of two lengths; ovary 2-locular, style filiform. Capsules enclosed in persistent hypanthium, splitting septically at summit.

About 35 species, cosmopolitan; *ca* 4 species Australia, 1 endemic; 3 species south-eastern Queensland.

- |   |                           |   |
|---|---------------------------|---|
| 1. Petals <i>ca</i> 8 mm long; leaves all opposite or whorled       | 1. <i>L. salicaria</i>    |   |
| Petals 2–4 mm long; leaves alternate at least above                 |                           | 2 |
| 2. Stamens exerted from hypanthium; plants erect                    | 2. <i>L. paradoxum</i>    |   |
| Stamens not exerted from hypanthium; plants procumbent or ascending | 3. <i>L. hyssopifolia</i> |   |

1. *Lythrum salicaria* L.

## PURPLE LOOSESTRIFE

Erect with perennial rootstock and usually annual angular stems, 0.5–1 m tall, pubescent. Leaves opposite or whorled, narrowly ovate, apex acute, base slightly stem clasping, 1.5–6 cm × 0.3–1.2 cm. Flowers clustered in upper axils, forming long terminal leafy spikes or panicles; hypanthium *ca* 5 mm long; sepals 5–6, very short; external appendages 5–6, 1–2 mm long; petals blue or purplish, 5–6, *ca* 8 mm long; stamens usually 12, 6 longer than others, exerted.

Widespread in the region, but more commonly met with in the cooler highlands in southern parts of the region. Usually found along watercourses or near swamps. Flowers summer.

2. *Lythrum paradoxum* Koehne

Erect glabrous annual; stems angular, up to *ca* 50 cm tall. Leaves alternate, narrowly ovate or linear, apex acute, base rounded, 1–3.2 cm × 0.1–0.6 cm. Flowers solitary or few together in axils; hypanthium 4–5 mm long, up to 6 mm long in fruit; sepals 4–6, minute, external appendages 4–6, *ca* 1 mm long; petals pink-purple, 4–6, 3–4 mm long; stamens 4–12, exerted.

Known from the Darling Downs and Burnett districts. Flowers summer–autumn.

3. *Lythrum hyssopifolia* L.

## LESSER LOOSESTRIFE

Procumbent or ascending glabrous annual; stems angular, up to *ca* 50 cm long. Leaves mostly alternate, narrowly ovate to linear-oblong, apex acute, base obtuse, 0.5–2.5 cm × 0.15–0.5 cm. Flowers solitary in axils; hypanthium *ca* 3 mm long in flower, longer in

fruit; sepals 4–6, broad, short, membranous, external appendages green, 4–6, *ca* 1 mm long; petals blue, red or purplish, 4–6, 1–2 mm long. **Fig. 15B.**

Known from the Stanthorpe-Wallangarra region of the southern Darling Downs district. Flowers late summer–autumn.

### 3. AMMANNIA L.

Annual erect or prostrate glabrous herbs of periodically marshy situations; stems quadrangular, at least above. Leaves  $\pm$  sessile, opposite, mostly decussate, rarely distichous-spirally arranged. Flowers axillary in cymes or umbels or crowded into bracteate heads; sepals 4, rarely 5–6; petals 4 or sometimes absent; stamens 2, 4, 8 or 11. Fruits globose or ellipsoid, thin-walled, irregularly dehiscent or opening by septical valves; seeds numerous.

About 30 species, cosmopolitan; *ca* 3 species Australia; 1 species south-eastern Queensland.

The genus in Australia requires further research.

#### 1. *Ammannia multiflora* Roxb.

Erect branched herb up to *ca* 60 cm tall. Leaves opposite, oblong-linear or oblong-obovate, narrowed below middle, base  $\pm$  dilated and cordate-auriculate, 0.8–5 cm  $\times$  0.15–0.8 cm. Flowers in cymes, peduncles up to *ca* 6 mm long; hypanthium *ca* 1–1.5 mm long, campanulate, 8-ribbed; petals 0.7–1 mm long; stamens 4. Fruits partly exserted from calyx, globose, 1.5–2 mm diameter.

Known from the Moreton and Darling Downs districts but probably also occurs elsewhere in the region, in damp soil or sometimes growing partially submerged in standing water. Flowers mainly autumn with some most of the year.

A number of varieties of this species have been described but pending further research are not accepted in this treatment.

F. M. Bailey, "Qd. Fl." 2: 674(1900) includes *Ammannia auriculata* Willd. as occurring in south-eastern Queensland. The Queensland Herbarium has no specimens of this species from the region and it is doubtful that it does occur in the region.

### 4. HEIMIA Link & Otto

Slender herbs or shrubs. Leaves opposite or with some alternate. Flowers pedunculate, solitary, axillary; hypanthium tubular, campanulate; sepals 5–7, alternating with 5–7 horn-like spreading processes; petals 5–7; stamens 10–18; ovary 3–6-locular. Capsules globose.

2 species from Central and South America; 1 species naturalized Australia, occurring in south-eastern Queensland.

#### 1. \**Heimia salicifolia* (Kunth) Link & Otto

*Nesaea salicifolia* Kunth

Glabrous shrub up to *ca* 1.5 m tall. Leaves mostly opposite,  $\pm$  sessile, ovate to linear-ovate to linear-obovate, apex obtuse to acute, base tapering, 1–3 cm  $\times$  0.15–0.6 cm. Peduncles 1–2 mm long; hypanthium up to *ca* 4 mm long; sepals triangular-acuminate, 1–2 mm long becoming closely connivent over capsule, horns about as long as sepals but spreading outwards; petals orange-yellow, *ca* 1.2 cm long or longer. Capsules *ca* 4 mm diameter, loculicidally dehiscent. **Fig. 15A.**

Native of Central and South America; naturalized in a few places in and near Brisbane. Flowers spring–summer.

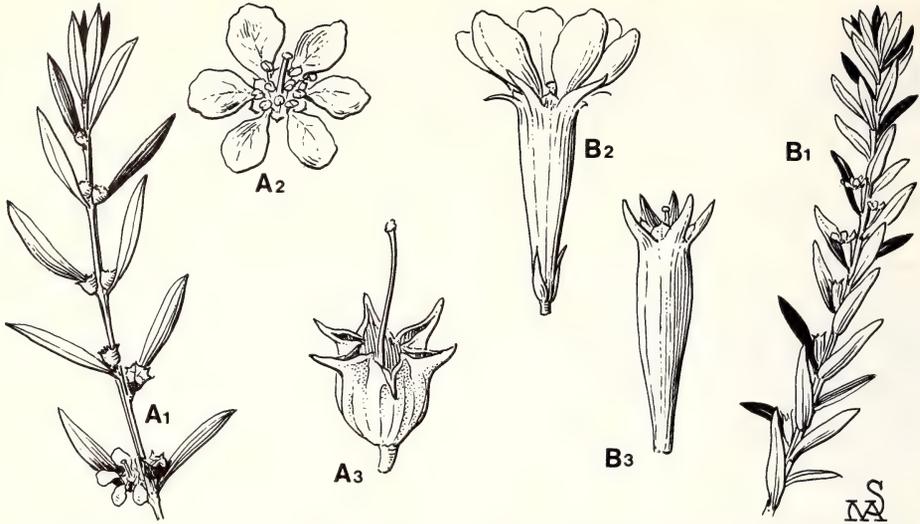


Fig. 15 LYTHRACEAE — A<sub>1</sub>-A<sub>3</sub> *Heimia salicifolia*, A<sub>1</sub> portion of flowering stem x1, A<sub>2</sub> flower x2, A<sub>3</sub> fruiting calyx x3; B<sub>1</sub>-B<sub>3</sub> *Lythrum hyssopifolia*, B<sub>1</sub> portion of flowering stem x1, B<sub>2</sub> flower x6, B<sub>3</sub> fruiting calyx x6.

## 5. ROTALA L.

Glabrous annual or perennial herbs of marshy situations or still water. Leaves opposite or whorled, sessile or petiolate. Flowers axillary, solitary or in spikes or racemes; hypanthium pellucid-punctate; sepals 3-6, mostly alternating with exterior appendages; petals 3-6 or absent; stamens 1-6; ovary incompletely 2-5-locular. Capsules septically 2-5-valved.

About 50 species from tropical and subtropical parts of the world; 5 species Australia; 2 species south-eastern Queensland.

- |  |                         |
|--|-------------------------|
| 1. Leaves less than 1.5 mm broad, in whorls of 3-8               | 1. <i>R. mexicana</i>   |
| Leaves more than 1.5 mm broad, opposite or rarely in whorls of 3 | 2. <i>R. densiflora</i> |

### 1. *Rotala mexicana* Cham. & Schlecht.

*Ammannia rotala* F. Muell.; *Rotala diglossandra* Koehne; *Rotala longibracteolata* Domin

Slender annual, simple or slightly branched, often creeping at base, often not above 6 cm tall though some creeping stems may be 15 cm long or longer. Leaves in whorls of 3-8, sessile, linear, 0.4-1.1 cm × 0.08-0.15 cm, young leaves sometimes reddish. Flowers solitary in axils, ± sessile; hypanthium ca 1 mm long; sepals 3-5, exterior appendages absent; petals minute or absent; stamens usually 3, not exceeding hypanthium; ovary incompletely 3-locular. Capsules 3-valved.

Widespread but not common in south-eastern Queensland, not yet recorded from the Darling Downs district. Usually found in wet swampy areas, sometimes completely submerged, as in roadside drains. Flowers autumn-winter.

### 2. *Rotala densiflora* (Roth ex Roemer & J. A. Schultes) Koehne

*Ammannia densiflora* Roth ex Roemer & J. A. Schultes; *Ammannia pentandra* Roxb. Annual or perhaps short-lived perennial, often shortly creeping at base with ascending or erect often reddish stems, up to ca 20 cm tall, usually much branched. Leaves often reddish, opposite or rarely floral ones in whorls of 3, sessile, ovate-cordate to oblong and almost cuneate, apex acute or obtuse, 0.5-2.5 cm × 0.15-0.8 cm, submerged leaves usually larger than emergent leaves. Flowers solitary in axils, ± sessile; hypanthium

up to *ca* 1 mm long; sepals 3–5, external appendages absent; petals minute or absent; stamens usually 5, not exceeding sepals. Capsules 3-, rarely 4-locular.

Known from the Moreton and Burnett districts and probably also to be found elsewhere in the region. Flowers autumn–winter.

F. M. Bailey, "Qd. Fl." 2:675(1900) included **Peplis portula** L. as naturalized in Queensland. This was a misidentification, the plants he was referring to in fact being **Pilea microphylla** (L.) Liebm. of the family Urticaceae.

## 99. MYRTACEAE

Trees or shrubs. Leaves mostly opposite, sometimes alternate or whorled, usually exstipulate, simple, usually entire, usually gland dotted. Flowers either axillary and solitary or in cymes or umbels, or terminal in heads spikes racemes or panicles, mostly bisexual, actinomorphic; floral tube (hypanthium) adnate to ovary; sepals usually 4–5, occasionally more; petals as many as calyx lobes or occasionally absent; stamens 5–many; ovary inferior or half inferior, 1–many-locular, style 1. Fruits capsules, nuts or berries, rarely schizocarps or drupes.

About 100 genera with 3 000 species worldwide; 47 genera with *ca* 1 300 species Australia; 31 genera with 220 species south-eastern Queensland.

1. Perianth segments fused to form deciduous operculum covering stamens in bud; fruits capsules . . . . .	12. <i>Eucalyptus</i>	2
Perianth segments free or if petals cohering then fruits berries . . . . .		
2. Filaments of stamens connate into 5 bundles . . . . .		3
Filaments not connate into 5 bundles, or connate into ring at base . . . . .		5
3. Flowers sessile, in spikes . . . . .	10. <i>Melaleuca</i>	
Flowers pedicellate, in cymes . . . . .		4
4. Capsules included within or barely exerted from hypanthium; petals white or cream . . . . .	13. <i>Lophostemon</i>	
Capsules exerted from hypanthium; petals yellow . . . . .	14. <i>Tristaniopsis</i>	
5. Leaves alternate . . . . .		6
Leaves opposite or in whorls of 3 . . . . .		10
6. Sepals with midribs produced into hair-like awns which persist in fruit . . . . .	3. <i>Calytrix</i>	
Sepals without awns . . . . .		7
7. Stamens shorter than or only slightly longer than petals . . . . .	7. <i>Leptospermum</i>	
Stamens 2 or more times as long as petals . . . . .		8
8. Flowers arranged in elongated spikes; sepals not persistent in fruit . . . . .	9. <i>Callistemon</i>	
Flowers solitary or in cymes umbels or heads; sepals sometimes persistent in fruit . . . . .		9
9. Flowers clustered into heads at least in south-eastern Queensland . . . . .	8. <i>Kunzea</i>	
Flowers in cymes umbels or solitary . . . . .	18. <i>Xanthostemon</i>	
10. Fruits succulent . . . . .		11
Fruits dry . . . . .		21
11. Ovaries 1-locular, seeds not separated by false septa . . . . .	30. <i>Rhodamnia</i>	
Ovaries 2- or more-locular, or if 1-locular then seeds separated by false septa . . . . .		12
12. Seeds mostly 15 or more per fruit . . . . .	23. <i>Rhodomyrtus</i>	
Seeds mostly less than 12 per fruit . . . . .		13
13. Ovaries 4–5-locular . . . . .	31. <i>Decaspermum</i>	
Ovaries 2–3-locular . . . . .		14

14. Calyces undivided in bud, separating into 4–5 lobes when in flower . . . . .	21. <i>Psidium</i>	15
Calyces divided in bud . . . . .		
15. Stigmas peltate . . . . .		16
Stigmas thin or clavate . . . . .		17
16. Anthers gland dotted; ovules 5–9 per loculus . . . . .	25. <i>Pilidiostigma</i>	
Anthers not gland dotted; ovules 10 or more per loculus . . . . .	22. <i>Archirhodomyrtus</i>	
17. Seed coats hard . . . . .	24. <i>Austromyrtus</i>	18
Seed coats soft . . . . .		
18. Flower buds and vegetative buds pubescent . . . . .	26. <i>Eugenia</i>	19
Flower buds and vegetative buds glabrous . . . . .		
19. Anther loculi globose or subglobose, divaricate, opening by terminal slit or pore . . . . .	29. <i>Acmena</i>	20
Anther loculi elongate, parallel, opening by longitudinal slit . . . . .		
20. Placentas confined to apex of each locule; fruits greenish in south-eastern Queensland . . . . .	28. <i>Waterhousia</i>	
Placentas extending from base to apex or confined to middle of each locule; fruits white, pink, red, blue or purple . . . . .	27. <i>Syzygium</i>	
21. Sepals 8; corollas absent; mangroves . . . . .	20. <i>Osbornia</i>	22
Sepals 4 or 5; corollas present; not mangroves . . . . .		
22. Stamens numerous, longer than petals . . . . .		23
Stamens 5–15 in south-eastern Queensland, as long as or shorter than petals, staminodes sometimes also present . . . . .		29
23. Flowers sessile, in globular heads, at least in south-eastern Queensland . . . . .		24
Flower pedicellate, in cymes or umbels . . . . .		26
24. Hypanthiums fused, forming ± globular heads . . . . .	15. <i>Syncarpia</i>	25
Hypanthiums free . . . . .		
25. Flower heads terminal on ends of branches . . . . .	8. <i>Kunzea</i>	
Flower heads in upper axils, often forming terminal panicle . . . . .	16. <i>Choricarpia</i>	
26. Hypanthiums usually with longitudinal ribs; sepals becoming woody at fruiting stage . . . . .	11. <i>Angophora</i>	27
Hypanthiums not ribbed; calyx lobes not becoming woody . . . . .		
27. Capsules wholly enclosed in hypanthiums . . . . .	19. <i>Backhousia</i>	28
Capsules partially exerted from hypanthiums at least in south-eastern Queensland . . . . .		
28. Leaves linear, often in whorls of 3 . . . . .	17. <i>Lysicarpus</i>	
Leaves not linear, always opposite . . . . .	18. <i>Xanthostemon</i>	
29. Stamens 10, alternating with 10 staminodes . . . . .		30
Stamens 5–15, staminodes absent . . . . .		31
30. Sepals with 1–10 hair-like awns . . . . .	2. <i>Homoranthus</i>	
Sepals without awns . . . . .	1. <i>Darwinia</i>	
31. Stamens 5–15, if 5 then not all opposite centre of petals . . . . .	6. <i>Baeckea</i>	32
Stamens 5, opposite centre of petals or sepals . . . . .		
32. Stamens opposite petals . . . . .	5. <i>Micromyrtus</i>	
Stamens opposite sepals . . . . .	4. <i>Thryptomene</i>	

### 1. DARWINIA Rudge

Shrubs. Leaves opposite, or scattered (not in Queensland); stipulate or exstipulate; blades entire, terete or flat, glabrous, glandular punctate. Flowers axillary or terminal, solitary, in pairs on common peduncle or in heads, bracteoles enclosing buds;

hypanthium cylindrical or turbinate, ribbed, glabrous, shiny, adnate in lower part to ovary; sepals 5, entire or ciliate; petals 5; stamens 10, anthers globose, opening by pores, staminodes 10; ovary 1-locular, ovules 2–8, style exceeding perianth, with collar of hairs below stigma, stigma small, capitate. Fruits dry, indehiscent, enclosed in calyx; seed solitary.

About 45 species all endemic in Australia; 1 species south-eastern Queensland.

### 1. *Darwinia decumbens* Byrnes

Decumbent shrub up to 15 cm tall and up to *ca* 2 m across. Leaves terete, channelled or flat above in lower part, apex apiculate, 0.8–1.2 cm × *ca* 0.04 cm. Flowers axillary, bracteoles *ca* 5 mm long; hypanthium 10-ribbed, 4–5 mm long.

Restricted to Barakula State Forest in the northern Darling Downs district. Flowers spring.

## 2. HOMORANTHUS Cunn. ex Schauer

Erect or spreading shrubs. Leaves opposite; shortly petiolate or almost sessile; blades linear, triangular or terete. Flowers few together on axillary peduncles or in racemes heads or panicles, bracts usually leaf-like, bracteoles 2; hypanthium cylindrical or urceolate, lower part adnate to ovary, with 5 distinct longitudinal ridges, upper part free, thin, usually smooth, persistent; sepals 5, with 1–10 elongated processes on each lobe; petals 5, entire; stamens 10, filaments linear, anthers globular, dehiscing by pores, staminodes 10, alternate with stamens; ovary 1-locular, ovules 2–20, style exceeding perianth, bearing ring of hairs below apex. Fruits nuts, each enclosed in hypanthium.

7 species, all endemic in eastern Australia; 3 species south-eastern Queensland.

- |   |                         |   |
|---|-------------------------|---|
| 1. Leaves densely minutely papillose . . . . .                          | 1. <i>H. papillatus</i> | 2 |
| Leaves smooth . . . . .   |                         |   |
| 2. Styles exceeding petals by more than 4 mm; usually spreading shrubs. | 2. <i>H. flavescens</i> |   |
| Styles exceeding petals by less than 3 mm; erect shrubs . . . . .       | 3. <i>H. virgatus</i>   |   |

### 1. *Homoranthus papillatus* Byrnes

Compact shrub up to 2 m tall. Leaves with petioles *ca* 0.5 mm long; blades linear, 3-gonous, apex acute or acuminate, 0.6–1.2 cm × *ca* 0.1 cm, densely minutely papillose, glandular punctate. Flowers solitary in upper leaf axils, peduncles 1–2 mm long; hypanthium cylindrical, *ca* 4 mm × 1–1.5 mm, glabrous, shiny, smooth, 5-ribbed; sepals subulate, up to 3 mm long; petals *ca* 1 mm long; style 6–9 mm long.

Restricted to the Girraween National Park in the south-eastern Darling Downs district on shallow soil amongst granite boulders. Flowers spring–summer.

### 2. *Homoranthus flavescens* Cunn. ex Schauer

Shrub up to *ca* 40 cm tall, branches usually decumbent. Leaves with petioles *ca* 0.5 mm long; blades linear, ± flattened, apex acute-acuminate, 0.6–1.3 cm × *ca* 0.1 cm, smooth, glandular punctate. Flowers solitary in upper leaf axils; hypanthium cylindrical, *ca* 4 mm × 1.5 mm, glabrous, wrinkled, 5-ribbed; sepals subulate, *ca* 1.5 mm long; petals *ca* 1.5 mm long; style exceeding petals by *ca* 4–5 mm. **Fig. 16A.**

Widespread in the region in a variety of soils. Flowers late spring–summer.

### 3. *Homoranthus virgatus* Cunn. ex Schauer

Shrub up to *ca* 60 cm tall, branches erect. Leaves with petioles *ca* 0.5 mm long; blades linear, ± terete, apex acute-acuminate, 0.7–1 cm × *ca* 0.1 cm, smooth, glandular punctate. Flowers solitary in upper leaf axils; hypanthium cylindrical, 4–5 mm long, glabrous, wrinkled, 5-ribbed; sepals subulate, *ca* 1.5 mm long; petals *ca* 1.5 mm long; style exceeding petals by less than 3 mm.

Widespread in coastal sandy soils, also known from the Chinchilla-Gurulmundi area of the Darling Downs district. Flowers late spring–summer.

### 3. CALYTRIX Labill.

Shrubs. Leaves scattered; stipules minute or absent; blades small, terete or triquetrous. Flowers solitary in upper axils forming leafy heads at or near apex of branches, peduncles short or absent, bracteoles persistent, rigid; hypanthium elongated, slender, 10-ribbed, rarely 5-ribbed; sepals 5, persistent, spreading with scarious margins, midrib produced into hair-like awn or short point; petals 5, spreading, deciduous; stamens numerous, anthers versatile, opening longitudinally, connective with gland-like appendage; ovary 1-locular, ovules 2, style filiform, stigma capitate. Fruits indehiscent, enclosed in dried hypanthium, usually with sepals attached; seed solitary.

About 40 species all endemic in Australia; 3 species south-eastern Queensland.

- |  |                         |   |
|--|-------------------------|---|
| 1. Petals <i>ca</i> 0.5 cm long . . . . .          | 1. <i>C. tetragona</i>  |   |
| Petals 0.7–1.2 cm long . . . . .                   |                         | 2 |
| 2. Flowers pink; leaves 0.15–0.5 cm long . . . . . | 2. <i>C. longiflora</i> |   |
| Flowers yellow; leaves 0.6–1.2 cm long . . . . .   | 3. <i>C. sp. 1.</i>     |   |

#### 1. *Calytrix tetragona* Labill.

#### FRINGE MYRTLE

Erect shrub up to *ca* 2 m tall. Leaves linear, triquetrous, 2–8 mm × *ca* 0.5 mm, glabrous or variously pubescent, often ciliate along margin. Flowers white to pink, sessile or subsessile, in upper leaf axils sparing terminal, up to *ca* 1.8 cm across including awns, bracteoles 3–5 mm long; hypanthium cylindrical, 10-ribbed, 6–10 mm long at anthesis; sepals broadly ovate, *ca* 2–2.5 mm long, with long fine awns up to *ca* 8 mm long; petals up to *ca* 5 mm long. Fruiting sepals usually red-brown. **Fig. 16B.**

In sandy or skeletal soils of the southern Darling Downs district. Flowers spring–summer.

#### 2. *Calytrix longiflora* (F. Muell.) Benth.

#### FRINGE MYRTLE

*Calycothrix longiflora* F. Muell.

Shrub up to *ca* 3 m tall. Leaves oblong, obovate or elliptic, triquetrous, apex rounded and often apiculate, base narrowed, 1.5–5 mm × 0.8–1.5 mm, usually ciliate along margin. Flowers pink, shortly pedunculate, axillary in upper axils, often appearing terminal, 2–2.5 cm across including awns, bracteoles 3–4 mm long; hypanthium cylindrical, 10-ribbed, 1–1.4 cm long at anthesis; sepals ± circular, *ca* 3 mm long, awn up to 1.2 cm long; petals 0.7–1.2 cm long. Fruiting sepals red to brown. **Fig. 16C.**

Known from sandy soils between Cecil Plains and Millmerran in the Darling Downs district. Flowers spring.

#### 3. *Calytrix* sp. 1.

#### FRINGE MYRTLE

Shrub up to *ca* 2 m tall. Leaves linear, triquetrous or flat with distinct keel, apex acute and apiculate, 0.6–1.2 cm × 0.1 cm, glabrous or with ciliate margin. Flowers yellow, sessile in upper leaf axils, appearing as terminal leafy heads, 2–3 cm across including awns, bracteoles 6–10 mm long; hypanthium cylindrical, 10-ribbed, 1–1.2 cm long at anthesis; sepals ± circular, 2–3 mm long, awn up to *ca* 1.4 cm long. Fruiting sepals brown.

Known from areas of skeletal and sandy soils north of Miles in the Darling Downs district. Flowers spring.

### 4. THRYPTOMENE Endl.

Glabrous shrubs. Leaves opposite, entire, small. Flowers solitary or paired in axils, subtended by pair of bracteoles at least in bud; sepals and petals 5 or rarely 6, borne on rim of calyx tube; stamens 5, opposite sepals in south-eastern Queensland or 10 in single whorl not always opposite sepals, rarely 6–9 or 15–30; anther connective with prominent gland; ovary 1-locular, style 1, stigma 1. Fruits indehiscent nuts.

About 25 species all endemic in Australia; 1 species south-eastern Queensland.

**1. *Thryptomene parviflora* (F. Muell. ex Benth.) Domin***Thryptomene oligandra* F. Muell. var. *parviflora* F. Muell. ex Benth.

Erect shrub up to *ca* 2 m tall. Leaves with petioles *ca* 0.5 mm long; blades narrowly obovate, apex obtuse or with minute mucro, somewhat recurved at tip, 1.5–7 mm × *ca* 1 mm, conspicuously gland dotted. Hypanthium *ca* 1 mm long. Fruits enclosed in scarcely enlarged hypanthium. **Fig. 16D.**

Western Darling Downs district. Flowers have been found all year round, probably in response to rain.

**5. MICROMYRTUS Benth.**

Shrubs. Leaves opposite, entire, small. Flowers up to 3 together on axillary peduncle or solitary axillary, subtended by pair of bracteoles at least in bud; sepals and petals 5–6 borne on rim of hypanthium; stamens 5 opposite petals in south-eastern Queensland or 10 or 12; anther connective with gland, but not prominent. Fruits indehiscent nuts.

About 19 species all endemic in Australia; 2 species south-eastern Queensland.

- |   |                         |
|---|-------------------------|
| 1. Flowers ± sessile; ovules 4 . . . . .                | 1. <i>M. sessilis</i>   |
| Flowers on pedicels 0.5–1 mm long; ovules 6–8 . . . . . | 2. <i>M. leptocalyx</i> |

**1. *Micromyrtus sessilis* J. W. Green***Micromyrtus ciliata* auct. non (Smith) Druce; *M. minutiflora* auct. non Benth., Benth.

Spreading or prostrate shrub up to 1.5 m tall. Leaves linear or narrowly obovate, apex obtuse, 1.5–3 mm × *ca* 0.5 mm, ciliolate along margin, keeled below near apex, conspicuously gland dotted. Flowers solitary, ± sessile, axillary; hypanthium 1–1.4 mm long, 5-ribbed; sepals 0.3–0.7 mm long, margin ciliolate; petals white to pale pink, 0.7–1.5 mm long; stamens 5, opposite petals; ovules 4. Fruits enclosed in scarcely enlarged hypanthium.

Known from Stanthorpe-Wallangarra and from around Miles in the Darling Downs district. Flowers spring.

**2. *Micromyrtus leptocalyx* (F. Muell.) Benth.***Baeckea leptocalyx* F. Muell.

Erect shrub 1–2.5 m tall, branches often pendulous. Leaves narrowly obovate, apex ± rounded, 1–5 mm × 0.5 mm, often ciliolate along margin, usually ± keeled below, conspicuously gland dotted. Flowers solitary, peduncles 0.5–1 mm long; hypanthium up to 2.5 mm long, 5-ribbed; sepals 0.2–0.5 mm long; petals white, cream or yellowish, 0.7–2 mm long; stamens 5, opposite petals; ovules 6–8. Fruits enclosed in scarcely enlarged hypanthium.

North-western Darling Downs district with a population along the coastal Wide Bay district between Gympie and Bundaberg. Flowers spring to autumn.

**6. BAECKEA L.**

Shrubs. Leaves opposite, entire. Flowers small, solitary or few together in axils or in pedunculate umbels or cymes; sepals 5; petals 5; stamens 3–20; ovary 2–3-locular, style 1, stigma 1. Fruits capsules enclosed in scarcely enlarged hypanthium.

About 72 species south-eastern Asia to Australia and New Caledonia; *ca* 70 species Australia; 11 species south-eastern Queensland.

- |  |                       |   |
|--|-----------------------|---|
| 1. Flowers in pedunculate umbels . . . . .                       | 1. <i>B. virgata</i>  | 2 |
| Flowers solitary or rarely few together, not in umbels . . . . . |                       |   |
| 2. Leaves linear, less than 1 mm broad . . . . .                 |                       | 3 |
| Leaves not linear, mostly 1 mm or more broad . . . . .           |                       | 6 |
| 3. Stamens 5 . . . . .   | 2. <i>B. linearis</i> | 4 |
| Stamens 7–15 . . . . .   |                       |   |

- |   |                          |    |
|---|--------------------------|----|
| 4. Peduncles 2–3 mm long with pair of deciduous bracts up to 1 mm below calyx . . . . .   | 3. <i>B. densifolia</i>  | 5  |
| Peduncles 1–2 mm long without bracts . . . . .  |                          |    |
| 5. Sepals with obtuse apex; ovaries 3-locular; plants of coastal wallum areas   | 4. <i>B. stenophylla</i> |    |
| Sepals with acute apex; ovaries 2-locular; plants of mountains of the southern Moreton district . . . . .                       | 5. <i>B. linifolia</i>   |    |
| 6. Leaf margins minutely ciliate-dentate; leaf blades 2.5–5 mm broad or if 1–2 mm broad then ovate-oblong . . . . .             |                          | 7  |
| Leaf margins entire or if a few ciliate-dentate then leaf blades obovate, 1–2 mm broad . . . . .                                |                          | 8  |
| 7. Leaves 2.5–5 mm broad . . . . .  | 6. <i>B. imbricata</i>   |    |
| Leaves 1–2 mm broad . . . . .   | 7. <i>B. diosmifolia</i> |    |
| 8. Leaves less than 4 mm long . . . . .   |                          | 9  |
| Leaves 4 mm or more long . . . . .  |                          | 10 |
| 9. Hypanthiums distinctly 5-ribbed; peduncles up to <i>ca</i> 6 mm long; plants of central and western Darling Downs district   | 8. <i>B. jucunda</i>     |    |
| Hypanthiums not ribbed; peduncles up to <i>ca</i> 2 mm long; plants from extreme south-eastern Darling Downs district . . . . . | 9. <i>B. sp. 1.</i>      |    |
| 10. Leaves <i>ca</i> 1 mm broad . . . . .   | 2. <i>B. linearis</i>    |    |
| Leaves 1.5–3 mm broad . . . . .   |                          | 11 |
| 11. Fruiting hypanthiums <i>ca</i> 2 mm broad; peduncles up to <i>ca</i> 2.5 mm long  | 10. <i>B. sp. 2.</i>     |    |
| Fruiting hypanthiums <i>ca</i> 3–4 mm broad; peduncles up to <i>ca</i> 8 mm long . . . . .                                      | 11. <i>B. sp. 3.</i>     |    |

### 1. *Baeckea virgata* (J. R. & G. Forster) Andr.

*Leptospermum virgatum* J. R. & G. Forster

Shrub up to *ca* 4 m tall. Leaves with petioles up to *ca* 1 mm long; blades narrowly ovate to narrowly obovate, apex obtuse to acute, mucronulate, 0.5–1.2 cm × 0.1–0.25 cm. Flowers in pedunculate umbels, peduncles 6–10 mm long, pedicels 3–4 mm long; hypanthium *ca* 1.5 mm long; sepals *ca* 0.5 mm long; petals white, *ca* 1.5–2 mm long; stamens 5–15; ovary 3-locular. **Fig. 16E.**

Eastern parts of the region, in wallum or eucalypt communities. Flowers summer. Cultivated as an ornamental. Of medium importance as a source of pollen for bees.

### 2. *Baeckea linearis* C. T. White

#### STRAGGLY BAECKEA

Shrub up to 2 m tall but often less than 1 m tall. Leaves with petioles less than 1 mm long; blades linear or linear-ovate, flat, 5–8 mm × *ca* 1 mm. Flowers solitary, peduncles less than 1 mm long; hypanthium 1–1.5 mm long, 5-angled; sepals *ca* 0.2 mm long; petals white, *ca* 1 mm long; stamens 5, opposite sepals; ovary 3-locular.

Moderately common in wallum country of the Moreton and Wide Bay districts. Flowers early spring.

### 3. *Baeckea densifolia* Smith

Shrub up to 1 m tall. Leaves usually opposite decussate, ± appressed to stem, ± sessile, linear-terete, apex with recurved mucro, 2–7 mm × *ca* 0.5 mm. Flowers solitary, peduncles 2–3 mm long with pair of deciduous bracts up to *ca* 1 mm below calyx; hypanthium *ca* 2 mm long; sepals *ca* 1 mm long; petals white, *ca* 2–3 mm long; stamens 8–12; ovary 3-locular.

Known from sandstone or granite areas of the Darling Downs, Burnett and western Wide Bay districts. Flowers spring–early summer.

### 4. *Baeckea stenophylla* F. Muell.

#### WEeping BAECKEA

Shrub up to *ca* 1 m tall, end of branches often weeping. Leaves opposite but sometimes appearing as if in whorls by reduction of lateral shoots; petioles less than 1 mm long; blades linear, concave, 4–10 mm × *ca* 0.5 mm. Flowers solitary, peduncles

1–2 mm long; hypanthium 1.5–3 mm long; sepals 0.5–1 mm long; petals white, 1–1.5 mm long; stamens 7–13; ovary 3-locular.

Moderately common in wallum country of the Moreton and Wide Bay districts. Flowers late spring–summer.

#### 5. *Baeckea linifolia* Rudge

Shrub up to *ca* 1.5 m tall. Leaves with petioles *ca* 1 mm long; blades linear, 0.6–1.4 cm × *ca* 0.05 cm. Flowers solitary, peduncles 1.5–2 mm long; hypanthium *ca* 1.5–2 mm long; sepals *ca* 0.5 mm long; petals white, *ca* 1.5–2 mm long; stamens 8–15; ovary 2-locular.

Mountains of the southern Moreton district. Flowers summer.

#### 6. *Baeckea imbricata* (Gaertn.) Druce

#### SPINDLY BAECKEA

*Baeckea crenulata* DC.; *Baeckea crenulata* var. *tenella* (Gaertn.) Benth.

Shrub up to 1 m tall. Leaves opposite decussate, ± sessile; blades obovate or elliptic to orbicular, apex mucronate, margin ciliate-dentate, 2.5–7 mm × 2.5–5 mm. Flowers solitary, peduncles 0–0.5 mm long; hypanthium *ca* 2 mm long; sepals *ca* 1 mm long; petals white, 1.5–2 mm long; stamens 5–10; ovary 2-locular.

Found in wallum country of the Moreton and Wide Bay districts. Flowers found mid spring to autumn.

#### 7. *Baeckea diosmifolia* Rudge

#### FRINGED BAECKEA

Shrub up to *ca* 1 m tall. Leaves opposite decussate, ± sessile; blades ovate-oblong, apex with minute recurved apiculum, margin minutely ciliate-denticulate, 3–5 mm × 1–2 mm. Flowers solitary, peduncles less than 1 mm long; hypanthium *ca* 2 mm long; sepals obtuse, *ca* 1 mm long; petals white, *ca* 1.5–2 mm long; stamens 7–10; ovary 2-locular.

Swampy areas of the Moreton district. Flowers autumn.

#### 8. *Baeckea jucunda* S. T. Blake

Shrub up to *ca* 1.5 m tall. Leaves opposite decussate, ± appressed to stem; petioles up to *ca* 0.5 mm long; blades obovate, apex with recurved tip, base cuneate, margin entire, not ciliate, 1.5–3 mm × *ca* 1 mm. Flowers solitary, peduncles up to *ca* 6 mm long with pair of bracts towards base; hypanthium *ca* 2 mm long; sepals *ca* 0.5 mm long; petals white, 1.5–3 mm long; stamens 3–6; ovary 3-locular.

Found on sandy soils of the Darling Downs district. Flowers spring–early summer.

#### 9. *Baeckea* sp. 1.

*Baeckea diosmifolia* auct. non Rudge

Shrub up to *ca* 1.5 m tall. Leaves opposite decussate, ± sessile; blades obovate, apex not apiculate, margin usually entire or occasionally minutely ciliate-denticulate, 1.5–3.5 mm × 0.5–1.5 mm. Flowers solitary, peduncles mostly 1–2 mm long; hypanthium *ca* 1.5 mm long; sepals acute, *ca* 0.8 mm long; petals white, *ca* 1.5–2 mm long; stamens *ca* 7–10; ovary 2-locular.

Swampy areas around Wallangarra in the Darling Downs district. Flowers summer.

#### 10. *Baeckea* sp. 2.

*Baeckea camphorata* auct. non R. Br.

Shrub up to *ca* 1.5 m tall. Leaves opposite decussate; petioles 0.5–1 mm long; blades elliptic or elliptic-obovate, apex obtuse, base rounded, margin entire, 4–8 mm × (1.5–)2.5–4 mm. Flowers solitary or few together in short axillary racemes, peduncles up to *ca* 2.5 mm long; hypanthium *ca* 1.5 mm long; sepals *ca* 0.8 mm long; petals white, *ca* 2 mm long; stamens up to *ca* 15; ovary 3-locular. **Fig. 16F.**

Rocky areas of the Glasshouse Mts. and Coochin Hills in the Moreton district, possibly also occurs around Eidsvold in the Burnett district and Mt. Walsh in the Wide Bay district. Flowers mainly summer–autumn but some in spring.

Material from Mt. Walsh and Eidsvold has somewhat smaller flowers and narrower leaves and may belong to a distinct taxon, but further collections are needed to be sure.

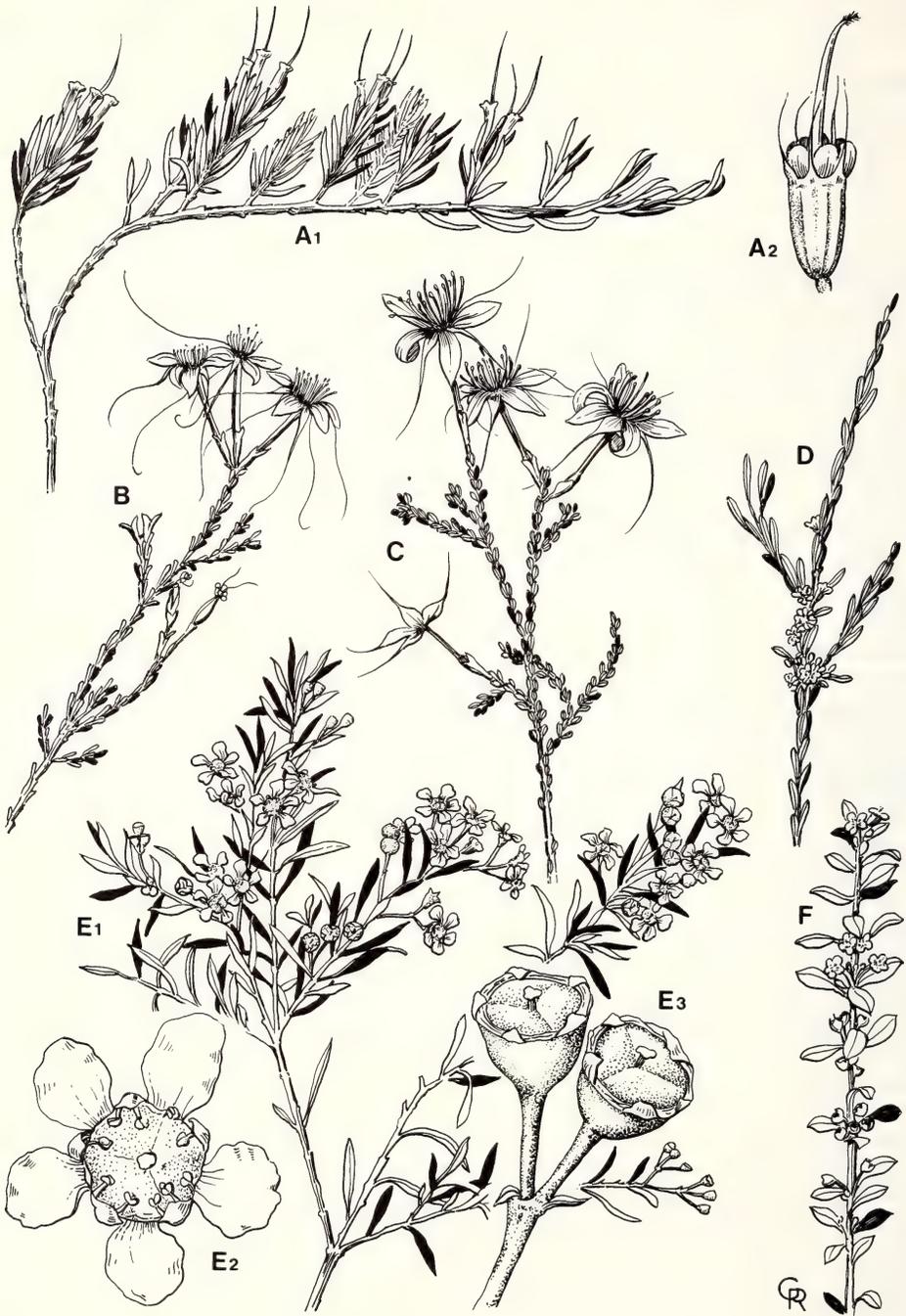


Fig. 16 MYRTACEAE — A<sub>1</sub>-A<sub>2</sub> *Homoranthus flavescens*, A<sub>1</sub> portion of flowering stem x1, A<sub>2</sub> flower x3; B-C *Calytrix* spp. — B *C. tetragona*, portion of flowering stem x1; C *C. longiflora*, portion of flowering stem x1; D *Thryptomene parviflora*, portion of flowering stem x1; E-F *Baeckea* spp. — E<sub>1</sub>-E<sub>3</sub> *B. virgata*, E<sub>1</sub> portion of flowering stem x1, E<sub>2</sub> flower x6, E<sub>3</sub> fruit x6; F *B. sp. 2.*, portion of flowering stem x1.

**11. *Baeckea* sp. 3.**

Shrub up to 3 m tall. Leaves opposite decussate; petioles *ca* 0.5 mm long; blades elliptic, apex apiculate, margin entire, 3–5 mm × 2–3 mm. Flowers not seen. Fruiting peduncles *ca* 5–8 mm long, articulated in lower half; fruiting hypanthium *ca* 3–4 mm broad; sepals *ca* 1 mm long; fruits 3-locular.

Known from the Girraween National Park near Stanthorpe in the Darling Downs district.

**7. LEPTOSPERMUM J. R. & G. Forster**

Shrubs or small trees. Leaves alternate, entire. Flowers solitary or 2 or more together at ends of short branches or in leaf axils, bracts scarious, usually early deciduous, bracteoles close under hypanthium; hypanthium adnate to ovary at base; sepals 5; petals 5, spreading; stamens numerous, free, not or scarcely longer than petals, anthers versatile, connective with globular gland; ovary usually 3–5-locular, occasionally 6–12-locular. Fruits capsules, valves usually protruding from persistent hypanthium.

About 80 species from south-eastern Asia, New Guinea to New Zealand; *ca* 60 species Australia, mostly endemic, several undescribed; 17 species south-eastern Queensland.

1. Fruits usually shed soon after flowering, or at most lasting until next flowering, valves hard but not particularly woody . . . . .	2
Fruits persistent, often for many years, valves very woody . . . . .	11
2. Hypanthium glabrous in flower . . . . .	3
Hypanthium silky hairy in flower . . . . .	4
3. Leaf apices obtuse . . . . .	1. <i>L. luehmannii</i>
Leaf apices acute . . . . .	2. <i>L. brachyandrum</i>
4. Hypanthium silky hairy in lower half only; fruits with succulent outer layer . . . . .	3. <i>L. semibaccatum</i>
Hypanthium silky hairy all over; fruits woody . . . . .	5
5. Summit of ovaries glabrous . . . . .	6
Summit of ovaries pubescent . . . . .	7
6. Leaves obtuse at base; hypanthium 2–2.5 mm long; fruits <i>ca</i> 6 mm broad . . . . .	4. <i>L. speciosum</i>
Leaves cuneate at base; hypanthium 3–4 mm long; fruits <i>ca</i> 4 mm broad . . . . .	5. <i>L. whitei</i>
7. Bark of numerous papery layers . . . . .	6. <i>L. attenuatum</i>
Bark hard . . . . .	8
8. Fruiting pedicels longer than hypanthium or occasionally few as long as hypanthium; leaves flat . . . . .	7. <i>L. brevipes</i>
Fruiting pedicels shorter than hypanthium or occasionally few as long as hypanthium; leaves flat or incurved . . . . .	9
9. Leaves incurved, pungent pointed . . . . .	8. <i>L. microcarpum</i>
Leaves flat, scarcely or not pointed . . . . .	10
10. Leaves 0.3–0.5 cm long; plants of the southern Darling Downs district . . . . .	9. <i>L. parvifolium</i>
Leaves 0.5–2.5 cm long; plants of rocky outcrops of the Burnett and Wide Bay districts . . . . .	10. <i>L. sp. 1.</i>
11. Leaves pungent pointed . . . . .	12
Leaves not pungent pointed . . . . .	13
12. Hypanthium <i>ca</i> 2 mm × 3 mm . . . . .	11. <i>L. juniperinum</i>
Hypanthium <i>ca</i> 3–4 mm × 4 mm . . . . .	12. <i>L. arachnoides</i>
13. Leaves with lemon odour when crushed . . . . .	14
Leaves without lemon odour . . . . .	15

- |  |                                     |
|--|-------------------------------------|
| 14. Leaves 0.3–0.6 cm long . . . . .   | 13. <i>L. liversidgei</i>           |
| Leaves 1–3.5 cm long . . . . .   | 14. <i>L. petersonii</i>            |
| 15. Leaves 0.15–0.4 cm long . . . . .  | 15. <i>L. minutifolium</i>          |
| Leaves 0.5–2.2 cm long . . . . .   | 16                                  |
| 16. Leaves mostly narrowly ovate, pungent pointed; fruits with smooth shiny papery outer layer which peels away as fruits mature; plants of the Stanthorpe-Wallangarra region . . . . .  | 16. <i>L. sp. 2.</i>                |
| Leaves mostly narrowly elliptic, not pungent pointed; fruits not as above; plants widespread in the Moreton and Wide Bay districts, rare in the central Darling Downs district . . . . . | 17. <i>L. flavescens</i> sens. lat. |

### 1. *Leptospermum luehmannii* F. M. Bailey

*Agonis luehmannii* (F. M. Bailey) C. T. White & Francis

Shrub up to *ca* 3 m tall; bark smooth, reddish brown, shed in long thin strips. Leaves with petioles less than 2 mm long; blades elliptic or oblong-elliptic, apex obtuse, base cuneate, 1–4 cm × 0.4–1 cm, glabrous except when young, shiny above and below, longitudinal veins 5. Flowers clustered 3–4 together; hypanthium *ca* 2.5 mm × 2.5–3 mm, glabrous; sepals *ca* 1.5 mm long, pubescent; petals white, 4–5 mm long; ovary 3-locular, glabrous. Fruits 3–5 mm broad, usually shed before next flowering. **Fig. 17B.**

Known from cliff faces or rocky slopes of the Glasshouse Mts., with one record from the Numinbah Valley. Flowers summer.

### 2. *Leptospermum brachyandrum* (F. Muell.) Druce

*Kunzea brachyandra* F. Muell.; *Leptospermum abnorme* F. Muell. ex Benth.; *Agonis abnormis* (F. Muell. ex Benth.) C. T. White & Francis

Shrub up to *ca* 6 m tall; bark flaky-fibrous. Leaves with petioles 1–1.5 mm long; blades linear-elliptic or linear-ovate, apex acute, base cuneate, 2–5 cm × 0.2–0.4 cm, silky hairy at first, soon glabrous. Flowers axillary or terminal, several together in compact racemes, pedicels up to 2 mm long, sometimes ± absent; hypanthium *ca* 3 mm × 2.5–3 mm, glabrous; sepals 1–1.5 mm long; petals white, 2–3 mm long; ovary 3–4-locular, summit glabrous. Fruits *ca* 4 mm broad, shed before next flowering.

Known from the Moreton and Wide Bay districts and the south-eastern Darling Downs district, often along creeks and river flats; also recorded once from the north-western Darling Downs district. Flowers spring–summer. Cultivated as an ornamental.

### 3. *Leptospermum semibaccatum* Cheel

Shrub up to *ca* 2 m tall. Leaves with petioles up to *ca* 1.5 mm long; blades oblong to narrowly obovate, apex obtuse to subacute, base cuneate, 5–10 mm × 1.5–3 mm, oil glands ± conspicuous, glabrous except when young. Flowers solitary, ± sessile; hypanthium *ca* 2.5–3 mm × *ca* 2–2.5 mm, silky hairy; sepals 1.5–2.5 mm long; petals white or pink, 3–5.5 mm long; ovary 5-locular, rarely 3–4-locular, pubescent at first but becoming glabrous. Fruits *ca* 4.5–6 mm across, succulent, shed soon after flowering. **Fig. 17C.**

Common in wallum country of the region. Flowers mainly spring.

### 4. *Leptospermum speciosum* Schauer

*Agonis scortechiniana* F. Muell.; *A. speciosa* (Schauer) C. T. White

Shrub up to *ca* 4 m tall but often less than 2 m tall; bark flaky. Leaves sessile or petioles up to *ca* 1 mm long; blades ovate-oblong or elliptic, apex acute, base obtuse, 1.5–3.8 cm × 0.4–1.2 cm, young leaves softly hairy, becoming less hairy with age, longitudinal nerves usually 5. Flowers usually 4–8 together in heads, terminal at first then axillary, heads surrounded by silky hairy bracts; hypanthium *ca* 2–2.5 mm × 3–4.5 mm, densely silky hairy; sepals *ca* 1.5–2 mm long; petals white, 3–4 mm long; ovary 3-locular, glabrous. Fruits *ca* 6 mm broad, shed before next flowering.

Wallum areas of the Moreton and Wide Bay districts. Flowers late winter–early spring.

**5. *Leptospermum whitei* Cheel**

*Agonis elliptica* C. T. White & Francis; *A. elliptica* var. *angustifolia* Cheel

Shrub or small tree up to ca 6 m tall; bark rough, often shed in strips. Leaves with petioles up to ca 1.5 mm long; blades elliptic or elliptic-ovate, occasionally elliptic-obovate, apex acute, base cuneate, 0.9–3 cm × 0.4–0.6 cm, pubescent at first, soon glabrous, often 3 longitudinal nerves present. Flowers in pairs or clusters, terminal but often becoming axillary by elongation of shoot; hypanthium ca 3–4 mm × ca 3–4 mm, silky hairy; sepals ca 1.5–2 mm long; petals white, 3–5 mm long; ovary 3-locular, glabrous. Fruits ca 4 mm broad, shed before next flowering. **Fig. 17D.**

Wallum areas to about as far north as Tin Can Bay. Flowers mid to late spring.

**6. *Leptospermum attenuatum* Smith**

*Leptospermum stellatum* Cav.

Shrub up to ca 6 m tall; bark of numerous papery layers. Leaves with petioles 0.5–3 mm long; blades linear-elliptic to elliptic or ovate or obovate, apex obtuse to acute, base cuneate, 1–3 cm × 0.1–0.6 cm, silky pubescent when young, soon glabrous. Flowers solitary or two together on short shoots in axils; hypanthium ca 3 mm × 3–5 mm, densely silky hairy; sepals 1.5–2 mm long, persistent; petals white, 3–6 mm long; ovary 3–5-locular, summit hairy. Fruits 3–7 mm broad, shed soon after flowering.

Widespread in the Moreton and Wide Bay districts, often in stony or sandy soils, also known from the Stanthorpe-Wallangarra area of the Darling Downs district. Flowers mostly spring.

A form with short pedicels has been referred to as ***Leptospermum attenuatum* var. *subsessile*** C. T. White. However, a critical revision is needed to ascertain whether this form warrants recognition.

**7. *Leptospermum brevipes* F. Muell.**

Shrub up to ca 4 m tall; bark hard. Leaves with petioles up to ca 1.5 mm long; blades obovate-elliptic, apex obtuse to acute with usually minute pungent point, base cuneate, margin ± flat, 0.6–2 cm × 0.2–0.35 cm, young leaves silky hairy, becoming glabrous though hairs may be held for some time. Flowers solitary or 2 together in axils, pedicels up to ca 5 mm long; hypanthium 2–2.5 mm × 2.5–3 mm, silky hairy, sepals ca 1.5 mm long; petals white, 3–4 mm long; ovary 3–4-locular, pubescent. Fruiting pedicels longer than hypanthium, occasionally as long as hypanthium; fruits 3–4 mm broad, shed before next flowering.

Known from the Stanthorpe-Wallangarra area of the Darling Downs district. Flowers spring.

**8. *Leptospermum microcarpum* Cheel**

Shrub up to ca 3 m tall; bark hard. Leaves with petioles up to ca 1.5 mm long; blades elliptic to obovate, apex usually acute, sometimes obtuse, pungent pointed, base cuneate-attenuate, margin incurved, 0.5–1.5 cm × 0.08–0.3 cm, sparsely silky hairy when young, becoming glabrous. Flowers solitary or in pairs in axils, pedicels up to ca 2 mm long; hypanthium 2–2.5 mm × 2.5–3 mm, silky hairy; sepals ca 1 mm long; petals white, 3–5 mm long; ovary 3–4-locular, pubescent. Fruiting pedicels shorter than hypanthium, occasionally as long as hypanthium; fruits 3–4 mm broad, shed before next flowering.

Known from the south-eastern Darling Downs district, the Moreton district and eastern Wide Bay district. Flowers spring.

**9. *Leptospermum parvifolium* Smith**

Shrub up to ca 3 m tall. Leaves with petioles up to ca 1 mm long; blades obovate to oblong, apex obtuse to ± acute, base cuneate, 3–5 mm × 1–2 mm, silky hairy when young, soon glabrous. Flowers mostly solitary, sessile or subsessile; hypanthium 2–2.5 mm × 2–2.5 mm, silky hairy; sepals ca 1 mm long; petals white, 2.5–3 mm long; ovary 4–5-locular, pubescent. Fruits 3–4 mm broad, shed before next flowering.

Known from near Inglewood in the southern Darling Downs district. Flowers spring.

**10. *Leptospermum* sp. 1.**

Shrub up to *ca* 2.5 m tall. Leaves with petioles up to *ca* 1.5 mm long; blades elliptic-oblong, apex acute to obtuse, base mostly cuneate to attenuate, margin flat, 0.5–2.5 cm × 0.15–0.3 cm, sparsely silky hairy when young, becoming glabrous. Flowers solitary in axils, peduncles *ca* 1 mm long; hypanthium 2–2.5 mm × 2.5–3 mm, silky hairy; sepals *ca* 1 mm long; petals white, 2.5–4 mm long; ovary 4–5-locular, pubescent. Fruiting pedicels shorter than calyx tube; fruits 3–4 mm broad, shed before next flowering.

Known from rocky outcrops of the Burnett and Wide Bay districts. Flowers spring.

**11. *Leptospermum juniperinum* Smith**

Shrub up to *ca* 3 m tall. Leaves with petioles up to *ca* 1 mm long; blades linear, linear-ovate or linear-elliptic, apex pungent pointed, base cuneate, 0.6–1.2 cm × 0.1–0.3 cm, silky hairy when young, soon glabrous, oil glands conspicuous. Flowers solitary, ± sessile; hypanthium *ca* 2 mm × *ca* 3 mm, hairy at least at base; sepals *ca* 1–1.5 mm long; petals white, *ca* 3 mm long; ovary 5-locular, glabrous. Fruits 5–7 mm broad. **Fig. 17E.**

Swampy coastal areas, usually on sandy soil, to about as far north as Cooloola and Fraser I. in the Wide Bay district. Flowers spring.

**12. *Leptospermum arachnoides* Gaertn.***Leptospermum arachnoideum* Smith

Shrub, spreading, up to *ca* 1 m tall. Leaves ± sessile, very narrowly ovate or ± linear, apex acuminate, pungent pointed, base cuneate, concave above, 0.7–1.1 cm × 0.1–0.3 cm, pubescent with long and short hairs. Flowers solitary, buds covered by imbricate scales; hypanthium *ca* 3–4 mm × *ca* 4 mm, with long dense spreading hairs; sepals 3–4 mm long; petals creamy-white, 3–4 mm long; ovary 5-locular, glabrous. Fruits 7–8 mm diameter.

Known from the Stanthorpe-Wallangarra area of the Darling Downs district. Flowers mid spring.

**13. *Leptospermum liversidgei* Baker & Smith***Leptospermum flavescens* Smith var. *citriodorum* F. M. Bailey

Shrub up to *ca* 3 m tall. Leaves with petioles less than 1 mm long; blades narrowly obovate to narrowly elliptic, apex obtuse to acute, base cuneate, 3–6 mm × 1.5–2.5 mm, glabrous, oil glands conspicuous, when crushed the leaves emit lemon scent. Flowers solitary, ± sessile; hypanthium 2–3 mm × 2.5–3.5 mm, glabrous or sometimes silky hairy; sepals *ca* 1.5 mm long; petals white, *ca* 4–5 mm long; ovary 5-locular, glabrous. Fruits 6–8 mm broad. **Fig. 17F.**

Found in wallum country of the Moreton and Wide Bay districts. Flowers summer. Cultivated as an ornamental.

**14. *Leptospermum petersonii* F. M. Bailey**

## LEMON SCENTED TEA TREE

*Leptospermum flavescens* Smith var. *citratum* J. F. Bailey & C. T. White; *L. citratum* (J. F. Bailey & C. T. White) Challinor, Cheel & Penfold

Shrub up to 6 m tall, bark flaky. Leaves with petioles absent or up to *ca* 1 mm long; blades narrowly elliptic, apex rounded, often notched, base cuneate, 1–3.5 cm × 0.2–0.4 cm, often larger in cultivated plants, sparsely hairy when young, soon glabrous, oil glands conspicuous, when crushed the leaves give lemon scent. Flowers solitary, ± sessile; hypanthium 2–3 mm × 4–5 mm, glabrous; sepals 2–2.5 mm long; petals white, *ca* 5–7 mm long; ovary 5-locular, glabrous. Fruits 6–7 mm broad.

Mountains of the ranges along the border with New South Wales and known from the extreme south-eastern Darling Downs district, often in rock crevices or on cliff tops. Flowers summer. It is widely cultivated as an ornamental.

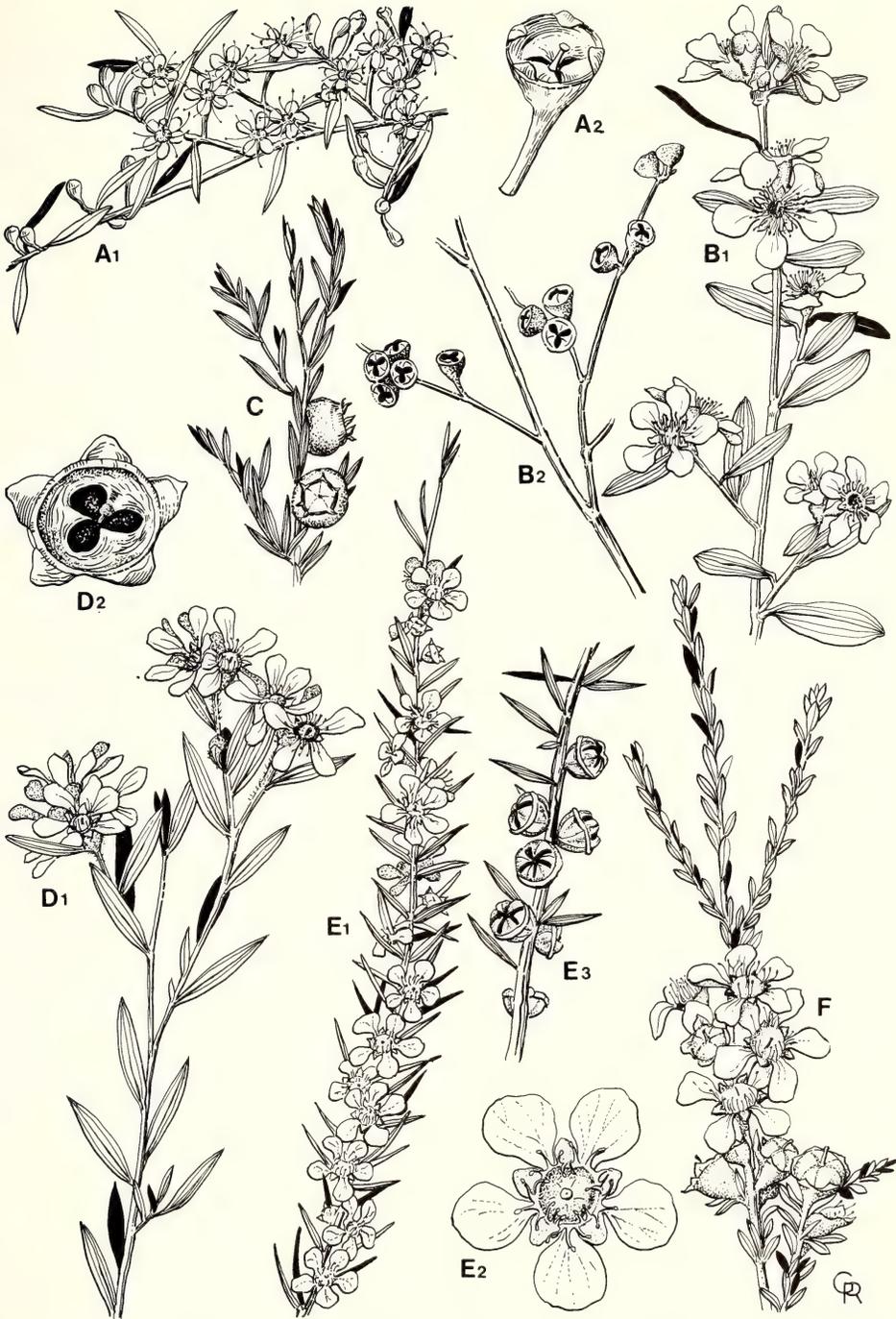


Fig. 17 MYRTACEAE — A<sub>1</sub>-A<sub>2</sub> *Kunzea ericoides*, A<sub>1</sub> portion of flowering stem x1, A<sub>2</sub> fruit x4; B-F *Leptospermum* spp. — B<sub>1</sub>-B<sub>2</sub> *L. luehmannii*, B<sub>1</sub> portion of flowering stem x1, B<sub>2</sub> fruit x1; C *L. semibaccatum*, portion of fruiting stem x1; D<sub>1</sub>-D<sub>2</sub> *L. whitei*, D<sub>1</sub> portion of flowering stem x1, D<sub>2</sub> fruit x4; E<sub>1</sub>-E<sub>3</sub> *L. juniperinum*, E<sub>1</sub> portion of flowering stem x1, E<sub>2</sub> flower x2; E<sub>3</sub> portion of fruiting stem x1; F *L. liversidgei*, portion of stem with flowers and young fruit x1.

**15. *Leptospermum minutifolium* (F. Muell. ex Benth.) C. T. White***Leptospermum flavescens* Smith var. *minutifolium* F. Muell. ex Benth.

Shrub up to ca 2 m tall. Leaves  $\pm$  sessile, elliptic or spatulate, apex acute to obtuse, 1.5–4 mm  $\times$  1–2 mm, glabrous, oil glands distinct. Flowers solitary, pedicels very short or absent; hypanthium 2–3 mm  $\times$  3–4 mm, glabrous; sepals ca 1.5 mm long, deciduous; petals white or pink, 2–3 mm long; ovary 5-locular, glabrous. Fruits ca 5–7 mm broad.

Stanthorpe-Wallangarra area of southern Darling Downs district, often in sandy soils. Flowers spring.

**16. *Leptospermum* sp. 2.***Leptospermum flavescens* Smith var. *grandiflorum* auct. Qld. non (Lodd.) Benth.

Shrub up to ca 2 m tall. Leaves subsessile, narrowly ovate, rarely elliptic to obovate, apex acute, pungent pointed, base cuneate or rounded, 0.5–1.2 cm  $\times$  0.15–0.25 cm, glabrous. Flowers solitary,  $\pm$  sessile; hypanthium ca 1.5–2.5 mm long, glabrous; sepals ca 2 mm long; petals white, 4–6 mm long; ovary 4–5-locular. Fruits persistent, 6–10 mm broad, with shiny papery outer layer which peels away once fruit matures.

Known from the Stanthorpe-Wallangarra area of the Darling Downs district. Flowers mid to late spring.

**17. *Leptospermum flavescens* Smith sens. lat.**

WILD MAY

*Leptospermum flavescens* var. *grandiflorum* auct. Qld. non (Lodd.) Benth.

Shrub up to ca 4 m tall. Leaves with petioles 0.5–2 mm long; blades narrowly elliptic, apex obtuse to acute, base narrowed, 0.8–2.2 cm  $\times$  0.15–0.4 cm, glabrous. Flowers solitary,  $\pm$  sessile; hypanthium 2–3.5 mm long, glabrous; sepals ca 2 mm long; petals white, 4–6 mm long; ovary 4–5-locular. Fruits persistent, 6–10 mm broad.

Common and widespread in the Moreton and Wide Bay districts, occasionally collected in the central Darling Downs district. Flowers early to mid spring. Various forms are cultivated as ornamentals.

The species as described above is very variable, probably including more than one taxon. A number of varieties have been described, however pending the outcome of a review of the group all the forms are here included under the one name.

**8. KUNZEA Reichb.**

Shrubs. Leaves mostly alternate, rarely opposite, entire. Flowers sessile or rarely pedunculate in upper axils or in terminal heads, rarely in spikes, bract 1 per flower, broad, bracteoles 2 per flower, sometimes several bracts imbricate around head; hypanthium ovoid or globular; sepals 5; petals 5, small; stamens numerous, in 1–several series, longer than petals, filaments filiform, anthers versatile, opening by longitudinal slits, connective with smaller globular gland; ovary 2–5-locular, ovules 2–many per loculus. Fruits loculicidal capsules, crowned by persistent calyx.

About 30 species, all endemic in Australia; 5 species south-eastern Queensland.

- |   |                          |
|---|--------------------------|
| 1. Flowers white or cream . . . . .   | 2                        |
| Flowers pink or mauve . . . . .   | 4                        |
| 2. Hypanthiums pubescent; leaves obovate . . . . .  | 1. <i>K. flavescens</i>  |
| Hypanthiums glabrous; leaves narrowly elliptic or narrowly ovate . . . . .                                    | 3                        |
| 3. Flowers in leafy racemes . . . . .   | 2. <i>K. ericoides</i>   |
| Flowers clustered in heads . . . . .  | 3. <i>K. bracteolata</i> |
| 4. Leaves obovate, concave but not channelled above, not densely hairy above . . . . .                        | 4. <i>K. obovata</i>     |
| Leaves narrowly ovate or narrowly elliptic, channelled above, channel lined with dense woolly hairs . . . . . | 5. <i>K. opposita</i>    |

**1. *Kunzea flavescens* C. T. White & Francis**

Shrub up to ca 2 m tall. Leaves with petioles ca 1 mm long; blades obovate, apex acute, base  $\pm$  cuneate, 3.5–8 mm  $\times$  1.5–2.5 mm. Flowers clustered into heads, bracts

and bracteoles similar, *ca* 2 mm long, pubescent; hypanthium *ca* 4 mm long, pubescent; sepals *ca* 2 mm long; petals white, *ca* 2 mm long; stamens whitish; style *ca* 4 mm long. Fruits *ca* 2.5 mm diameter.

Known only from around Crows Nest in the Moreton district and Mt. Walsh in the Wide Bay district. Flowers spring.

## 2. *Kunzea ericoides* (A. Rich.) J. Thompson

*Leptospermum ericoides* A. Rich.; *Kunzea peduncularis* F. Muell.; *Leptospermum phylloides* (Cunn. ex Schauer) Cheel

Shrub or small tree up to *ca* 6 m tall. Leaves with petioles up to *ca* 1.5 mm long; blades linear-ovate or linear-elliptic, apex acute, base cuneate, 1.2–2.5 cm × 0.2–0.4 cm, glabrous or with few hairs when young, oil glands conspicuous. Flowers in leafy racemes, pedicels 4–7 mm long; hypanthium 2–2.5 mm long, glabrous; sepals *ca* 0.5 mm long, ± persistent; petals white, 2–2.5 mm long; stamens whitish. Fruits 2–3 mm broad, flat on top. **Fig. 17A.**

Known from the Lamington National Park in the southern Moreton district, from near Wallangarra in the Darling Downs district and from Mt. Walsh in the Wide Bay district. Flowers mid summer. Cultivated as an ornamental shrub.

## 3. *Kunzea bracteolata* Maiden & Betche

Shrub up to *ca* 1.5 m tall. Leaves with petioles 0.5–1 mm long; blades narrowly elliptic, apex acute, base cuneate, 4–8 mm × 1.5–2 mm, usually ciliate along margins. Flowers clustered into heads, bracts *ca* 1 mm long, margin ciliate, bracteoles *ca* 2.5 mm long, margin ciliate; hypanthium *ca* 2.5 mm long, glabrous; sepals *ca* 2 mm long, glabrous; petals cream, 2–3 mm long; stamens cream; style 3–4 mm long. Fruits *ca* 3 mm diameter.

Known from the granite country in the Stanthorpe-Wallangarra area of the Darling Downs district. Flowers spring–early summer.

## 4. *Kunzea obovata* Byrnes

Shrub up to 3 m tall. Leaves alternate; petioles up to 1 mm long; blades obovate, rarely broadly elliptic, apex acute, usually reflexed at tip, 3–9 mm × 0.5–1.5 mm, sparsely hairy when young, at length glabrous. Flowers clustered into heads, bracts and bracteoles similar, *ca* 2 mm long, silky hairy; hypanthium *ca* 2 mm long, silky hairy; sepals *ca* 1.5 mm long; petals pink or mauve, *ca* 1.5 mm long; stamens pink or mauve; style *ca* 6 mm long. Fruits *ca* 3 mm diameter.

Known from the Stanthorpe-Wallangarra area of the Darling Downs district on soils derived from granite. Flowers spring.

## 5. *Kunzea opposita* F. Muell.

Shrub up to *ca* 3 m tall. Leaves opposite to alternate; sessile; blades narrowly ovate or narrowly elliptic, apex rounded to acute, base ± rounded, 1.5–3 mm × *ca* 0.5 mm, glabrous below, channelled and densely hairy in channel above. Flowers clustered into heads, bracts and bracteoles similar, *ca* 1 mm long; hypanthium *ca* 2 mm long, pubescent to ± glabrous; sepals *ca* 1–1.5 mm long; petals pink or mauve, *ca* 1.5 mm long; stamens pink or mauve, style *ca* 4 mm long. Fruits *ca* 2.5 mm diameter. **Fig. 18A.**

Known from sandy soils of the Darling Downs district. Flowers spring.

## 9. CALLISTEMON R. Br.

Shrubs or small trees. Leaves alternate. Flowers in cylindrical spikes, at first terminal but axis soon growing out into leafy shoot; hypanthium ovoid, campanulate or urceolate; sepals 5; petals 5; stamens numerous, much longer than petals, in 2 or more series, rarely united in short ring at base; ovary 3–4-locular, ovules numerous per loculus, style simple, stigma usually inconspicuous. Fruits woody capsules, usually remaining on stem for several years.

20 or more species, endemic in Australia; 13 species south-eastern Queensland.

1. Filaments united into short ring at base . . . . .	1. <i>C. viminalis</i>	2
Filaments not united . . . . .		
2. Filaments red or pink . . . . .		3
Filaments cream, white, yellowish or greenish . . . . .		9
3. Flower spikes less than 4 cm broad . . . . .		4
Flower spikes 4 cm or more broad . . . . .		5
4. Leaves 0.6–1.2 cm broad; anthers dark . . . . .	2. <i>C. sp. 1.</i>	
Leaves 0.2–0.5 cm broad; anthers yellow . . . . .	3. <i>C. sp. 2.</i>	
5. Mature fruits 4–5 mm broad . . . . .		6
Mature fruits 6–9 mm broad . . . . .		7
6. Leaves 0.2–0.3 cm broad . . . . .	4. <i>C. sp. 3.</i>	
Leaves 0.8–1.6 cm broad . . . . .	5. <i>C. comboynensis</i>	
7. Hypanthiums glabrous; flower spikes 3–5 cm long; petals conspicuously densely silky hairy . . . . .	6. <i>C. montanus</i>	
Hypanthiums hairy; flower spikes 5–10 cm long; petals not conspicuously densely silky hairy . . . . .		8
8. Apices of leaves more abruptly narrowed than bases; plants of coastal wallum areas . . . . .	7. <i>C. pachyphyllus</i>	
Apices and bases $\pm$ evenly tapered; plants of the Stanthorpe-Wallangarra area of the southern Darling Downs district . . . . .	8. <i>C. rigidus</i>	
9. Leaves 1–2 mm broad . . . . .	9. <i>C. sieberi</i>	
Leaves 3 mm or more broad . . . . .		10
10. Flower spikes more than 4 cm broad . . . . .		11
Flower spikes less than 4 cm broad . . . . .		12
11. Hypanthiums 4–5 mm long, densely softly villous; plants of the Stanthorpe-Wallangarra area of the southern Darling Downs district . . . . .	10. <i>C. flavo-virens</i>	
Hypanthiums 3–4 mm long, minutely hairy; plants of coastal wallum areas . . . . .	7. <i>C. pachyphyllus</i>	
12. Bark papery; sepals <i>ca</i> 1 mm long . . . . .	11. <i>C. salignus</i>	
Bark hard, dark; sepals 1–2 mm long . . . . .		13
13. Filaments 0.7–1 cm long; shrub up to 3 m tall . . . . .	12. <i>C. pallidus</i>	
Filaments 1.2–1.5 cm long; tree up to 5 m tall . . . . .	13. <i>C. formosus</i>	

**1. *Callistemon viminalis* (Solander ex Gaertn.) G. Don ex Loudon**

*Metrosideros viminalis* Solander ex Gaertn.; *Melaleuca viminalis* (Solander ex Gaertn.) Byrnes; *M. viminalis* var. *minor* Byrnes; *Callistemon speciosus* auct. non DC., F. M. Bailey

Shrub or small tree up to 10 m tall; bark dark, rough, furrowed. Leaves scattered; blades narrowly elliptic, apex acute, apiculate, base cuneate or attenuate, 3.5–6 cm  $\times$  0.3–0.7 cm, often broader in northern Queensland, pubescent when young, becoming glabrous. Inflorescences many-flowered dense to open spikes up to *ca* 12 cm long, flowers single; hypanthium 3–4 mm long, villous, or usually  $\pm$  glabrous in northern Queensland; sepals 1–2 mm long; petals pink to red, 4–5 mm long; stamens red, united into a sometimes indistinct ring at base; style up to *ca* 2.5 cm long, glabrous. Fruits 5–6 mm  $\times$  4–5 mm, orifice *ca* 3–4 mm diameter.

Usually found along creek or river banks in eastern parts of the region to about as far west as Pittsworth in the Darling Downs district. Flowers mainly spring but occur most of the year. There are a number of horticultural forms widely cultivated as ornamentals. Medium importance as a source of pollen for bees.

**2. *Callistemon* sp. 1.**

Shrub up to *ca* 4 m tall. Leaf blades elliptic or elliptic-obovate, apex acute, pungent pointed, base narrowed, 2–5 cm  $\times$  0.6–1.2 cm, silky hairy when young, soon glabrous. Spikes 3–6 cm  $\times$  3–3.5 cm; hypanthium 3–4 mm long, moderately densely softly hairy

to ± glabrous; sepals 1–1.5 mm long; petals pale, 3–4 mm long, sparsely silky hairy; filaments mauve-pink, 1–1.3 cm long, anthers dark; style mauve-pink, 1.2–1.5 cm long. Fruits 5–6 mm diameter, orifice 2.5–3.5 mm diameter.

Found in moist soils in the Stanthorpe-Wallangarra region of the southern Darling Downs district. Flowers spring–early summer.

### 3. *Callistemon* sp. 2.

Shrub or small tree up to 4 m tall. Leaf blades linear-elliptic, apex acute, pungent pointed, base narrowed, 2–7.5 cm × 0.2–0.5 cm, silky hairy when young, soon glabrous. Spikes 2–7 cm × 2–2.5 cm, often sparsely flowered; hypanthium 2–2.5 mm long, usually glabrous or with sparse to dense spreading hairs; sepals 1–1.5 mm long; petals 2.5–3 mm long; filaments pink, sometimes fading to white, 0.7–1 cm long, anthers yellow; style pinkish, *ca* 0.7–1 cm long. Fruits 3–4.5 mm diameter, orifice 2–3 mm diameter.

Known mainly from along the Condamine R. and its tributaries from about Chinchilla westwards and a few other widely spaced localities in the Darling Downs district. Flowers mostly summer–autumn.

### 4. *Callistemon* sp. 3.

Shrub up to *ca* 3 m tall. Leaf blades linear-elliptic, apex acute, pungent pointed, base narrowed, 2–5 cm × 0.2–0.3 cm, with sparse to dense silky hairs when young, soon becoming glabrous. Spikes 2–5 cm × *ca* 4–4.5 cm; hypanthium 2.5–3 cm long with soft sparse to dense ± spreading hairs; sepals 1–1.5 mm long; petals 3–4 mm long, glabrous; filaments red, 1.5–2 cm long, anthers yellow; style red, 1.5–2 cm long. Fruits 4–5 mm diameter, orifice 2.5–3 mm diameter.

Known from the vicinity of Stanthorpe in the Darling Downs district. Flowers summer–autumn.

### 5. *Callistemon comboyensis* Cheel

### CLIFF BOTTLEBRUSH

Shrub, prostrate to erect, mostly less than 2 m tall, rarely up to 4 m tall. Leaf blades narrowly elliptic or narrowly obovate, 4–8 cm × 0.8–1.6 cm, young leaves pinkish and silky pubescent but colour and hairs lost as leaves mature. Spikes 5–9 cm × 4–6 cm; hypanthium 3–4 mm long, sparsely to densely softly hairy; sepals 1.5–2 mm long, sparsely to densely softly hairy; petals greenish, 3–4 mm long, sparsely to densely hairy, or at least ciliate on margin; filaments crimson, 2–3 cm long, anthers purplish; style crimson, 2–3 cm long. Fruits *ca* 4–5 mm broad, orifice 2–3 mm broad.

Known from rock crevices of cliffs of the mountains and ranges in the southern Moreton district usually at altitudes above 700 m. Flowers mainly summer–autumn but some occur most of the year. Cultivated as an ornamental and under ideal conditions in cultivation can form a small tree up to 5 m tall.

### 6. *Callistemon montanus* C. T. White ex S. T. Blake

### MOUNTAIN BOTTLEBRUSH

Erect shrub up to 5 m tall. Leaf blades narrowly obovate, apex acute, base attenuate, 5–11.5 cm × 0.5–1.1 cm, young leaves pinkish brown and softly hairy but colour and hairs lost as leaves mature. Spikes 3–5 cm × 5–6 cm; hypanthium 3.5–5 mm long, glabrous; sepals 1.5–2 mm long; petals greenish, 4–5 mm long, densely silky hairy; filaments crimson, *ca* 2.5 cm long, anthers red-brown; style crimson, *ca* 2.5 cm long. Fruits ± deflexed, *ca* 7–9 mm broad, orifice 4–4.5 mm broad.

Found in shallow soils in the ranges along the border with New South Wales, usually near cliff edges, often in eucalypt communities. Flowers mainly spring but some throughout the year. Cultivated as an ornamental to a limited extent.

### 7. *Callistemon pachyphyllus* Cheel

### WALLUM BOTTLEBRUSH

*Callistemon pachyphyllus* var. *angustifolius* Cheel; *C. pachyphyllus* var. *viridis* Cheel; *C. pachyphyllus* var. *rubro-lilacinus* Cheel

Shrub up to *ca* 1.5 m tall. Leaf blades very narrowly oblong, apex rounded to acute, apiculate, base attenuate, 4.5–8 cm × 0.4–1.2 cm, young leaves with silky hairs, soon glabrous. Spikes 5–10 cm × *ca* 5 cm; hypanthium 3–4 mm long, minutely hairy; sepals 1.5–2 mm long; petals greenish, *ca* 4 mm long, hairy at least on margin; filaments red with crimson anthers or pale green with green anthers, 1.8–2.5 cm long; style red or greenish, 2–2.5 cm long. Fruits 6–8 mm diameter, orifice *ca* 3 mm diameter. **Fig. 18C.**

In sandy soils, mostly in swampy areas near the coast in the Moreton and Wide Bay districts. Flowers mainly spring and autumn with some throughout the year. Sometimes cultivated as an ornamental.



Fig. 18 MYRTACEAE — A *Kunzea opposita*, portion of flowering stem x1; B–E *Callistemon* spp. — B *C. rigidus*, portion of flowering stem x1; C. *C. pachyphyllus*, portion of fruiting stem x1; D *C. sieberi*, portion of flowering stem x1; E<sub>1</sub>–E<sub>2</sub> *C. salignus*, E<sub>1</sub> portion of flowering stem x1, E<sub>2</sub> fruit x1.

**8. *Callistemon rigidus* R. Br.**

STIFF BOTTLEBRUSH

Shrub up to *ca* 3 m tall, sparsely branched. Leaf blades rigid, linear-elliptic, apex abruptly narrowed, sometimes obtusely so, mucronate, base attenuate, 3.5–10 cm × 0.2–0.6 cm, sparsely silky hairy when young, soon glabrous. Spikes 7–10 cm × 5–6 cm; hypanthium *ca* 4 mm long, softly hairy; sepals *ca* 1.5 mm long; petals greenish, *ca* 4 mm long, sparsely to densely silky hairy; filaments red, 2–2.5 cm long, anthers red; style red, 2.5–3 cm long. Fruits *ca* 6–7 mm diameter, orifice *ca* 2.5–3 mm diameter. **Fig. 18B.**

Stanthorpe-Wallangarra area of the southern Darling Downs district. Flowers spring. Cultivated as an ornamental.

**9. *Callistemon sieberi* DC.**

Shrub up to *ca* 1 m tall. Leaf blades linear, sometimes compressed-terete, apex pungent pointed, 1.5–3 cm × 0.1–0.2 cm, often broader in southern Australia, densely hairy when young, soon glabrous. Spikes 2–4 cm × *ca* 2 cm; individual flowers subtended by brownish conspicuous deciduous bracts *ca* 6 mm long; hypanthium 2–2.5 mm long, glabrous in south-eastern Queensland; sepals *ca* 1 mm long; petals *ca* 2.5–3 mm long; filaments creamy-yellow, 5–8 mm long, anthers yellow; style yellow, *ca* 8 mm long. Fruits 4–6 mm diameter, orifice 2–3 mm diameter. **Fig. 18D.**

Found in moist soils around Stanthorpe in the southern Darling Downs district. Flowers spring.

Queensland material differs from New South Wales material in having generally narrower leaves and a glabrous calyx tube.

**10. *Callistemon flavo-virens* (Cheel) Cheel***Callistemon rugulosus* DC. var. *flavo-virens* Cheel

Shrub up to *ca* 2 m tall. Leaf blades narrowly elliptic, or narrowly obovate, apex acute, apiculate, base attenuate, 3–8 cm × 0.4–1.2 cm, silky hairy when young, soon glabrous. Spikes 5–7.5 cm × 4.5–5.5 cm; hypanthium *ca* 4–5 mm long, densely softly villous; sepals *ca* 1.5 mm long; petals greenish, 4–5 mm long, sparsely to densely villous; filaments greenish, 1.2–2 cm long, anthers yellow; style greenish, 1.2–2 cm long. Fruits 6–7 mm diameter, orifice 2–3 mm diameter.

Stanthorpe-Wallangarra area of the southern Darling Downs district. Flowers mainly spring–summer.

**11. *Callistemon salignus* (Smith) DC.**

WHITE BOTTLEBRUSH; WILLOW BOTTLEBRUSH

*Metrosideros saligna* Smith

Tree up to 15 m tall; bark papery. Leaf blades narrowly elliptic or elliptic, apex and base ± equally attenuated, 3–11 cm × 0.5–1.5(–2) cm, reddish and sparsely to densely silky hairy when young, soon losing colour and hairs. Spikes 3–8 cm × 2.5–3 cm; hypanthium *ca* 2.5 mm long, glabrous; sepals *ca* 1 mm long; petals greenish, *ca* 2.5–3 mm long, ± glabrous except for ciliate margin; filaments greenish white, *ca* 1.1–1.3 cm long, anthers greenish yellow; style greenish, *ca* 1.3 cm long. Fruits 4–5 mm diameter, orifice 2–2.5 mm diameter. **Fig. 18E.**

Widespread in eastern parts of the region, in a variety of habitats but occurs mainly along water courses. Flowers mainly spring. Of medium importance as a source of pollen for bees.

**12. *Callistemon pallidus* (Bonpl.) DC.**

LEMON BOTTLEBRUSH

*Metrosideros pallida* Bonpl.

Shrub up to 3 m tall; bark hard, fissured. Leaf blades narrowly elliptic or narrowly obovate, apex acute, apiculate, base attenuate, 3–6 cm × 0.6–1.2(–1.5) cm, silky hairy and pinkish when young, soon losing hairs and colour. Spikes 3–7.5 cm × 2–3 cm; hypanthium 2.5–4 mm long, glabrous to densely woolly hairy; sepals *ca* 1.2–2 mm long; petals greenish, *ca* 4 mm long, ± glabrous to ± densely hairy, margin often ciliate; filaments cream, sometimes tinged green, 0.7–1 cm long, anthers darker than filaments; style greenish cream, *ca* as long as filaments. Fruits 4.5–6 mm diameter, orifice 2–3 mm diameter.

Known from the Springbrook area of the southern Moreton district and the Stanthorpe-Wallangarra area of the southern Darling Downs district. Flowers spring–summer.

Further research may show that the populations from around Springbrook and from the southern Darling Downs district represent different subspecies of *Callistemon pallidus*.

### 13. *Callistemon formosus* S. T. Blake

Tree up to 5 m tall. Leaf blades narrowly elliptic, apex acute, base attenuate, 4.5–8.5 cm × 0.3–1 cm, young leaves purplish with sparse appressed hairs but colour and hairs lost as leaves mature. Spikes 3–8 cm × 3–3.7 cm; hypanthium *ca* 3 mm long, glabrous or pubescent; sepals 1.5–2 mm long; petals greenish white, *ca* 3.5 mm long, glabrous; filaments creamy-white, 1.2–1.5 cm long, anthers yellow; style creamy-white, 1.2–1.5 cm long. Fruits 5–6 mm broad, orifice *ca* 2–3 mm diameter.

Known from a few scattered localities in the Burnett and Moreton districts, apparently occurring in or near depauperate rainforest. Flowers spring–summer.

## 10. MELALEUCA L.

Shrubs or trees, sometimes with papery bark. Leaves opposite, subopposite or alternate. Inflorescences terminal or axillary, spikes or heads, rarely racemes, rachis often continuing vegetative growth; flowers bisexual or male, 1–3 subtended by bract; hypanthium adnate to ovary at base; sepals 5 or more; petals 5; stamens numerous, longer than petals; filaments united at base into 5 bundles (claws) opposite petals, anthers versatile, longitudinally dehiscent; ovary enclosed in hypanthium, 3-locular, ovules numerous. Fruits capsules embedded in enlarged often woody hypanthium; seeds numerous.

About 150 species south-eastern Asia, New Guinea, Australia and New Caledonia; 61 species Australia, many endemic; 20 species south-eastern Queensland.

1. Leaves less than 5 mm long . . . . .	2
Leaves more than 5 mm long . . . . .	3
2. Stamens cream to white; bark papery . . . . .	1. <i>M. irbyana</i>
Stamens mauve, fading to cream; bark hard . . . . .	2. <i>M. pallescens</i>
3. Leaves opposite or subopposite . . . . .	4
Leaves alternate or irregularly arranged . . . . .	7
4. Flowers mauve . . . . .	3. <i>M. thymifolia</i>
Flowers cream or whitish . . . . .	5
5. Staminal claws more than 4 mm long . . . . .	4. <i>M. linariifolia</i>
Staminal claws less than 4 mm long . . . . .	6
6. Leaves less than 2 mm broad . . . . .	5. <i>M. densispicata</i>
Leaves more than 2 mm broad . . . . .	6. <i>M. cheelii</i>
7. Flowers in heads . . . . .	8
Flowers in spikes . . . . .	9
8. Leaves with curved rigid tips; usually twiggy shrubs . . . . .	7. <i>M. uncinata</i>
Leaves with straight rigid tips; shrubs but not usually twiggy . . . . .	8. <i>M. nodosa</i>
9. Leaves sessile . . . . .	10
Leaves petiolate though sometimes shortly so . . . . .	11
10. Bark hard, fissured; leaves 5–11-nerved . . . . .	9. <i>M. bracteata</i>
Bark papery or scaly; leaves 15–30-nerved . . . . .	10. <i>M. styphelioides</i>
11. Most leaves 5- or more-veined; flowers grouped in triads along inflorescence . . . . .	12
Leaves with 3 veins, rarely 5; flowers usually single along inflorescence, occasionally grouped in triads along inflorescence . . . . .	15

- |   |                             |
|---|-----------------------------|
| 12. Young leaves with straight silky close-pressed hairs . . . . .                          | 13                          |
| Young leaves with crisped or curved hairs and sometimes few long<br>straight ones . . . . . | 14                          |
| 13. Leaves mostly more than 2.5 cm wide; inflorescences 3.3–6 cm<br>wide . . . . .          | 11. <i>M. viridiflora</i>   |
| Leaves mostly less than 2.5 cm wide; inflorescences 2.5–3.5 cm<br>wide . . . . .            | 12. <i>M. quinquenervia</i> |
| 14. Stamens less than 1 cm long, usually more than 25 filaments per<br>flower . . . . .     | 13. <i>M. dealbata</i>      |
| Stamens up to 2 cm long, less than 25 filaments per flower . . . . .                        | 14. <i>M. nervosa</i>       |
| 15. Leaves more than 3 mm wide . . . . .  | 16                          |
| Leaves less than 3 mm wide . . . . .  | 17                          |
| 16. Hypanthiums glabrous . . . . .  | 15. <i>M. groveana</i>      |
| Hypanthiums pubescent . . . . .   | 16. <i>M. sieberi</i>       |
| 17. Staminal claws 0.6–1.2 cm long . . . . .  | 17. <i>M. alternifolia</i>  |
| Staminal claws less than 0.5 cm long . . . . .  | 18                          |
| 18. Stamens pink; leaves <i>ca</i> 0.5 mm wide . . . . .                                    | 18. <i>M. diosmatifolia</i> |
| Stamens white; leaves 1 mm or more wide . . . . .   | 19                          |
| 19. Styles pubescent . . . . .  | 19. <i>M. decora</i>        |
| Styles glabrous . . . . .   | 20                          |
| 20. Hypanthiums pubescent . . . . .   | 16. <i>M. sieberi</i>       |
| Hypanthiums glabrous . . . . .  | 20. <i>M. lanceolata</i>    |

### 1. *Melaleuca irbyana* R. T. Baker

Shrub or small tree up to 8 m tall; bark papery. Leaves scattered or spirally arranged, sessile, elliptic to ovate, apex acute to acuminate, base rounded or truncate, 2.5–4.5 mm × *ca* 1 mm, glabrous or sometimes with ciliate margin. Inflorescences spikes up to *ca* 2 cm × 1–1.8 cm; hypanthium 1.5–2.5 mm long, glabrous; petals white or tinged pink, *ca* 1.5 mm long; stamens white, claw 2.5–4 mm long; style 7–9 mm long, glabrous. Fruits 3–4 mm × 3–4 mm, orifice 1–2 mm diameter. **Fig. 20E.**

Common in poorly drained soils in central parts of the southern Moreton district. Flowers spring–summer. Often cultivated as an ornamental.

### 2. *Melaleuca pallescens* Byrnes

Shrub up to 3 m tall; bark hard, furrowed. Leaves scattered, sessile, obovate, apex obtuse to acuminate, base truncate or rounded, 1–5 mm × 0.5–1 mm, glabrous. Inflorescences spikes up to *ca* 2 cm × *ca* 1.5 cm; flowers mostly in triads; hypanthium 1–2 mm long, puberulous to glabrous; petals white, usually with pink midline, *ca* 1.5 mm long; stamens mauve to pink, fading to cream, claw 2–3 mm long; style 6–8 mm long, glabrous. Fruits 3–5 mm × 3–5 mm, orifice 1–2 mm diameter.

Western Darling Downs district. Flowers spring.

### 3. *Melaleuca thymifolia* Smith

#### THYME HONEYMYRTLE

Shrub mostly less than 1 m tall, but rarely up to 6 m tall; bark flaking. Leaves with petioles up to *ca* 1 mm long; blades narrowly elliptic to elliptic, apex acute, base cuneate, 0.5–1.5 cm × 0.1–0.3 cm, glabrous or thinly hairy when young. Inflorescences spikes up to *ca* 2 cm × up to 2 cm; flowers solitary; hypanthium 2–3 mm long, glabrous; petals pink to purple, 3–5 mm long; stamens pink to purple, claw 4–6 mm long; style 8–10 mm long, glabrous. Fruits 4–6 mm × 4–6 mm including thickened persistent sepals, orifice *ca* 2 mm diameter. **Fig. 19A.**

Common in wet sandy areas of the Moreton and Wide Bay districts, extending into the Darling Downs and Burnett districts. Flowers spring–summer. Often cultivated as an ornamental.

**4. *Melaleuca linariifolia* Smith****FLAXLEAF PAPERBARK**

Shrub or small tree up to 10 m tall; bark layered, papery. Leaves opposite or subopposite,  $\pm$  sessile, linear or narrowly elliptic, apex acute, apiculate, base cuneate, 1–3 cm  $\times$  0.1–0.3 cm, pubescent when young, soon becoming glabrous, 3-nerved. Inflorescences many-flowered spikes up to *ca* 3.5 cm long; flowers solitary; hypanthium 1.5–2 mm long, glabrous; sepals 1–2 mm long; petals white, 2–3 mm long; stamens white, claw 0.4–1.5 cm long; style 4–7 mm long, glabrous. Fruits 2.5–3.5 mm  $\times$  2.5–3.5 mm, orifice 2–3 mm diameter.

Two varieties occur in the region:

- |  |  |
|--|--|
| 1. Staminal claws usually more than 8 mm long; fruits usually cylindrical, valves included | <i>M. linariifolia</i> var. <i>linariifolia</i>  |
| Staminal claws usually less than 8 mm long; fruits usually turbinate, valves exerted       | <i>M. linariifolia</i> var. <i>trichostachya</i> |

*Melaleuca linariifolia* var. *linariifolia* (Fig. 19B.) is known from swampy areas or along drainage lines of the eastern Moreton district. *M. linariifolia* var. *trichostachya* (Lindl.) Benth. (*M. trichostachya* Lindl.) is widespread in the area, usually occurring along drainage lines. Both varieties flower spring with an occasional flush in late summer–autumn. Both varieties are widely cultivated. Of medium importance as a source of pollen for bees.

**5. *Melaleuca densispicata* Byrnes**

Shrub up to 4 m tall; bark layered, papery or scaly. Leaves opposite decussate, sessile, linear or very narrowly ovate, apex acute, base cuneate, 0.5–1.2 cm  $\times$  0.05–0.12 cm, glabrous. Inflorescences many-flowered dense spikes up to *ca* 4 cm long; flowers in triads; hypanthium *ca* 1 mm long, glabrous; sepals up to *ca* 1 mm long; petals chaffy, up to 2 mm long; stamens white, claw 4–6 mm long; style 8–10 mm long, glabrous. Fruits 2–3 mm  $\times$  3–5 mm, densely packed, orifice *ca* 2 mm diameter.

Western Darling Downs district, usually on clay soils. Flowers spring–summer.

**6. *Melaleuca cheelii* C. T. White**

Shrub or small tree up to 10 m tall; bark layered, papery. Leaves opposite decussate; petioles 0.5–1.5 mm long; blades elliptic, apex acute, base cuneate, 5–10 mm  $\times$  2–6 mm, pubescent at first, becoming glabrous. Inflorescences few–many-flowered  $\pm$  open spikes up to *ca* 2.5 cm long; flowers mostly single, few in triads; hypanthium 2–3 mm long, pubescent; sepals 0.5–1 mm long; petals white, 2–3 mm long; stamens white, claw 1.5–2.5 mm long; style 1–1.2 cm long, glabrous. Fruits 4–5 mm  $\times$  3–4 mm, orifice *ca* 2 mm diameter.

Restricted to the north-eastern Wide Bay district, usually near creeks or in wallum country. Flowers spring.

**7. *Melaleuca uncinata* R. Br.**

*Melaleuca nodosa* (Gaertn.) Smith var. *stenostoma* Domin

Shrub up to 3 m tall, usually virgate; bark layered, papery and fibrous. Leaves scattered; petioles very short or absent; blades terete or sometimes linear or linear-elliptic, often compressed, apex acute, cuspidate, mostly with strongly recurved tip, base cuneate, 1.5–6 cm  $\times$  *ca* 0.1 cm, silky hairy at first, becoming  $\pm$  glabrous. Inflorescences few–many-flowered dense heads up to *ca* 1.5 cm long at anthesis; flowers usually single; hypanthium 1–2 mm long, pubescent; sepals *ca* 0.2 mm long; petals white to yellow, *ca* 1 mm long; stamens white to yellow, claw *ca* 2 mm long; style 4–6 mm long, glabrous. Fruits *ca* 3 mm  $\times$  3 mm, orifice *ca* 1 mm diameter. **Fig. 20B.**

Western Darling Downs district, usually in sandstone areas. Flowers spring.



Fig. 19 MYRTACEAE — A–E *Melaleuca* spp. — A<sub>1</sub>–A<sub>3</sub> *M. thymifolia*, A<sub>1</sub> portion of flowering stem  $\times 1$ , A<sub>2</sub> staminal bundle  $\times 6$ , A<sub>3</sub> portion of fruiting stem  $\times 1\frac{1}{2}$ ; B<sub>1</sub>–B<sub>2</sub> *M. linariifolia* var. *linariifolia*, B<sub>1</sub> portion of flowering stem  $\times 1\frac{1}{2}$ ; B<sub>2</sub> staminal bundle  $\times 6$ ; C *M. bracteata*, staminal bundle  $\times 6$ ; D *M. lanceolata*, staminal bundle  $\times 6$ ; E *M. nervosa* forma *latifolia*, staminal bundle  $\times 3$ .

**8. *Melaleuca nodosa* (Gaertn.) Smith** PRICKLYLEAF PAPERBARK*Metrosideros nodosa* Gaertn.; *M. nodosa* var. *tenuifolia* (DC.) Penfold

Shrub up to 7 m tall; bark layered, papery. Leaves scattered; petioles up to *ca* 1 mm long; blades terete or linear-ovate, apex acute, straight at tip, base cuneate, 1.5–4 cm × 0.1–0.3 cm, sericeous at first, later glabrous. Inflorescences few–many-flowered dense shortly pedunculate heads up to *ca* 1.5 cm long at anthesis; flowers single or in pairs or triads; hypanthium 1–1.5 mm long, pubescent towards base; sepals up to 0.5 mm long; petals yellow-white, 1–1.5 mm long; stamens yellow, claw 1–2 mm long; style 6–8 mm long, glabrous. Fruits *ca* 3 mm × 3 mm, orifice 1–1.5 mm diameter. **Fig. 20C.**

Widespread in the region, usually on sandy soils. Flowers spring. Often cultivated in gardens. Of medium importance as a source of pollen for bees.

**9. *Melaleuca bracteata* F. Muell.** BLACK TEA TREE; RIVER TEA TREE*Melaleuca glaucocalyx* Gandoger; *M. genitifolia* Smith var. *coriacea* Ewart; *M. daleana* Blakely; *M. monticola* J. M. Black

Shrub or tree up to 15 m tall; bark fissured, hard. Leaves scattered, sessile, narrowly ovate to ovate, apex acute to acuminate, base cuneate, 0.5–2.8 cm × 0.1–0.3 cm, pubescent, sometimes becoming glabrous. Inflorescences few–many-flowered dense or open spikes up to 2.5 cm long; flowers solitary or in triads; hypanthium 1–2 mm long, pubescent; sepals 0.5–1.7 mm long; petals white, 1.5–2 mm long; stamens white, claw 3–4 mm long; style 7–8 mm long. Fruits 2.5–3 mm × 2.5–3 mm, including persistent sepals, orifice 2–2.5 mm wide. **Fig. 19C.**

Widespread in the region, usually along water courses. Flowers spring. Several horticultural forms are widely cultivated as ornamentals.

**10. *Melaleuca styphelioides* Smith**

Shrub or tree up to 20 m tall; bark layered, papery or hard and scaly. Leaves scattered, sessile, ovate or narrowly ovate, apex acute-acuminate, pungent pointed, base cuneate, 0.4–2.5 cm × 0.2–0.6 cm, puberulous or at least ciliate on margin, soon glabrous. Inflorescences few–many-flowered dense spikes up to *ca* 2 cm long; flowers in triads, occasionally single; hypanthium 1.5–2.5 mm long, pubescent or glabrous; sepals 1.5–2 mm long; petals white, 1–2 mm long; stamens white, claw 3–4 mm long; style 0.7–1.1 cm long, glabrous. Fruits 2.5–6.5 mm × 2–4 mm including persistent sepals, orifice *ca* 1.5 mm diameter.

Two varieties occur in the region:

- |   |  |
|---|--|
| 1. Bark papery; sepals tapered, usually more than 2 mm long;<br>filaments usually less than 20 per claw . . . . . | <i>M. styphelioides</i> var.<br><i>styphelioides</i> |
| Bark scaly; sepals shortly acuminate, less than 2 mm long;<br>filaments usually more than 20 per claw . . . . .   | <i>M. styphelioides</i> var.<br><i>squamophloia</i>  |

*Melaleuca styphelioides* var. *styphelioides* (Fig. 20G.) is found in coastal sandy areas while *M. styphelioides* var. *squamophloia* Byrnes is found in the western Darling Downs district, usually in brigalow communities. Both varieties flower spring. *M. styphelioides* var. *styphelioides* is commonly cultivated in gardens.

**11. *Melaleuca viridiflora* Solander ex Gaertn.** BROAD LEAVED  
TEA TREE*Melaleuca leucadendron* (L.) L. var. *cunninghamii* (Schauer) F. M. Bailey; *M. leucadendron* var. *viridiflora* (Solander ex Gaertn.) Cheel; *M. leucadendron* var. *sanguinea* Cheel

Tree 3–7 m tall, occasionally up to 18 m tall, young parts silky hairy. Leaves with petioles 0.4–2 cm long; blades narrowly to broadly elliptic or ± obovate, apex obtuse to ± acute, base narrowed, sometimes abruptly so, 6–22 cm × 2–6 cm, stiff and thick. Inflorescences dense or open spikes, mostly terminal, often 1–3 together, 4–15 cm long; flowers in triads; hypanthium 2–3.5 mm long; sepals 1–2 mm long; petals greenish white to white or yellowish or red, 2–5 mm long; stamens white to

yellow-green or red, claw 0.5–4 mm long; style 1.7–2.5 mm long, glabrous. Fruits 2.5–4 mm × 4–6 mm, orifice 2.5–4 mm diameter.

North-eastern Wide Bay district in sandy or gravelly swampy areas or where ground water is close to the surface. Flowers found most of the year with the main periods being spring and autumn.

**12. *Melaleuca quinquenervia* (Cav.) S. T. Blake**

PAPER BARKED  
TEA TREE

*Metrosideros quinquenervia* Cav.; *Melaleuca viridiflora* Solander ex Gaertn. var. *rubriflora* Brongn. & Gris; *M. viridiflora* var. *angustifolia* auct. non Blume, (L.f.) Byrnes

Tree up to 25 m tall, young parts silky hairy. Leaves with petioles 4–10 mm long; blades narrowly ovate to narrowly obovate, apex acute or narrowly obtuse, base gradually narrowed to petiole, mostly 5–9 cm × 0.6–2.4 cm, stiff, thick. Inflorescences terminal or upper axillary spikes, solitary or 2–3 together, 4–8.5 cm long; flowers in triads; hypanthium 2–2.5 mm long; sepals 1–2 mm long; petals white or creamish or red, 3–3.5 mm long; stamens white, creamish or red, claw 1.5–2 mm long; style 1.7–2.5 mm long, glabrous. Fruits 3.5–4 mm × 4–5 mm, orifice 2.5–4 mm diameter.

Widespread in coastal parts of the region, in sandy or gravelly swampy areas or where ground water is close to the surface. Flowers found most of the year with the main periods being spring and autumn. Cultivated as an ornamental. A major source of pollen and honey for bees.

**13. *Melaleuca dealbata* S. T. Blake**

Tree up to 25 m tall; bark layered, papery. Leaves scattered; petioles 6–10 mm long; blades elliptic to obovate, apex acute, base cuneate to attenuate, 5–12 cm × 1–3.2 cm, with dense short crisped hairs and few long straight hairs mainly near margin when young, becoming glabrous. Inflorescences many-flowered very open spikes up to 13 cm long, rachis densely tomentose; flowers in triads; hypanthium 2–2.5 mm long, densely tomentose; sepals 0.8–1.6 mm long; petals white, 2.5–3.5 mm long; stamens white, claw 0.8–2 mm long; style 8–10 mm long, glabrous. Fruits 3–4 mm × 3–4 mm, orifice 1.5–2 mm diameter.

Found in swampy near-coastal areas north of Maryborough. Flowers mainly spring.

**14. *Melaleuca nervosa* (Lindl.) Cheel forma *latifolia* Byrnes**

Shrub or tree up to 10 m tall; bark layered, papery. Leaves scattered; petioles 4–10 mm long; blades narrowly elliptic to elliptic, apex acute, apiculate, base cuneate, 3–9 cm × 0.5–3 cm, tomentose at first, becoming glabrous. Inflorescences many-flowered open or dense spikes up to 10 cm long; hypanthium 1.8–3 mm long, tomentose; sepals up to *ca* 1 mm long; petals white, creamy or red, up to 4 mm long; stamens yellow-green or red, claw 0.5–2 mm long; style up to 2 cm long, glabrous. Fruits 2–4 mm × 2–4 mm, orifice 1–3 mm diameter. **Fig. 19E; Fig. 20D.**

Found in the north-eastern Wide Bay district, usually on flat country with sandy surface soils, usually in association with *Eucalyptus* spp. Flowers winter–spring.

**15. *Melaleuca groveana* Cheel & C. T. White**

Shrub or small tree up to 10 m tall; bark layered, papery. Leaves scattered; petioles 1.5–3 mm long; blades narrowly elliptic, apex acute, apiculate, base cuneate or attenuate, 1–5.5 cm × 0.3–0.7 cm, puberulous at first, soon glabrous. Inflorescences few–many-flowered open spikes up to *ca* 3.5 cm long; flowers single; hypanthium 3–4.5 mm long, glabrous; sepals 1.5–2 mm long; petals white, 3–4 mm long; stamens white, claw 1–3 mm long; style 1–1.2 cm long, glabrous. Fruits 4–7 mm × 4–7 mm, orifice 2–3 mm long. **Fig. 20A.**

Known from a few places in the Moreton and Burnett districts. Flowers spring.

**16. *Melaleuca sieberi* Schauer**

*Melaleuca parviflora* Lindl. var. *latifolia* Maiden & Betche

Shrub or tree up to 20 m tall; bark layered, papery. Leaves scattered; petioles up to 1 mm long; blades narrowly elliptic to narrowly ovate, apex acute, often apiculate, base cuneate, 0.4–1.5 cm × 0.1–0.4 cm, glabrous or pubescent when young. Inflorescences few–many-flowered spikes up to *ca* 2 cm long; flowers usually single;

hypanthium 2–3 mm long, pubescent; sepals 1–1.5 mm long; petals white or pinkish, 2–3 mm long; stamens white, claw 2–3 mm long; style 8–10 mm long, glabrous. Fruits 3–5 mm × 3–5 mm, orifice 2–3 mm diameter.

Eastern Moreton and Wide Bay districts, in damp sandy soils. Flowers spring.

**17. *Melaleuca alternifolia* (Maiden & Betche) Cheel**

*Melaleuca linariifolia* Smith var. *alternifolia* Maiden & Betche

Shrub up to 7 m tall; bark layered, papery. Leaves scattered to whorled; petioles *ca* 1 mm long; blades linear, apex acute, 1–3.5 cm × 0.05–0.12 cm, glabrous or with few hairs when young. Inflorescences many-flowered open to dense spikes up to *ca* 5 cm long; flowers solitary; hypanthium 1.5–2 mm long, glabrous; sepals *ca* 1 mm long; petals white, 2–3 mm long; stamens white, claw 0.6–1.2 cm long; style 3–4 mm long, glabrous. Fruits 2–3 mm × 2–3 mm, orifice 1.5–2.5 mm diameter.

Stanthorpe-Wallangarra area of the Darling Downs district, usually along streams. Flowers spring. Cultivated as an ornamental.

**18. *Melaleuca diosmatifolia* Dum. Cours.**

*Melaleuca erubescens* Otto; *M. ericifolia* Smith var. *erubescens* (Otto) Benth.

Shrub up to 2 m tall; bark hard, rough. Leaves scattered; petioles *ca* 0.5 mm long; blades terete, sometimes flattened towards apex, apex apiculate, mostly 0.5–1.1 cm × *ca* 0.05 cm, glabrous. Inflorescences many-flowered open to dense spikes up to *ca* 4 cm long, on axillary branchlets; flowers solitary; hypanthium *ca* 2 mm long, glabrous; sepals *ca* 0.5 mm long; petals pink, up to *ca* 2 mm long; stamens pink, claw 3.5–6 mm long; style 8–10 mm long. Fruits *ca* 3 mm × 4 mm, orifice *ca* 2 mm diameter. **Fig. 20F.**

Known from the Darling Downs district. Flowers spring. Cultivated as an ornamental.

**19. *Melaleuca decora* (Salisb.) J. Britten**

*Metrosideros decora* Salisb.; *Melaleuca genistifolia* Smith

Shrub or tree up to *ca* 12 m tall; bark layered, papery. Leaves scattered; petioles up to *ca* 1 mm long; blades linear, oblong or narrowly elliptic, apex acute, base cuneate or attenuate, 0.5–1.6 cm × 0.1–0.2 cm, pubescent when young, becoming glabrous. Inflorescences many-flowered open spikes up to 6 cm long; flowers solitary or in pairs or triads; hypanthium 1.5–2.2 mm long, glabrous or sparsely hairy; sepals 0.5–1 mm long; petals white, 2–2.5 mm long; stamens white, claw 2–3.5 mm long; style 6–7 mm long, thinly pubescent. Fruits 2–3 mm × 2–3 mm, orifice 1–2.5 mm diameter.

Known from widely separated localities in the Moreton, Burnett and Darling Downs districts, usually in sandy soils. Flowers spring. Cultivated as an ornamental.

**20. *Melaleuca lanceolata* Otto**

**WESTERN TEA TREE**

*Melaleuca pubescens* Schauer; *Melaleuca parviflora* Lindl. var. *pubescens* (Schauer) Domin; *Cajuputi pubescens* (Schauer) Skeels

Shrub or small tree up to 10 m tall; bark black, rough, fissured. Leaves scattered; petioles *ca* 1 mm long; blades linear-oblong to linear-ovate, apex acute, base attenuate, 0.5–1.5 cm × 0.1–0.3 cm, pubescent when young, soon becoming glabrous. Inflorescences many-flowered open sometimes leafy spikes up to *ca* 5 cm long; hypanthium 2–3 mm long, glabrous or with few hairs towards base; sepals *ca* 1 mm long; petals white, 1.5–2.5 mm long; stamens white, claw 1–1.5 mm long; style 5–7 mm long, glabrous. Fruits 4–5 mm × *ca* 4 mm, orifice *ca* 1 mm diameter. **Fig. 19D.**

Western Darling Downs district. Flowers mostly summer but some occurring at other times of the year. A major source of pollen for bees.



Fig. 20 MYRTACEAE — A-G *Melaleuca* spp. — A *M. groveana*, stem with flowers and flower buds x1; B<sub>1</sub>-B<sub>2</sub> *M. uncinata*, B<sub>1</sub> leaf x1, B<sub>2</sub> leaf tip x6; C<sub>1</sub>-C<sub>2</sub> *M. nodosa*, C<sub>1</sub> leaf x1, C<sub>2</sub> leaf tip x6; D *M. nervosa* forma *latifolia*, leaf x1; E *M. irbyana*, leaf x6; F *M. diosmatifolia*, leaf x6; G<sub>1</sub>-G<sub>2</sub> *M. styphelioides* var. *styphelioides*, G<sub>1</sub> portion of flowering stem x1, G<sub>2</sub> fruit x1.

## 11. ANGOPHORA Cav.

Trees or shrubs. Leaves opposite, glabrous, pinnately nerved, punctate but oil glands small and obscure. Inflorescences usually terminal panicles of umbels; hypanthium continued above ovary summit, usually ribbed; sepals 4–5, usually tooth-like; petals 4–5, free, spreading, deciduous; stamens numerous, in several series, free; anthers versatile, apical gland present, longitudinally dehiscent; stigma capitate; ovary 3-locular, rarely 2- or 4-locular; ovules numerous per loculus. Fruits capsules within woody usually ribbed enlarged hypanthium usually surmounted by persistent sepals.

8 species, all endemic in eastern Australia; 4 species south-eastern Queensland.

- |   |                          |   |
|---|--------------------------|---|
| 1. Leaves sessile or petioles mostly less than 3 mm long; leaf blades usually with cordate base | 1. <i>A. subvelutina</i> |   |
| Leaves with petioles usually more than 3 mm long; mature leaf blades not cordate at base        |                          | 2 |
| 2. Bark smooth, usually reddish; ribs on buds and fruits rarely prominent, not awned            | 2. <i>A. costata</i>     |   |
| Bark rough, fibrous; ribs on buds and fruits prominent, usually awned                           |                          | 3 |
| 3. Pedicels of flowers and fruits 1–1.8 cm long; hypanthium 7–8 mm wide; fruits 1–1.8 cm long   | 3. <i>A. woodsiana</i>   |   |
| Pedicels of flowers and fruits up to 1 cm long; hypanthium 3–4 mm wide; fruits 0.6–1 cm long    | 4. <i>A. floribunda</i>  |   |

1. *Angophora subvelutina* F. Muell.

## BROADLEAF APPLE

Tree up to 30 m tall; bark rough, flaky and brittle; branchlets often pendulous; young branchlets and inflorescences with scattered long red hairs as well as dense short white ones. Leaves sessile or shortly petiolate, broadly ovate, apex obtuse to acute, often apiculate, base cordate, margin undulate, mostly 6–14 cm × 2–6 cm, glaucous. Inflorescences with pedicels 0.5–1.5 cm long; hypanthium broadly conical, 3–4 mm long; sepals usually 5, rarely 4, 1.5–3 mm long; petals usually 5, rarely 4, ca 2 mm long; stamens up to 10 mm long. Fruits 6–10 mm × 6–10 mm, distinctly ribbed. **Fig. 30A.**

Widespread in the Moreton and Wide Bay districts north to about Maryborough, also in the eastern Darling Downs district and south-eastern Burnett district. Flowers mostly spring–summer. Major source of pollen for bees.

2. *Angophora costata* (Gaertn.) J. Britten

## SMOOTHBARK APPLE; RUSTY GUM

*Metrosideros costata* Gaertn.; *Angophora lanceolata* Cav.

Tree up to 30 m tall; bark pink or reddish, smooth, decorticating. Leaves with petioles 0.5–2 cm long; blades ovate to narrowly ovate, apex acute to acuminate, base cuneate, 4–16 cm × 0.7–2.5 cm. Inflorescences usually dense, pedicels up to 10 mm long; hypanthium broadly conical, up to ca 5 mm long, ribbed, glabrous or hairy; sepals 4–5, minute; petals 4–5, ca 3 mm long; stamens up to 10 mm long. Fruits 0.8–1.2 cm × 0.6–0.9 cm, smooth or slightly ribbed.

Sandy or stony soils throughout the region, common. Main flowering period late spring–early summer though flowers occur most of the year. Major source of pollen for bees.

3. *Angophora woodsiana* F. M. Bailey

*Angophora intermedia* DC. var. *woodsiana* (F. M. Bailey) F. M. Bailey

Tree up to 30 m tall; bark rough, furrowed. Leaves with petioles 0.7–2 cm long; blades ovate to narrowly ovate, apex acute to acuminate, base cuneate, 6–16 cm × 1.5–4.5 cm. Inflorescences open, pedicels 1–3 cm long; hypanthium broadly conical, ca 5–7 mm × 6–8 mm, glabrous, strongly ribbed; sepals distinct, ca 2 mm long, laterally flattened; petals 4–5, 3–4 mm long; stamens up to ca 10 mm long. Fruits 1–1.8 cm × 1–1.5 cm, distinctly ribbed.

Sandy soils of coastal areas and coastal ranges of eastern parts of the region north to about the Noosa R. Main flowering period summer. Major source of pollen for bees.

**4. *Angophora floribunda* (Smith) Domin****ROUGHBARK APPLE**

*Metrosideros floribunda* Smith; *Angophora intermedia* DC.

Tree up to *ca* 20 m tall; bark rough, usually deeply furrowed. Leaves with petioles 0.5–1 cm long; blades ovate or narrowly ovate, apex acute to acuminate, base cuneate, (5–)7–18 cm × 1–4.5 cm. Inflorescences dense, branches and pedicels ± pubescent, often with long reddish hairs also, pedicels 4–10 mm long; hypanthium broadly conical, 3–4 mm long, pubescent, sometimes with long red hairs, distinctly ribbed; sepals distinct, usually 5, *ca* 1–1.5 mm long, laterally flattened; petals usually 5, 2–3 mm long; stamens up to *ca* 8 mm long. Fruits 6–10 mm × 6–8 mm, distinctly ribbed.

Widespread in the region, often on deeper soils, most common in the Darling Downs district. Main flowering period late winter–spring. Major source of pollen for bees, medium importance as source of honey for bees.

**12. EUCALYPTUS L'Hérit.**

Trees, mallees or shrubs; bark smooth and decorticating in ribbons or plates, or persistent, rough, often fibrous, one bark type throughout or persistent rough below, decorticating smooth above. Leaves alternate, opposite, or subopposite, sessile or petiolate, rarely peltate, entire, rarely sinuate, (juvenile leaves mostly opposite or subopposite and sessile or subsessile), mostly glabrous, rarely scabrid, scaly or pilose, venation reticulate, with intramarginal vein, rarely with 2 intramarginal veins, oil glands sparse to very dense, small to large. Inflorescences basically umbelliform, 3–many-flowered, rarely single flowers, solitary axillary or in axillary or terminal racemes or panicles, often in compound sometimes leafy inflorescences, pedicels and/or peduncles sometimes absent; hypanthium obconical, truncate-ovoid to hemispherical, striate or smooth, sometimes rugose; operculum single or double, deciduous, sometimes falling separately, formed by fusion of sepals and petals separately or all fused together, short or elongated, often umbonate or beaked, smooth, striate or rugose; stamens numerous, anthers versatile or basifixed, 2-locular, opening by slits or pores, with apical gland; ovary half inferior, style single, surrounded at base by annular nectary. Fruits capsules enclosed in usually woody hypanthium which is smooth outside or with longitudinal ribs, operculum scar(s) and scar of filament bases at summit, dried nectary inside forming disc, disc flat, raised or depressed, valves of capsule terminal, 3–6, exserted, level with rim or enclosed.

Over 500 species Australia, Timor and other Lesser Sunda Is., Celebes, New Guinea, New Britain, southern Philippine Is.; over 500 species Australia; 91 species south-eastern Queensland.

The first step in identifying a eucalypt is to note the **bark type** on both the **trunk** and the **branches**. The key to groups is then used leading to a key to species in each group. In most cases correct identification requires a specimen of **adult leaves**, **mature fruits** and **mature buds**. Occasionally **juvenile leaves** may also be required.

Eucalypts constitute a complex group difficult to understand and often exhibit marked clinal variation in a population, even in characters such as bark type. Hybridization between species is also known to occur, and some hybrids have been given species names. These names are listed below each of the presumed parental species, if the parental species are known to or possibly could occur in the region. This is not an indication that the hybrid is known to occur in Queensland, nor does it mean that other species do not hybridize. It may help account for the variability in some species or explain why a particular specimen will not key satisfactorily to any species.

L. D. Pryor and L. A. S. Johnson in "A Classification of the Eucalypts", Australian National University, Canberra, 1975, have allocated a code symbol to each recognized taxon of **Eucalyptus** and these are given after the species description, e.g. **E. tessellaris** has as its code BAA:A.

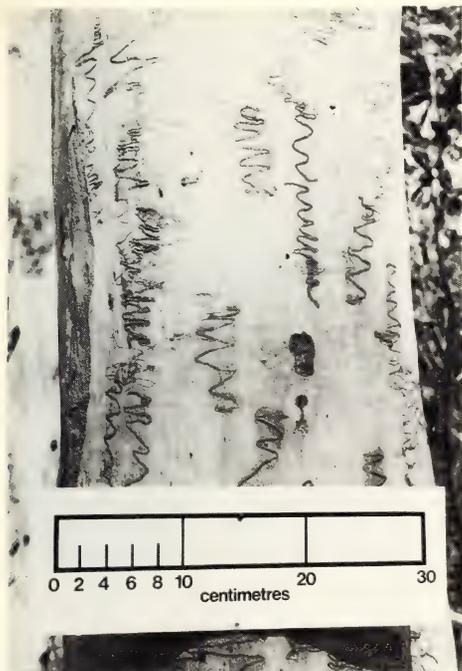
## KEY TO GROUPS

- |  |   |
|--|---|
| 1. Bark shed annually leaving a smooth, matt or dimpled surface, often with an accumulation of rough bark adhering loosely at the base of the trunk<br>Bark persistent, rough over whole trunk and branches, or shed from branches only, or from upper part of trunk and branches . . . . .  | GROUP 1 — SMOOTH BARKS<br>2                             |
| 2. Bark shed typically from branches, or branches and upper third or two thirds of trunk . . . . .<br>Bark persistent rough throughout, or sometimes smallest branches smooth barked . . . . .   | GROUP 2 — HALF BARKS<br>3                               |
| 3. Bark hard, thick, widely and deeply furrowed, often impregnated with kino (a dark gum exudate) and light grey, dark grey or black . . . . .<br>Bark otherwise . . . . .   | GROUP 3 — IRONBARKS<br>4                                |
| 4. Bark short fibred, longitudinally and transversely fissured, forming small irregular though roughly rectangular plates which are firm or spongy or flaky<br>Bark either medium to long fibred, longitudinally fissured, or short fibred and moderately thin with narrow shallow longitudinal fissures sometimes breaking up into very small firm plates . . . . .   | GROUP 4 — BLOODWOOD BARKS<br>5                          |
| 5. Bark long fibred, able to be pulled off in long strings, thick, spongy, deeply and widely furrowed, loosely interlaced beneath, with outer layers weathered to grey or grey-brown . . . . .<br>Bark medium fibred, not able to be pulled off in long strings, closely and finely interlaced, thin or thick, firm or spongy (mahoganies and peppermints), or shortly finely fibred, with narrow longitudinal fissures sometimes forming very small firm flakes which are usually partly deciduous with age, exposing large often bleached areas (box bark) . . . . . | GROUP 5 — STRINGYBARKS<br>GROUP 6 — OTHER FIBROUS BARKS |

## GROUP 1 — SMOOTH BARKS

- |   |                           |
|---|---------------------------|
| 1. Lower bark (stocking) rough, regularly tessellated; fruits thin walled, easily crushed, cylindrical to slightly urceolate, 0.8–1.2 cm × 0.5–0.8 cm, or woody and globular-urceolate, 0.9–1.3 cm × 1–1.4 cm . . . . .   | 2                         |
| Lower bark not tessellated; fruits woody, but not as above . . . . .  | 3                         |
| 2. Fruits thin walled, easily crushed, cylindrical to slightly urceolate, 0.8–1.2 cm × 0.5–0.8 cm . . . . .   | 1. <i>E. tessellaris</i>  |
| Fruits woody, not easily crushed, globular-urceolate, 0.9–1.3 cm × 1–1.4 cm . . . . .   | 9. <i>E. torelliana</i>   |
| 3. Fruits woody, urceolate, 1–2 cm × 0.7–1.5 cm, bark smooth and usually dimpled . . . . .  | 4                         |
| Fruits woody but not urceolate, up to 1 cm long, bark not dimpled, smooth or matt . . . . .   | 6                         |
| 4. Peduncles and pedicels thick; buds 1.2–1.5 cm long; operculum as long as or shorter than hypanthium; fruits 1.2–1.5 cm wide<br>Peduncles and pedicels slender; buds 0.6–1.3 cm long, operculum ± half the length of hypanthium; fruits 0.7–1.3 cm wide . . . . . | 12. <i>E. henryi</i><br>5 |
| 5. Leaves lemon scented when crushed; fruits 1–1.3 cm × 0.7–1 cm . . . . .  | 10. <i>E. citriodora</i>  |
| Leaves not lemon scented when crushed; fruits 1–2 cm × 0.8–1.3 cm . . . . .   | 11. <i>E. maculata</i>    |
| 6. Leaves markedly discolourous . . . . .   | 7                         |
| Leaves concolourous or slightly discolourous . . . . .  | 12                        |

## SOME BARK TYPES IN EUCALYPTUS



1. SMOOTH BARK —  
*Eucalyptus signata*



2. HALF BARK —  
*Eucalyptus tessellaris*

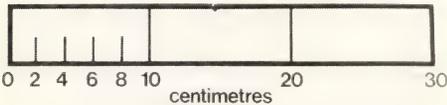


3. IRONBARK —  
*Eucalyptus drepanophylla*

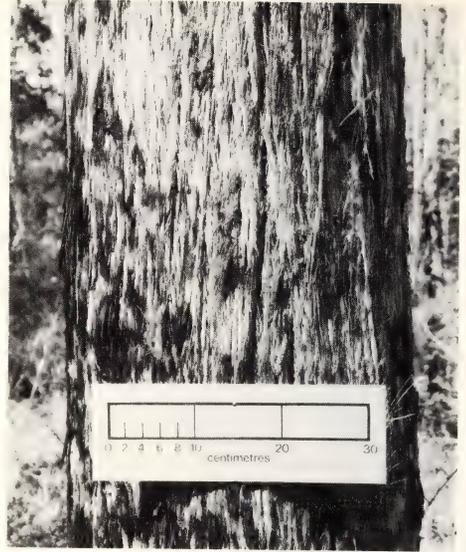


4. BLOODWOOD BARK —  
*Eucalyptus trachyphloia*

## SOME BARK TYPES IN EUCALYPTUS



5. STRINGYBARK —  
*Eucalyptus nigra*

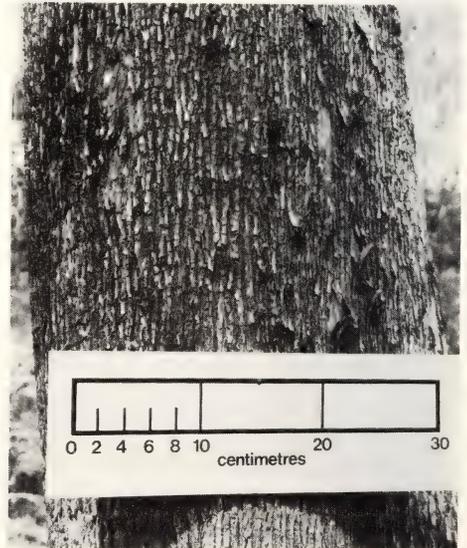


6. STRINGYBARK —  
*Eucalyptus acmenoides*

**NOTE** — It can be difficult to distinguish stringybarks from mahoganies. If you are unsure, use both Keys 5 and 6 to determine which species best fits your specimen.



7. OTHER FIBROUS  
BARK-MAHOGANY —  
*Eucalyptus umbra*



8. OTHER FIBROUS  
BARK-BOX —  
*Eucalyptus moluccana*

- |   |                            |    |
|---|----------------------------|----|
| 7. Mallees or small trees up to 12 m tall; inflorescences terminal or upper axillary racemes or small panicles of 3–7-flowered umbels, often with single umbels; fruits often ribbed or wrinkled when dry, sometimes with rudimentary teeth, valves rudimentary, capsules dehiscent by a star shaped disc . . . . . | 14. <i>E. curtisii</i>     | 8  |
| Trees up to 50 m tall, sometimes mallees; inflorescences axillary 4–12 flowered umbels; fruits not ribbed or wrinkled, valves well developed . . . . .  |                            |    |
| 8. Bark decortivating in ribbons, surface smooth; disc depressed, narrow . . . . .  |                            | 9  |
| Bark decortivating in patches, surface matt or granular; disc flat or raised . . . . .  |                            | 10 |
| 9. Buds and fruits often somewhat glaucous; valves broadly triangular, incurved . . . . .   | 36. <i>E. grandis</i>      |    |
| Buds and fruits not glaucous; valves narrowly triangular, erect or strongly turned outwards . . . . .   | 37. <i>E. saligna</i>      |    |
| 10. Buds turbinate to pyriform, 0.3–0.6 cm long; fruits with disc flat, narrow, valves below or just above rim level . . . . .  | 35. <i>E. deanei</i>       |    |
| Buds ovoid to ellipsoid, 0.4–0.8 cm or 0.7–1.5 cm long; fruits with disc $\pm$ flat to raised, valves exerted . . . . .   |                            | 11 |
| 11. Buds 0.4–0.8 cm long, usually shortly beaked; fruits hemispherical, obconical or turbinate, 0.3–0.5 cm $\times$ 0.4–0.7 cm . . . . .  | 42. <i>E. propinqua</i>    |    |
| Buds 0.7–1.5 cm long, often strongly beaked; fruits turbinate, truncate-ovoid, or almost globular, 0.5–1 cm $\times$ 0.6–1.1 cm . . . . .   | 43. <i>E. punctata</i>     |    |
| 12. Fruits with valves distinctly exerted . . . . .   |                            | 13 |
| Fruits with valves level with or below rim . . . . .  |                            | 31 |
| 13. Mallees or occasionally small trees; fruits with subulate valves, stamens usually not immediately deciduous . . . . .   |                            | 14 |
| Trees; fruits with triangular, but not subulate valves, stamens deciduous . . . . .   |                            | 16 |
| 14. Leaves with prominent venation especially when dried; fruits with disc raised, prominent . . . . .  | 51. <i>E. tereticornis</i> |    |
| Leaves with very obscure venation; fruits with disc depressed . . . . .   |                            | 15 |
| 15. Fruits truncate-globular or ovoid, 3–5 mm $\times$ 4–5.5 mm, stamens usually not immediately deciduous . . . . .  | 45. <i>E. bakeri</i>       |    |
| Fruits hemispherical, 5–6 mm $\times$ 7–8 mm, stamens deciduous . . . . .   | 44. <i>E. pachycalyx</i>   |    |
| 16. Inflorescences terminal or upper axillary racemes or panicles of umbels; fruits thin walled but leathery, broadly obconical to shallowly hemispherical, 2–4 mm $\times$ 3–5 mm, disc at rim level and very narrow, valves 3 or 4, large . . . . .   | 66. <i>E. microtheca</i>   |    |
| Inflorescences simple axillary umbels; fruits woody, not as above . . . . .   |                            | 17 |
| 17. Fruits with disc annular and separate from valves . . . . .   |                            | 18 |
| Fruits with disc fused to base of valves . . . . .  |                            | 20 |
| 18. Leaf blades often glaucous, apices acute to obtuse, apiculate, or occasionally shortly acuminate; buds with $\pm$ cylindrical operculum narrower than top of hypanthium, apex rounded or abruptly acute, often glaucous . . . . .   | 48. <i>E. sp. 1.</i>       |    |
| Leaf blades not glaucous, though sometimes bluish green, apices attenuate to acuminate; buds with conical or narrowly conical, or sometimes somewhat cylindrical operculum, often constricted in lower third, apex acute to attenuate . . . . .   |                            | 19 |
| 19. Leaves linear-ovate to very narrowly ovate, fruits 4–8 mm $\times$ 5–8 mm . . . . .   | 47. <i>E. seeana</i>       |    |
| Leaves narrowly ovate to ovate, fruits 6–8 mm $\times$ 7–9 mm . . . . .   | 49. <i>E. bancroftii</i>   |    |
| 20. Buds with operculum less than 1 $\frac{1}{2}$ times as long as hypanthium usually $\pm$ as long as or shorter than hypanthium . . . . .   |                            | 21 |
| Buds with operculum 1 $\frac{1}{2}$ –5 times as long as hypanthium . . . . .  |                            | 27 |

21. Hypanthium on buds and fruits angular, pedicels poorly defined, 0–3 mm long; trees restricted to the area from Bundaberg south to the Isis R. . . . . 46. *E. hallii*  
 Hypanthium on buds and fruits not angular, pedicels absent or present, definite; trees of the McPherson Ra., and eastern Darling Downs district . . . . . 22
22. Leaves linear-ovate, often falcate, venation faint, 12°–20° to midvein; buds ellipsoid to turbinate, 4–6 mm long . . . . . 58. *E. scoparia*  
 Leaves very narrowly ovate to ovate, sometimes falcate, venation faint to visible, 25°–50° to midvein; buds ovoid-rhomboid or ellipsoid, 6–8 mm long, or if 5 mm long then buds ovoid . . . . . 23
23. Leaf blades usually ovate to oblong-elliptic, apex obtuse, 6–13(–15) cm × 3.5–6.5(–7.5) cm . . . . . 57. *E. camphora*  
 Leaf blades very narrowly ovate to narrowly ovate, apex attenuate or acuminate, 6.5–25 cm × 0.7–3.5(–4.5) cm . . . . . 24
24. Fruits with narrowly triangular subulate valves . . . . . 44. *E. pachycalyx*  
 Fruits with triangular to broadly triangular but not subulate valves . . . . . 25
25. Juvenile leaves with crenulate margins; peduncles 0.7–1.6 cm long, slightly to distinctly flattened, 2–3 mm broad at top, pedicels 2–5 mm long; fruits hemispherical, 4–5 mm × 5–8 mm . . . . . 59. *E. dunnii*  
 Juvenile leaves with entire margins; peduncles 0.4–1 cm long, slightly angular, or 0.7–0.9 cm, often slightly flattened and up to ca 2 mm broad at top, pedicels 0–3 mm long; fruits truncate-ovoid, turbinate, or sometimes hemispherical, 4–6 mm × 5.5–7 mm or 5–7 mm × 5–8 mm . . . . . 26
26. Juvenile leaves ± triangular, amplexicaul, widest at base; fruits with disc often extending 1–2 mm down the side, peduncles often slightly flattened, 7–9 mm long . . . . . 63. *E. viminalis*  
 Juvenile leaves orbicular or very broadly ovate, or elliptic to oblong; fruits with convex disc extending no more than 1 mm down the side; peduncles slightly angular, 4–10 mm long . . . . . 64. *E. dalrympleana* subsp. *heptantha*
27. Small trees of poor form; leaves and buds often glaucous; fruits with flat to slightly raised narrow to medium width disc . . . . . 53. *E. dealbata*  
 Usually tall trees; leaves and buds not glaucous, or rarely if somewhat glaucous then buds more than 1.2 cm long; fruits with raised wide disc . . . . . 28
28. Buds 0.7–1.2 cm long, operculums 1.5–2 times as long as hypanthiums, constricted into a distinct beak or occasionally conical . . . . . 54. *E. camaldulensis*  
 Buds 0.9–2 cm long, operculums 2–5 times as long as hypanthiums, conical or narrowly conical . . . . . 29
29. Juvenile leaves large, orbicular, up to 15 cm wide; peduncles stout, slightly flattened, usually with 10–20 flowers per umbel, rarely 7 . . . . . 50. *E. amplifolia*  
 Juvenile leaves ovate to orbicular, up to 10 cm wide, bluish green; peduncles slender, terete or slightly angular, usually with 7 flowers per umbel, rarely up to 12 . . . . . 30
30. Buds 1.2–2 cm long; fruits 4–8 mm × 5–10 mm; widespread in the region, but uncommon in the Darling Downs district . . . . . 51. *E. tereticornis*  
 Buds 0.9–1.5 cm long; fruits 4–5 mm × (3–)5–7 mm; found in the southern Darling Downs district . . . . . 52. *E. blakelyi*
31. Bark usually with scribble-like marks; buds clavate, 7–9 mm or 3–5 mm long; fruits 0.7–1.1 cm × 0.7–1.1 cm or 0.5–0.7 cm × 0.4–0.6 cm . . . . . 32  
 Bark never with scribble-like marks; buds ovoid, obovoid, ellipsoid, cylindrical or ± globular; fruits not the above combination of lengths and widths . . . . . 33

32. Leaf blades with veins parallel to or up to 20° to midvein; buds 7–9 mm long; fruits 0.7–1.1 cm × 0.7–1.1 cm  
 Leaf blades with veins 15°–40° to midvein; buds 3–5 mm long; fruits 0.5–0.7 cm × 0.4–0.6 cm . . . . . 30. *E. pauciflora*
33. Mallees up to 5 m tall; venation at 15°–20° to midrib; fruits cylindrical to campanulate, rim pointing upwards or outwards, 6–9 mm × 5–8 mm . . . . . 34. *E. signata*  
 Trees up to 40 m tall, or rarely if mallees then venation at ca 40° to midrib; fruits truncate-ovoid, turbinate to hemispherical, rim pointing inwards, or upwards when hemispherical, of various sizes . . . . . 31. *E. approximans* . . . . . 34
34. Buds nearly globular, 3–4 mm long; fruits truncate-ovoid or hemispherical, 2.5–5 mm × 4–6 mm, valves 5 or 6, level with rim or slightly exerted . . . . . 76. *E. argophloia*  
 Buds 5–8 mm long, or if less then buds ellipsoid to turbinate; fruits various, valves 3 or 4, or if rarely 5 then inserted below rim . . . . . 35
35. Leaves with venation at 50°–60° to midrib, irregular; fruits cupular to campanulate, 4–5 mm × 4–5 mm . . . . . 56. *E. michaeliana*  
 Leaves with venation less than 50° to midrib; fruits various generally larger or not the above combination of measurements, or not the above shape . . . . . 36
36. Leaf blades narrowly ovate, falcate, base oblique; bark decorticating in long strips; peduncles flattened, 1–2.2 cm long, buds 3–6 mm long . . . . . 29. *E. oreades*  
 Leaf blades not falcate, base not oblique; bark decorticating in patches, if in strips then peduncles 7–9 mm long, buds 6–8 mm long . . . . . 37
37. Bark decorticating in long strips; pedicels 0–3 mm long; fruits with disc distinctly to slightly raised, intermediate to wide . . . . . 63. *E. viminalis*  
 Bark decorticating in patches; pedicels 2–8(–10) mm long; fruits with flat or depressed narrow to wide disc . . . . . 38
38. Leaves with obtuse apex, 3.5–7.5 cm wide; buds with operculum 1–1½ times as long as hypanthium . . . . . 57. *E. camphora*  
 Leaves with acute, acuminate or attenuate apex, less than 3 cm wide; buds with operculum shorter than hypanthium . . . . . 39
39. Buds ellipsoid to broadly ellipsoid, ± as broad as long; fruits truncate-ovoid to hemispherical, 6–8 mm × 5–8 mm, disc flat or slightly depressed . . . . . 89. *E. melliodora*  
 Buds narrowly ovoid, cylindrical or obovoid to turbinate; fruits either truncate-ovoid to hemispherical, 4–8 mm × 3–4.5 mm, or truncate-ovoid to turbinate, 4–7 mm × 3–6 mm . . . . . 40
40. Leaves narrowly ovate to ovate, often glaucous; buds obovoid to turbinate; fruits truncate-ovoid to turbinate, 4–7 mm × 3–6 mm, valves 4 or 5, below or ± rim level . . . . . 69. *E. intertexta*  
 Leaves linear-ovate to narrowly ovate, not glaucous; buds narrowly ovoid or cylindrical; fruits truncate-ovoid to hemispherical, 4–8 mm × 3–4.5 mm, valves 3 or 4, obscure, below rim . . . . . 71. *E. thozetiana*

## GROUP 2 — HALF BARKS

1. Ironbark on trunk, decorticating smooth on branches . . . . . 79. *E. decorticans*  
 Basal bark otherwise . . . . . 2
2. Bark on lower trunk tessellated (bloodwood) . . . . . 3  
 Bark otherwise . . . . . 5
3. Fruits thin walled, easily crushed, cylindrical to slightly urceolate, 0.8–1.2 cm × 0.5–0.8 cm . . . . . 1. *E. tessellaris*  
 Fruits thick walled, woody, not easily crushed, urceolate, usually globose and shiny, 0.9–2 cm × 0.8–1.5 cm . . . . . 4

- |   |                             |    |
|---|-----------------------------|----|
| 4. Juvenile leaves not peltate nor cordate, not hispid, not retained on mature trees; pedicels 0.5–1.3 cm long  | 2. <i>E. dichromophloia</i> |    |
| Juvenile leaves often peltate or cordate, hispid, present on mature trees; pedicels 0.1–0.4 cm long   | 9. <i>E. torelliana</i>     |    |
| 5. Mallees; leaves linear to very narrowly ovate, oil glands large and numerous, venation obscure   | 77. <i>E. viridis</i>       |    |
| Trees or rarely mallees; leaves linear to ovate, oil glands not large, venation faint or visible, 20°–60° to midvein  |                             | 6  |
| 6. Bark decorticating in strips on upper trunk and branches; fruits truncate-ovoid to hemispherical, 0.7–1 cm × 0.8–1.1 cm  | 26. <i>E. pilularis</i>     |    |
| Bark not decorticating in strips; fruits various, less than 8 mm wide or if more than fruits subcylindrical or turbinate, 0.7–1 cm × 0.5–0.9 cm                                       |                             | 7  |
| 7. Fruits thin walled but leathery, broadly obconical to shallowly hemispherical, 2–4 mm × 3–5 mm, disc very narrow, valves 3 or 4, large and exerted                                 | 66. <i>E. microtheca</i>    |    |
| Fruits not thin-walled, not as above, more than 4 mm long, or if less, valves not exerted, disc narrow to wide, valves 4 or 5, level with rim or below or if exerted then disc raised |                             | 8  |
| 8. Buds ellipsoid to broadly ellipsoid, as broad as long, 5–7 mm long; fruits with disc flat or only slightly depressed; underbark yellow   | 89. <i>E. melliodora</i>    |    |
| Buds elongated, ellipsoid-ovoid, obovoid or turbinate, usually 7–10 mm long, if less than buds obovoid to turbinate; fruits with disc various; underbark not yellow                   |                             | 9  |
| 9. Discs strongly raised, valves strongly exerted   | 55. <i>E. exserta</i>       |    |
| Discs depressed or flat, valves at or below rim level   |                             | 10 |
| 10. Buds 4–5 mm long on pedicels 1–4 mm long; fruits 2.5–5 mm × 3–5 mm, discs flat or only slightly depressed   | 68. <i>E. largiflorens</i>  |    |
| Buds 5–10 mm long or if 4 mm long then on pedicels 4–9 mm long; fruits various but discs definitely depressed   |                             | 11 |
| 11. Leaves green, glossy, firm; pedicels 1–5 mm long; valves 3 or 4, enclosed   |                             | 12 |
| Leaves often glaucous, or dull green; pedicels 3–10 mm long; valves 4 or 5, ± at rim level or slightly below or above   |                             | 13 |
| 12. Umbels 5–15-flowered; fruits 5–9 mm × 5–6 mm; leaf blades ovate to broadly ovate  | 72. <i>E. moluccana</i>     |    |
| Umbels 4–8-flowered; fruits 3.5–6 mm × 4–5 mm; leaf blades narrowly ovate to ovate  | 73. <i>E. microcarpa</i>    |    |
| 13. Buds (4–)6–7 mm long; fruits 2.5–7 mm × 3–6 mm  | 69. <i>E. intertexta</i>    |    |
| Buds 8–10 mm long; fruits sometimes ribbed, 7–10 mm × (5–)6–9 mm  | 70. <i>E. orgadophila</i>   |    |

## GROUP 3 — IRONBARKS

- |   |                            |   |
|---|----------------------------|---|
| 1. Leaves buds and usually fruits glaucous  |                            | 2 |
| Leaves buds and fruits not glaucous, occasionally leaves bluish green   |                            | 4 |
| 2. Leaves mostly opposite, base cordate or obtuse   | 82. <i>E. melanophloia</i> |   |
| Leaves alternate, base rounded to cuneate   |                            | 3 |
| 3. Leaves narrowly to broadly ovate, apex acute to obtuse, apiculate, up to 13.5 cm long; buds 0.7–0.9 cm long, operculums as long as or shorter than hypanthiums; valves 3 or 4, sunken    | 88. <i>E. caleyi</i>       |   |
| Leaves narrowly ovate to ovate, apex attenuate, up to 25 cm long; buds 0.8–1.5(–2) cm long, operculums as long as to twice as long as hypanthiums; valves 4 or 5, level with rim or exerted | 78. <i>E. fibrosa</i>      |   |

- |  |                             |
|--|-----------------------------|
| 4. Inflorescences of simple axillary umbels . . . . .  | 5                           |
| Inflorescences of terminal or upper axillary racemes or panicles . . . . .   | 6                           |
| 5. Leaves ovate, narrowly ovate or oblong, apex blunt and apiculate; pedicels 0.2–0.4 cm long; buds 0.5–0.8 cm long; fruits 5–6 mm × 5–7 mm . . . . .  | 87. <i>E. panda</i>         |
| Leaves narrowly ovate, apex attenuate; pedicels 0.7–1.5 cm long; buds 0.8–1.2 cm long; fruits 7–10 mm × 7–9 mm . . . . .   | 90. <i>E. sideroxylon</i>   |
| 6. Buds narrowly ellipsoid to ovoid, 0.8–1.5(–2) cm long; operculums generally longer than to twice as long as hypanthiums; fruits with flat to convex disc, of narrow to medium width . . . . . | 78. <i>E. fibrosa</i>       |
| Buds obovoid or spindle shaped, or if ellipsoid or ovoid, then 6–9 mm long, operculums as long as or shorter than hypanthiums; fruits with narrow, flat to slightly depressed disc . . . . .     | 7                           |
| 7. Leaves slightly discolourous; operculums conical or semi-ellipsoid, shorter and slightly narrower than hypanthium at junction . . . . .   | 8                           |
| Leaves concolourous; operculums conical, semi-ellipsoid or hemispherical, as long as or shorter than, but same width as hypanthium at junction . . . . .   | 9                           |
| 8. Bark often decorticating, smooth on upper branches; buds 0.5–0.6 cm long; fruits 5–7 mm × 4–5 mm . . . . .  | 85. <i>E. melanoleuca</i>   |
| Bark persistent to smaller branches; buds 0.5–1.1 cm long; fruits 7–9 mm × 5–7.5 mm . . . . .  | 86. <i>E. sp. 2.</i>        |
| 9. Bark decorticating, smooth on upper branches; fruits 6–9 mm × 5–7 mm . . . . .  | 79. <i>E. decorticans</i>   |
| Bark rough to smaller branches; fruits 3–6 mm × 3–6 mm or 4–6 mm × 4.5–7.5 mm . . . . .  | 10                          |
| 10. Leaves very narrowly ovate or occasionally narrowly ovate, 5–18 cm × 0.6–1.5(–2.2) cm, green or bluish green; buds 4–6 mm long; fruits truncate-ovoid to cupular . . . . .                   | 81. <i>E. crebra</i>        |
| Leaves narrowly ovate, 7–22 cm × 1–3.5(–4.5) cm, green; buds 6–9 mm long; fruits truncate-ovoid to turbinate . . . . .   | 80. <i>E. drepanophylla</i> |

## GROUP 4 — BLOODWOOD BARKS

- |   |                             |
|---|-----------------------------|
| 1. Leaves markedly discolourous . . . . .   | 2                           |
| Leaves concolourous or slightly discolourous . . . . .  | 6                           |
| 2. Fruits hemispherical to truncate-globular, 0.4–0.9 cm × 0.6–1.3 cm . . . . .   | 16. <i>E. cloeziana</i>     |
| Fruits globular to urceolate, usually more than 1 cm × 0.7 cm . . . . .   | 3                           |
| 3. Fruits 0.5–1 cm × 0.4–0.7 cm . . . . .   | 6. <i>E. trachyphloia</i>   |
| Fruits 1–3 cm × 1–2 cm . . . . .  | 4                           |
| 4. Fruits cylindrical or elongated-urceolate, (1.5–)2–3 cm × 1.1–1.8 cm, generally at least 1½ times as long as wide; buds scurfy . . . . .                                 | 3. <i>E. polycarpa</i>      |
| Fruits ovoid-urceolate to barrel shaped, 1–2 cm × 1–1.8 cm, usually only slightly longer than wide; buds not scurfy . . . . .   | 5                           |
| 5. Fruits ovoid-urceolate or barrel shaped, apex turned upwards, often with a dull scaly surface; seeds with large wing; bark rough throughout . . . . .                    | 4. <i>E. intermedia</i>     |
| Fruits usually urceolate, apex turned outwards, often faintly ribbed and with a shiny surface; seeds with a narrow wing; bark smooth on smaller branches . . . . .          | 5. <i>E. gummiifera</i>     |
| 6. Bark decorticating from upper branches (gum-topped bloodwood), rough bark reddish; buds 0.6–0.8 cm long; fruits urceolate or usually globose and shiny, smooth . . . . . | 2. <i>E. dichromophloia</i> |
| Bark yellowish, persistent, rough throughout; buds 0.8–1.9 cm long; fruits ovoid-urceolate or campanulate, smooth or faintly longitudinally ridged . . . . .                | 7                           |

7. Buds obovoid or subcylindrical, 0.8–1.4 cm long; fruits ovoid-urceolate, 1–1.6 cm × 0.7–1.2 cm . . . . . 7. *E. bloxsomei*  
 Buds turbinate, usually wrinkled, 1.3–1.9 cm long; fruits urceolate or campanulate, 1.5–3 cm × 1.4–2 cm . . . . . 8. *E. watsoniana*

## GROUP 5 — STRINGYBARKS

1. Leaves markedly discolourous . . . . . 2  
 Leaves concolourous or only slightly discolourous . . . . . 4
2. Buds clavate, 5–6 mm long, tapering into pedicels; fruits elongated, turbinate or obconical, 5–9 mm × 4–6 mm; bark soft reddish brown . . . . . 91. *E. microcorys*  
 Buds pyriform to obovoid, 6–7 mm long, or ovoid to ellipsoid, 5–7 mm long, neither tapering into pedicels; fruits globular or truncate-ovoid; bark black or grey brown . . . . . 3
3. Buds pyriform to obovoid, 6–7 mm long; fruits globular to globose, or often somewhat urceolate, 4-lobed at summit, 0.8–1.4 cm × 1–1.5 cm; bark black . . . . . 13. *E. baileyana*  
 Buds ovoid to ellipsoid, 5–7 mm long; fruits usually truncate-ovoid, 0.4–0.6 cm × 0.4–0.7 cm; bark grey-brown . . . . . 18. *E. acmenoides*
4. Buds 2.3–3 cm long; fruits 1.5–2.5 cm × 1.6–2.5 cm, both longitudinally ridged . . . . . 27. *E. planchoniana*  
 Buds less than 1 cm long; fruits less than 1.3 cm wide, not markedly ridged . . . . . 5
5. Fruits longer than wide, often faintly longitudinally ribbed, 0.7–1.1 cm × 0.6–0.9 cm . . . . . 28. *E. obliqua*  
 Fruits as wide as or wider than long, not ribbed, of various dimensions . . . . . 6
6. Pedicels 0–2 mm long; buds 0.3–0.6 cm long; fruits 3–5(–6) mm long, disc depressed to flat . . . . . 7  
 Pedicels 2–8 mm long, or if less then disc of fruits ascending; buds 0.6–1.1 cm long; fruits 4–10 mm long, disc various . . . . . 8
7. Peduncles terete, pedicels absent; buds 3–4 mm long; fruits 3–5 mm × 6–8 mm, valves 4, disc narrow . . . . . 24. *E. cameronii*  
 Peduncles flattened, pedicels 0–2 mm long; buds 5–6 mm long; fruits 4–6 mm × 4–6 mm, valves 3, disc wide . . . . . 25. *E. conglomerata*
8. Fruits globular, globose or truncate-globular, disc ± level to steeply raised, 2–4 mm wide . . . . . 9  
 Fruits truncate-ovoid to hemispherical, disc ± flat or slightly raised, up to 2 mm wide, but usually 1–1.5 mm wide . . . . . 10
9. Pedicels 2–8 mm long; buds not angular; discs ± level to slightly raised; smaller branches smooth, whitish . . . . . 19. *E. laevopinea*  
 Pedicels absent or rarely up to 3 mm long; buds angular; discs steeply ascending; bark rough throughout . . . . . 20. *E. youmanii*
10. Bark fibrous, but generally not as coarse as a stringybark; leaf venation 35°–60° to midvein; buds ovoid to ellipsoid, 0.7–1.1 cm long, operculums as long as or longer than hypanthiums . . . . . 17. *E. umbra*  
 Bark stringy; leaf venation 15°–35° to midvein; buds ± ellipsoid to obovoid, 6–7 mm long; operculums usually slightly shorter than hypanthiums . . . . . 11
11. Pedicels 0–2 mm long; buds obovoid, minutely warted with oil glands; operculums obtusely conical to hemispherical; fruits with disc ascending, often broader than long . . . . . 22. *E. nigra*  
 Pedicels (1–)2–5 mm long; buds ± ellipsoid, smooth, operculums acutely conical, usually umbonate; fruits with disc flat to slightly ascending . . . . . 12

12. Leaf blades often thin textured, often slightly discolourous; occurring on McPherson Ra. and Great Dividing Ra. north to ca Bunya Mts. . . . . 21. *E. eugenoides*  
 Leaf blades coarse textured, concolourous; confined to the Granite Belt area of the Darling Downs district . . . . . 23. *E. caliginosa*

## GROUP 6 — OTHER FIBROUS BARKS

- |  |                             |
|--|-----------------------------|
| 1. Leaves markedly discolourous . . . . .  | 2                           |
| Leaves concolourous or only slightly discolourous . . . . .  | 9                           |
| 2. Fruits with distinctly exerted valves . . . . .   | 3                           |
| Fruits with valves at $\pm$ rim level . . . . .  | 5                           |
| 3. Buds with operculum 2–4 times as long as hypanthium; fruits $\pm$ as long as wide, 0.5–0.8 cm $\times$ 0.5–0.8 cm, valves narrowly triangular . . . . .                 | 41. <i>E. resinifera</i>    |
| Buds with operculum up to twice as long as hypanthium; fruits somewhat wider than long, 0.6–1.5 cm $\times$ 0.7–1.5 cm, valves broadly triangular . . . . .                | 4                           |
| 4. Peduncles flattened markedly, 1–2.5 cm $\times$ 0.4–0.7 cm at apex; trees of coastal lowlands or coastal plains . . . . .   | 39. <i>E. pellita</i>       |
| Peduncles flattened, 0.6–1.2 cm $\times$ 0.3–0.4 cm at apex; shrubs or small trees of McPherson Ra. . . . .  | 40. <i>E. notabilis</i>     |
| 5. Fruits cylindrical or campanulate, 0.9–1.6 cm $\times$ 0.8–1.1 cm, valves 3, rarely 4, usually joined across orifice . . . . .  | 38. <i>E. robusta</i>       |
| Fruits truncate-globular to hemispherical, 0.3–0.6 cm $\times$ 0.4–0.7 cm, valves 4 or 5, free, or 0.4–0.9 cm $\times$ 0.6–1.3 cm, valves 3, free . . . . .                | 6                           |
| 6. Leaves with venation at 60°–80° to midvein; buds 3–4 mm long . . . . .  | 15. <i>E. tenuipes</i>      |
| Leaves with venation at 35°–60° to midvein; buds 5–10 mm long . . . . .  | 7                           |
| 7. Buds clavate, tapering into pedicels, 5–6 mm long; fruits elongated, turbinate or obconical, 5–9 mm $\times$ 4–6 mm . . . . .   | 91. <i>E. microcorys</i>    |
| Buds and fruits not as above . . . . .   | 8                           |
| 8. Buds obovoid to turbinate, 6–10 mm long; fruits usually hemispherical to truncate-globular, 0.4–0.9 cm $\times$ 0.6–1.3 cm, valves 3 . . . . .                          | 16. <i>E. cloeziana</i>     |
| Buds ovoid to ellipsoid, 5–7 mm long; fruits usually truncate-ovoid, 0.4–0.5(–0.6) cm $\times$ 0.4–0.5(–0.7) cm, valves usually 4 . . . . .                                | 18. <i>E. acmenoides</i>    |
| 9. Leaves with margins commonly crenate to sinuate, usually with visible marginal glands . . . . .   | 62. <i>E. quadrangulata</i> |
| Leaves with entire margins, never with visible marginal glands . . . . .   | 10                          |
| 10. Fruits with distinctly exerted valves . . . . .  | 11                          |
| Fruits with valves at $\pm$ rim level or below rim . . . . .   | 14                          |
| 11. Buds 0.8–1.2 cm long, operculums 1.5–3 times as long as hypanthiums; fruits ovoid, globular or turbinate, 3–7 mm $\times$ 4–9 mm, disc wide, strongly raised . . . . . | 55. <i>E. exserta</i>       |
| Buds 0.3–0.8 cm long; operculums shorter than or $\pm$ as long as hypanthiums; fruits various, but disc flat or slightly raised, very narrow to medium width . . . . .     | 12                          |
| 12. Fruits thin walled but leathery, broadly obconical to shallowly hemispherical, 2–4 mm $\times$ 3–5 mm, disc very narrow . . . . .                                      | 66. <i>E. microtheca</i>    |
| Fruits woody, turbinate to almost globular, truncate, ovoid or hemispherical, 3–7 mm $\times$ 5–7 mm, disc narrow to medium width . . . . .                                | 13                          |

13. Buds 6–8 mm long, operculums  $\pm$  as long as hypanthiums; fruits turbinate to truncate-ovoid or hemispherical, 5–7 mm  $\times$  5–7 mm; leaves dark green, buds and fruits never glaucous . . . . . 60. *E. bridgesiana*  
 Buds 4–5 mm long; operculums shorter than hypanthiums; fruits turbinate to almost globular, 3–5 mm  $\times$  5–6 mm; leaves, buds and fruits often slightly glaucous . . . . . 65. *E. nova-anglica*
14. Leaves grey to bluish grey; inflorescences buds and usually fruits glaucous; buds angular or ridged, 1–1.5 cm long . . . . . 75. *E. albens*  
 Leaves green, rarely slightly glaucous, fertile parts not glaucous; buds not angular or ridged, less than 1 cm long . . . . . 15
15. Leaves usually ovate to broadly ovate, obovate, elliptic, circular or sometimes broadly rhomboid, apex obtuse or retuse, 3–10 cm  $\times$  1.8–7.5 cm, shiny; fruits 2–4 mm  $\times$  2.5–3.5 mm . . . . . 67. *E. populnea*  
 Leaves linear-ovate to ovate, rarely broadly ovate, apex attenuate to acute, not shiny, or if obtuse then leaves narrow, or fruits larger . . . . . 16
16. Umbels 7–many-flowered, usually solitary, axillary . . . . . 17  
 Umbels 3–8, rarely 10-flowered, usually in panicles or racemes . . . . . 20
17. Leaf blades with venation at 35°–60° to midvein; buds ovoid to ellipsoid, 0.7–1.1 cm long . . . . . 17. *E. umbra*  
 Leaf blades with venation at 15°–30° to midvein; buds clavate to globular, 3–7 mm long . . . . . 18
18. Pedicels 5–7 mm long; fruits obconical, pyriform, campanulate or hemispherical, 0.4–0.7 cm  $\times$  0.5–0.8 cm . . . . . 33. *E. andrewsii*  
 Pedicels 2–5 mm long; fruits truncate-ovoid, ellipsoid or globular, 0.3–0.6 cm  $\times$  0.3–0.6 cm, or 0.7–1.1 cm  $\times$  0.6–0.9 cm and sometimes urceolate . . . . . 19
19. Fruits 0.3–0.6 cm  $\times$  0.3–0.6 cm, never ridged . . . . . 32. *E. radiata*  
 Fruits 0.7–1.1 cm  $\times$  0.6–0.9 cm, often faintly longitudinally ridged . . . . . 28. *E. obliqua*
20. Fruits elongated obconical or obconical or with a flared rim . . . . . 21  
 Fruits truncate-ovoid, hemispherical, campanulate, cylindrical or ellipsoid, or almost globular, without a flared rim . . . . . 22
21. Leaves 0.6–2.5 cm wide; buds 3–5 mm long; fruits elongated-obconical, 4–7 mm  $\times$  3.5–5 mm . . . . . 83. *E. conica*  
 Leaves 3.5–6 cm wide; buds 5–8 mm long; fruits  $\pm$  obconical with a flared rim, 6–10 mm  $\times$  5–9 mm . . . . . 84. *E. baueriana*
22. Pedicels absent; fruits 4–7 mm  $\times$  6–8 mm, disc raised, moderately wide . . . . . 61. *E. banksii*  
 Pedicels present, at least 1 mm long; fruits not the above combination of lengths and widths . . . . . 23
23. Fruits 3–5 mm  $\times$  5–6 mm, disc raised . . . . . 65. *E. nova-anglica*  
 Fruits 2.5–6 mm  $\times$  3–5 mm or 6–10 mm  $\times$  5–9 mm, disc flat or depressed . . . . . 24
24. Fruits 2.5–6 mm  $\times$  3–5 mm . . . . . 25  
 Fruits 6–10 mm  $\times$  5–9 mm . . . . . 27
25. Buds ovoid to obovoid, 5–9 mm long; fruits campanulate, truncate-ovoid, subglobose or shortly cylindrical, 3.5–6 mm  $\times$  4–5 mm, disc depressed, wide . . . . . 73. *E. microcarpa*  
 Buds ovate to clavate or turbinate, 3–5 mm long; fruits turbinate, truncate-ovoid or hemispherical, 2.5–5 mm  $\times$  3–5 mm, disc depressed, narrow, or flat or slightly depressed, narrow to medium width . . . . . 26
26. Leaf blades linear-oblong to very narrowly oblong-ovate; fruits turbinate to truncate-ovoid, disc depressed, narrow . . . . . 74. *E. pilligaensis*  
 Leaf blades very narrowly ovate to oblong; fruits hemispherical to truncate-ovoid, disc flat or only slightly depressed, narrow to medium width . . . . . 68. *E. largiflorens*

27. Leaves often glaucous; buds obovoid, usually 8–10 mm long; fruits sometimes ribbed, disc depressed . . . . . 70. *E. orgadophila*  
 Leaves not glaucous; buds ellipsoid to broadly ellipsoid, 5–7 mm long; fruits not ribbed, disc flat or only slightly depressed . . . . . 89. *E. melliodora*

### 1. *Eucalyptus tessellaris* F. Muell.

CARBEEN; MORETON BAY ASH

*Eucalyptus viminalis* Hook.

Tree up to 30 m tall; bark grey, regularly tessellated, rough, persistent on lower trunk, abruptly changing to decorticating smooth above (half bark). Adult leaves alternate; petioles 0.5–1.2 cm long; blades very narrowly ovate to almost linear, apex attenuate, finely pointed, base cuneate to attenuate, 6–25 cm × 0.5–2.5 cm, concolourous, venation fine but visible, 45°–60° to midvein, intramarginal vein close to margin but distinct. Inflorescences axillary, rarely terminal, racemes or short panicles of 2–7-flowered umbels or single umbels, peduncles up to 7 mm long, pedicels up to 3 mm long; buds turbinate, 5–7 mm long; operculum depressed hemispherical, shorter than hypanthium. Fruits thin walled, easily crushed, cylindrical to slightly urceolate, 0.8–1.2 cm × 0.5–0.8 cm, disc depressed, wide, valves 3, below rim. **Fig. 21A.** (BAA:A)

Throughout the region, mainly in open forest commonly on sandy soils, (though not present on the Granite Belt). Flowers mainly late spring–summer. Cultivated as an ornamental tree. Timber heavy hard and tough, fairly easy to work, dresses well, also used in construction work which is not in contact with the ground.

### 2. *Eucalyptus erythrophloia* Blakely

GUM TOPPED BLOODWOOD;  
VARIABLE BARKED BLOODWOOD

*Eucalyptus dichromophloia* auct. S.E. Qld. non F. Muell.

Tree up to 12 m tall; bark persistent, rough, shortly fibrous, irregularly fissured (bloodwood) with some irregular patches, upper parts decorticating and smooth usually with rusty or brown scales. Adult leaves alternate; petioles 1–2 cm long; blades very narrowly ovate to ovate, apex attenuate to acute, base cuneate to occasionally attenuate, 8–23 cm × 1–4.5 cm, slightly discolourous, venation faint, fine, regular, close, 60°–70° to midrib, intramarginal vein very close to margin. Inflorescences terminal, usually large panicles of 3–6-flowered umbels, peduncles 1.5–2.5 cm long, pedicels 0.5–1.3 cm long; buds broadly obovoid to pyriform, smooth, 6–8 mm long; operculum depressed hemispherical often with small beak or umbo, much shorter than hypanthium. Fruits woody, urceolate, usually globose and shiny, often speckled, 1–2 cm × 0.8–1.5 cm, disc depressed, wide, valves usually 4, deeply enclosed. **Fig. 21B.** (CAFEGA)

Northern districts of the region in grassy woodland. Flowers mainly spring–summer. Timber fairly durable, and when trunks are sound and of good enough form can be used for rural purposes, as well as for moderate quality firewood.

### 3. *Eucalyptus polycarpa* F. Muell.

LONG FRUITED BLOODWOOD

*Eucalyptus terminalis* auct. non F. Muell.

Tree up to 20 m tall but generally smaller; bark persistent, rough, shortly fibrous, irregularly fissured (bloodwood). Adult leaves alternate; petioles 1–2.5 cm long; blades very narrowly ovate to narrowly ovate, apex attenuate, base cuneate, 8.5–25 cm × 1–3 cm, discolourous, venation faint, fine, regular, close, 60°–70° to midvein, intramarginal vein close to margin. Inflorescences terminal, often large panicles of 3–6-flowered umbels, peduncles 0.5–1.3 cm long, pedicels 0.5–1.3 cm long; buds pyriform or obovoid, 7–10 mm long, mostly scurfy; operculum depressed hemispherical, with umbo, shorter than hypanthium. Fruits woody, cylindrical or elongated-urceolate, (1.5–)2–3 cm × 1.1–1.8 cm, disc depressed, wide, valves deeply enclosed. **Fig. 21C.** (CAFIB)

Northern and western districts of the region in woodland. Flowers autumn–winter. Timber heavy hard and strong, but affected by wavy grain, durable in the ground, used in the round or split for posts, strainers and other farm timber, and makes good firewood.

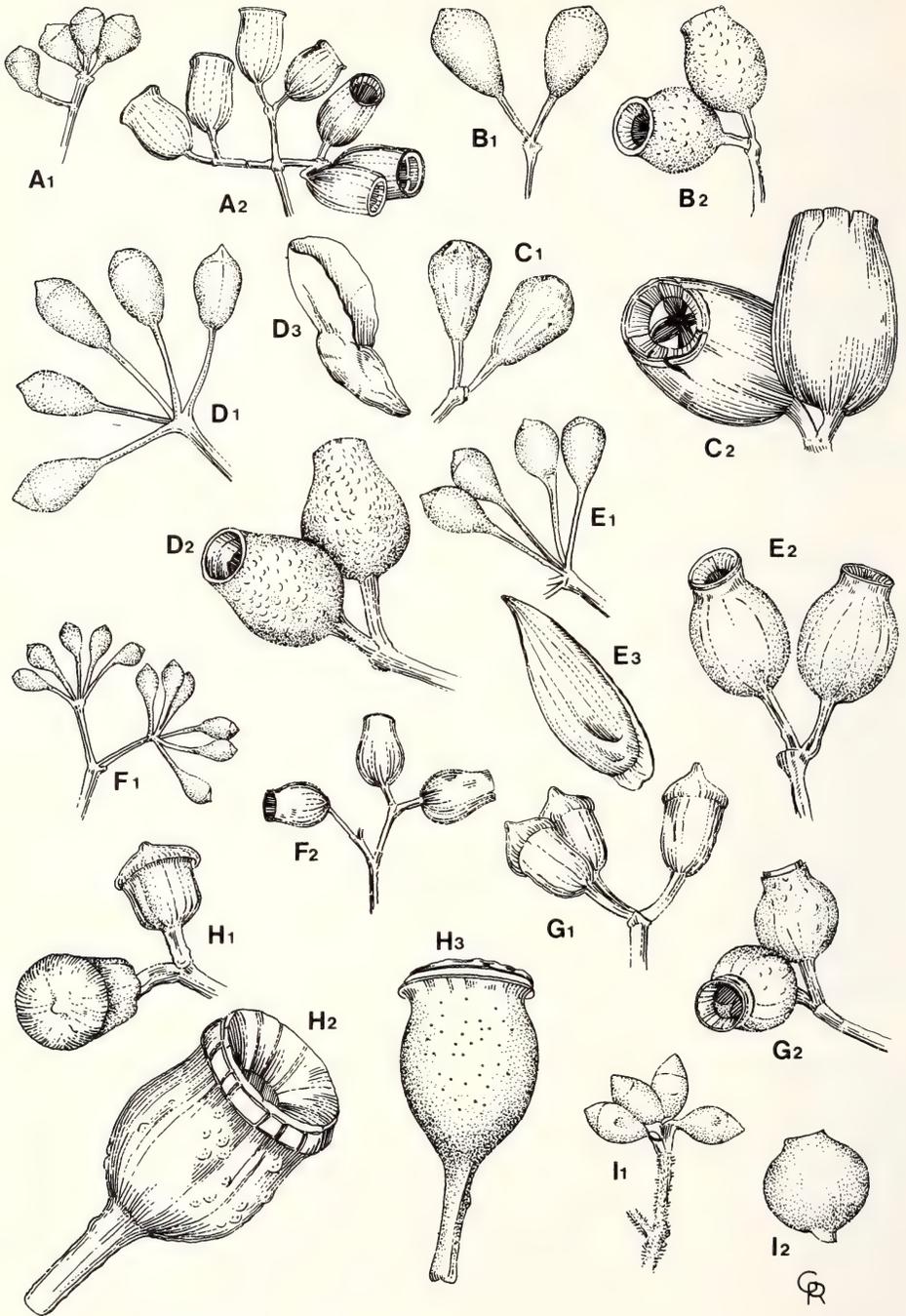


Fig. 21 MYRTACEAE — *Eucalyptus* spp. — A<sub>1</sub>–A<sub>2</sub> *E. tessellaris*, A<sub>1</sub> buds x1, A<sub>2</sub> fruits x1; B<sub>1</sub>–B<sub>2</sub> *E. erythrophloia*, B<sub>1</sub> buds x1, B<sub>2</sub> fruits x1; C<sub>1</sub>–C<sub>2</sub> *E. polycarpa*, C<sub>1</sub> buds x1, C<sub>2</sub> fruits x1; D<sub>1</sub>–D<sub>3</sub> *E. intermedia*, D<sub>1</sub> buds x1, D<sub>2</sub> fruits x1, D<sub>3</sub> seed x3; E<sub>1</sub>–E<sub>3</sub> *E. gummifera*, E<sub>1</sub> buds x1, E<sub>2</sub> fruits x1, E<sub>3</sub> seed x3; F<sub>1</sub>–F<sub>2</sub> *E. trachyphloia*, F<sub>1</sub> buds x1, F<sub>2</sub> fruits x1; G<sub>1</sub>–G<sub>2</sub> *E. bloxsoni*, G<sub>1</sub> buds x1, G<sub>2</sub> fruits x1; H<sub>1</sub>–H<sub>3</sub> *E. watsoniana*, H<sub>1</sub> buds x1, H<sub>2</sub> ribbed fruit x1, H<sub>3</sub> smooth fruit x1; I<sub>1</sub>–I<sub>2</sub> *E. torelliana*, I<sub>1</sub> buds x1, I<sub>2</sub> fruits x1.

**4. *Eucalyptus intermedia* R. T. Baker****PINK BLOODWOOD**

Tree up to 36 m tall; bark persistent to smallest branches, light yellow-brown, rough, short fibred, irregularly fissured, scaly (bloodwood). Adult leaves alternate or sometimes subopposite; petioles (0.5–)1–2.5 cm long; blades very narrowly ovate to ovate, apex acute to acuminate, base cuneate, (6–)10–16 cm × (1.1–)1.5–4 cm, discolourous, venation fine, regular, close, 60°–75° to midvein, intramarginal vein close to margin. Inflorescences terminal panicles of 5–8-flowered umbels, peduncles 1–1.8 cm long, pedicels 5–8 mm long; buds ellipsoid to obovoid, 0.7–1.5 cm long; operculum hemispherical to broadly conical, usually with short beak or umbo, shorter than hypanthium. Fruits woody, ovoid to urceolate or barrel shaped, apex pointed upwards, often with dull scaly surface, 1.2–2 cm × 1–1.8 cm, disc depressed, wide, valves 3 or 4, deeply enclosed; seeds with large wing. **Fig. 21D.** (CAFID)

Widespread in the Moreton, Wide Bay, Burnett and eastern Darling Downs districts in open forests and woodlands on a range of soil types. Flowers summer–autumn. Timber pink, strong, very durable but often contains gum veins, used in the ground, for railway sleepers or for general construction. Minor to medium importance as a source of honey and medium importance as a source of pollen for bees.

**5. *Eucalyptus gummifera* (Solander ex Gaertn.) Hochr.****RED BLOODWOOD**

*Meterosideros gummifera* Solander ex Gaertn.; *Eucalyptus corymbosa* Smith

Tree up to 36 m tall or a mallee on sand; bark red-brown, fissured, ± tessellated (bloodwood) becoming smooth on smaller branches with an intermediate zone of curly scaly bark. Adult leaves alternate; petioles 1.2–2.5 cm long, often flattened; blades ovate, narrowly ovate or oblong, apex acuminate to attenuate, base cuneate, often broadly so, 7.5–19 cm × (1.2–)2–5 cm, discolourous, venation fine, regular, close, 55°–70° to midvein, intramarginal vein close to margin. Inflorescences terminal panicles of 4–8-flowered umbels, peduncles 1–2.5 cm long, pedicels 0.7–1.2 cm long; buds ellipsoid to obovoid, 0.7–1.3 cm long; operculum very short, depressed hemispherical, sometimes with short point, much shorter than hypanthium. Fruits woody, usually urceolate, apex generally spreading outwards, often faintly ribbed and surface shiny, (1–)1.2–1.8 cm × (0.8–)1.2–1.5 cm, often as broad as long in smaller fruits, disc depressed, wide, valves 3 or 4, deeply enclosed; seeds with narrow wing. **Fig. 21E.** (CAFUF)

Coastal districts on deep sands, rhyolite or sandstone. Flowers summer–autumn. Timber red, very durable but gum veins prevent extensive use as sawn timber, used mainly in the round as poles, bed-logs, house stumps and posts.

**HYBRID: *E.* × *nowraensis* Maiden (*E. gummifera* × *E. maculata*)**

**6. *Eucalyptus trachyphloia* F. Muell.****BROWN BLOODWOOD**

Tree up to 24 m tall; bark persistent, yellowish brown, rough, shortly fibrous, irregularly fissured (bloodwood). Adult leaves alternate; petioles 0.9–1.6 cm long; blades narrowly ovate or very narrowly ovate, apex attenuate, base cuneate, 7.5–13(–18) cm × 0.5–2.5(–3) cm, discolourous, venation fine, faint, regular, close, 50°–60° to midvein, intramarginal vein very close to margin. Inflorescences terminal, large panicles of 3–6-flowered umbels, peduncles 0.5–1.3 cm long, pedicels 2–7 mm long; buds obovoid to turbinate, 3–5 mm long; operculum depressed hemispherical with small beak or umbo, much shorter than hypanthium. Fruits woody, but thin walled, urceolate, ovoid, or cylindrical-ovoid, 5–10 mm × 4–7 mm, disc depressed, wide, valves usually 3, deeply enclosed. **Fig. 21F.** (CAFUJ)

Locally common throughout the region in open forest on sandy or stony soils, often on slopes or ridges. Flowers mainly late summer or autumn. Timber light in colour, open grained, moderate strength and durability, with gum veins, used for construction, mine props, fencing and fuel. Minor importance as a source of honey, medium importance as a source of pollen for bees.

**7. *Eucalyptus bloxsomei* Maiden****YELLOW JACKET**

Tree up to 24 m tall; bark persistent, yellowish, rough, shortly fibrous, irregularly fissured (bloodwood), inner bark yellow. Adult leaves alternate; petioles 1–3.5 cm long; blades very narrowly ovate to ovate, apex attenuate, base attenuate to cuneate, 7.5–16 cm × 0.5–4 cm, slightly discolourous, venation usually faint, fine, regular,

close, 50°–60° to midvein, intramarginal vein usually close to margin. Inflorescences terminal panicles of 3–7-flowered umbels, peduncles 0.8–1.8 cm long, pedicels 2–7 mm long; buds obovoid, subcylindrical, 0.8–1.4 cm long; operculum hemispherical to broadly conical with distinct short beak, much shorter than hypanthium. Fruits woody, ovoid-urceolate, 1–1.6 cm × 0.7–1.2 cm, with faint longitudinal ridges, disc depressed and wide; valves usually 3, deeply enclosed. **Fig. 21G.** (CCA:C)

Darling Downs and Burnett districts in eucalypt woodland and/or cypress pine woodland. Flowers winter–spring. Timber hard, moderately heavy, strong and durable, gum veins common.

**8. *Eucalyptus watsoniana* F. Muell.** LARGE FRUITED YELLOW JACKET  
Tree up to 25 m tall; bark persistent, yellowish, rough, short fibred, irregularly fissured, scaly (bloodwood). Adult leaves alternate; petioles 1.5–3.5 cm long; blades narrowly to broadly ovate, apex acute, attenuate, base cuneate, 8–22 cm × 1.8–8(–12) cm, concolourous, venation fine, regular, close, 45°–50° to midvein, intramarginal vein usually remote. Inflorescences short terminal racemes or panicles of 3–7-flowered umbels, peduncles 1.2–2.5 cm long, thick, sometimes flattened, pedicels (3–)5–10 mm long; buds turbinate, usually wrinkled, 1.3–1.9 cm long; operculum depressed hemispherical with umbo, wider than and shorter than hypanthium. Fruits woody, urceolate or campanulate, 1.5–3 cm × 1.4–2.5 cm, smooth or faintly longitudinally ridged, disc depressed, wide, valves 3, deeply enclosed. **Fig. 21H.** (CCA:D)

Darling Downs and Burnett districts, often on stony or sandy soils or sandstone ridges. Flowers winter–spring. Timber brownish hard heavy, strong and durable.

**9. *Eucalyptus torelliana* F. Muell.** CADAGA; CADAGHI  
Tree up to 30 m tall; bark persistent, rough, fibrous, scaly (bloodwood) on lower trunk, decortivating and smooth slaty green above (half bark), young tips reddish or whitish hispid. Juvenile leaves often retained on mature trees, opposite to alternate, petioles hispid, blades broadly ovate, apex obtuse to acute, base peltate, cordate or rounded, up to ca 20 cm × 11 cm, often hispid; adult leaves alternate, petioles 1.2–2.5 cm long, blades narrowly ovate, apex attenuate, base cuneate or slightly oblique, margin often undulate, 7.5–16 cm × 1.8–3.5 cm, slightly paler below, venation distinct, 45°–70° to midrib, intramarginal vein near to but distinct from margin. Inflorescences terminal, often large panicles of 3–7-flowered umbels, peduncles 0.4–2 cm long, pedicels 1–4 mm long; buds broadly ellipsoid or ellipsoid-obovoid, 0.7–1.2 cm long; operculum dark brown, ± hemispherical, often slightly umbonate, shorter than light brown hypanthium. Fruits globular-urceolate, 0.9–1.3 cm × 1–1.4 cm, disc depressed, wide, valves 3, deeply enclosed. **Fig. 21I.** (CCB:A)

Native of rainforest of tropical Queensland in the vicinity of Cairns; extensively cultivated as an ornamental and may become naturalized in favourable sites near habitation in the coastal districts. Flowers spring. Timber brown, hard, strong, subject to gum veins, durable above ground, has been used for general construction.

**10. *Eucalyptus citriodora* Hook.** LEMON SCENTED GUM; LEMON SCENTED IRON GUM

Tree up to 40 m tall; bark decortivating in small or large patches, smooth and usually dimpled (gum). Adult leaves alternate, lemon scented when crushed; petioles 0.8–2.3 cm long; blades linear-ovate to very narrowly ovate, apex attenuate, base narrowly cuneate, 7.5–21 cm × 0.6–2.4(–3.4) cm, concolourous or slightly discolourous, venation visible, regular, 35°–50° to midvein, intramarginal vein distinct but close to margin. Inflorescences axillary racemes of single flowers or 2–5-flowered umbels, peduncles 4–10 mm long, pedicels 2–6 mm long; buds turbinate to pyriform, 6–10 mm long; operculum hemispherical with short umbo, ± half length of hypanthium. Fruits woody, urceolate, 1–1.3 cm × 0.7–1 cm, disc depressed and wide, valves 3, below rim. **Fig. 22A.** (CCC:A)

Northern districts of the region in eucalypt open forests, and woodlands often on slopes. Flowers winter. Timber light brown to grey-brown, hard, strong and very tough, heavy, moderately durable to durable, works easily. Commonly cultivated as an ornamental.

**11. *Eucalyptus maculata* Hook.**

**SPOTTED GUM; SPOTTED IRON GUM**

*Eucalyptus variegata* F. Muell.

Tree up to 40 m tall; bark decorticating in small or large patches, smooth and usually dimpled (gum). Adult leaves alternate; petioles 1–3.5 cm long; blades linear-ovate to narrowly ovate, apex attenuate, base cuneate, 7.5–24 cm × 0.8–4 cm, concolourous or slightly discolourous, venation visible, regular, 35°–50° to midvein, intramarginal vein distinct but close to margin. Inflorescences axillary racemes of single flowers or 2–5-flowered umbels, peduncles 0.2–1.2 cm long, pedicels 2–6.5 mm long; buds turbinate to pyriform, 0.6–1.3 cm long; operculum hemispherical with short umbo to definite beak, ± half length of hypanthium. Fruits woody, urceolate, 1–2 cm × 0.8–1.3 cm, disc depressed and wide, valves 3, below rim. **Fig. 22B.** (CCC:B)

Throughout the region in open forest, often on stony slopes or ridges. Flowers winter to early summer. Timber light brown to grey-brown, hard, strong and very tough, heavy, moderately durable, works easily, produces good poles. Minor importance as a source of honey, medium importance as a source of pollen for bees. Sometimes cultivated.

**HYBRID: *E.* × *nowraensis* Maiden (*E. gummifera* × *E. maculata*)**

**12. *Eucalyptus henryi* S. T. Blake**

**COARSE SPOTTED GUM; LARGE LEAVED SPOTTED GUM**

Tree up to 20 m tall; bark decorticating in patches, smooth and usually dimpled (gum). Adult leaves alternate; petioles 1.5–3 cm long; blades ovate to narrowly ovate, apex attenuate, base cuneate, sometimes oblique, 11.5–28(–30) cm × 2–8.5 cm, concolourous or rarely slightly discolourous, venation usually more distinct on one surface, regular, fine, 35°–50° to midvein, intramarginal vein distinct from margin. Inflorescences axillary racemes or panicles of 3-flowered umbels, rarely terminal, peduncles thick, 4–9 mm long, pedicels 3–5 mm long; buds ellipsoid to turbinate, 1.2–1.5 cm long; operculum hemispherical to broadly conical with short beak or umbo, as long as or shorter than hypanthium. Fruits woody, truncate-ovoid to urceolate, 1.2–2 cm × 1.2–1.5 cm, disc depressed and wide, valves 3, below rim. **Fig. 22C.** (CCC:C)

Moreton district from Brisbane environs southwards, e.g. Strathpine, Mt. Coot-tha, Ipswich, Nerang, in sandy clay or sandy soils. Flowers summer.

**13. *Eucalyptus baileyana* F. Muell.**

**BAILEY'S STRINGYBARK**

Tree up to 40 m tall; bark persistent, dark to almost black, fibrous, with papery layers (stringybark), thick, with large amounts of kino. Adult leaves alternate; petioles 1–2.5 cm long; blades narrowly ovate, apex attenuate, base narrowly cuneate to cuneate, 8–18 cm × 1–3 cm, discolourous, venation visible, usually regular, fine, 50°–60° to midrib, intramarginal vein near margin. Inflorescences 4–8-flowered axillary umbels, peduncles 1.8–3.5 cm long, pedicels 5–10 mm long; buds pyriform to obovoid, *ca* 6–7 mm long; operculum hemispherical, often shortly beaked, shorter than hypanthium; staminal filaments connate in 4 bundles. Fruits globular to globose, often somewhat urceolate, 4-lobed, 0.8–1.4 cm × 1–1.5 cm, faintly longitudinally ridged, disc depressed, wide, valves 3, level with or slightly above rim. **Fig. 22D.** (EFABA)

Moreton, Burnett and Darling Downs districts, usually in eucalypt forest on sandstone ridges. Flowers summer.

**14. *Eucalyptus curtisii* Blakely & C. T. White**

**PLUNKETT MALLEE**

Mallee or small tree up to 12 m tall; bark decorticating in thin strips, smooth (gum). Adult leaves alternate or subopposite; petioles 0.7–1.5 cm long; blades narrowly ovate to ovate, apex attenuate, base cuneate, 5.5–16 cm × 1.2–3.5 cm, discolourous, venation visible, 45°–60° to midrib, intramarginal vein distinct, often remote from margin. Inflorescences terminal or upper axillary racemes or small panicles of

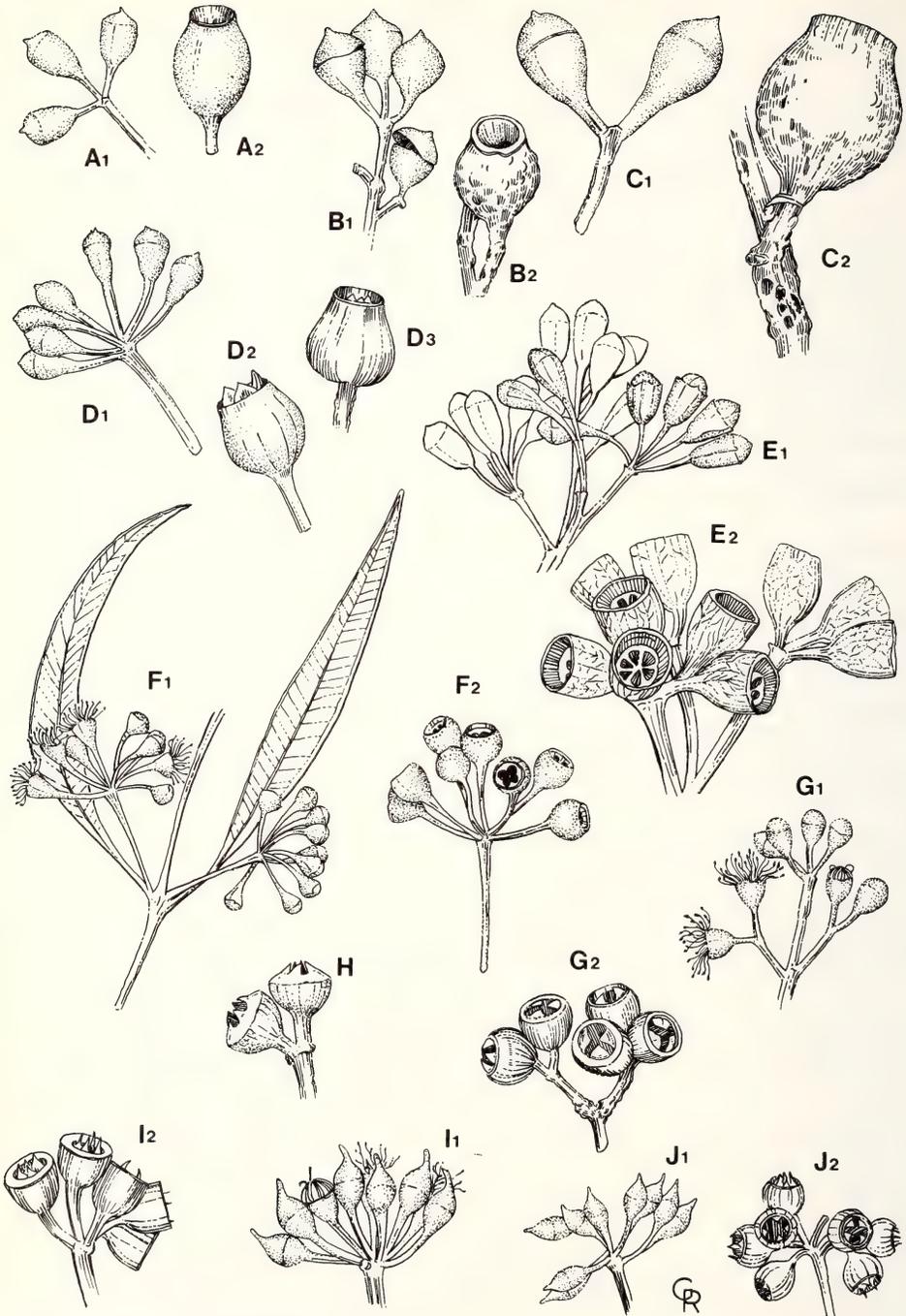


Fig. 22 MYRTACEAE — *Eucalyptus* spp. — A<sub>1</sub>–A<sub>2</sub> *E. citriodora*, A<sub>1</sub> buds x1, A<sub>2</sub> fruits x1; B<sub>1</sub>–B<sub>2</sub> *E. maculata*, B<sub>1</sub> buds x1, B<sub>2</sub> fruits x1; C<sub>1</sub>–C<sub>2</sub> *E. henryi*, C<sub>1</sub> buds x1, C<sub>2</sub> fruits x1; D<sub>1</sub>–D<sub>3</sub> *E. baileyana*, D<sub>1</sub> buds x1, D<sub>2</sub>–D<sub>3</sub> fruits x1; E<sub>1</sub>–E<sub>2</sub> *E. curtisii*, E<sub>1</sub> buds x1, E<sub>2</sub> fruits x1; F<sub>1</sub>–F<sub>2</sub> *E. tenuipes*, F<sub>1</sub> inflorescences with buds and flowers x1, F<sub>2</sub> fruits x1; G<sub>1</sub>–G<sub>2</sub> *E. cloeziana*, G<sub>1</sub> part inflorescence with buds and flowers x1, G<sub>2</sub> fruits x1; H *E. umbra* subsp. *umbra*, fruits x1; I<sub>1</sub>–I<sub>2</sub> *E. umbra* subsp. *carnea*, I<sub>1</sub> buds x1, I<sub>2</sub> fruits x1; J<sub>1</sub>–J<sub>2</sub> *E. acmenoides*, J<sub>1</sub> buds x1, J<sub>2</sub> fruits x1.



*E. umbra* subsp. *umbra* (Fig. 22H.) (MAG:AA) occurs in coastal areas often on poorly drained flats, while *E. umbra* subsp. *carnea* (R. T. Baker) L. A. S. Johnson (*E. carnea* R. T. Baker; *E. acmenoides* var. *carnea* (R. T. Baker) Maiden) (Fig. 22I.) (MAG:AB) occurs in subcoastal areas of the Moreton, Wide Bay and eastern Burnett districts, and is the more common of the two. Flowers spring-early summer. Heartwood light brown, close textured, somewhat interlocked, moderately heavy and moderately durable. Minor importance as a source of both honey and pollen for bees.

### 18. *Eucalyptus acmenoides* Schauer

WHITE MAHOGANY; YELLOW STRINGYBARK

*Eucalyptus triantha* auct. non Link, Blakely

Tree up to 40 m tall; bark persistent, fibrous, rough, fissured longitudinally (stringybark), usually decorticating on upper branches. Adult leaves alternate; petioles 0.8–1.8 cm long; blades narrowly ovate to linear-ovate, apex attenuate, base cuneate, sometimes oblique, 7–15 cm × 0.75–2.5(–4) cm, discolourous, venation barely visible to conspicuous, 35°–60° to midvein, intramarginal vein usually remote from margin. Inflorescences axillary 4–20-flowered umbels or racemes of umbels, peduncles 0.5–2 cm long, slightly flattened, pedicels 2–6 mm long; buds ovoid to ellipsoid, 5–7 mm long; operculum conical, commonly beaked, as long as or longer than hypanthium. Fruits woody, usually truncate-ovoid, 4–5(–6) mm × 4–5(–7) mm, disc flat or depressed, intermediate or narrow, valves usually 4, level with rim. Fig. 22J. (MAG:C)

Throughout the region in open forests on sandy or sandy loam or stony soil. Flowers spring-early summer. Timber yellowish brown or occasionally brown, with close texture and usually interlocked grain, hard, strong, stiff and tough, very durable and termite resistant; one of the best eucalypt timbers to work. Medium importance as a source of honey, major importance as a source of pollen for bees.

### 19. *Eucalyptus laevopinea* R. T. Baker

SILVERTOP STRINGYBARK

*Eucalyptus laevopinea* var. *minor* Maiden, nom. illeg.; *E. laevopinea* var. *minor* auct. non R. T. Baker, Blakely

Tree up to 25 m tall; bark persistent, rough, long fibred, deeply longitudinally fissured (stringybark), smaller branches smooth, whitish. Adult leaves alternate; petioles 0.5–2.5 cm long; blades narrowly ovate, apex acute to attenuate, base cuneate or occasionally oblique, 7.5–20 cm × 1–3(–4.2) cm, concolourous, venation visible, 25°–40° to midvein, intramarginal vein variable, usually some distance from margin. Inflorescences axillary 5–10-flowered umbels, peduncles 0.8–1.8 cm long, usually slightly flattened, pedicels 2–8 mm long; buds clavate to ellipsoid, 6–9 mm long; operculum hemispherical with small umbo, or conical, ± as long as hypanthium. Fruits woody, hemispherical, truncate-ovoid or slightly depressed globular, 0.6–1 cm × 0.7–1.3 cm, generally broader than long, disc slightly to quite raised, very wide, valves 3–4, slightly exserted or rarely below rim. Fig. 23A. (MAHAB)

South-eastern parts of Darling Downs district, east and south-east of Warwick, on basaltic soils on the Great Dividing Ra. Flowers late summer-autumn. Timber pale coloured, moderate strength and durability and weight, used for general construction.

HYBRID: *E. laevopinea* n-var. *turbinata* Blakely & McKie (probably a hybrid with *E. laevopinea* as one parent).

### 20. *E. youmanii* Blakely & McKie

LARGE FRUITED STRINGYBARK;  
YOUMAN'S STRINGYBARK

Tree up to 20 m tall; bark persistent, rough throughout, long fibred, deeply longitudinally fissured (stringybark). Adult leaves alternate; petioles 1–2 cm long; blades ovate to narrowly ovate, apex attenuate to acuminate, base cuneate or narrowly so, oblique, 5.5–18 cm × 0.9–3(–4.5) cm, concolourous, venation visible on one side, faint on the other, 25°–35° to midvein, intramarginal vein variable. Inflorescences axillary 7-flowered, rarely 5–11-flowered umbels, peduncles 0.4–1.5 cm long, flattened, pedicels absent or rarely up to 3 mm long; buds ellipsoid to rhomboid, angular, 6–9 mm long; operculum conical, *ca* as long as hypanthium. Fruits globular or truncate-globose, 0.5–1 cm × 0.7–1.2 cm, often slightly broader than long, disc

steeply raised and very wide, valves usually 3 or 4, markedly exerted. **Fig. 23B.** (MAHAE)

South-eastern Darling Downs district in eucalypt forest on steeply sloping to undulating country on granite and traprock. Flowers summer. Heartwood brown, fissile, and sufficiently durable for fencing, used in general building but not an important commercial species.

**HYBRID: *E. youmanii* n-var. *sphaerocarpa* Blakely & McKie (probably *E. stellulata* Sieber ex DC. × *E. youmanii*)**

**21. *Eucalyptus eugenioides* Sieber ex Sprengel** THIN LEAVED STRINGYBARK; WHITE STRINGYBARK

*Eucalyptus wilkinsoniana* R. T. Baker; *E. laevopinea* R. T. Baker var. *minor* R. T. Baker; *E. wiburdi* Blakely; *E. wilkinsoniana* var. *crassifruca* Blakely; *E. acervula* Sieber ex DC.; *E. piperita* Smith var. *eugenioides* (Sieber ex Sprengel) Benth.; *E. globoidea* auct. non Blakely

Tree up to 30 m tall; bark grey over red-brown, persistent, long fibred, rough throughout, strongly longitudinally furrowed (stringybark). Adult leaves alternate; petioles 0.7–2.2 cm long; blades narrowly ovate, apex acuminate, occasionally attenuate, base cuneate, oblique, 6–15 cm × 1–3.2 cm, concolourous or slightly discolourous, venation visible, 20°–35° to midvein, intramarginal vein distinct or near margin. Inflorescences axillary 7- or more-flowered umbels, peduncles 0.5–1.5 cm long, slightly angular or flattened, pedicels 1–3(–4) mm long; buds ± ellipsoid, 6–7 mm long, smooth; operculum conical or semi-ellipsoid, usually shortly beaked, slightly shorter than hypanthium. Fruits woody, truncate-ovoid, to hemispherical, 4–8 mm × 5–10 mm, disc flat or only slightly raised, usually 1–1.5 mm wide, valves 3 or 4, ± level with rim or exerted. **Fig. 23C.** (MAHEA)

Mainly McPherson Ra. and Great Dividing Ra. north to Bunya Mts., on the more fertile soils at higher altitudes e.g. Mt. Tamborine, Binna Burra, Cunningham's Gap, Highfields. Flowers mainly spring–summer. Timber light brown to pale pink, hard, strong and tough, durable or moderately so, generally straight grained and easy to split.

On sandstone areas or sandy soil in the Dawes Ra. north of Monto in the Burnett district is a form with pedicels 3–4 mm long and has variously been referred to as *E. nigra* or *E. sp. aff. E. nigra* since it occurs in a habitat in which *E. nigra* is more commonly found than *E. eugenioides* but has long pedicellate buds and fruits. Further study is necessary to determine where this taxon should be placed.

In typical forms of *E. eugenioides* the disc is flat or slightly ascending, but in some areas along the Great Dividing Ra. the disc in the fruits of some plants is more markedly raised and atypical. See also note on *E. tindaliae* Blakely, under **22. *E. nigra*.**

**22. *Eucalyptus nigra* R. T. Baker** QUEENSLAND WHITE STRINGYBARK

*Eucalyptus phaeotricha* Blakely & McKie  
Tree up to 30 m tall; bark grey or grey-brown over red-brown, persistent, rough throughout or sometimes upper branches smooth, fibrous and stringy, prominently fissured (stringybark). Adult leaves alternate; petioles 0.8–1.6 cm long; blades ovate or narrowly ovate, apex acute to acuminate, base cuneate to oblique, 7–15 cm × 1.5–3.5(–4) cm, slightly discolourous to concolourous, venation visible, 20°–35° to midvein, intramarginal vein distinct or near margin. Inflorescences axillary 11- or more-flowered umbels, peduncles 0.8–1.2 cm long, ± flattened, pedicels 0–2 mm long; buds obovoid, 6–7 mm long, minutely warted with oil glands; operculum obtusely conical or somewhat rounded. Fruits hemispherical or broader than long, 0.4–0.8 cm × 0.6–1.1 cm, disc ascending, 1.5–2 mm wide, valves 3 or 4, ± level with rim or slightly exerted. **Fig. 23D.** (MAHEB)

Mainly coastal districts in siliceous soils at lower altitudes, e.g. Canungra, Stradbroke I., Beerwah, Maryborough areas. Flowers summer–autumn. Timber pale, moderate weight, fissile, strong and durable in the ground, a first class general construction timber used both for house framing and general building, also satisfactory for flooring and inside finish. Minor importance as a source of both honey and pollen for bees.

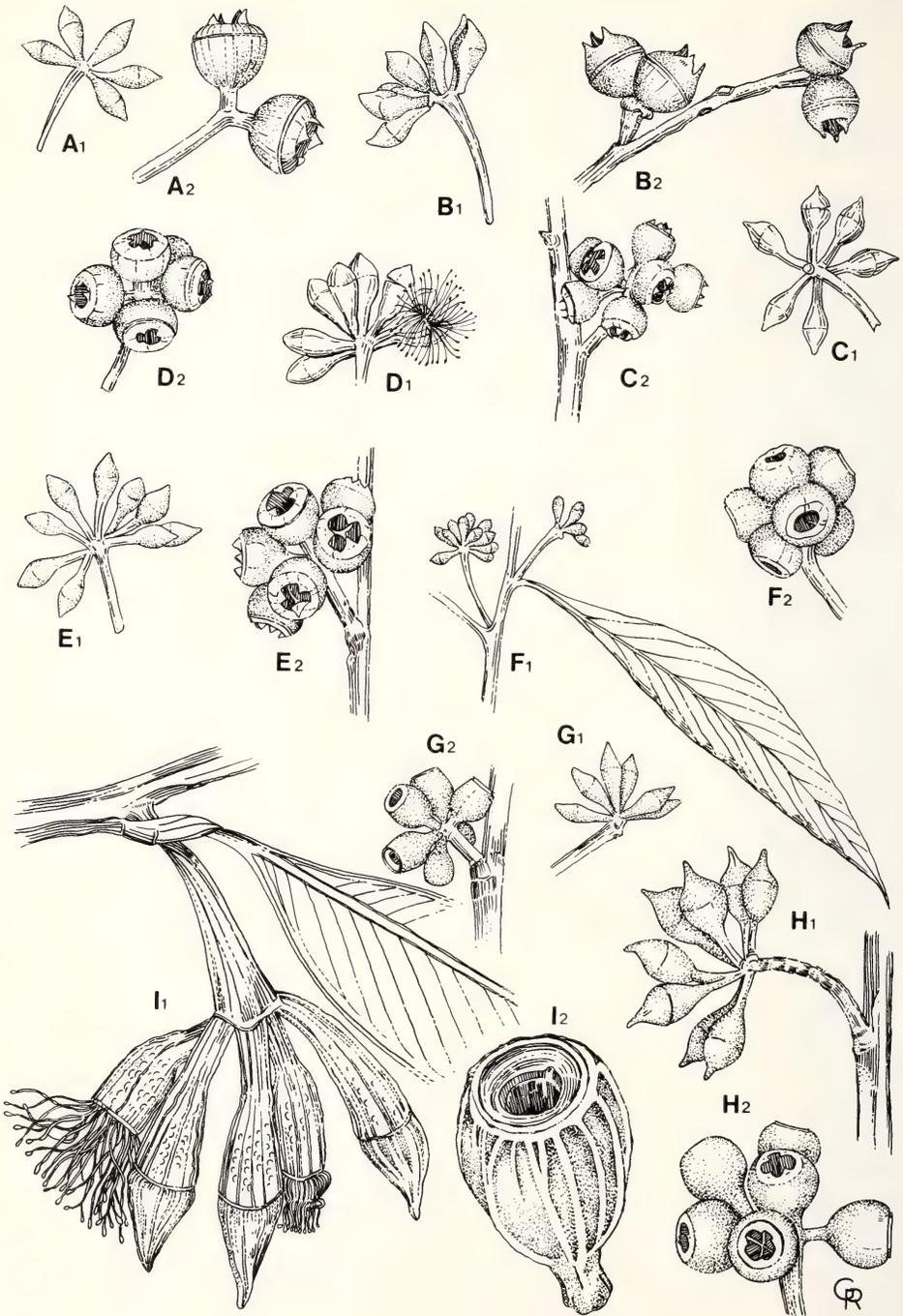


Fig. 23 MYRTACEAE — *Eucalyptus* spp. — A<sub>1</sub>–A<sub>2</sub> *E. laevopinea*, A<sub>1</sub> buds x1, A<sub>2</sub> fruits x1; B<sub>1</sub>–B<sub>2</sub> *E. youmanii*, B<sub>1</sub> buds x1, B<sub>2</sub> fruits x1; C<sub>1</sub>–C<sub>2</sub> *E. eugenioides*, C<sub>1</sub> buds x1, C<sub>2</sub> fruits x1; D<sub>1</sub>–D<sub>2</sub> *E. nigra*, D<sub>1</sub> buds x1, D<sub>2</sub> fruits x1; E<sub>1</sub>–E<sub>2</sub> *E. caliginosa*, E<sub>1</sub> buds x1, E<sub>2</sub> fruits x1; F<sub>1</sub>–F<sub>2</sub> *E. cameronii*, F<sub>1</sub> inflorescences with buds x1, F<sub>2</sub> fruits x1; G<sub>1</sub>–G<sub>2</sub> *E. conglomerata*, G<sub>1</sub> buds x1, G<sub>2</sub> fruits x1; H<sub>1</sub>–H<sub>2</sub> *E. pitularis*, H<sub>1</sub> buds x1, H<sub>2</sub> fruits x1; I<sub>1</sub>–I<sub>2</sub> *E. planchoniana*, I<sub>1</sub> inflorescence with buds and flowers x1, I<sub>2</sub> fruit x1.

Considerable variation in this species and *E. eugenioides* makes clear distinction between the two very difficult. See also notes under 21. *E. eugenioides* for atypical or intergrading taxa. Some authorities maintain that *E. tindaliae* Blakely, TINDALE'S STRINGYBARK; RAMORNIE STRINGYBARK, occurs in south-eastern Queensland though the usually accepted distribution of that species is from the far north coast of New South Wales to Woolgoolga. It can be distinguished from *E. nigra* by its buds not being warted and its disc being 2–2.5 mm wide, convex, and bright reddish when fresh.

**23. *Eucalyptus caliginosa* Blakely & McKie** BROAD LEAVED  
STRINGYBARK; NEW ENGLAND STRINGYBARK

*Eucalyptus cyathiformis* Blakely & McKie

Tree up to ca 25 m tall; bark grey over red-brown, rough throughout, thick, fibrous and stringy, often deeply furrowed (stringybark). Adult leaves alternate; petioles 0.5–1.5(–2) cm long; blades ovate or narrowly ovate, often falcate, apex acute to attenuate, base oblique or sometimes broadly cuneate, 6–13(–16.5) cm × 1–3(–3.5) cm, concolourous, venation visible, 15°–30° to midvein, intramarginal vein usually distant from margin. Inflorescences axillary simple 7–many-flowered umbels, peduncles sometimes flattened, 0.5–1.5 cm long, pedicels 2–5 mm long; buds ± ellipsoid, 6–7 mm long; operculum conical, sometimes with an umbo. Fruits hemispherical, occasionally truncate-globose, 5–7 mm × 6–9 mm, rim thick, disc level to slightly ascending, valves 3 or 4, exserted, or ± level with rim. **Fig. 23E.** (MAHED)

Mainly the Granite Belt area of the Darling Downs district. Flowers mainly autumn–winter or early spring. Timber heavy, hard, at least moderately durable, splits and saws readily for a eucalypt, uses varied, e.g. firewood, fencing, light framing.

HYBRID: *E.* × *tinghaensis* Blakely & McKie (hybrid swarm *E. caliginosa* × *E. mckieana* Blakely) See also 24. *E. cameronii*.

**24. *Eucalyptus cameronii* Blakely & McKie** DIEHARD STRINGYBARK

Tree up to ca 30 m tall; bark persistent, fibrous, longitudinally fissured (stringybark). Adult leaves alternate; petioles 0.5–1.2 cm long; blades narrowly ovate, commonly falcate, apex attenuate, base oblique, 5–10 cm × 1–2.5 cm, nearly concolourous, venation faint, 25°–40° to midvein, intramarginal vein distinct from margin. Inflorescences axillary 7–15-flowered umbels, peduncles 5–10 mm long, pedicels absent; buds ovoid or ellipsoid, 3–5 mm long; operculum semi-ellipsoid, slightly shorter than hypanthium. Fruits woody, globular, 3–5 mm × 6–8 mm, crowded, disc depressed, narrow, valves 4, just below level of rim. **Fig. 23F.** (MAHEH)

Southernmost parts of the Darling Downs district on undulating granite country; rare. Flowers spring. Heartwood light brown, of moderately fine texture and relatively easy to work, strong and durable but high shrinkage in drying; used for general building and commercially important.

*E. mckieana* Blakely, McKIE'S STRINGYBARK, is thought by some specialists to occur in Queensland but there are no authentic records at the Queensland Herbarium. *E. mckieana* can be distinguished from *E. cameronii* by its pedicellate buds. See also 23. *E. caliginosa*.

**25. *Eucalyptus conglomerata* Maiden & Blakely** SWAMP STRINGYBARK

Tree up to 12 m tall; bark fibrous, persistent, longitudinally and sometimes transversely fissured (atypical stringybark). Adult leaves alternate; petioles 1–2.2 cm long; blades ovate to narrowly ovate, apex acute, apiculate, base cuneate, usually oblique, 6–16 cm × 1.3–3.5 cm, concolourous, venation faint, 20°–35° to midrib, intramarginal vein remote. Inflorescences axillary, multi-flowered umbels, often racemose by leaf abortion, peduncles flattened, 5–10 mm long, pedicels 0–2 mm long; buds narrowly ellipsoid, 5–6 mm long; operculum truncate-ellipsoid to conical, shorter than hypanthium. Fruits woody, globular to truncate-ovoid, 4–5(–6) mm ×

4–5(–6) mm, often crowded, disc depressed to flat, wide, valves 3, usually just below rim. **Fig. 23G.** (MAHEJ)

Swampy wallum or poor sandy areas fringing wallum flats in the Moreton and Wide Bay districts; rare. Flowers late winter.

## 26. *Eucalyptus pilularis* Smith

BLACKBUTT

*Eucalyptus semicorticata* F. Muell.

Tree up to 60 m tall; bark grey-brown, rough, fibrous, persistent on lower trunk, decorticating in strips and smooth on upper trunk and branches (half bark). Adult leaves alternate; petioles 1–2 cm long; blades narrowly ovate, sometimes falcate, apex attenuate, base cuneate, oblique, 7.5–19 cm × 1.2–4 cm, discolourous, venation usually visible, 30°–45° to midvein, intramarginal vein usually distant from margin. Inflorescences axillary 6–12-flowered umbels, peduncles flattened, 0.8–2.5 cm long, pedicels 2–8 mm long; buds ovoid to ellipsoid, 0.9–1.1 cm long; operculum conical, often beaked, longer than hypanthium. Fruits woody, truncate-ovoid to hemispherical, 0.7–1 cm × 0.8–1.1 cm, broader than long, disc flat or depressed, medium to wide, valves 4, ± level with rim. **Fig. 23H.** (MAIAAA)

Moreton, Darling Downs and Wide Bay districts, on slopes on sandy or other well drained siliceous soils, often on high sand dunes of the offshore islands. Flowers mainly summer–autumn, sometimes spring. Timber light yellowish brown, hard, strong, stiff and tough, of moderate to good durability, usually straight grained and easily worked, used mainly in general and house construction and is the principal commercial hardwood species of this region.

## 27. *Eucalyptus planchoniana* F. Muell.

NEEDLEBARK; BASTARD  
TALLOWOOD; NEEDLEBARK STRINGYBARK; PLANCHON'S  
STRINGYBARK

Tree up to 30 m tall or often a mallee on offshore islands; bark rough, persistent, hard, splintery-fibred with shallow longitudinal furrows (hard stringybark). Adult leaves alternate; petioles 1.5–3 cm long; blades very narrowly ovate to narrowly ovate, apex attenuate, base cuneate, sometimes oblique, 11–20(–23) cm × 1.5–4 cm, concolourous, venation visible, 45°–60° to midrib, intramarginal vein variable. Inflorescences of 4–7-flowered axillary umbels, peduncles distinctly flattened, 1.5–3 cm long, pedicels 2–8 mm long; buds elongated ellipsoid, ridged, 2.3–3 cm long; operculum narrowly conical, slightly shorter than hypanthium. Fruits woody, globular to truncate-ovoid, 1.5–2.5 cm × 1.6–2.5 cm, usually slightly longer than broad, longitudinally ridged, disc depressed, wide, valves 4, below rim. **Fig. 23I.** (MAIBB)

Moreton district on low ridges and gentle slopes of the offshore islands on deep sandy soils, or subcoastal sandstone areas. Flowers summer. Heartwood light to dark brown, sometimes greasy, hard, moderately heavy, durable, suitable for general construction.

## 28. *Eucalyptus obliqua* L'Hérit.

MESSMATE STRINGYBARK

*Eucalyptus obliqua* var. *degressa* Blakely; *E. obliqua* var. *megacarpa* Blakely; *E. obliqua* var. *microstoma* Blakely; *E. obliqua* var. *pilula* Blakely; *E. pallens* DC.; *E. decaisneana* Blume; *E. heterophylla* Miq.; *E. nervosa* F. Muell. ex Miq.

Tree up to 60 m tall; bark persistent, rough, fibrous, furrowed (stringybark). Adult leaves alternate; petioles 1–2.1 cm long; blades ovate, commonly falcate, apex attenuate or acuminate, base cuneate, oblique, 6.5–15 cm × 1.3–4 cm, concolourous or slightly paler beneath, venation usually distinct, 20°–30° to midvein, intramarginal vein distinct and remote from margin. Inflorescences axillary 7–12-flowered umbels, peduncles slightly to distinctly flattened, 0.6–1.5 cm long, pedicels 2–5 mm long; buds clavate, 5–7 mm long; operculum hemispherical, very shortly beaked, shorter than hypanthium. Fruits woody, truncate-ovoid or ellipsoid, sometimes somewhat urceolate, 0.7–1.1 cm × 0.6–0.9 cm, often faintly longitudinally ribbed, disc depressed, intermediate to wide, valves usually 4, below rim. **Fig. 24A.** (MAKAA)

Great Dividing Ra. east of Warwick and Girraween National Park in the Darling Downs district; rare. Flowers mainly summer. Wood pale brown to brown, with open texture, usually straight grain and fairly well defined annual rings, of moderate hardness, strength and durability, splits readily, easily worked, glued and stained, used for pulp production and a wide range of purposes in construction and manufacture; one of the most important commercial hardwoods in Australia.

HYBRIDS: *E. obliqua* n-var. **discocarpa** Blakely (probably *E. muelleriana* × *E. obliqua*).

**29. *Eucalyptus oreades*** R. T. Baker BLUE MOUNTAINS ASH; SMOOTH BARKED MOUNTAIN ASH

*Eucalyptus altior* Maiden; *E. luehmanniana* F. Muell. var. *altior* Deane & Maiden  
Tree up to 35 m tall; bark persistent, rough, fibrous, finely fissured at base (box bark), decorticating above in long strips, (gum). Adult leaves alternate; petioles 1–2.3 cm long; blades narrowly ovate, falcate, apex attenuate, base cuneate, oblique, 6.5–16(–21) cm × 1.3–3(–4) cm, concolourous, venation visible, 15°–25° to midvein, intramarginal vein remote. Inflorescences axillary 6–9-flowered umbels, peduncles flattened, 1–2.2 cm long, pedicels 2–4 mm long; buds ellipsoid to turbinate, 3–6 mm long; operculum hemispherical to conical, usually shortly beaked, ± as long as hypanthium. Fruits woody, hemispherical to cylindrical, 6–10 mm × 6–10 mm, disc usually flat and wide, valves 4, below rim. **Fig. 24B.** (MAKDA)

McPherson Ra. e.g. Springbrook, Lamington Plateau, on rhyolite or trachyte at high altitudes. Flowers summer.

**30. *Eucalyptus pauciflora*** Sieber ex Sprengel SNOW GUM; WHITE SALLY

*Eucalyptus coriacea* Cunn. ex Schauer; *E. phlebophylla* F. Muell. ex Miq.; *E. submultiplinervis* Miq.; *E. sylvicultrix* F. Muell.

Tree usually up to 18 m tall; bark smooth throughout, white, creamy-white or greyish white, often with scribbles. Adult leaves alternate; petioles (0.5–)1.2–2.8 cm long; blades narrowly ovate-elliptic to ovate, often falcate, apex acuminate, base cuneate, 6–16(–20) cm × 1–3.5(–4.3) cm, concolourous, green to blue green, glossy, thick, venation conspicuous, from longitudinal to *ca* 20° to midvein, intramarginal vein distinct. Inflorescences simple, axillary 11- or more-flowered umbels, peduncles stout, 0.7–2.2 cm long, pedicels 1–4 mm long; buds obovate to clavate, often warty, 7–9 mm long, sometimes glaucous; operculum hemispherical to conical, often umbonate. Fruits cupular to obconical, 0.7–1.1 cm × 0.8–1.1 cm, disc level to slightly descending, thick, valves 3, rarely 4, ± level with rim. **Fig. 24C.** (MAKHAA)

Recorded from Bald Rock National Park in New South Wales, possibly to be found in adjacent high altitude areas of southern most Queensland. Flowers spring–summer. Timber light pinkish brown, rather lightweight, comparatively soft, moderately strong but with many gum veins, sometimes used for fence posts and firewood but usually left since it is an important member of the protection forests of alpine areas.

HYBRIDS: *E. pauciflora* n-var. **cylindrocarpa** Blakely )  
& McKie )  
*E. pauciflora* n-var. **densiflora** Blakely & ) probably all hybrids with  
McKie ) ***E. pauciflora*** as one parent  
*E. pauciflora* n-var. **rusticata** Blakely & )  
McKie )  
*E. × vitrea* R. T. Baker (***E. pauciflora*** subsp. ***pauciflora*** × *E. radiata*  
subsp. ***radiata***)

**31. *Eucalyptus approximans*** Maiden MALLEE ASH; NEW ENGLAND MALLEE; BARREN MOUNTAIN MALLEE

Includes *Eucalyptus codonocarpa* Blakely & McKie

Mallee up to 5 m tall; bark decorticating, smooth (gum). Adult leaves alternate; petioles 0.5–1.5 cm long; blades narrowly ovate, apex attenuate, base attenuate to narrowly cuneate, 4.5–15 cm × 0.6–2.2 cm, usually concolourous, venation usually visible below, 15°–20° to midrib, intramarginal vein remote. Inflorescences axillary 3–7-flowered umbels, peduncles 5–10 mm long, flattened, pedicels 0–3 mm long; buds turbinate, 5–7 mm long; operculum hemispherical, shorter than hypanthium. Fruits woody, cylindrical or campanulate, 6–9 mm × 5–8 mm, disc shallowly depressed to flat, usually narrow, valves 3, below or level with rim. **Fig. 24D.** (MAKIKB)

Recorded from near the top of Mt. Norman near Wallangarra, in pockets of soil in clefts on granite outcrops, and the tops of Mt. Barney, Mt. Maroon, Springbrook, and Ship's Stern Ra. and Dave's Ck. Country in Lamington National Park, on trachyte or rhyolite in depressions of rocky areas. Flowers autumn–winter.

The Queensland specimens are considered by some eucalypt specialists to belong to a different taxon from either *E. approximans* subsp. *approximans* or *E. approximans* subsp. *codonocarpa* (Blakely & McKie) L. A. S. Johnson & Blaxell (*E. codonocarpa* Blakely & McKie), though the Mt. Norman material seems superficially at least to resemble that of *E. approximans* subsp. *codonocarpa* from the type locality. Further study is necessary to accurately place this form (or forms).

### 32. *Eucalyptus radiata* Sieber ex DC. NARROW LEAVED PEPPERMINT

*Eucalyptus australiana* R. T. Baker & H. G. Smith; *E. radiata* var. *australiana* (R. T. Baker & H. G. Smith) Blakely; *E. radiata* var. *subexserta* Blakely; *E. radiata* var. *subplatyphylla* Blakely & McKie; *E. phellandra* R. T. Baker & H. G. Smith

Tree up to 15 m tall; bark persistent, rough, fibrous, finely fissured (box or peppermint bark). Adult leaves alternate or subopposite; petioles 1–1.3(–2) cm long; blades very narrowly ovate, sometimes falcate, apex attenuate, base attenuate, sometimes oblique, 7–15 cm × 0.7–1.5(–2.2) cm, concolourous, venation usually visible, 20°–30° to midrib, intramarginal vein remote, sometimes 2 present. Inflorescences axillary 8–16-flowered umbels, peduncles 5–10 mm long, pedicels 2–4 mm long; buds clavate, 4–6 mm long; operculum hemispherical, shortly beaked, shorter than hypanthium. Fruits woody, truncate-ovoid to globular, 3–6 mm × 3–6 mm, disc flat or slightly depressed, moderately wide, valves 3 or 4, below rim. **Fig. 24E.** (MATELA)

Southern Darling Downs district on undulating or mountainous country; rare. Flowers spring–summer. Timber pale pink or light brown, open textured, straight grained with kino pockets, light, fairly easily worked and readily split, moderately hard and strong, but durability low for use in contact with the ground, suitable for light construction with select grades for joinery. Some varieties or forms are important sources of essential oils, e.g. cineol.

HYBRID: *E.* × *vitrea* R. T. Baker (*E. pauciflora* subsp. *pauciflora* × *E. radiata* subsp. *radiata*)

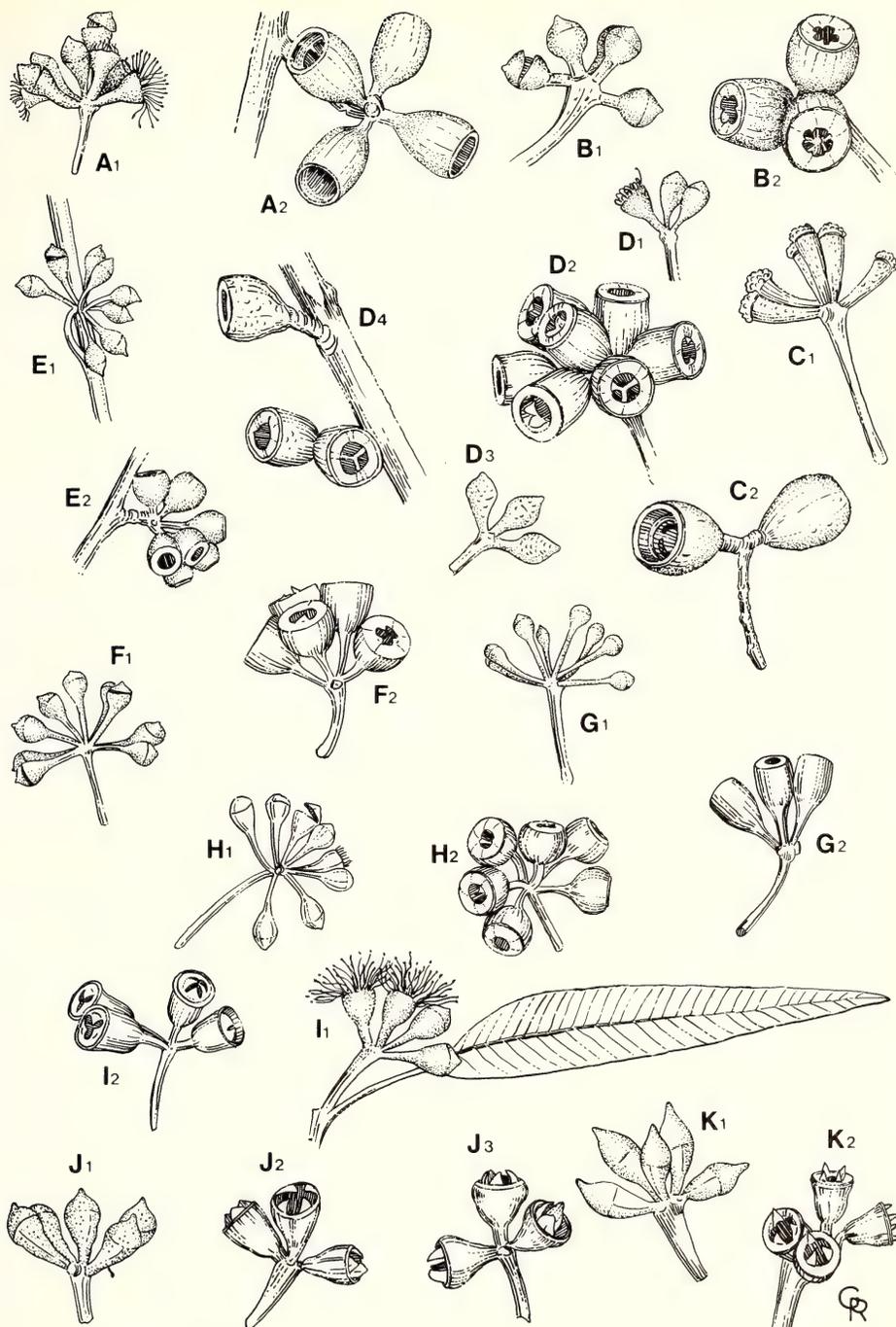
### 33. *Eucalyptus andrewsii* Maiden NEW ENGLAND BLACKBUTT

Tree up to 40 m tall; bark persistent, rough, fibrous, with deep longitudinal fissures (peppermint or box bark). Adult leaves alternate; petioles 1.2–2.5 cm long; blades narrowly ovate, usually falcate, apex attenuate, base cuneate, usually oblique, 8.5–21 cm × 0.8–4 cm, often glaucous, concolourous, venation faint to visible, 15°–25° to midvein, intramarginal vein remote. Inflorescences axillary 7–15-flowered umbels or sometimes racemes or panicles of umbels, peduncles 1–2.5 cm long, often flattened, pedicels 5–7 mm long; buds clavate to globular, 3–5 mm long; operculum hemispherical, sometimes apiculate, shorter than hypanthium. Fruits woody, obconical, pyriform, campanulate or hemispherical, 4–7 mm × 5–8 mm, disc usually flat, wide, valves usually 4, below or level with rim.

Two subspecies occur in the region:

- Juvenile leaves and generally buds dull bluish green to glaucous; fruits hemispherical, as wide as or wider than long . . . . . *E. andrewsii* subsp. *andrewsii*
- Juvenile leaves stems and buds not glaucous; fruits obconical, pyriform to campanulate, longer than wide . . . . . *E. andrewsii* subsp. *campanulata*

*E. andrewsii* subsp. *andrewsii* (**Fig. 24F.**) (MATHDA) is found mainly on western and southern areas of the Granite Belt and is a smaller tree than *E. andrewsii* subsp. *campanulata* (R. T. Baker & H. G. Smith) L. A. S. Johnson & D. Blaxell (*E. campanulata* R. T. Baker & H. G. Smith) (**Fig. 24G.**) (MATHDB) which is found throughout the region in rocky or mountainous areas, e.g. eastern Granite Belt, McPherson Ra., Mt. Walsh. Flowers late spring–summer. Timber pale coloured, open grained, hard, moderately strong and heavy and moderately durable though *E. andrewsii* subsp. *campanulata* has a tendency to form gum veins and shakes. Both are used in general construction. *E. andrewsii* subsp. *campanulata* has also been called NEW ENGLAND ASH or GUM TOPPED PEPPERMINT.



**Fig. 24** MYRTACEAE — *Eucalyptus* spp. — A<sub>1</sub>–A<sub>2</sub> *E. obliqua*, A<sub>1</sub> buds x1, A<sub>2</sub> fruits x1; B<sub>1</sub>–B<sub>2</sub> *E. oreades*, B<sub>1</sub> buds x1, B<sub>2</sub> fruits x1; C<sub>1</sub>–C<sub>2</sub> *E. pauciflora*, C<sub>1</sub> buds x1, C<sub>2</sub> fruits x1; D<sub>1</sub>–D<sub>4</sub> *E. approximans*, D<sub>1</sub>–D<sub>2</sub> Lamington Plateau form, D<sub>1</sub> buds x1, D<sub>2</sub> fruits x1, D<sub>3</sub>–D<sub>4</sub> Mt. Norman form, D<sub>3</sub> buds x1, D<sub>4</sub> fruits x1; E<sub>1</sub>–E<sub>2</sub> *E. radiata*, E<sub>1</sub> buds x1, E<sub>2</sub> fruits x1; F<sub>1</sub>–F<sub>2</sub> *E. andrewsii* subsp. *andrewsii*, F<sub>1</sub> buds x1, F<sub>2</sub> fruits x1; G<sub>1</sub>–G<sub>2</sub> *E. andrewsii* subsp. *campanulata*, G<sub>1</sub> buds x1, G<sub>2</sub> fruits x1; H<sub>1</sub>–H<sub>2</sub> *E. signata*, H<sub>1</sub> buds x1, H<sub>2</sub> fruits x1; I<sub>1</sub>–I<sub>2</sub> *E. deanei*, I<sub>1</sub> inflorescence with buds and flowers x1, I<sub>2</sub> fruits x1; J<sub>1</sub>–J<sub>3</sub> *E. grandis*, J<sub>1</sub> buds x1, J<sub>2</sub>–J<sub>3</sub> fruits x1; K<sub>1</sub>–K<sub>2</sub> *E. saligna*, K<sub>1</sub> buds x1, K<sub>2</sub> fruits x1.

**34. *Eucalyptus signata* F. Muell.**

SCRIBBLY GUM

*Eucalyptus micrantha* DC. var. *signata* (F. Muell.) Blakely; *E. racemosa* var. *signata* (F. Muell.) R. D. Johnston & R. Marryatt

Tree up to 20 m tall, sometimes a mallee on deeply weathered sands; bark smooth, decorticating, marked by tracks of insect larvae (scribbly gum). Adult leaves alternate; petioles 0.9–2 cm long; blades very narrowly ovate to narrowly ovate, often falcate, apex attenuate, base cuneate, often oblique, 7–18.5 cm × 1–3.5(–5.5) cm, inconspicuous, venation usually visible, 15°–40° to midrib, intramarginal vein variable. Inflorescences of axillary 5–12-flowered umbels, rarely in short terminal panicles, peduncles 0.5–1(–2) cm long, usually flattened, pedicels tapering into bud, 2–5 mm long; buds clavate, 3–5 mm long; operculum hemispherical, often apiculate, shorter than hypanthium. Fruits woody, hemispherical to pyriform, 5–7 mm × 4–6 mm, disc flat or slightly raised, wide, valves usually 4, ± level with or below rim. **Fig. 24H.** (MATKD)

Moreton and Wide Bay districts mainly on sandy slopes or hillsides with heaths, but also areas of sandstone and rhyolite, e.g. Ship's Stern Ra., near Binna Burra. Flowers winter–spring. Minor importance as a source of honey, negligible importance as a source of pollen for bees.

**35. *Eucalyptus deanei* Maiden** DEANE'S GUM; ROUND LEAVED GUM; MOUNTAIN BLUE GUM; BROWN GUM

Tree up to 50 m tall; bark decorticating, cream when new, weathering to grey and red-brown patches, smooth (gum), sometimes rough at base. Adults leaves alternate; petioles 1.5–3 cm long; blades narrowly ovate to ovate, apex attenuate, base cuneate, sometimes oblique, 7–15 cm × 1.5–4.5(–5) cm, discoloured, venation visible, 35°–45° to midvein, intramarginal vein near margin or narrow leaves. Inflorescences axillary 6–10-flowered umbels, peduncles 0.7–1.5 cm long, slightly to distinctly flattened, pedicels 2–7 mm long; buds turbinate to pyriform, 3–6 mm long; operculum hemispherical, often shortly beaked, shorter than hypanthium. Fruits campanulate to turbinate, sometimes slightly urcelolate, 4–6 mm × 5–6 mm, disc flat, narrow, valves 3 or 4, below or just above rim. **Fig. 24I.** (SECAA)

Southern Darling Downs district in moist eucalypt forest on lower slopes of fertile valleys on Great Dividing Ra. and Granite Belt. Flowers mainly late summer–autumn. Timber hard, strong, stiff, tough, moderately durable but the trees are not usually as sound as *E. saligna*; used for general house construction especially framing and flooring.

**36. *Eucalyptus grandis* W. Hill ex Maiden** FLOODED GUM; ROSE GUM*Eucalyptus saligna* var. *pallidivalvis* R. T. Baker & H. G. Smith

Tree up to 50 m tall; bark decorticating in long strips, smooth (gum), often rough, scaly, persistent at base of trunk. Adult leaves alternate; petioles 1–2.5 cm long; blades very narrowly ovate to narrowly ovate, apex attenuate, base cuneate to rounded, 8–12 cm × 1.2–4(–5) cm, discoloured, venation fine, regular, 35°–55° to midvein, intramarginal vein close to margin. Inflorescences axillary 4–12-flowered umbels, peduncles 0.5–1.5 cm long, flattened, pedicels 0–4 mm long; buds ellipsoid to turbinate, 7–10 mm long; operculum conical to hemispherical, beaked, ± as long as hypanthium. Fruits woody, turbinate to pyriform, 5–8 mm × 5–7 mm, somewhat glaucous, disc depressed, narrow, valves 3–5, level with rim or exerted, incurved. **Fig. 24J.** (SECAB)

Moreton and Wide Bay districts in moist eucalypt forest often with rainforest elements in the understorey, in moist loamy soils of alluvial or volcanic origin. Flowers mainly autumn. Cultivated as an ornamental. Timber pink to light reddish brown, moderately hard, very variable in density, of moderate strength and durability, straight grained but coarse in texture, used extensively for house construction. Minor importance as a source of honey, medium importance as a source of pollen for bees.

HYBRID: *E. grandis* n-var. *grandiflora* Maiden (*E. grandis* × *E. robusta*)

**37. *Eucalyptus saligna* Smith**

SYDNEY BLUE GUM

*Eucalyptus saligna* var. *protusa* Blakely & McKie

Tree up to ca 50 m tall; bark decorticating in long strips, smooth (gum), but often rough and persistent, flaky at base of trunk. Adult leaves alternate; petioles 1–2.5 cm

long; blades very narrowly ovate to narrowly ovate, apex attenuate, base cuneate to rounded, 7.5–23 cm × 1–4(–4.5) cm, discolourous, venation fine, regular, 35°–55° to midvein, intramarginal vein close to margin. Inflorescences axillary 7–12-flowered umbels, peduncles 0.5–1.5 cm long, flattened, pedicels 0–5 mm long, buds ellipsoid to turbinate, 6–9 mm long; operculum conical to hemispherical, beaked, *ca* as long as hypanthium. Fruits woody, turbinate to pyriform, 5–8 mm × 4–7 mm, disc depressed, narrow, valves 3–5, level with rim or exerted, often strongly turned outwards. **Fig. 24K.** (SECAC)

Eastern Darling Downs, Moreton, south-western and northern Wide Bay and northern Burnett districts, usually at higher altitudes or mountain slopes, e.g. Crow's Nest, McPherson Ra., Blackall Ra., Dawes Ra., in eucalypt forest on moderately fertile soils. Flowers summer–autumn. Timber red or pink, hard, strong, stiff and tough, moderately dense and moderately durable, coarse textured, with straight or sometimes wavy grain, easy to work, dress and finish, and takes a good polish; used as a general purpose hardwood and is one of the important construction timbers in New South Wales.

**HYBRID:** *E. botryoides* Smith n-var. *lynei* Blakely (*E. resinifera* × *E. saligna*)

**38. *Eucalyptus robusta* Smith** SWAMP MAHOGANY; SWAMP MESSMATE

*Eucalyptus multiflora* Poiret; *E. robusta* var. *bivalvis* Blakely; *E. rostrata* Cav.

Tree up to 25 m tall, sometimes mallee; bark rough, persistent, fibrous, furrowed, flaky (scalybark). Adult leaves alternate; petioles 2–3.5 cm long; blades ovate, apex attenuate, base cuneate, rounded or oblique, 8.5–25 cm × 3–8 cm, discolourous, venation regular, fine, visible, 50°–60° to midrib, intramarginal vein distinct but usually close to margin. Inflorescences axillary 5–10-flowered umbels, peduncles strongly flattened, 1–2.5 cm long, pedicels (0–)0.4–1.3 cm long; buds ovoid or ellipsoid, constricted at base of operculum, 1.5–2(–2.4) cm long; operculum elongated-conical or acuminate, strongly beaked, ± as long as or much longer than hypanthium. Fruits woody, cylindrical to campanulate, 0.9–1.6 cm × 0.8–1.1 cm, disc flat or depressed, intermediate width, valves 3, rarely 4, below or slightly above rim, usually joined across orifice. **Fig. 25A.** (SECAF)

Moreton and Wide Bay districts, occurring mainly in swampy wallum country. Flowers autumn–winter. Cultivated as an ornamental. Timber light red to reddish brown, coarse textured, moderately hard, strong and durable, rather light. Minor importance as a source of pollen and honey for bees.

**HYBRIDS:** *E.* × *kirtoniana* F. Muell.; *E.* × *patentinervis* R. T. Baker (*E. robusta* × *E. tereticornis*)

*E. grandis* n-var. *grandiflora* Maiden (*E. grandis* × *E. robusta*)

**39. *Eucalyptus pellita* F. Muell** LARGE FRUITED RED MAHOGANY

Tree up to 35 m tall, generally much smaller in south-eastern Queensland; bark persistent, reddish brown, rough, shortly fibrous, soft, spongy, usually coarsely fissured and layered, flaky or scaly (scaly or stringy-bark). Adult leaves alternate or sometimes subopposite; petioles 1.5–3.3 cm long; blades narrowly ovate to ovate, apex attenuate, base cuneate or broadly cuneate, or oblique, 8–25 cm × 2–6.3 cm, discolourous, venation regular, visible, 45°–60° to midvein, intramarginal vein distinct; often remote from margin. Inflorescences of axillary simple 3–7-flowered umbels, peduncles distinctly flattened, 1–2.5 cm × 0.4–0.7 cm at apex, pedicels stout, usually angular, 2–10 mm long; buds turbinate to ellipsoid-obovoid, 1.1–1.6 cm long; operculum conical to somewhat hemispherical, beaked, sometimes broader and longer than hypanthium. Fruits woody, turbinate or cupular, 0.7–1.5 cm × (0.7–)0.8–1.5 cm, disc ± flat, wide, valves usually 4, occasionally 3 or 5, broadly triangular, erect or slightly turned outwards, operculum scar 1–3 mm wide. **Fig. 25B.** (SECCA)

Recorded from low ridges or areas elevated a few metres above wallum flats of the Moreton district. Flowers mainly summer. Heartwood red to dark red, moderately heavy, moderately strong and durable, grain somewhat interlocked and not difficult to work; has a wide range of building and heavy ornamental uses.

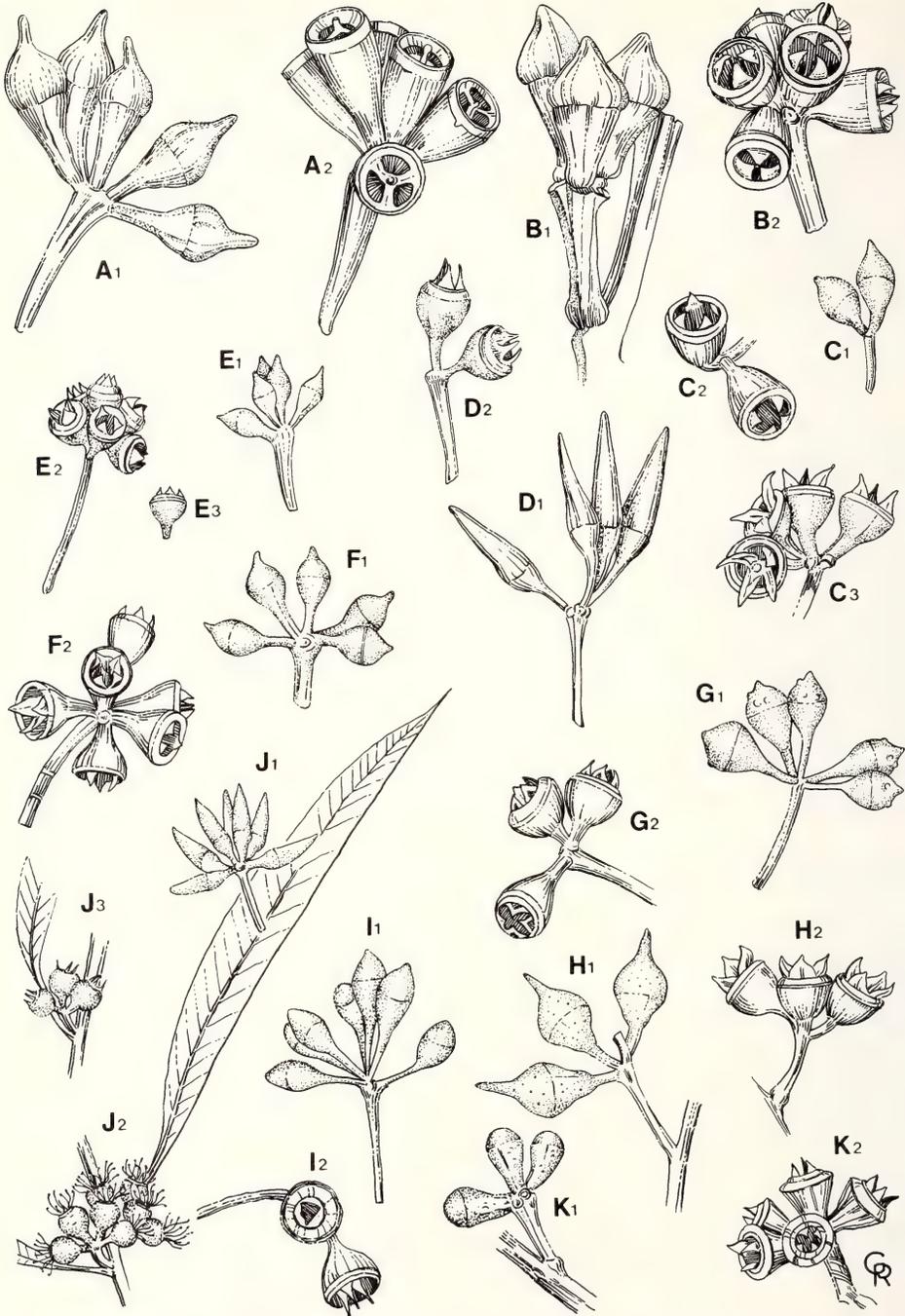


Fig. 25 MYRTACEAE — *Eucalyptus* spp. — A<sub>1</sub>–A<sub>2</sub> *E. robusta*, A<sub>1</sub> buds x1, A<sub>2</sub> fruits x1; B<sub>1</sub>–B<sub>2</sub> *E. pellita*, B<sub>1</sub> buds x1, B<sub>2</sub> fruits x1; C<sub>1</sub>–C<sub>3</sub> *E. notabilis*, C<sub>1</sub> buds x1, C<sub>2</sub>–C<sub>3</sub> fruits x1; D<sub>1</sub>–D<sub>2</sub> *E. resinifera*, D<sub>1</sub> buds x1, D<sub>2</sub> fruits x1; E<sub>1</sub>–E<sub>3</sub> *E. propinqua* var. *propinqua*, E<sub>1</sub> buds x1, E<sub>2</sub>–E<sub>3</sub> fruits x1; F<sub>1</sub>–F<sub>2</sub> *E. propinqua* var. *major*, F<sub>1</sub> buds x1, F<sub>2</sub> fruits x1; G<sub>1</sub>–G<sub>2</sub> *E. punctata* var. *didyma*, G<sub>1</sub> buds x1, G<sub>2</sub> fruits x1; H<sub>1</sub>–H<sub>2</sub> *E. punctata* var. *longirostrata*, H<sub>1</sub> buds x1, H<sub>2</sub> fruits x1; I<sub>1</sub>–I<sub>2</sub> *E. pachycalyx*, I<sub>1</sub> buds x1, I<sub>2</sub> fruits x1; J<sub>1</sub>–J<sub>3</sub> *E. bakeri*, J<sub>1</sub> buds x1, J<sub>2</sub> inflorescence showing stamens persistent on developing fruits x1, J<sub>3</sub> old fruits x1; K<sub>1</sub>–K<sub>2</sub> *E. hallii*, K<sub>1</sub> buds x1, K<sub>2</sub> fruits x1.

**40. *Eucalyptus notabilis* Maiden**

BLUE MOUNTAINS MAHOGANY

Tree up to 30 m tall, but in Queensland much smaller, often shrubby; bark persistent, rough, fibrous, fissured (scaly or stringybark). Adult leaves alternate; petioles 1–2.5 cm long; blades narrowly ovate, apex attenuate, base cuneate, 10–15 cm × 1.6–3 cm, discolourous, venation visible, 55°–60° to midvein, intramarginal vein usually near margin. Inflorescences axillary 5–9-flowered umbels, peduncles flattened, 0.6–1.2 cm × 0.3–0.4 cm at apex, pedicels 0–4 mm long; buds ovoid, ellipsoid or turbinate, 0.7–1.3 cm long; operculum conical or broadly conical, rarely beaked, 1–2 times as long as hypanthium. Fruits woody, turbinate to truncate-ovoid or hemispherical, 6–8 mm × 7.5–10 mm, disc raised or flat, usually narrow, operculum scar 1 mm, rarely 2 mm wide, valves usually 4, broadly triangular, exserted. **Fig. 25C.** (SECCB)

McPherson Ra. on trachyte or rhyolite, on ridges or slopes, e.g. Mt. Maroon. Flowers summer. Timber generally hard, strong and stiff, moderately durable, suitable for general construction and fencing.

**41. *Eucalyptus resinifera* Smith**

RED MAHOGANY; RED STRINGYBARK;

RED MESSMATE

*Eucalyptus hemilampra* F. Muell.; *E. resinifera* var. *grandiflora* Benth.

Tree up to 45 m tall; bark persistent, rough, fibrous, fissured, scaly (mahogany or stringybark). Adult leaves alternate; petioles 1–2.5 cm long; blades narrowly ovate, sometimes falcate, apex attenuate, base cuneate, 7–15(–18) cm × 1.2–2.5(–4) cm, discolourous, venation faint to clearly visible, regular, fine, 40°–60° to midrib, intramarginal vein distinct from margin. Inflorescences axillary 5–11-flowered umbels, peduncles usually slightly flattened, 0.7–2(–2.5) cm × 0.2–0.3(–0.4) cm, pedicels slender, 5–9 mm long; buds ovoid, 1.2–2 cm long; operculum elongated-conical, 2–4 times as long as hypanthium. Fruits woody, truncate-ovoid to hemispherical, 5–8 mm × 5–8 mm, disc slightly raised, narrow to medium width, operculum scar 1 mm, rarely 2 mm wide, valves 3 or 4, narrowly triangular, exserted. **Fig. 25D.** (SECCC)

Moreton and Wide Bay districts, usually on sandy or other well drained soils, e.g. Cooloola sandhills area, near Crow's Nest. Flowers spring–summer. Sometimes cultivated. Timber dark red, moderately open texture, interlocked grain hard, strong, stiff and tough, moderately durable, suitable for house construction and office fittings, shipbuilding, sleepers and general construction. Medium importance as a source of honey, major importance as a source of pollen for bees.

HYBRID: *E. botryoides* Smith n-var. *lynei* Blakely (*E. resinifera* × *E. saligna*)

**42. *Eucalyptus propinqua* Deane & Maiden**

GREY GUM

Tree up to 40 m tall; bark decorticating in large plates, pustulate (gum), new bark usually bright orange-yellow. Adult leaves alternate; petioles 1–3 cm long; blades narrowly ovate, apex acute to attenuate, base cuneate, 7–21 cm × 0.9–3.4(–4.5) cm, discolourous, venation fine, usually visible, 45°–55° to midvein, intramarginal vein near margin. Inflorescences axillary 5–10-flowered umbels, peduncles 0.4–1.5 cm long, flattened, pedicels 2–7 mm long; buds ovoid to broadly ellipsoid, 4–8 mm long; operculum hemispherical to conical, beak usually short, as long as or shorter than hypanthium. Fruits woody, hemispherical, obconical or turbinate, 3–5 mm × 4–7 mm, disc narrow to intermediate, usually slightly raised, valves 3 or 4, exserted.

Two varieties occur in the region:

1. Leaves up to 16 cm × 2.5 cm; pedicels slender, 2–7 mm long; buds generally rounded, 4–6.5 mm long; fruits hemispherical or broadly obconical, 3–4 mm × 4–5(–6) mm
- Leaves up to 21 cm × 4.5 cm; pedicels coarse, angular, 0–4 mm long; buds angular, 6–8 mm long; fruits obconical, 4–5 mm × 5–7 mm

*E. propinqua* var. *propinqua*

*E. propinqua* var. *major*

*E. propinqua* var. *propinqua* (Fig. 25E.) (SECEA) which has also been called SMALL FRUITED GREY GUM is widespread in the Moreton, Wide Bay and eastern Darling Downs and Burnett districts usually on lowlands, low hillsides or ridge of undulating country in open forest while *E. propinqua* var. *major* Maiden (*E. major* (Maiden) Blakely) (Fig. 25F.) (SECEB) seems to be confined to the southern Moreton district. *E. propinqua* var. *propinqua* flowers summer–autumn while *E. propinqua* var. *major* flowers summer. Timber

red to red-brown, coarse but uniform in texture, with interlocked grain, very hard and strong, stiff and tough, and very durable; one of the prime structural timbers in Australia. Minor importance as a source of honey and medium importance as a source of pollen for bees.

#### 43. *Eucalyptus punctata* DC.

GREY GUM

*Eucalyptus shiressii* Maiden & Blakely; *E. tereticornis* var. *brachycorys* Benth.

Tree up to 30 m tall; bark decorticating in large plates, pustulate (gum), new bark orange-yellow. Adult leaves alternate; petioles 1.2–2.8 cm long; blades very narrowly ovate to narrowly ovate, apex attenuate, base cuneate, 8.5–19 cm × 1.1–4 cm, discolourous, venation fine but usually visible, 45°–55° to midvein, intramarginal vein close to margin. Inflorescences axillary 6–10-flowered umbels, peduncles flattened, 0.6–2 cm long, pedicels 3–8 mm long; buds ovoid to ellipsoid, 0.7–1.5 cm long; operculum hemispherical to rostrate, sometimes strongly beaked, shorter than to much longer than hypanthium. Fruits woody, turbinate, truncate-ovoid or almost globular, 0.5–1 cm × 0.6–1.1 cm, disc flat to raised, medium width, valves usually 4, exserted.

Two varieties occur in the region:

1. Operculum wrinkled, ± conical, ± as long as wide, and ± as long as calyx tube; valves on fruits wide

*E. punctata* var. *didyma*

- Operculum smooth, slightly or strongly beaked, often twice as long as wide and 1<sup>1</sup>/<sub>3</sub>–2 times as long as calyx tube; valves on fruit narrow

*E. punctata* var. *longirostrata*

*E. punctata* var. *didyma* R. T. Baker & H. G. Smith (Fig. 25G.) (SECEDD) occurs in the Moreton and eastern Darling Downs districts and *E. punctata* var. *longirostrata* Blakely (Fig. 25H.) (SECEDE) occurs in the Darling Downs, Burnett and Wide Bay (Gympie hinterland) districts. Both flower summer. Timber heavy, hard, strong and durable, somewhat difficult to work, a good quality construction material though inferior to *E. propinqua*.

#### 44. *Eucalyptus pachycalyx* Maiden & Blakely

SHINY BARKED GUM

Tree up to 10 m tall; bark decorticating in patches, smooth (gum). Adult leaves alternate or sometimes opposite; petioles 1–2 cm long; blades narrowly ovate, usually falcate, apex attenuate, base cuneate, sometimes slightly oblique, 7–12 cm × 1.2–2 cm, concolourous, venation faint, 35°–50° to midrib, intramarginal vein faint and variable. Inflorescences axillary 3–7-flowered umbels, often in pairs, peduncles 0.6–1.5 cm long, pedicels 3–6 mm long; buds ovoid or ellipsoid, 6–7 mm long, up to 10 mm long in northern Queensland; operculum conical or rounded, as long as or longer than hypanthium. Fruits woody, hemispherical, 5–6 mm × 7–8 mm, disc ± flat, medium width, valves 3 or 4, exserted, needle-like. Fig. 25I. (SIQ:E)

Recorded from Barakula State Forest north-west of Chinchilla in open woodland on sandy soils. Flowers summer in northern Queensland, but mature buds seen autumn–winter in south-eastern Queensland. Heartwood dark red but physical properties not known.

*E. pachycalyx* until recently has been regarded as confined to the Herberton-Stannary Hills-Irvinebank area of northern Queensland. The buds of this southern taxon are generally ellipsoid with a bluntly conical or hemispherical operculum ± as long as the calyx tube, rather than being ovoid with a conical operculum longer than the calyx tube as in the northern one. In addition the northern taxon often though not always has pustulate petioles, young branchlets and inflorescences which the southern taxon does not. The southern taxon may deserve distinction at an infraspecific level.

#### 45. *Eucalyptus bakeri* Maiden

BAKER'S MALLEE

Mallee or small tree up to 10 m tall; bark decorticating in long strips, smooth (gum), persistent, fibrous, narrowly fissured (box) on trunk of arborescent plants. Adult leaves usually subopposite or alternate; petioles 4–10 mm long; blades narrowly oblong-ovate to narrowly oblong-obovate, apex acuminate, sharp, base attenuate, 5–10 cm × 0.5–1.2 cm, concolourous, venation visible only with lens, 35°–45° to midvein, intramarginal vein close to margin. Inflorescences axillary 5–12-flowered umbels, peduncles 3–10 mm long, pedicels 1–3 mm long; buds ellipsoid or ovoid,

7–10 mm long; operculum elongated-conical, as long as or longer than hypanthium and lighter in colour. Fruits woody, truncate-globular or ovoid, 3–5 mm × 4–5.5 mm, disc depressed, irregular, valves 3 or 4, exserted, subulate, stamens usually not immediately deciduous. **Fig. 25J.** (SIR:E)

Burnett and Darling Downs districts usually on gentle rises on poor sandy or stony soils, often forming a distinct mallee community; in Darling Downs district usually associated with *E. viridis*. Flowers mainly late winter–spring. Timber brownish red, hard, heavy and very tough, but tree too small to be of commercial use.

#### 46. *Eucalyptus hallii* Brooker

#### GOODWOOD GUM

Tree up to 17 m tall; bark decorticating in patches, smooth (gum). Leaves alternate; petioles 1.2–3.5 cm long; blades very narrowly ovate or narrowly ovate, apex attenuate, base cuneate, 8.5–22 cm × 1.5–4.5(–6) cm, concolourous, venation visible, 45°–60° to midvein, intramarginal vein close to margin but distinct. Inflorescences axillary 5–9-flowered umbels, peduncles 3–10 mm long, flattened, pedicels 0–3 mm long, poorly defined; buds clavate to turbinate, 6–8 mm long; operculum hemispherical, usually shorter than angular hypanthium. Fruits woody, turbinate, angular, 5–8 mm × 5–7 mm, disc raised, medium to wide, valves 3 or 4, exserted. **Fig. 25K.** (SNAGA)

Apparently restricted to low country from Bundaberg south to the Isis R. and east of Childers in eucalypt forest with *Melaleuca* spp. and *Banksia robur* on acid earths.

#### 47. *Eucalyptus seeana* Maiden

#### NARROW LEAVED RED GUM

Tree up to 35 m tall; bark decorticating in large patches, usually slightly pustulate, mottled white at first becoming grey (gum). Adult leaves alternate; petioles 1–3 cm long; blades linear-ovate to very narrowly ovate, often falcate, apex long attenuate, base cuneate, 7.5–20 cm × 0.7–2(–3.5) cm, concolourous, venation visible, 30°–60° to midvein, intramarginal vein distinct but usually close to margin. Inflorescences axillary 4–11-flowered umbels, peduncles 0.5–1.5 cm long, pedicels 2–6 mm long; buds elongated-ovoid, 1–1.5 cm long; operculum usually narrowly conical, apex acute to attenuate, 2–4 times longer than hypanthium, sometimes slightly constricted in lower third. Fruits usually turbinate to hemispherical, or sometimes in Darling Downs district ± obconical, 4–8 mm × 5–8 mm, outer operculum scar wide and steeply ascending, disc annular and separate from valves, valves 3 or 4, exserted. **Fig. 26A.** (SNECA)

Poorly drained clayey soils on low ridges and flats of the Moreton district and Darling Downs district mainly in the Stanthorpe-Amosfield area. Flowers spring–early summer. Timber heavy, hard, with an interlocked grain, does not split or saw readily, durability adequate for fence posts but not used to any great extent. Medium importance as a source of honey and pollen for bees.

#### 48. *Eucalyptus* sp. 1.

#### *Eucalyptus bancroftii* auct. non Maiden

Tree up to 15 m tall, usually much smaller; bark decorticating, smooth, grey or cream, somewhat mottled (gum). Adult leaves alternate; petioles 1–2(–3) cm long; blades narrowly ovate to ovate, apex acute to obtuse, apiculate, occasionally shortly acuminate, base cuneate to broadly cuneate or rounded, (3.5–)5–13 cm × (1.2–)2.5–4.5 cm, concolourous, often glaucous, venation at ca 50°–60° to midvein, intramarginal vein distinct, often remote from margin. Inflorescences axillary, usually 7-flowered umbels, peduncles 0.7–1.3 cm long, pedicels 3–5 mm long; buds ± cylindrical, 1–1.2 cm long, operculum cylindrical, usually narrower than hypanthium, scar prominent, apex obtuse or abruptly acute. Fruits hemispherical, often angular or ribbed, (5–)6–8 mm × (5–)6.5–10 mm, outer operculum scar wide and vertical, disc annular and separate from valves, valves 3 or 4, exserted. **Fig. 26B.** (SNECC)

Granite Belt area of the Darling Downs district usually in eucalypt forest amongst granite outcrops. Flowers summer.

This taxon has been wrongly referred to as *E. bancroftii*. Locally on the Granite Belt it has been called CABBAGE GUM due to its rather broad leaves.

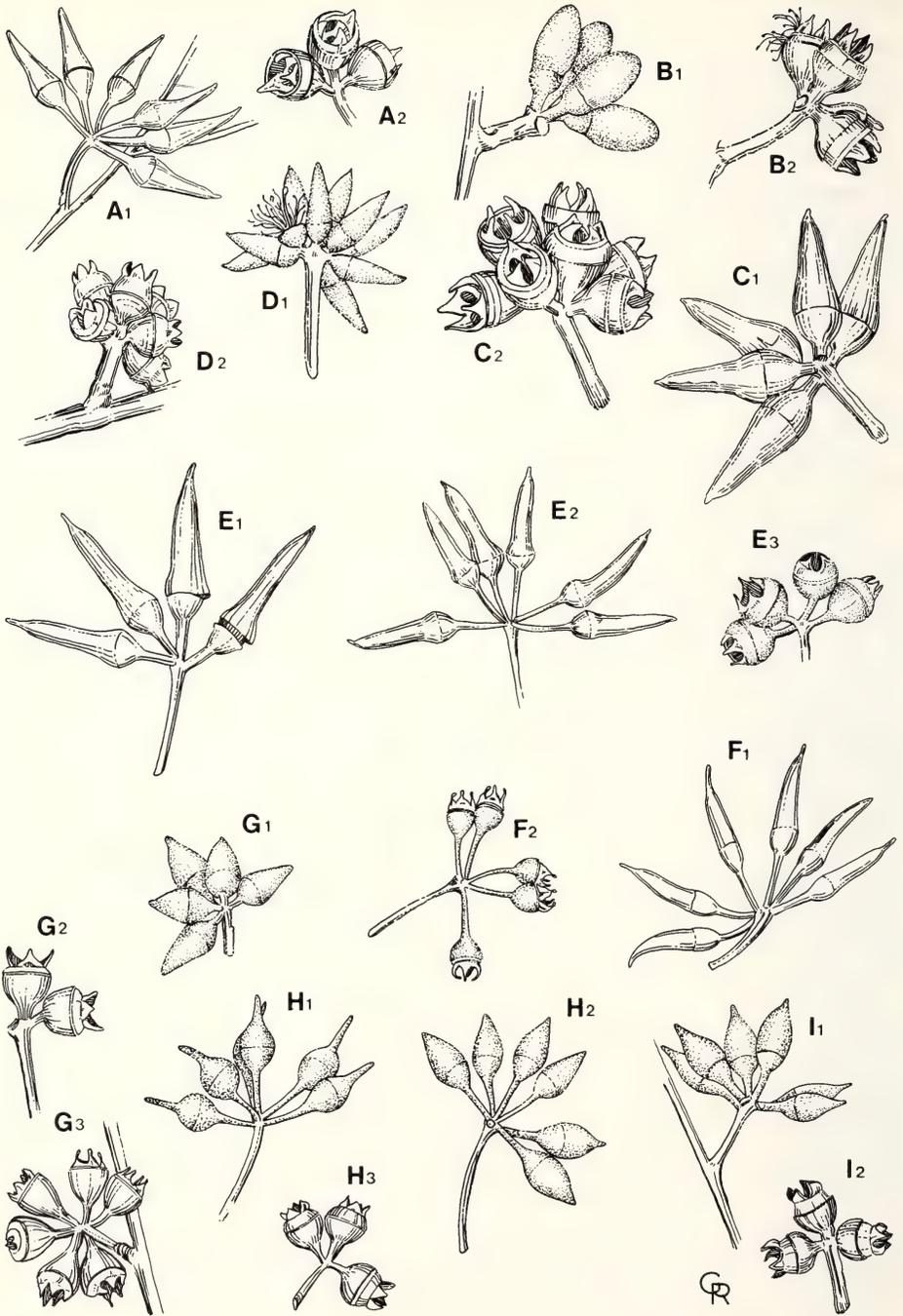


Fig. 26 MYRTACEAE — *Eucalyptus* spp. — A<sub>1</sub>–A<sub>2</sub> *E. seeana*, A<sub>1</sub> buds x1, A<sub>2</sub> fruits x1; B<sub>1</sub>–B<sub>2</sub> *E. sp. 1.*, B<sub>1</sub> buds x1, B<sub>2</sub> fruits x1; C<sub>1</sub>–C<sub>2</sub> *E. bancroftii*, C<sub>1</sub> buds x1, C<sub>2</sub> fruits x1; D<sub>1</sub>–D<sub>2</sub> *E. amplifolia*, D<sub>1</sub> buds x1, D<sub>2</sub> fruits x1; E<sub>1</sub>–E<sub>3</sub> *E. tereticornis*, E<sub>1</sub>–E<sub>2</sub> buds x1, E<sub>3</sub> fruits x1; F<sub>1</sub>–F<sub>2</sub> *E. blakelyi*, F<sub>1</sub> buds x1, F<sub>2</sub> fruits x1; G<sub>1</sub>–G<sub>3</sub> *E. dealbata* var. *dealbata*, G<sub>1</sub> buds x1, G<sub>2</sub>–G<sub>3</sub> fruits x1; H<sub>1</sub>–H<sub>3</sub> *E. camaldulensis*, H<sub>1</sub>–H<sub>2</sub> buds x1, H<sub>3</sub> fruits x1; I<sub>1</sub>–I<sub>2</sub> *E. exserta*, I<sub>1</sub> buds x1, I<sub>2</sub> fruits x1.

**49. *Eucalyptus bancroftii* Maiden** ORANGE GUM; BANCROFT'S RED GUM  
*Eucalyptus seeana* Maiden var. *constricta* Blakely; *E. tereticornis* var. *bancroftii*  
 Maiden nom. illeg.

Tree up to 30 m tall, usually much smaller; bark decorticating in large patches or flakes, bright orange at first becoming grey and dark grey or grey-brown (gum). Adult leaves alternate; petioles 1–4 cm long; blades narrowly ovate to sometimes very narrowly ovate, usually falcate, apex attenuate to acuminate, base cuneate, sometimes slightly oblique, 8–23 cm × 1.5–4.5 cm, often thick, concolourous, venation visible, 30°–60° to midvein, intramarginal vein distinct but usually close to margin. Inflorescences axillary 7-flowered umbels, peduncles stout, angular, 0.7–1.5 cm long, pedicels 2–5 mm long; buds elongated-ovoid to ± cylindrical, 1.5–2 cm long; operculum ± cylindrical to conical, generally slightly constricted. Fruits ± hemispherical, often angular or ribbed, 6–8 mm × 7–9 mm, outer operculum scar wide and vertical, disc annular and separate from valves, valves 3 or 4, very exserted. **Fig. 26C.** (SNECE)

Wallum flats on sandy soils in coastal lowlands, or on low ridges close to the coast. Flowers spring–summer. Heartwood reddish like that of most red gums, but it is brittle and considered inferior to many of the timbers in the group.

**50. *Eucalyptus amplifolia* Naudin** CABBAGE GUM  
*Eucalyptus amplifolia* var. *sessiliflora* Blakely

Tree up to 30 m tall; bark decorticating in patches, smooth (gum). Juvenile leaves ± orbicular, 8–15 cm wide; adult leaves alternate; petioles (1–)2–3.8 cm; blades narrowly ovate, occasionally ovate, apex attenuate, base cuneate, (8–)10–21 cm × (1.2–)1.5–4.5 cm, concolourous, venation usually distinct, 40°–50° to midvein, intramarginal vein remote from margin. Inflorescences axillary 7–20-flowered umbels, peduncles 0.7–1.8 cm long, flattened, pedicels 0–5 mm long; buds narrowly ovoid, 0.9–1.5 cm long; operculum beaked, 2–5 times longer than hypanthium. Fruits woody, nearly globular, 3–5(–7) mm × 4–6(–9) mm, disc raised and wide, valves 3 or 4, exserted. **Fig. 26D.** (SNEEA)

South-eastern Darling Downs district mainly in hilly country on lower slopes and flats on heavy basaltic soils. Flowers spring–summer. Timber inferior in hardness, strength and durability to many of the commercial species of the red gum group.

*E. amplifolia* var. *sessiliflora* has been used for those plants with ± sessile buds *ca* 0.9–1.2 cm long but as buds varying widely in length can be found on one specimen, this is of no taxonomic significance. This species is known to hybridize with *E. tereticornis*.

**51. *Eucalyptus tereticornis* Smith** BLUE GUM; FOREST RED GUM; RED  
 IRON GUM

*Eucalyptus umbellata* (Gaertn.) Domin var. *media* Blakely; *E. tereticornis* var. *pruiniflora* (Blakely) Cameron; *E. umbellata* var. *pruiniflora* Blakely; *E. subulata* Cunn. ex Schauer; *E. umbellata* auct. non (Gaertn.) Domin

Tree up to 45 m tall; bark decorticating in irregular patches, smooth (gum), often rough or scaly at base. Adult leaves alternate; petioles 1–3.5 cm long; blades narrowly ovate, usually falcate, apex attenuate, base cuneate to broadly cuneate, 8–24(–32) cm × 1–3.5(–5) cm, concolourous, rarely subglaucous, venation visible, usually conspicuous, 40°–55° to midvein, intramarginal vein distinct from margin. Inflorescences axillary 5–12-flowered umbels, peduncles 0.6–2 cm long, pedicels 3–8 mm long; buds ovate, usually elongated, 1.2–2 cm long, rarely subglaucous; operculum conical, rarely blunt at apex, sometimes somewhat constricted in lower half, 2–5 times longer than hypanthium. Fruits woody, hemispherical to truncate-globular, 4–7(–8) mm × 5–8.5(–10) mm, disc raised, wide, valves usually 4, exserted. **Fig. 26E.** (SNEEB)

Throughout the region often on alluvial flats or on other fertile soils, e.g. on basaltic ridges, but also sometimes on mountain slopes or plateaux; not common in the Darling Downs district. Flowers winter–late spring. Sometimes cultivated. Timber red, hard and heavy with uniform texture but interlocked grain, strong and durable, chiefly used in heavy construction and building scantlings, and as mining timbers and posts. Minor or occasionally medium importance as a source of honey, major importance as a source of pollen for bees.

A mallee which appears to be closely related to typical *E. tereticornis* has been found on the slopes of Mt. Beerwah and Mt. Coochin in the Moreton district. It has leaves, buds and fruits at the small end of the range of measurements accepted in *E. tereticornis* and further study is required to accurately place this form. It has been locally called MT. BEERWAH RED GUM.

HYBRIDS: *E. tereticornis* n-var. **media** (Blakely) Cameron (*E. camaldulensis* × *E. tereticornis*)  
*E.* × *kirtoniana* F. Muell.; *E.* × *patentinervis* R. T. Baker (*E. robusta* × *E. tereticornis*)

### 52. *Eucalyptus blakelyi* Maiden

BLAKELY'S RED GUM

*Eucalyptus blakelyi* var. *parvifructa* Blakely; *E. blakelyi* var. *irrorata* Blakely

Tree up to ca 20 m tall; bark decorticating in large plates or flakes over whole trunk leaving smooth or matt mottled surface (gum). Adult leaves alternate; petioles 1–3 cm long; blades narrowly ovate to sometimes ovate, occasionally falcate, apex attenuate, base cuneate, 8.5–20 cm × 1–3.5 cm, concolourous, venation visible, 35°–50° to midrib, intramarginal vein distinct from margin. Inflorescences 5–11-flowered umbels, peduncles 0.5–1.5 cm long, slightly angular, pedicels 2–10 mm long; buds narrowly ovate, 0.9–1.5 cm long; operculum ± conical, 2–5 times longer than hypanthium. Fruits woody, ovoid to truncate-globular, 4–5 mm × (3–)5–7 mm, disc raised, broad, valves usually 4, exserted. **Fig. 26F.** (SNEEFA)

Southern Darling Downs district, mainly Granite Belt to just south of Warwick on lower slopes and flats on the deeper sandy loam soils. Flowers spring–summer. Timber pink to reddish brown, with uniform texture but interlocked grain, hard, strong and durable to very durable, heavy, but not milled to any great extent.

### 53. *Eucalyptus dealbata* Cunn. ex Schauer

TUMBLEDOWN GUM;  
TUMBLEDOWN RED GUM

Small tree usually up to 15 m tall, trunk usually short; bark decorticating in irregular patches, smooth (gum), often rough or scaly at base of trunk. Adult leaves alternate; petioles 0.8–2.5 cm long; blades narrowly ovate, apex attenuate, base cuneate, 6–19 cm × 1–4 cm, usually glaucous at least when young, concolourous, venation visible, 35°–50° to midvein, intramarginal vein distinct from or sometimes remote from margin. Inflorescences axillary 5–11-flowered umbels, peduncles 0.5–1.3 cm long, pedicels 1–5 mm long; buds ovoid, 0.6–1.2 cm long, usually glaucous; operculum conical, often elongated, 1.5–2.5 times longer than hypanthium. Fruits woody, hemispherical, turbinate to almost globular, 4–6 mm × 3–7 mm, disc medium or narrow, flat or slightly raised, valves usually 4, exserted.

Two varieties occur in the region:

- |                                    |   |   |   |   |   |  |
|------------------------------------|---|---|---|---|---|--|
| 1. Adult leaves and buds glaucous  | . | . | . | . | . | <i>E. dealbata</i> var. <i>dealbata</i>    |
| Adult leaves and buds not glaucous | . | . | . | . | . | <i>E. dealbata</i> var. <i>chloroclada</i> |

Darling Downs district from the drier western side of the Granite Belt westward through traprock and sandstone country, *E. dealbata* var. *dealbata* (**Fig. 26G.**) (SNEEJ) usually on stony rises, *E. dealbata* var. *chloroclada* Blakely (SNEEH) usually on sandy plains. *E. dealbata* var. *dealbata* flowers autumn to spring while *E. dealbata* var. *chloroclada* flowers usually spring. Timber reddish, heavy, hard, moderately durable but with interlocked grain, and the tree's poor form precludes sawing; used for firewood, and sometimes for posts and strainers. Medium importance as a source of honey, major importance as a source of pollen for bees.

### 54. *Eucalyptus camaldulensis* Dehnh.

RIVER RED GUM; RED GUM

*Eucalyptus rostrata* Schlechtendal; *E. rostrata* var. *brevirostris* F. Muell. ex Miq.; *E. camaldulensis* var. *brevirostris* (F. Muell. ex Miq.) Blakely; *E. rostrata* var. *borealis* (R. T. Baker & H. G. Smith) Blakely

Tree up to 36 m tall; bark decorticating in irregular patches, smooth (gum). Adult leaves alternate; petioles 0.8–3 cm long; blades narrowly ovate, sometimes falcate, apex attenuate, base cuneate, 7.5–23(–28) cm × 1–4 cm, concolourous, venation

visible, 35°–50° to midrib, intramarginal vein distinct from margin. Inflorescences axillary 5–11-flowered umbels, peduncles 0.6–1.5 cm long, pedicels 0.3–0.7(–1) cm long; buds ovoid, 0.7–1.2 cm long; operculum conical or constricted into distinct beak, 1.5–2 times longer than hypanthium. Fruits woody, hemispherical or ovoid to truncate-globular, 3–7 mm × 4.5–9 mm, disc raised, medium to wide, valves usually 4, exserted. **Fig. 26H.** (SNEEPA)

Darling Downs and Burnett districts usually in sandy soils along creeks or drainage lines. Flowers spring–summer. Timber red with close texture and interlocked or wavy grain, gum veins and pockets common, hard and durable, resistant to termites, not difficult to saw but tends to warp in drying, used hewn, or sawn for structural purposes where moderate strength and durability are required. Major importance as a source of both honey and nectar for bees.

**E. camaldulensis** var. **acuminata** (J. D. Hook.) Blakely is a name of uncertain application.

**HYBRID:** *E.* × **oxypoma** Blakely (*E. camaldulensis* subsp. *camaldulensis* × *E. largiflorens*)

**55. *Eucalyptus exserta* F. Muell.** QUEENSLAND PEPPERMINT; YELLOW MESSMATE; MESSMATE; PEPPERMINT

*Eucalyptus exserta* var. *parvula* Blakely; *E. insulana* F. M. Bailey

Tree up to 25 m tall but smaller and sometimes a mallee in drier areas; bark persistent, rough, shortly fibrous, longitudinally furrowed on trunk and larger branches (box-stringybark), decorticating, smooth on smaller branches (gum) but amount of rough bark variable. Juvenile leaves linear; adult leaves alternate; petioles 1–2 cm long; blades narrowly ovate to sometimes linear-ovate, apex attenuate to acuminate, base attenuate to cuneate, 8–18 cm × 0.5–2(–3) cm, concolourous, venation distinct, 30°–50° to midrib, intramarginal vein distinct from margin. Inflorescences axillary 5–8-flowered umbels, peduncles stout, angular, 0.5–1.5 cm long, pedicels 1–5 mm long; buds ovoid or ellipsoid, sometimes elongated, 0.7–1.2 cm long; operculum conical, sometimes beaked, 2–5 times as long as hypanthium. Fruits woody, ovoid, globular or turbinate, 2.5–7 mm × 4–9 mm, disc medium to wide and strongly raised, valves usually 4, strongly exserted. **Fig. 26I.** (SNEEX)

All districts of the region on infertile soils; subcoastal to coastal areas north of Maryborough, stony ridges in the western Darling Downs and Burnett districts as a small tree or mallee (referred to previously as *E. exserta* var. *parvula*) and also mountain tops of the Moreton district as a mallee. Flowers late spring–summer. Timber pale pinkish brown, with close intergrown grain, heavy, hard, durable but tending to be somewhat brittle, supply limited but used locally for general construction, especially house framing, and in the round or split for farm fencing material. Minor importance as a source of honey, medium importance as a source of pollen for bees.

**56. *Eucalyptus michaeliana* Blakely** HILLGROVE GUM; BRITTLE GUM

Tree up to 30 m tall; bark decorticating usually in small patches or flakes, smooth (gum), sometimes scaly at base of trunk. Adult leaves alternate, sometimes subopposite; petioles 1–3 cm long; blades narrowly ovate, apex attenuate, base cuneate, 10–20 cm × 1.2–3.7 cm, almost concolourous, venation visible, irregular, 50°–60° to midvein, intramarginal vein distinct from margin. Inflorescences axillary panicles of 3–5 umbels each with 3–7 flowers, peduncles 5–10 mm long, slightly or distinctly flattened, pedicels 2–5 mm long; buds ovoid to obovoid, 4–5 mm long; operculum hemispherical to broadly conical, sometimes with umbo, shorter than hypanthium. Fruits woody, cupular to campanulate, 4–5 mm × 4–5 mm, disc slightly depressed, narrow, valves 3 or 4, slightly below rim. **Fig. 27A.** (SNI:A)

Mt. Ballow area of the McPherson Ra., rare. Flowers spring. Heartwood reported to be red, brittle.

**57. *Eucalyptus camphora* R. T. Baker** MOUNTAIN SWAMP GUM; BROAD LEAVED SALLY

*Eucalyptus ovata* Labill. var. *aquatica* Blakely

Tree up to 20 m tall; bark decorticating, smooth (gum), usually scaly at base of trunk. Adult leaves alternate; petioles 1.2–3.8 cm long, blades usually ovate to oblong-elliptic, apex obtuse, base cuneate, 6–13(–15) cm × 3.5–6.5(–7.5) cm,

concolourous, venation faint but visible, 35°–40° to midvein, intramarginal vein usually remote from margin. Inflorescences axillary 3–7-flowered umbels, peduncles 0.7–1.8 cm long, pedicels 2–5 mm long; buds ovoid to rhomboid, 6–8 mm long; operculum conical, usually attenuate or beaked, 1–1½ times longer than calyx tube. Fruits woody, turbinate, usually 4–6 mm × 5–8 mm, disc narrow and usually flat, valves 3 or 4, exserted, or ± at rim level. **Fig. 27B.** (SPEAA)

Restricted to swampy flats along Racecourse Ck. east of Wallangarra in the Darling Downs district. Flowers autumn. Heartwood pale.

**58. *Eucalyptus scoparia* Maiden**

WALLANGARRA WHITE GUM

Tree up to 12 m tall; bark decorticating, smooth (gum), pale and powdery. Adult leaves alternate; petioles 0.7–2 cm long; blades linear-ovate, often falcate, apex attenuate, base attenuate to narrowly cuneate, 10–18 cm × 0.6–1.7 cm, concolourous, venation faint, 12°–20° to midvein, intramarginal vein close to margin. Inflorescences axillary, usually 7-flowered umbels, peduncles 7–10 mm long, slightly flattened, pedicels 1–3 mm long; buds ellipsoid to turbinate, often slightly constricted near middle, 4–6 mm long; operculum conical, sometimes slightly beaked, *ca* as long as hypanthium. Fruits woody, truncate-ovoid, 4–6 mm × 4–6 mm, disc raised and wide, valves 3 or 4, exserted. **Fig. 27C.** (SPECM)

Near Wallangarra, growing mainly in depressions amongst massive domed granitic outcrops. Flowers mainly spring to early summer. Timber pale coloured, fissile. Cultivated as an ornamental mainly in New South Wales.

**59. *Eucalyptus dunnii* Maiden**

DUNN'S WHITE GUM; WHITE GUM

Tree up to 36 m tall; bark decorticating in long strips, smooth (gum), often scaly and corky at base of trunk. Juvenile leaves orbicular to ovate or cordate; adult leaves alternate; petioles 0.8–4 cm long; blades very narrowly ovate to narrowly ovate, apex attenuate, base cuneate, often undulate, 10–25 cm × 1–2.5(–4.5) cm, slightly discolourous, venation faint to clearly visible, 30°–45° to midvein, intramarginal vein distinct from or close to margin. Inflorescences axillary 4–7-flowered umbels, peduncles 0.7–1.6 cm long, slightly or distinctly flattened, pedicels 2–5 mm long; buds ovoid, 5–7 mm long; operculum hemispherical to conical, beaked, slightly longer than hypanthium. Fruits woody, hemispherical, 4–5 mm × 5–8 mm, disc narrow to medium width, flat or slightly raised, valves 3 or 4, exserted. **Fig. 27D.** (SPIDA)

McPherson Ra. and Great Dividing Ra. in the eastern Darling Downs district in open forest mainly on deep fertile soils. Flowers autumn. Timber whitish, coarse grained, fissile, tough, not durable in the ground, useful for light construction.

**60. *Eucalyptus bridgesiana* R. T. Baker**

APPLE BOX

*Eucalyptus bridgesiana* var. *amblycorys* (Blakely) Cameron; *E. stuartiana* F. Muell. var. *amblycorys* Blakely; *E. stuartiana* auct. non F. Muell.

Tree up to 20 m tall; bark persistent, shortly fibrous, finely fissured tending to scaly (box). Adult leaves alternate; petioles 1.5–3.5 cm long; blades very narrowly ovate to narrowly ovate, apex attenuate, base attenuate to cuneate, 10.5–25 cm × 1.5–3.7 cm, concolourous, venation visible, widely spaced, 25°–40° to midrib, intramarginal vein usually remote from margin. Inflorescences axillary 5–7-flowered umbels, peduncles flattened, 0.5–1.5 cm long, pedicels 1–3 mm long; buds ovoid or ellipsoid, 6–8 mm long; operculum conical, ± as long as hypanthium or beaked or hemispherical with a small point. Fruits woody, turbinate to truncate-ovoid or hemispherical, 4–7 mm × 5–7 mm, disc narrow to medium width, flat to slightly raised, valves usually 3, exserted. **Fig. 27E.** (SPIDCA)

South-eastern Darling Downs district particularly in the Stanthorpe area, mainly in woodlands. Flowers summer–autumn. Timber light brown to brown, usually with pink or orange tints, moderately hard, strong, but not durable or only moderately durable, of no commercial value. Useful to apiarists.

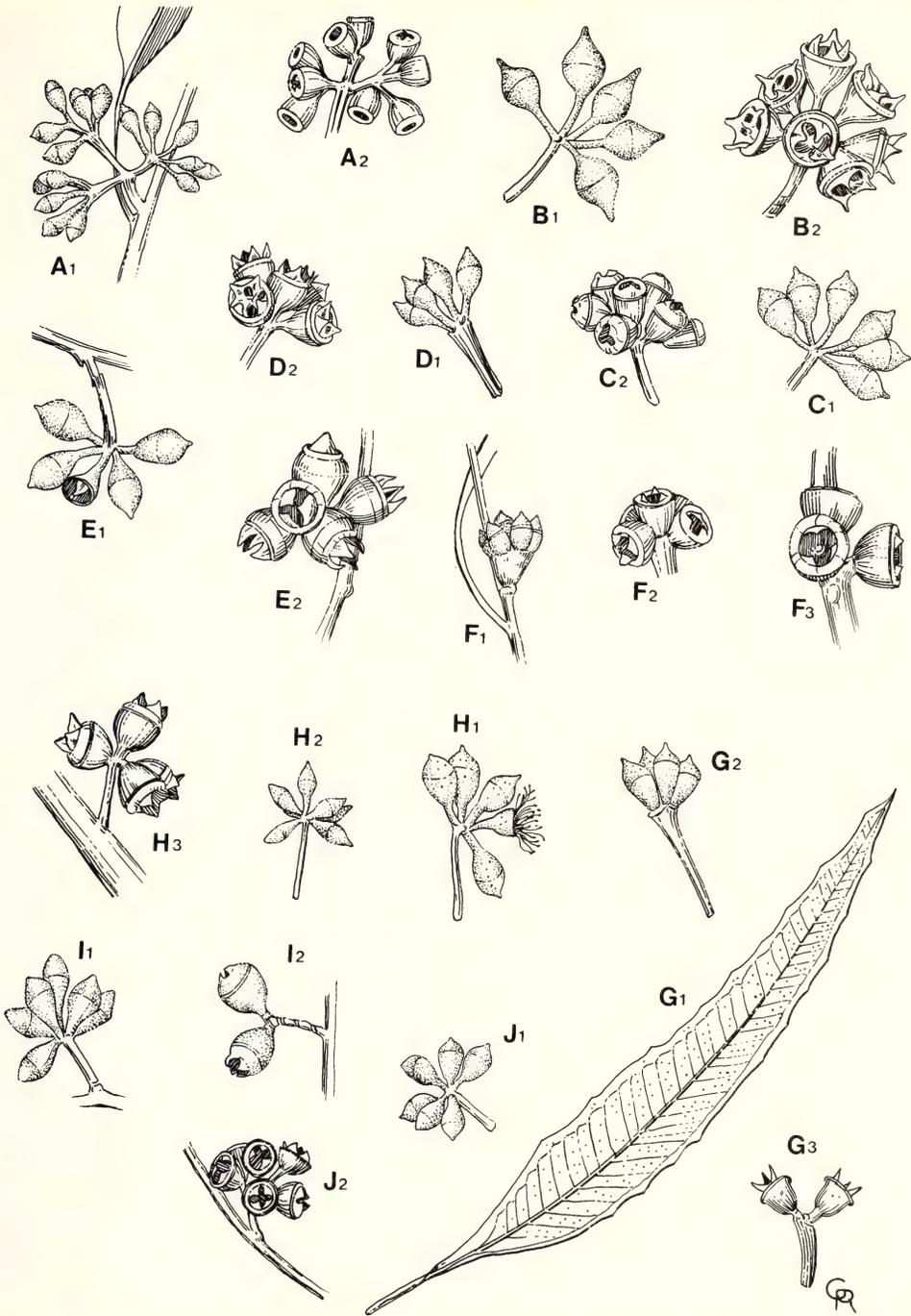


Fig. 27 MYRTACEAE — *Eucalyptus* spp. — A<sub>1</sub>–A<sub>2</sub> *E. michaeliana*, A<sub>1</sub> inflorescence with buds x1, A<sub>2</sub> fruits x1; B<sub>1</sub>–B<sub>2</sub> *E. camphora*, B<sub>1</sub> buds x1, B<sub>2</sub> fruits x1; C<sub>1</sub>–C<sub>2</sub> *E. scoparia*, C<sub>1</sub> buds x1, C<sub>2</sub> fruits x1; D<sub>1</sub>–D<sub>2</sub> *E. dunnii*, D<sub>1</sub> buds x1, D<sub>2</sub> fruits x1; E<sub>1</sub>–E<sub>2</sub> *E. bridgesiana*, E<sub>1</sub> buds x1, E<sub>2</sub> fruits x1; F<sub>1</sub>–F<sub>3</sub> *E. banksii*, F<sub>1</sub> buds x1, F<sub>2</sub>–F<sub>3</sub> fruits x1; G<sub>1</sub>–G<sub>3</sub> *E. quadrangulata*, G<sub>1</sub> leaf showing glands along margin x1, G<sub>2</sub> buds x1, G<sub>3</sub> fruits x1, H<sub>1</sub>–H<sub>2</sub> *E. viminalis*, H<sub>1</sub>–H<sub>2</sub> buds x1, H<sub>3</sub> fruits x1; I<sub>1</sub>–I<sub>2</sub> *E. dalrympleana* subsp. *heptantha*, I<sub>1</sub> buds x1, I<sub>2</sub> fruits x1; J<sub>1</sub>–J<sub>2</sub> *E. nova-anglica*, J<sub>1</sub> buds x1, J<sub>2</sub> fruits x1.

**61. *Eucalyptus banksii* Maiden** TENTERFIELD WOOLLYBUTT  
 Tree up to 30 m tall but generally much smaller in Queensland; bark persistent, shortly fibrous, narrowly fissured (box). Adult leaves alternate; petioles 1.8–3(–4) cm; blades narrowly ovate, apex attenuate, base cuneate, (7–)12–15 cm × 1.3–3.5 cm, concolourous, venation often faint but visible, 20°–40° to midrib, intramarginal vein remote. Inflorescences axillary 5–7-flowered umbels, peduncles 2–8 mm long, flattened, pedicels absent; buds ovoid to globular, 3–6 mm long; operculum hemispherical or broadly conical sometimes with umbo, ± as long as hypanthium. Fruits woody, truncate-ovoid to hemispherical, often crowded and angular, 4–7 mm × 6–8 mm, disc raised, moderately wide, valves 3 or 4, slightly to moderately exserted. **Fig. 27F.** (SPIFA)

Cliff tops on McPherson Ra. west of Lamington Plateau, and Great Dividing Ra., north to Mt. Mistake, and also Granite Belt generally associated with massive granite outcrops, growing in crevices usually where there is considerable runoff of rainwater. Flowers summer–autumn. Heartwood reported to be pale coloured, hard and of good quality but it is not considered commercially important.

**62. *Eucalyptus quadrangulata* Deane & Maiden** SOFT WHITE BOX; WHITE TOPPED BOX

Tree up to 45 m tall; bark persistent, shortly fibrous, narrowly fissured (box). Adult leaves alternate; petioles 0.8–2(–4.5) cm long; blades narrowly ovate, apex attenuate, base cuneate to narrowly cuneate, margin commonly crenate to sinuate often with visible marginal glands, 9–20(–25) cm × 1–2(–2.8) cm, concolourous or slightly paler below, venation faint but visible, 40°–50° to midrib, intramarginal vein usually distinct from margin. Inflorescences axillary 4–8-flowered umbels, peduncles 0.5–1.5 cm long, slightly flattened, pedicels 0–2 mm long; buds obovoid to ellipsoid, 5–8 mm long; operculum conical, usually beaked, shorter than hypanthium. Fruits woody, conical, campanulate or truncate-ovoid, 4–8 mm × 4–5 mm, disc flat and narrow, valves 3 rarely 4, exserted. **Fig. 27G.** (SPIHA)

McPherson Ra., and Great Dividing Ra. north to Mt. Mistake on basaltic soils at high altitudes. Flowers late summer–autumn. Timber pale, heavy, hard and very durable, useful for both light and heavy construction.

**63. *Eucalyptus viminalis* Labill.** MANNA GUM; ROUGH BARKED RIBBON GUM

*Eucalyptus viminalis* var. *rhynchocorys* F. Muell.; *E. fabrorum* Schlechtendal; *E. persicifolia* Lodd.; *E. pilularis* DC., nom. illeg.; *E. patentiflora* F. Muell.; *E. huberana* auct. non Naudin

Tree up to 40 m tall; bark decorticating in long strips, smooth (gum), usually with some persistent scaly bark on base of trunk. Juvenile leaves narrowly ovate to elliptic, tapered to apex, usually amplexicaul; adult leaves alternate; petioles 0.8–2.5 cm long; blades narrowly ovate, apex attenuate, base attenuate, 7–20(–28) cm × 0.7–2.5 cm, concolourous, venation visible, 25°–50° to midvein, intramarginal vein distinct from margin. Inflorescences axillary 3–7-flowered umbels, peduncles 7–9 mm long, often slightly flattened, pedicels 0–3 mm long; buds ovoid to ellipsoid, 6–8 mm long; operculum hemispherical to conical, sometimes with short beak, ± as long as hypanthium. Fruits woody, turbinate to hemispherical, 5–7 mm × 5–8 mm, disc distinctly or slightly raised, intermediate to wide, valves 3 or 4, exserted or level with rim. **Fig. 27H.** (SPIKK)

Western side of Great Dividing Ra. north to Cunningham's Gap area and Goomburra Valley near Mt. Mistake, in woodlands to tall open forest mainly on ridges and hillsides on basalt soils. Flowers summer–autumn. Timber pale yellow or pink, moderately hard but not strong or durable, density variable, grain straight and open, sometimes suitable for light construction. Medium importance as a source of both honey and pollen for bees.

**64. *Eucalyptus dalrympleana* Maiden subsp. *heptantha* L. A. S. Johnson**  
 MOUNTAIN GUM; MOUNTAIN WHITE GUM; WHITE GUM;  
 BROAD LEAVED WHITE GUM

Tree up to ca 35 m tall; bark decorticating in long strips usually to ground level, smooth, usually blotched, white and grey (gum). Juvenile leaves orbicular or very

broadly ovate, obtuse or sometimes acute, widest near base; adult leaves alternate; petioles 0.7–3 cm long; blades narrowly ovate, occasionally falcate, apex acuminate to attenuate, base cuneate or narrowly cuneate, sometimes oblique, 6.5–20 cm × 0.9–3.5 cm, concolourous, venation visible, 25°–50° to midvein, intramarginal vein distinct from margin. Inflorescences usually 7-flowered umbels, peduncles 0.4–1 cm long, slightly angular, pedicels 0–3 mm long; buds ovoid, 7–8 mm long; operculum conical, ± as long as hypanthium, or shorter. Fruits woody, hemispherical to ± truncate-ovoid, 4–6 mm × 5.5–7 mm, disc usually slightly ascending, wide, valves 3 or rarely 4, exserted. **Fig. 27I.** (SPINCC)

Western slopes of Great Dividing Ra. from Cunningham's Gap south, and Granite Belt area on swampy flats. Flowers ? autumn. Timber white or pale pink, of moderately open texture, straight grained, with fairly prominent growth rings, of moderate hardness and strength but low durability, sometimes used for house framing, flooring and lining where high durability is not necessary.

**65. *Eucalyptus nova-anglica* Deane & Maiden**

NEW ENGLAND

PEPPERMINT; BLACK PEPPERMINT

*Eucalyptus cinerea* F. Muell. ex Benth. var. *nova-anglica* (Deane & Maiden) Maiden  
Tree up to 20 m tall; bark persistent, fibrous, furrowed, smaller branches decortivating, smooth. Adult leaves alternate; petioles 1.5–3.2 cm long; blades ovate to narrowly ovate, apex attenuate, base narrowly cuneate, 7.5–21 cm × 0.8–3.3 cm, concolourous, often slightly glaucous, venation visible or faint, 35°–40° to midvein, intramarginal vein usually close to margin. Inflorescences axillary 4–7-flowered umbels, peduncles 5–10 mm long, pedicels 2–4 mm long; buds ovoid, 4–5 mm long; operculum conical, usually shorter than hypanthium. Fruits woody, turbinate to almost globular, 3–5 mm × 5–6 mm, disc raised, narrow to medium width, valves 3 or 4, usually exserted. **Fig. 27J.** (SPINS)

South-eastern Darling Downs district on lower hillsides and flats mainly on granite derived soils, dominating woodland communities. Flowers summer–autumn. Timber soft, not strong or durable, heartwood pale pinkish colour, not considered of commercial value but is sometimes used locally for fencing and other farm purposes.

**66. *Eucalyptus microtheca* F. Muell.**

COOLIBAH; COOLABAH

Tree up to 20 m tall; bark variable, usually persistent, shortly fibrous, usually with wavy longitudinal fissures and fine transverse fissures, scaly (box) and decortivating smooth above; example of almost totally persistent or totally decortivating or even deeply furrowed bark are known. Adult leaves alternate; petioles 0.5–2 cm long; blades variable in shape, from linear-ovate to broadly ovate, apex acute or blunt, base cuneate, 7.5–18.5 cm × 0.7–2.5(–4) cm, concolourous, venation fine but visible, 35°–60° to midrib, intramarginal vein variable but usually close to margin. Inflorescences terminal or upper axillary racemes or panicles of 3–7-flowered umbels, peduncles 3–9 mm long, pedicels 1–5 mm long; buds ellipsoid to obovoid, 3–4.5 mm long; operculum depressed hemispherical to broadly conical with umbo or short beak, shorter than hypanthium. Fruits thin walled but leathery, broadly obconical to shallowly hemispherical, 2–4 mm × 3–5 mm, disc level with rim and very narrow, valves 3 or 4, usually large and exserted. **Fig. 28A.** (SUADFA)

Darling Downs district, widespread on seasonally flooded clay to clay loam soils, e.g. Condamine R. and Moonie R. floodplains. Flowers late spring–summer. Timber dark brown to black with numerous vessels with white contents, very dense, grain interlocked, of no commercial value. Medium importance as a source of honey, major importance as a source of pollen for bees.

HYBRID: *E.* × *yagobieii* Maiden; *E.* × *rivularis* Blakely (*E. melanophloia* × *E. microtheca*)

**67. *Eucalyptus populnea* F. Muell.**

POPLAR BOX; BIMBLE BOX

*Eucalyptus populifolia* Hook.; *E. populnea* var. *obconica* (Blakely) Cameron; *E. populifolia* var. *obconica* Blakely

Tree up to 20 m tall; bark persistent, shortly fibrous, narrowly fissured mainly longitudinally (box). Adult leaves alternate; petioles 1.5–5 cm long; blades narrowly to broadly ovate, obovate, elliptic, circular or sometimes broadly rhomboid, apex obtuse

or retuse, base cuneate to obtuse, 3–10 cm × 1.8–7.5 cm, usually concolourous, shiny, venation visible, 25°–40° to midrib, intramarginal vein remote from margin. Inflorescences terminal racemes or panicles of 4–7-flowered umbels with axillary umbels, peduncles 4–10 mm long, pedicels 1–4 mm long; buds turbinate, obovoid or ellipsoid, 3–5 mm long; operculum hemispherical, usually with umbo, shorter than hypanthium. Fruits woody, truncate-ovoid, hemispherical or obconical, 2–4 mm × 2.5–3.5 mm, disc depressed, narrow, valves 3 or 4, below or level with rim. **Fig. 28B.** (SUDEAA)

Mainly Darling Downs district and Burnett districts, often forming extensive stands on flats and very low ridges on loams and clay loams. Flowers summer–autumn, occasionally spring. Timber pale brown, hard, strong and very durable but not easy to work, useful for shade and ornament, and local pastoral needs. Moderate importance as a source of honey, minor importance as a source of pollen for bees.

**HYBRIDS:** *E.* × **beasleyi** Blakely (*E. melanophloia* × *E. populnea*)

*E.* × **rariflora** F. M. Bailey; *E.* × **tenandrensis** Maiden (*E. crebra* × *E. populnea*, *E.* × **rariflora** misapplied to *E. largiflorens* × *E. populnea*)

**68. *Eucalyptus largiflorens* F. Muell.**

**BLACK BOX**

*Eucalyptus bicolor* Cunn. ex Hook.; *E. pendula* Cunn.

Tree up to 18 m tall; bark usually persistent throughout, fibrous, finely fissured (box), sometimes upper parts decortivating. Adult leaves alternate; petioles 0.5–2.2 cm long; blades very narrowly ovate, narrowly ovate to oblong, apex acute, sometimes obtuse, often apiculate, base cuneate to attenuate, 5–16 cm × 1–2.5 cm, concolourous or slightly discolourous, venation faint, 25°–40° to midrib, intramarginal vein distinct from margin. Inflorescences terminal or axillary panicles or racemes of 3–7-flowered umbels usually with axillary umbels, peduncles 5–9 mm long, pedicels 1–4 mm long; buds obovoid to turbinate, 4–5 mm long; operculum hemispherical to conical, shorter than hypanthium. Fruits woody, hemispherical to truncate-ovoid, 2.5–5 mm × 3–5 mm, disc flat or slightly depressed, narrow to medium width, valves 3–5, below level of rim. **Fig. 28C.** (SUDEC)

Mainly Western Darling Downs district on flats on alluvial clay soils. Flowers autumn. Timber pink to reddish brown, heavy, hard and durable.

**HYBRID:** *E.* × **oxypoma** Blakely (*E. camaldulensis* subsp. **camaldulensis** × *E. largiflorens*)

**69. *Eucalyptus intertexta* R. T. Baker**

**GUM BARKED COOLIBAH; FOREST GUM**

*Eucalyptus intertexta* var. *diminuta* Blakely; *E. intertexta* var. *fruticosa* Blakely & Jacobs

Tree up to 24 m tall, sometimes mallee; bark variable, usually persistent, scaly, rough, irregularly fissured, becoming finely fissured and shortly fibrous (box) below, decortivating, smooth (gum) above; distribution of each bark type very variable. Adult leaves alternate; petioles 0.8–2.5 cm long; blades very variable in shape and venation, narrowly ovate to ovate, apex acute to acuminate, base attenuate, 5–15 cm × 1–3 cm, concolourous, sometimes glaucous, venation usually visible, ca 40° to midvein, intramarginal vein usually near margin. Inflorescences terminal or upper axillary panicles or racemes of 4–6-flowered umbels often with single axillary umbels, peduncles 0.6–1.3 cm long, often slightly flattened, pedicels 4–9 mm long; buds obovoid to turbinate, (4–)6–7 mm long; operculum hemispherical to broadly conical with umbo or small beak, shorter than hypanthium. Fruits truncate-ovoid to turbinate, 4–7 mm × 3–6 mm, disc depressed, narrow to wide, valves 4 or 5, below or ± level with rim. **Fig. 28D.** (SUH:A)

Darling Downs district often on low ridges in sandy soils. Flowers autumn–winter, occasionally summer. Heartwood red, hard, heavy with a very interlocked grain, but can be used in the round.

**HYBRIDS:** *E.* × **dorisiana** Blakely (*E. intertexta* × *E. viridis*)

*E.* × **ednaeana** Blakely (*E. intertexta* × *E. sideroxylon* subsp. **sideroxylon**)

**70. *Eucalyptus orgadophila* Maiden & Blakely** MOUNTAIN COOLIBAH*Eucalyptus intertexta* R. T. Baker var. *magna* Blakely

Tree up to 15 m tall; bark fibrous, persistent, rough, fissured longitudinally (box) on trunk, decorticating smooth (gum) on branches. Adult leaves alternate; petioles 0.9–2.2 cm long; blades ovate to narrowly ovate, apex attenuate or blunt, base attenuate to cuneate, 5–18 cm × 0.8–3 cm, concolourous, often glaucous, venation usually faint, 25°–40° to midrib, intramarginal vein near margin or remote. Inflorescences usually small terminal panicles of 4–7-flowered umbels, sometimes axillary umbels, peduncles 0.7–1.3(–2) cm long, pedicels 3–7(–10) mm long; buds obovoid, usually 8–10 mm long; operculum hemispherical to conical, often shortly beaked. Fruits woody, truncate-ovoid, subcylindrical or turbinate, sometimes ribbed, 7–10 mm × (5–)6–9 mm, disc depressed, usually narrow, valves 4 or 5 below rim. **Fig. 28E.** (SUH:C)

Darling Downs district often on hillsides or undulating country mainly on basalt derived soils. Flowers autumn–winter. Timber heavy, strong and moderately durable with a reputed good resistance to termites, shrinkage only moderate, but not of commercial importance. Medium importance as a source of honey, major importance as a source of pollen for bees.

**71. *Eucalyptus thozetiana* F. Muell. ex R. T. Baker** YAPUNYAH; MOUNTAIN YAPUNYAH; THOZET'S BOX; THOZET'S IRONBOX*Eucalyptus gracilis* F. Muell. var. *thozetiana* F. Muell.

Tree up to 25 m tall, often smaller; bark decorticating in plates, smooth (gum), sometimes persistent, rough, furrowed at base. Adult leaves alternate; petioles 0.5–1.5 cm long; blades narrowly ovate to linear-ovate, apex attenuate, base attenuate to cuneate, 7–16 cm × 0.5–1.4(–2) cm, concolourous, venation faint, 25°–35° to midrib, intramarginal vein usually near margin. Inflorescences axillary 4–8-flowered umbels, sometimes in terminal panicles, peduncles 0.5–1.3 cm long, pedicels 3–5 mm long; buds narrowly ovoid to cylindrical, 5–7 mm long; operculum conical to hemispherical, sometimes beaked, shorter than hypanthium. Fruits woody, truncate-ovoid to hemispherical, rarely urceolate, 4–8 mm × 3–4.5 mm, disc broad, depressed, valves 3 or 4, obscure, below rim. **Fig. 28F.** (SUJ:A)

Western Darling Downs district usually on stony slopes in grassy woodland, often forming communities with brigalow on clay soils. Flowers winter–spring. Timber dark brown to almost black, speckled with short white lines, very heavy, strong, very hard and very durable, but saws readily for such a dense timber, seasons without distortion and can be used for general construction and interior fittings.

**72. *Eucalyptus moluccana* Roxb.** GUM TOPPED BOX; GREY BOX*Eucalyptus hemiphloia* F. Muell. ex Benth.

Tree up to 25 m tall; bark persistent, shortly fibrous, closely longitudinally fissured, irregularly transversely fissured (box), decorticating on upper trunk and branches. Adult leaves alternate; petioles 1.2–2.8 cm long; blades ovate, sometimes broadly ovate, apex attenuate to acute, base cuneate, 10–16(–20) cm × 2–8 cm, concolourous, venation visible, 25°–40° to midvein, intramarginal vein remote from margin. Inflorescences terminal or axillary panicles or racemes of 5–15-flowered umbels often with single axillary umbels, peduncles 0.6–1.2 cm long, pedicels 1–5 mm long, sometimes obscure; buds elongated-ellipsoid or obovoid, 7–9 mm long; operculum elongated conical, often beaked, as long as or slightly shorter than hypanthium. Fruits woody, truncate-ovoid to cylindrical, campanulate or urceolate, 5–9 mm × 5–6 mm, disc depressed, narrow to moderately wide, valves usually 4, enclosed. **Fig. 28G.** (SUL:B)

Moreton, Wide Bay and Burnett districts and eastern parts of Darling Downs district, in open forest often forming pure stands, and tending to occur on slightly saline soils. Flowers summer–autumn. Timber light brown with fine uniform texture and generally interlocked grain, heavy, extremely hard and very strong, stiff and tough, very durable and resistant to termite attack, difficult to work, but one of the best eucalypts for structural purposes. In the round it is widely used for poles and piles, whilst hewn it is in demand for bridge and wharf timbers, railway sleepers and other heavy construction; also one of the best wood fuels. Medium importance as a source of honey, not important as a source of pollen for bees.

This species intergrades with *E. microcarpa*.

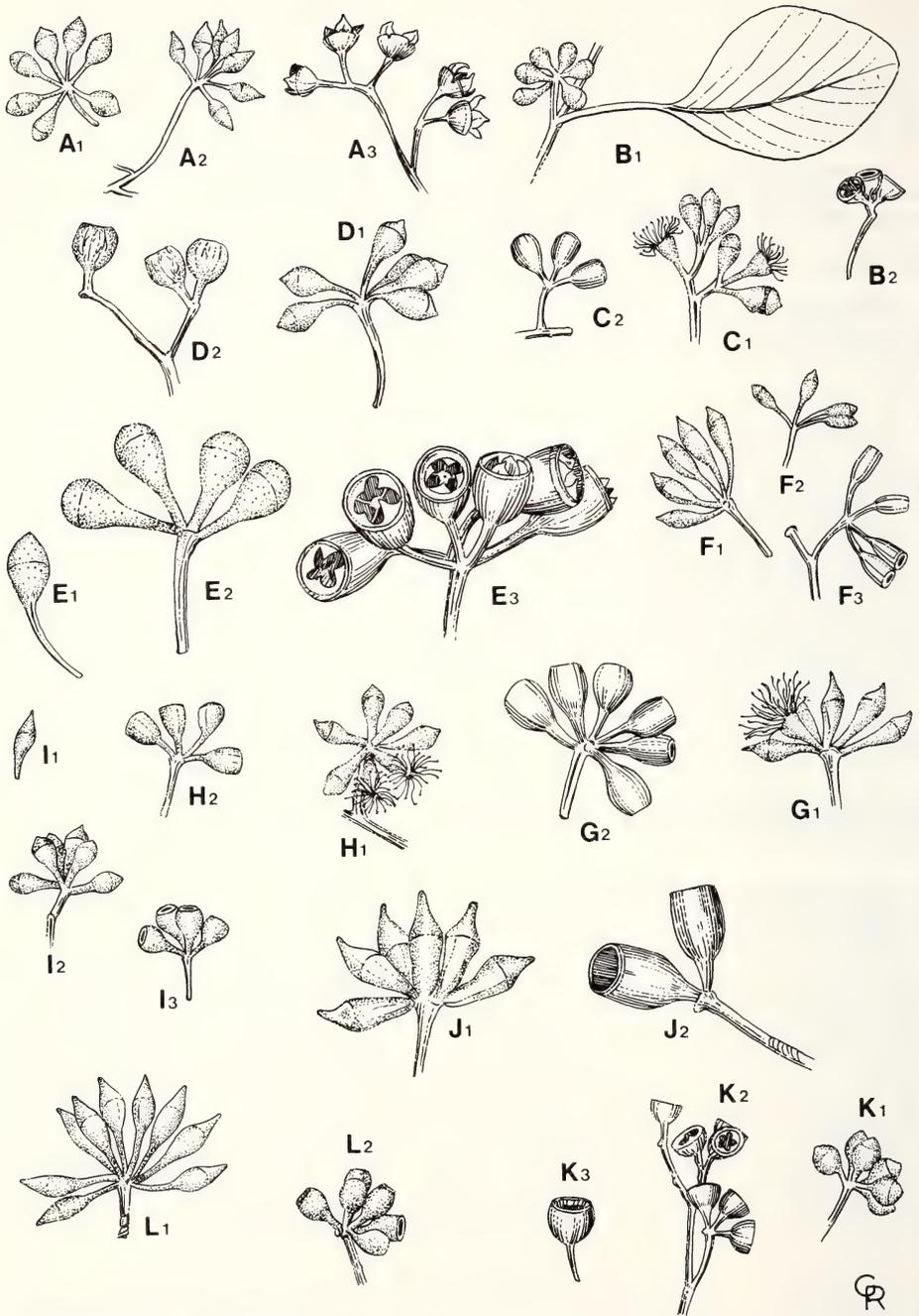


Fig. 28 MYRTACEAE — *Eucalyptus* spp. — A<sub>1</sub>–A<sub>3</sub> *E. microtheca*, A<sub>1</sub>–A<sub>2</sub> buds x1, A<sub>3</sub> fruits x1; B<sub>1</sub>–B<sub>2</sub> *E. populnea*, B<sub>1</sub> leaf and buds x1, B<sub>2</sub> fruits x1; C<sub>1</sub>–C<sub>2</sub> *E. largiflorens*, C<sub>1</sub> buds and flowers x1, C<sub>2</sub> fruits x1; D<sub>1</sub>–D<sub>2</sub> *E. intertexta*, D<sub>1</sub> buds x1, D<sub>2</sub> fruits x1; E<sub>1</sub>–E<sub>3</sub> *E. orgadophila*, E<sub>1</sub>–E<sub>2</sub> buds x1, E<sub>3</sub> fruits x1; F<sub>1</sub>–F<sub>3</sub> *E. thozetiana*, F<sub>1</sub>–F<sub>2</sub> buds x1, F<sub>3</sub> fruits x1; G<sub>1</sub>–G<sub>2</sub> *E. moluccana*, G<sub>1</sub> buds and flowers x1, G<sub>2</sub> fruits x1; H<sub>1</sub>–H<sub>2</sub> *E. microcarpa*, H<sub>1</sub> buds and flowers x1, H<sub>2</sub> fruits x1; I<sub>1</sub>–I<sub>3</sub> *E. pilligaensis*, I<sub>1</sub>–I<sub>2</sub> buds x1, I<sub>3</sub> fruits x1; J<sub>1</sub>–J<sub>2</sub> *E. albens*, J<sub>1</sub> buds x1, J<sub>2</sub> fruits x1; K<sub>1</sub>–K<sub>3</sub> *E. argophloia*, K<sub>1</sub> buds x1, K<sub>2</sub>–K<sub>3</sub> fruits x1; L<sub>1</sub>–L<sub>2</sub> *E. viridis*, L<sub>1</sub> buds x1, L<sub>2</sub> fruits x1.

**HYBRIDS:** *E.* × **boormanii** Deane & Maiden (*E. fibrosa* subsp. *fibrosa* × *E. moluccana*)  
*E.* × **forthiana** Blakely (*E. moluccana* × *E. siderophloia*)  
*E.* × **hybrida** Maiden (*E. moluccana* × *E. paniculata* Smith)

**73. *Eucalyptus microcarpa*** (Maiden) Maiden BROWN BOX; GREY BOX  
*Eucalyptus hemiphloia* F. Muell. ex Benth. var. *microcarpa* Maiden; *E. woollsiana* auct. non R. T. Baker; *E. odorata* Behr ex Schlechtendal var. *woollsiana* auct. non (R. T. Baker) Maiden  
 Tree up to 20 m tall; bark persistent, shortly fibrous, numerous close longitudinal fissures (box), decorticating and smooth on branches. Adult leaves alternate; petioles 0.6–2 cm long; blades narrowly ovate to ovate, apex acute to attenuate, base cuneate, 7.5–15 cm × 1–2.5 cm, concolourous, venation faint to conspicuous, 20°–30° to midvein, intramarginal vein usually remote from margin. Inflorescences axillary or terminal panicles or racemes of 4–8-flowered umbels or single umbels, peduncles 3–9 mm long, pedicels 1–4 mm long; buds ovoid to obovoid, 5–9 mm long; operculum conical, often elongated, as long as or slightly shorter than hypanthium. Fruits woody, campanulate, truncate-ovoid, subglobose or shortly cylindrical, 3.5–6 mm × 4–5 mm, disc depressed, wide, valves 3 or 4, enclosed. **Fig. 28H.** (SUL:DB)

Mainly western areas of the Darling Downs district on a range of soils. Flowers autumn–winter, sometimes late summer. Timber hard, tough, heavy, strong and very durable but not easily sawn, mainly used in the round or hewn for fencing material and sleepers, also an excellent fuel. Major importance as a source of honey, minor importance as a source of pollen for bees.

This species intergrades with *E. moluccana*.

**HYBRIDS:** *E.* × **barmedmanensis** Maiden (*E. microcarpa* × *E. sideroxylon* subsp. *sideroxylon*)  
*E. viridis* n-var. **latiuscula** Blakely (*E. microcarpa* × *E. viridis*)

**74. *Eucalyptus pilligaensis*** Maiden NARROW LEAVED GREY BOX;  
MALLEE BOX; PILLIGA GREY BOX  
 Tree up to 20 m tall; bark persistent, shortly fibrous, closely longitudinally fissured (box), usually decorticating, smooth on branches. Adult leaves alternate; petioles 0.6–1.8 cm long; blades linear-oblong to very narrowly oblong-ovate, apex acute to attenuate, base attenuate, 5.5–15 cm × 0.5–2 cm, concolourous, venation faint, 30°–40° to midvein, intramarginal vein usually distinct from margin. Inflorescences axillary 4–7-flowered umbels or axillary, rarely terminal, racemes or panicles of umbels, peduncles 3–10 mm long, pedicels 1–4 mm long; buds ovoid to clavate, 4–5 mm long; operculum broadly conical, about as long as hypanthium. Fruits woody, turbinate to truncate-ovoid, 2.5–4 mm × 3–4 mm, disc depressed, narrow, valves usually 4, just below level of rim. **Fig. 28I.** (SUL:F)

Darling Downs district on clay soils, often associated with brigalow. Flowers mainly autumn and winter, to spring. Timber light brown, grain usually interlocked, very heavy, very strong, very tough and very durable, useful for fuel, and many farm purposes where strength and durability are necessary, and a great weight not a disadvantage. Medium importance as a source of honey, but produces insufficient pollen to stimulate brood rearing by bees.

**75. *Eucalyptus albens*** Miq. ex Benth. WHITE BOX  
*Eucalyptus albens* var. *elongata* Blakely; *E. hemiphloia* F. Muell. ex Benth. var. *albans* (Miq. ex Benth.) Maiden  
 Tree up to 24 m tall; bark persistent, shortly fibrous, closely longitudinally fissured (box), usually decorticating, smooth on branches. Adult leaves alternate; petioles 1–3(–4) cm long; blades narrowly to broadly ovate, apex acuminate, sometimes apiculate, base cuneate or broadly cuneate, 5–18 cm × 1.5–4.5 cm, concolourous, grey to bluish grey, venation visible to conspicuous, 20°–30° to midvein, intramarginal vein usually remote from margin. Inflorescences axillary 3–7-flowered umbels or small panicles or racemes of umbels, glaucous, peduncles 0.7–2 cm long, pedicels up to

6 mm long, sometimes obscure; buds elongated-ellipsoid or ovoid, angular or ridged, 1–1.5 cm long, glaucous; operculum conical, usually elongated, often beaked, slightly shorter than hypanthium. Fruits woody, often glaucous, cylindrical to ellipsoid, usually urceolate, 0.8–1.3 cm × 0.6–0.8 cm, disc depressed, wide, valves 4 or 5, enclosed. **Fig. 28J.** (SUL:G)

Western slopes of Great Dividing Ra. and traprock country west of Stanthorpe in woodland. Flowers autumn–winter. Timber heavy, hard, strong, durable but not readily worked; used split or in the round for fencing or hewn or sawn for sleepers, also an excellent fuel. Major importance as a source of choice honey, medium importance as a source of pollen for bees.

**HYBRIDS:** *E.* × **affinis** Deane & Maiden (*E. albens* × *E. sideroxylon* subsp. **sideroxylon**)

*E.* × **currabubula** Blakely (*E. albens* × *E. viridis*)

*E.* × **robsoniae** Blakely & McKie; *E. melliodora* n-var. *murrurundi* Blakely (*E. albens* × *E. melliodora*)

**76. *Eucalyptus argophloia* Blakely** QUEENSLAND WESTERN WHITE GUM  
Tree up to 35 m tall; bark decorticating, white, smooth (gum). Adult leaves alternate; petioles 0.5–1.5 cm long; blades linear-ovate to narrowly ovate, apex attenuate, base attenuate to cuneate, 6–15 cm × 0.7–2 cm, concolourous, venation visible, sometimes conspicuous, 30°–40° to midrib, intramarginal vein distinct or remote. Inflorescences axillary 6–9-flowered umbels, peduncles 0.5–1.2 cm long, pedicels 2–5 mm long; buds nearly globular, 3–4 mm long; operculum hemispherical, shorter than hypanthium. Fruits woody, hemispherical to truncate-ovoid, 2.5–5 mm × 4–6 mm, disc flat and narrow, valves 5 or 6, ± level with rim or slightly exserted. **Fig. 28K.** (SUNAA)

Darling Downs district, naturally occurring in the Chinchilla area, on flats or areas of low relief on clays or clay loam soils, often associated with brigalow. Flowers autumn–winter. Timber very strong, hard and durable, heartwood deep red; used locally for fencing and general construction. Extensively planted for ornament and shade in western areas.

**77. *Eucalyptus viridis* R. T. Baker** GREEN MALLEE; GREEN MALLEE BOX  
*Eucalyptus viridis* var. *ovata* Blakely

Mallee up to 10 m tall; bark short fibred on lower trunk (box), smooth decorticating above (gum). Adult leaves alternate; petioles 0.4–1 cm long; blades linear to very narrowly ovate, apex attenuate or acuminate, base attenuate, 6–13.5 cm × 0.35–1.3 cm, concolourous, oil glands large and numerous, venation obscure. Inflorescences axillary 4–9-flowered umbels, peduncles (2–)5–9 mm long, pedicels 3–5 mm long; buds ovoid, 4–6 mm long; operculum broadly conical, shorter than hypanthium. Fruits woody, truncate-globular, 3–5 mm × 4–5 mm, disc level with or below rim, narrow, valves usually 4, below rim. **Fig. 28L.** (SUNEH)

Darling Downs district, mainly in the Inglewood area, usually dominating mallee scrub. Flowers mainly spring–summer. Timber hard, yellow, close grained; “mallee roots” an excellent firewood. One of the most important eucalypts for the distillation of essential oils.

**HYBRIDS:** *E. viridis* n-var. **latiuscula** Blakely (*E. microcarpa* × *E. viridis*)

*E.* × **currabubula** Blakely (*E. albens* × *E. viridis*)

*E.* × **dorisiana** Blakely (*E. intertexta* × *E. viridis*)

*E.* × **leptocarpa** Blakely (probably *E. crebra* × *E. viridis*)

**78. *Eucalyptus fibrosa* F. Muell.**

*Eucalyptus siderophloia* auct. non Benth.; *E. siderophloia* Benth. var. *rostrata* Benth.; *E. bowmanii* F. Muell. ex Benth.

Tree up to 30 m tall; bark persistent, rough, deeply longitudinally furrowed, scaly (ironbark), except for small branches. Adult leaves alternate; petioles 1.5–4.5 cm long; blades narrowly ovate to ovate, apex attenuate, base cuneate, 9–25 cm × (1.2–)2–4.5 cm, concolourous, green or glaucous, venation visible, 35°–45° to midrib, intramarginal vein distinct from margin. Inflorescences usually terminal or upper axillary racemes, rarely panicles, of 4–8-flowered umbels usually with single axillary umbels, peduncles 0.8–2 cm long, often somewhat flattened, pedicels 0.3–1(–1.2) cm

long; buds narrowly ellipsoid or ovoid, 0.8–1.5(–2) cm long, green or glaucous; operculum conical to elongated-conical, as long as to twice as long as hypanthium. Fruits woody, truncate-ovoid to hemispherical or turbinate, 6–10 mm × 5–9 mm, disc flat or convex, narrow to medium width, valves 4 or 5, level with rim or exerted.

Two subspecies occur in the region:

1. Young parts, leaves and buds green . . . . . *E. fibrosa* subsp. *fibrosa*  
At least young parts, leaves and buds glaucous . . . . . *E. fibrosa* subsp. *nubila*

**E. fibrosa** subsp. **fibrosa**, BROAD LEAVED RED IRONBARK, BROAD LEAVED IRONBARK, RED IRONBARK (Fig. 29A.) (SUP:AA) occurs on sandy or stony soils of the eastern Darling Downs, Burnett, Wide Bay and Moreton districts. Flowers mainly summer–autumn. Timber dark red, very hard, very strong and very durable, heavy, close grained and generally interlocked, slow to dry but does not collapse appreciably, used in the round for poles and piles when of suitable size, otherwise hewn or sawn for heavy construction where strength and durability are necessary. Minor importance as a source of honey, medium importance as a source of pollen for bees. **E. fibrosa** subsp. **nubila** (Maiden & Blakely) L. A. S. Johnson (*E. nubilis* Maiden & Blakely; *E. siderophloia* Benth. var. *glauca* Deane & Maiden) (Fig. 29B.) (SUP:AB), DUSKY LEAVED IRONBARK, BLUE LEAVED IRONBARK, occurs in the western Darling Downs district on sandy or stony soils. Timber properties unknown but probably similar to that of **E. fibrosa** subsp. **fibrosa**. Medium importance as a source of choice honey, minor importance as a source of pollen for bees.

HYBRIDS: **E.** × **boormanii** Deane & Maiden (**E. fibrosa** subsp. **fibrosa** × **E. moluccana**)  
**E.** × **murphyi** Maiden & Blakely (probably **E. conica** × **E. fibrosa** subsp. **nubila**)

**79. Eucalyptus decorticans** (F. M. Bailey) Maiden GUM TOPPED IRONBARK  
*Eucalyptus siderophloia* Benth. forma *decorticans* F. M. Bailey

Tree up to 35 m tall; bark persistent, rough, deeply furrowed, hard (ironbark), decortivating, smooth on upper branches. Adult leaves alternate; petioles 1–2 cm long; blades narrowly ovate to narrowly oblong, apex attenuate, base cuneate, 6–17 cm × (1–)1.4–2.5 cm, concolourous, venation usually faint, 40°–50° to midvein, intramarginal vein variable. Inflorescences terminal or upper axillary panicles or racemes of 3–9-flowered umbels or with axillary umbels, peduncles 0.9–1.5 cm long, usually slightly flattened, pedicels 3–7 mm long; buds obovoid, ellipsoid or spindle shaped, 7–9 mm long; operculum hemispherical or semi-ellipsoid, ± as long as hypanthium. Fruits woody, truncate-ovoid to nearly cylindrical, 6–9 mm × 5–7 mm, disc slightly depressed, narrow, valves 3 or 4, ± level with rim. Fig. 29C. (SUP:D)

Darling Downs and Burnett districts, also near Yarraman in the Moreton district, generally on hilly country, often on sandstone or sometimes stony clays. Flowers spring–summer. Timber brown to reddish brown, heavy, hard, very strong and durable, grouped with the grey ironbarks for commercial purposes.

**80. Eucalyptus drepanophylla** F. Muell. ex Benth. GREY IRONBARK;  
QUEENSLAND GREY IRONBARK

*Eucalyptus decepta* Blakely; *E. nanglei* R. T. Baker; *E. siderophloia* Benth.; *E. crebra* var. *macrocarpa* Domin

Tree up to 30 m tall; bark persistent, rough, deeply furrowed (ironbark), rough to small branches. Adult leaves alternate; petioles 0.8–3 cm long; blades narrowly ovate, apex attenuate, base attenuate to narrowly cuneate, 7–22 cm × 1.1–3.5(–4.5) cm, concolourous, venation faint, 35°–50° to midvein, intramarginal vein close to or distinct from margin. Inflorescences terminal or upper axillary racemes or panicles of 4–7-flowered umbels with single axillary umbels, peduncles 0.3–1.5 cm long, pedicels 2–8 mm long; buds spindle shaped to ovoid, 6–9 mm long; operculum conical, sometimes beaked, as long as or shorter than hypanthium. Fruits woody, truncate-ovoid to turbinate, 4–6 mm × 4.5–7.5 mm, disc flat or slightly depressed, narrow, valves 3–5, level with rim or slightly protruding. Fig. 29D. (SUP:E)

Throughout the region usually on stony slopes or ridges on poorer soils, in mixed open forest. Flowers winter to early summer. Timber red, hard, heavy, tough, an engineering hardwood of exceptionally high strength and a very high natural durability, favoured for bridge construction and poles, also used for general construction, an excellent fuel. Major importance as a source of high quality honey, minor importance as a source of pollen for bees.

**81. *Eucalyptus crebra* F. Muell.** NARROW LEAVED IRONBARK; NARROW LEAVED RED IRONBARK

*Eucalyptus racemosa* Cav. var. *longiflora* Blakely; *E. parviflora* F. Muell.; *E. racemosa* auct. non Cav.

Tree up to 27 m tall; bark persistent, rough, deeply furrowed, hard (ironbark) to small branches. Leaves alternate; petioles 1–2 cm long; blades narrowly ovate to very narrowly ovate, apex attenuate, base attenuate to cuneate, 5–18 cm × 0.6–1.5(–2.2) cm, concolourous, green to bluish green, venation usually faint, 30°–45° to midvein, intramarginal vein distinct from margin. Inflorescences terminal or upper axillary panicles or racemes of 4–9-flowered umbels sometimes with single axillary umbels, peduncles 2–6 mm long, pedicels 2–5 mm long; buds obovoid to spindle shaped, 4–6 mm long; operculum semi-ellipsoid to conical, sometimes shortly beaked, much shorter to nearly as long as hypanthium. Fruits woody, truncate-ovoid to cupular, 3–6 mm × 3–6 mm, disc slightly depressed to flat, narrow, valves 3 or 4, slightly below to slightly above rim. **Fig. 29E.** (SUP:S)

Widespread in open forests and woodlands throughout the region. Flowers mainly late winter to summer, sometimes also autumn. Timber dark red, very hard, very strong, and very durable, close grained and generally interlocked, heavy, slow to dry but does not collapse appreciably. Minor to major importance as a source of choice honey (production erratic), major importance as a source of pollen for bees.

**HYBRIDS:** *E.* × *rariflora* F. M. Bailey; *E.* × *tenandrensis* Maiden (*E. crebra* × *E. populnea*)

*E.* × *leptocarpa* Blakely (probably *E. crebra* × *E. viridis*)

*E.* × *peacockeana* Maiden (*E. crebra* × *E. melliodora*)

*E.* × *taylorii* Maiden (*E. conica* × *E. crebra*)

**82. *Eucalyptus melanophloia* F. Muell.** SILVER LEAVED IRONBARK

Tree up to 20 m tall; bark rough, persistent, usually black, hard, deeply furrowed, (ironbark). Juvenile leaves usually retained on mature trees, leaves mostly opposite; petioles 0–2 mm long; blades ovate to broadly ovate, apex usually blunt, base cordate or obtuse, 2.5–9(–10) cm × 1.5–3.5(–6) cm, glaucous, concolourous, venation faint, 40°–55° to midvein, intramarginal vein faint and irregular. Inflorescences axillary 3–7-flowered umbels or short terminal panicles of umbels, peduncles 0.5–2 cm long, pedicels 2–7 mm long; buds ellipsoid, 5–7 mm long, glaucous; operculum conical with small beak, *ca* as long as hypanthium. Fruits woody, turbinate to hemispherical, 3–7 mm × 3.5–7 mm, disc depressed, narrow, valves 3, slightly below or above rim. **Fig. 29F.** (SUP:V)

Widespread throughout the region on gently undulating country in grassy woodlands on a range of soils though more common on fertile soils, e.g. those derived from basalt. Flowers mainly summer. Timber hard, heavy and durable but not readily worked, logs seldom of good form for sawing but suitable for construction, used in the round or hewn for fencing and other farm purposes. Medium importance as a source of honey, medium to major importance as a source of pollen for bees.

**HYBRIDS:** *E.* × *auburnensis* Maiden (*E. melanophloia* × *E. melliodora*)

*E.* × *beasleyi* Blakely (*E. melanophloia* × *E. populnea*)

*E. melanophloia* n-var. *senta* Blakely (hybrid with *E. melanophloia* as one parent.)

*E.* × *yagobiei* Maiden; *E.* × *rivularis* Blakely (*E. melanophloia* × *E. microtheca*)

**83. *Eucalyptus conica* Deane & Maiden** FUZZY BOX

*Eucalyptus baueriana* Schauer var. *conica* Maiden

Tree up to 20 m tall; bark persistent, shortly fibrous, with fine longitudinal fissures (box), decorticating smooth (gum) on upper branches. Adult leaves alternate; petioles 1.2–2 cm long; blades narrowly ovate, apex attenuate, base cuneate, 5–15 cm × 0.6–2.5 cm, concolourous, venation faint to visible, 25°–40° to midvein, intramarginal vein more conspicuous, usually remote from margin. Inflorescences short panicles or racemes of 4–10-flowered umbels with axillary umbels, peduncles 3–10 mm long, pedicels 1–6 mm long; buds clavate to rhomboid, 3–5 mm long; operculum broadly

conical, beaked, much shorter than hypanthium. Fruits woody but thin, elongated-obconical, tapering into indistinct pedicel, 4–7 mm × 3.5–5 mm, disc depressed, narrow to medium width, valves 3 or 4, below rim. **Fig. 29G.** (SUT:B)

South-eastern Darling Downs district and Crow's Nest and Yarraman areas of the western Moreton district on gentle slopes or flats on sandy or sometimes more fertile soils. Flowers late winter–spring. Timber hard, strong, durable but does not split or work readily. Medium importance as a source of choice honey, minor importance as a source of pollen for bees.

**HYBRIDS:** *E.* × **murphyi** Maiden & Blakely (probably *E. conica* × *E. fibrosa* subsp. **nubila**)  
*E.* × **taylorii** Maiden (*E. conica* × *E. crebra*)

**84. *Eucalyptus baueriana* Schauer**

**BLUE BOX; ROUND LEAVED BOX;  
FUZZY BOX**

Tree up to 25 m tall; bark persistent, shortly fibrous, closely longitudinally fissured, irregularly transversely fissured, scaly (box). Adult leaves alternate; petioles 0.5–2 cm long; blades ovate to broadly ovate, rarely narrowly ovate, apex blunt or often abruptly acuminate, base cuneate to rounded, 6–10 cm × 3.5–6 cm, concolourous, subglaucous, venation visible, 30°–40° to midvein, intramarginal vein remote. Inflorescences terminal or axillary panicles or racemes of 3–8-flowered umbels usually with single axillary umbels, peduncles 0.5–1.2 cm long, pedicels 0–5 mm long; buds obovoid to pyriform or clavate, 5–8 mm long; operculum hemispherical to broadly conical, with umbo or small beak, shorter than hypanthium. Fruits woody, obconical, rim flared, 0.6–1(–1.2) cm × 0.5–0.9 cm, disc depressed, moderately wide to wide; valves 3 or 4, enclosed. **Fig. 29H.** (SUT:C)

Southernmost parts of Darling Downs district, e.g. around Wallangarra, Stanthorpe and Dalveen areas, preferring moderately good loams or clay loams on river flats or similar sites. Flowers late spring–summer. Timber pale brown (heartwood) heavy, strong and durable but grain interlocked, making it difficult to split, does not burn readily.

**85. *Eucalyptus melanoleuca* S. T. Blake**

**YARRAMAN IRONBARK**

Tree up to 30 m tall; bark persistent, rough, deeply furrowed, hard (ironbark), decorticating, smooth on smaller branches. Adult leaves alternate; petioles 1.2–3 cm long; blades narrowly ovate, apex attenuate, base cuneate, 5.5–15 cm × 1–2.5(–3.5) cm, slightly discolourous, venation faint, 40°–45° to midvein, intramarginal vein close to margin. Inflorescences terminal or upper axillary racemes or panicles of 4–6-flowered umbels usually with single axillary umbels, peduncles 0.6–1.5 cm long, pedicels 2–5 mm long; buds obovoid, ribbed, 5–6 mm long; operculum conical or semi-ellipsoid, shorter and narrower than hypanthium. Fruits woody, truncate-ovoid to ± cylindrical, 5–7 mm × 4–5 mm, disc slightly depressed, narrow, valves usually 4, enclosed. **Fig. 29I.** (SUV:C)

Yarraman area of Moreton district and Dawes Ra. in the northern Burnett district. Flowers spring–summer.

**86. *Eucalyptus* sp. 2.**

**GREY IRONBARK**

Tree up to 30 m tall; bark persistent, rough, deeply furrowed, hard or corky (ironbark) to smaller branches. Adult leaves alternate; petioles 0.8–2 cm long; blades narrowly ovate or sometimes ovate, apex attenuate, base cuneate, 6–15 cm × 0.8–3.5 cm, slightly discolourous, venation faint, 35°–45° to midvein, intramarginal vein close to margin. Inflorescences terminal or upper axillary panicles or racemes of 3–9-flowered umbels usually with single axillary umbels, peduncles 0.8–1.8 cm long, pedicels 3–10 mm long; buds spindle shaped to obovoid, ribbed, 0.5–1.1 cm long; operculum conical, slightly shorter and narrower than hypanthium. Fruits woody, pyriform, truncate-ovoid or truncate-obovoid, or somewhat cylindrical, curved inwards towards apex, commonly with 1 or more ridges, 7–9 mm × 5–7.5 mm, disc flat or slightly depressed, narrow to intermediate width, valves usually 4, just below rim. **Fig. 29J.** (SUV:F)

Rocky hillsides of the region on trachyte, rhyolite or sandstone, e.g. Mt. French, Crow's Nest, Mt. Walsh, Plunkett area, often in woodland. Flowers winter–spring.

This taxon has been referred to as *E.* sp. aff. ***E. paniculata* Smith.**

**87. *Eucalyptus panda* S. T. Blake** TUMBLEDOWN IRONBARK; BROGAN'S IRONBARK; CORKY IRONBARK

Tree up to 20 m tall; bark persistent, rough, deeply furrowed, hard (ironbark). Adult leaves alternate; petioles 0.8–2 cm long; blades ovate, narrowly ovate to oblong, apex blunt and apiculate, base cuneate, 4.5–10.5 cm × 0.7–2.5 cm, concolourous, subglaucous, venation 50°–60° to midvein, intramarginal vein distinct from margin. Inflorescences axillary 5–7-flowered umbels, peduncles 5–6 mm long; pedicels 2–4 mm long; buds obovoid to broadly ellipsoid, 5–8 mm long; operculum conical with umbo, slightly shorter than hypanthium. Fruits woody, truncate-ovoid, 5–6 mm × 5–7 mm, disc flat or depressed, narrow to medium width, valves 4 or 5, below level of rim. **Fig. 29K.** (SUV:G)

Western Darling Downs district on sand plains or on shallow sands overlying low sandstone ridges. Flowers winter–spring. Poor form precludes any commercial use except possibly for firewood. Minor to major importance as a source of choice honey, medium importance as a source of pollen for bees.

**88. *Eucalyptus caleyi* Maiden** CALEY'S IRONBARK; DROOPING IRONBARK  
*Eucalyptus coerulea* R. T. Baker & H. G. Smith

Tree up to 30 m tall; bark rough, usually black, deeply furrowed, persistent to small branches (ironbark). Adult leaves alternate; petioles 1.3–2.8(–3.5) cm long; blades narrowly to broadly ovate, apex obtuse to acute, often apiculate, base cuneate to rounded, 4.5–13.5 × 1–5 cm, glaucous, concolourous, venation faint, 30°–40° to midvein, intramarginal vein variable. Inflorescences usually 7-flowered umbels, solitary axillary or in small panicles, peduncles subterete, (0.5–)0.8–2.5 cm long, pedicels 0.5–1(–1.5) cm long; buds glaucous, ovoid to rhomboid, 7–9 mm long; operculum conical, often slightly beaked, as long as or shorter than hypanthium. Fruits woody, truncate-ovoid to pyriform, (0.5–)0.7–1.2 cm × 0.5–0.9 cm, disc usually narrow and flat, valves 3 or 4, sunken. **Fig. 29L.** (SUV:K)

Darling Downs district on stony ridges and hillsides on sandstone, traprock or granite country mainly from Inglewood to the New England Highway. Flowers late autumn to early spring. Heartwood deep red, very heavy, very hard, strong and durable, also a good fuel. Major importance as a source of choice honey, but not important as a source of pollen for bees, colonies often dwindling seriously.

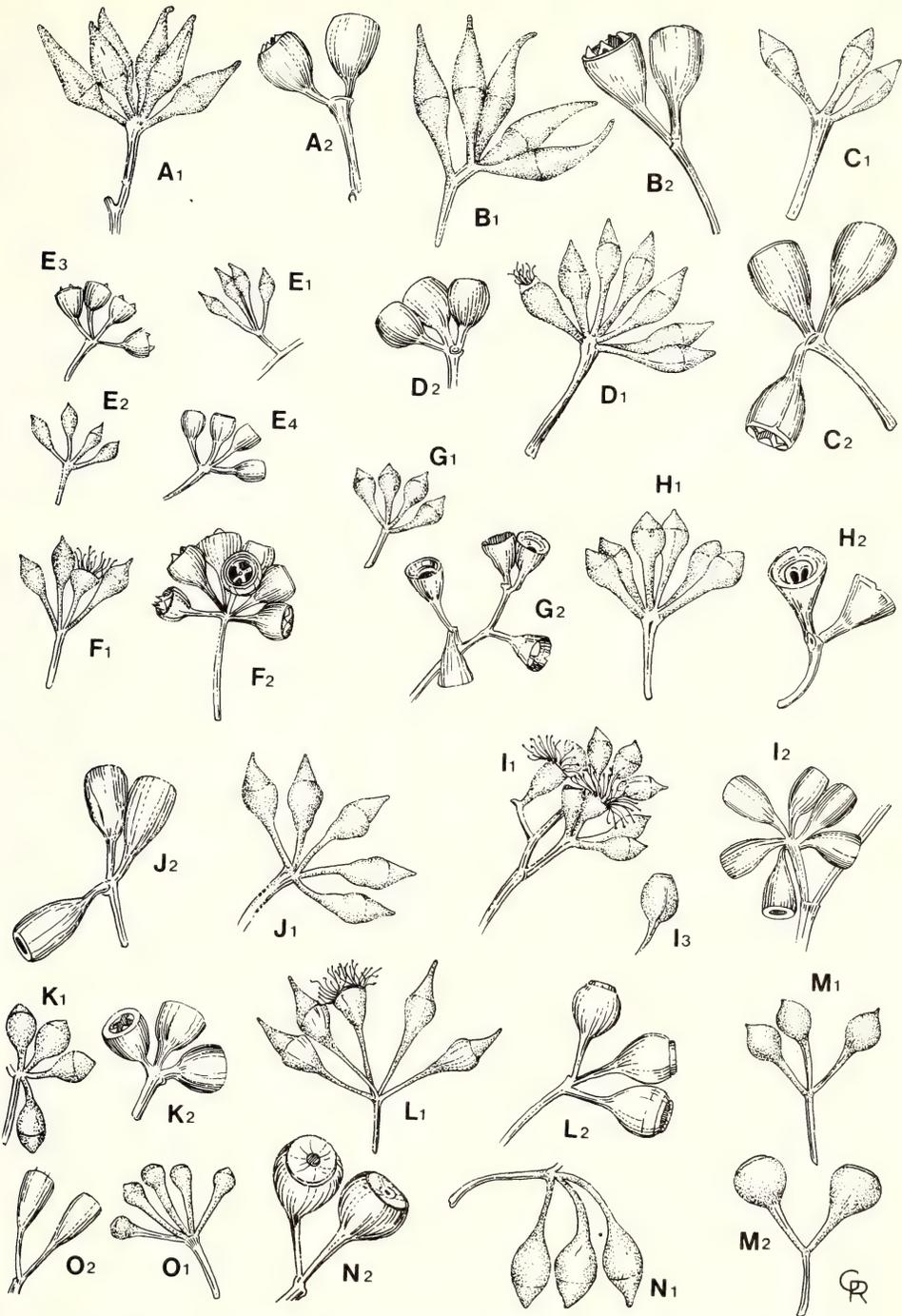
**89. *Eucalyptus melliodora* Cunn. ex Schauer** YELLOW BOX; HONEY BOX; YELLOW IRONBOX

*Eucalyptus forsythii* Maiden; *E. melliodora* var. *brachycarpa* Blakely; *E. melliodora* var. *elliptocarpa* Blakely; *E. stopfordii* Maiden; *E. patentiflora* Miq.

Tree up to 30 m tall; bark fibrous, persistent, rough below (box), decorticating, smooth above (gum); demarcation height very variable; underbark yellowish. Adult leaves alternate; petioles 0.8–2 cm long; blades narrowly ovate, apex attenuate, base cuneate, 5–18 cm × 0.7–2.8 cm, concolourous, venation faint to visible, 20°–40° to midrib, intramarginal vein remote, sometimes 2 on wider leaves. Inflorescences axillary single umbels or terminal racemes or panicles of umbels, each 3–7-flowered, peduncles 0.4–1.2 cm long, pedicels 2–8(–10) mm long; buds ellipsoid to broadly ellipsoid, 5–7 mm long; operculum conical, sometimes beaked, shorter than hypanthium. Fruits woody, truncate-ovoid to hemispherical, 6–8 mm × 5–8 mm, staminal ring often retained, disc flat or slightly depressed, of medium width, valves 4–6, below rim. **Fig. 29M.** (SUX:A)

Mainly southern Darling Downs district and occasionally in hilly areas in Moreton, Wide Bay, and Burnett districts, in grassy woodland usually on light to somewhat heavy alluvial soils, loams and sandy loams. Flowers mainly late winter to early summer. Timber pale yellow-brown, hard, heavy, strong and durable, close textured and interlocked grain, difficult to work, used for poles and heavy construction, an excellent firewood. Major importance as a source of top quality honey, not important as a source of pollen for bees.

**HYBRIDS:** **E. × auburnensis** Maiden (**E. melanophloia** × **E. melliodora**)  
**E. × peacockeana** Maiden (**E. crebra** × **E. melliodora**)  
**E. × robsoniae** Blakely & McKie; *E. melliodora* n-var. *murrurundi* Blakely (**E. albens** × **E. melliodora**)



**Fig. 29** MYRTACEAE — *Eucalyptus* spp. — A<sub>1</sub>–A<sub>2</sub> *E. fibrosa* subsp. *fibrosa*, A<sub>1</sub> buds x1, A<sub>2</sub> fruits x1; B<sub>1</sub>–B<sub>2</sub> *E. fibrosa* subsp. *nubila*, B<sub>1</sub> buds x1, B<sub>2</sub> fruits x1; C<sub>1</sub>–C<sub>2</sub> *E. decorticans*, C<sub>1</sub> buds x1, C<sub>2</sub> fruits x1; D<sub>1</sub>–D<sub>2</sub> *E. drepanophylla*, D<sub>1</sub> buds x1, D<sub>2</sub> fruits x1; E<sub>1</sub>–E<sub>4</sub> *E. crebra*, E<sub>1</sub>–E<sub>2</sub> buds x1, E<sub>3</sub>–E<sub>4</sub> fruits x1; F<sub>1</sub>–F<sub>2</sub> *E. melanophloia*, F<sub>1</sub> buds and flower x1, F<sub>2</sub> fruits x1; G<sub>1</sub>–G<sub>2</sub> *E. conica*, G<sub>1</sub> buds x1, G<sub>2</sub> fruits x1; H<sub>1</sub>–H<sub>2</sub> *E. baueriana*, H<sub>1</sub> buds x1, H<sub>2</sub> fruits x1; I<sub>1</sub>–I<sub>3</sub> *E. melanoleuca*, I<sub>1</sub> buds and flowers x1, I<sub>2</sub>–I<sub>3</sub> fruits x1; J<sub>1</sub>–J<sub>2</sub> *E. sp. 2.*, J<sub>1</sub> buds x1, J<sub>2</sub> fruits x1; K<sub>1</sub>–K<sub>2</sub> *E. panda*, K<sub>1</sub> buds x1, K<sub>2</sub> fruits x1; L<sub>1</sub>–L<sub>2</sub> *E. caleyi*, L<sub>1</sub> buds x1, L<sub>2</sub> fruits x1; M<sub>1</sub>–M<sub>2</sub> *E. melliodora*, M<sub>1</sub> buds x1, M<sub>2</sub> fruits x1; N<sub>1</sub>–N<sub>2</sub> *E. sideroxyton*, N<sub>1</sub> buds x1, N<sub>2</sub> fruits x1; O<sub>1</sub>–O<sub>2</sub> *E. microcorys*, O<sub>1</sub> buds x1, O<sub>2</sub> fruits x1.

**90. *Eucalyptus sideroxylo* Cunn. ex Woolls** MUGGA; RED IRONBARK  
Tree up to 30 m tall; bark persistent, rough, deeply furrowed longitudinally, hard (ironbark), decorticating on branchlets. Adult leaves alternate; petioles 0.8–2 cm long; blades narrowly ovate, apex attenuate, base cuneate, 6–15 cm × 1.2–2.8 cm, concolourous, venation faint to visible, 25°–40° to midvein, intramarginal vein variable, often remote, sometimes 2. Inflorescences axillary 3–7-flowered umbels, peduncles 0.7–1.5(–2) cm long, sometimes slightly flattened, pedicels 0.7–1.5 cm long; buds ovoid, usually markedly attenuate at base, often slightly constricted at base of operculum, pendulous, 0.8–1.2 cm long; operculum conical or semi-ellipsoid and beaked, shorter and usually narrower than hypanthium. Fruits truncate-ellipsoid or truncate-ovoid, 7–10 mm × 7–9 mm, disc depressed and wide, valves usually 5, enclosed. **Fig. 29N.** (SUX:IA)

Occurs in the Yarraman, Wandai and Nanango areas, typically found on poor shallow sandy or gravelly soils. Flowers late winter to summer. Timber dark red, with coarse interlocked grain and fine texture, heavy, hard, very strong and very durable, difficult to work, hewn for sleepers and sawn for general construction. Major importance as source of choice honey, minor importance as a source of pollen for bees.

**HYBRIDS:** *E.* × *affinis* Deane & Maiden (*E. albens* × *sideroxylo* subsp. *sideroxylo*)  
*E.* × *ednaeana* Blakely (*E. intertexta* × *sideroxylo* subsp. *sideroxylo*)  
*E.* × *barmedmanensis* Maiden (*E. microcarpa* × *E. sideroxylo* subsp. *sideroxylo*)

**91. *Eucalyptus microcorys* F. Muell.** TALLOWWOOD  
Tree up to 50 m tall; bark persistent, reddish brown, fibrous, fissured, soft, often flaky with small holes in the underbark (stringybark). Adult leaves alternate; petioles 0.8–1.8 cm long; blades narrowly ovate, apex attenuate, base attenuate, 5–14 cm × 1.1–3.5 cm, discolourous, venation visible, 45°–60° to midvein, intramarginal vein close to margin. Inflorescences terminal or upper axillary panicles or racemes of 4–7-flowered umbels usually with axillary umbels, peduncles 0.8–1.5 cm long, pedicels 3–8 mm long; buds clavate, tapering into pedicels, 5–6 mm long; operculum hemispherical to conical, much shorter than hypanthium. Fruits woody, elongated, turbinate, or obconical, 5–9 mm × 4–6 mm, disc nearly flat, narrow to moderate width, valves usually 3, ± level with rim or slightly exserted. **Fig. 29O.** (SWA:A)

Moreton and Wide Bay districts in moist eucalypt open forest on a range of soil types. Flowers late winter–spring, sometimes summer. Timber yellowish brown, shiny and rather greasy, heavy, hard, very strong and very durable, moderately coarse textured, usually interlocked grain, comparatively easy to work and easy to polish, used for light and heavy construction as well as posts, poles and sleepers. Minor importance as a source of honey, medium importance as a source of pollen for bees.

### 13. LOPHOSTEMON Schott

Trees or shrubs. Leaves of mature plants alternate, crowded at ends of branchlets in pseudowhorls, terminal bud covered by scales; juvenile leaves opposite. Flowers in axillary dichasial cymes; sepals 5; petals 5; filaments united into fascicles on claws opposite petals; ovary half inferior, stigma capitate. Capsules not or scarcely exserted from persistent hypanthium.

4 species Australia with one extending to New Guinea; 2 species south-eastern Queensland.

- |  |                         |
|--|-------------------------|
| 1. Sepals narrowly subulate, deciduous in fruit; petals 5–6 mm long;<br>staminal claws 0.8–1.2 cm long . . . . . | 1. <i>L. confertus</i>  |
| Sepals broad, persistent in fruit; petals ca 3 mm long; staminal<br>claws ca 3 mm long . . . . .                 | 2. <i>L. suaveolens</i> |

**1. *Lophostemon confertus* (R. Br.) Peter G. Wilson & Waterhouse** BRUSH BOX  
*Tristania conferta* R. Br.; *T. conferta* var. *fibrosa* F. M. Bailey  
Tree up to ca 35 m tall, stem diameter up to ca 1.3 m; bark scaly, below, usually smooth on branches; young shoots often covered with silky hairs and exuding milky juice when broken. Leaves alternate but crowded at ends of branchlets; petioles

0.8–3 cm long; blades elliptic or ovate-elliptic, apex acute to acuminate, base cuneate, 8–16 cm × 2.5–5.5 cm, glabrous. Flowers in cymes of 3–8 flowers in axils of upper leaves; hypanthium 3–6 mm long, silky hairy; sepals narrow, *ca* as long as hypanthium, deciduous; petals white, 5–7 mm long; staminal claw 0.8–1.2 cm long. Fruits bell shaped, 1–1.3 cm long. **Fig. 30B.**

Widespread and common except in drier parts of the region, around the edges of rainforest and in most types of eucalypt forests. Flowers spring–summer. This is an important timber species. It is also widely planted as a shade tree. Of medium importance as a source of honey for bees.

**2. *Lophostemon suaveolens* (Solander ex Gaertn.) Peter G. Wilson & Waterhouse**  
SWAMP MAHOGANY

*Melaleuca suaveolens* Solander ex Gaertn.; *Tristania suaveolens* (Solander ex Gaertn.) Smith; *T. suaveolens* var. *glabrescens* F. M. Bailey; *Homaliopsis forbesii* S. Moore

Tree up to *ca* 25 m tall, stem diameter up to *ca* 90 cm; bark fissured and flaky. Leaves alternate; petioles 1–3 cm long; blades ovate-elliptic to elliptic to elliptic-oblong, apex acute to acuminate, base cuneate to rounded, 6–15 cm × 3–7 cm, usually hoary below, often also above, rarely ± glabrous. Flowers in axillary cymes of 3–8 flowers; hypanthium 3–4 mm long, densely hairy; sepals broad, rounded, *ca* 0.7–1.5 mm long, persistent in fruit; petals white, 3–6 mm long; staminal claw *ca* 3 mm long. Fruits 4–6 mm × 5–8 mm. **Fig. 30C.**

Widespread and common in coastal districts usually in swampy areas or on alluvial flats, occasionally found further inland along streams. Flowers spring–summer. Timber is particularly useful in situations where it will contact the ground. Of medium importance as a source of honey for bees.

**14. TRISTANIOPSIS Brongn. & Gris**

Trees or shrubs. Leaves alternate. Inflorescences cymose, axillary; sepals 5, persistent; petals 5; stamens in fascicles opposite petals; ovary half inferior, 3-, rarely 2-locular, stigma capitate. Fruits capsules, half exerted from hypanthium.

About 30 species south-eastern Asia, New Guinea, Australia to New Caledonia; 3 species Australia; 2 species south-eastern Queensland.

- |   |                      |
|---|----------------------|
| 1. Leaves narrowly obovate; bark smooth, decorticating in thin strips | 1. <i>T. laurina</i> |
| Leaves narrowly elliptic; bark fibrous, persistent                    | 2. <i>T. collina</i> |

**1. *Tristaniopsis laurina* (Smith) Peter G. Wilson & Waterhouse** WATER GUM

*Melaleuca laurina* Smith; *Tristania laurina* (Smith) R. Br.; *T. bakeriana* Gandoger

Tree up to 30 m tall but often less than 10 m tall; bark smooth, decorticating in thin strips. Leaves with petioles 0.4–1.3 cm long; blades narrowly obovate to obovate, apex acute or occasionally acute-acuminate, 4–14 cm × 1–3(–4.5) cm, dark green above, pale beneath. Flowers in axillary cymes, pedicels 3–6 mm long; hypanthium *ca* 4 mm long; sepals *ca* 1 mm long; petals yellow, 3–5 mm long; staminal bundles shorter than petals. Fruits 6–10 mm long; seeds winged.

Known from the Moreton and Wide Bay districts usually along creek or river banks, relatively common. Flowers late spring–early summer. Cultivated as an ornamental.

**2. *Tristaniopsis collina* Peter G. Wilson & Waterhouse**

Shrub or tree up to 30 m tall but mostly less than 10 m tall; bark fibrous, persistent. Leaves with petioles 2–6 mm long; blades narrowly elliptic, apex acuminate, 3–6.5 cm × 1–1.5 cm, dark green above, paler beneath. Flowers in axillary cymes, pedicels 3–5 mm long; hypanthium *ca* 4 mm long; sepals *ca* 1 mm long; petals yellow, 2.5–3.5 mm long; staminal bundles slightly longer than petals. Fruits 6–8 mm long; seeds winged.

Known from mountains and ranges of the southern Moreton district, not common. Flowers summer.

## 15. SYNCARPIA Tenore

Trees. Leaves opposite, penninerved. Flowers 6–10 together, hypanthiums fused into globular heads, heads solitary axillary or several together at ends of branchlets; upper part of hypanthiums free, erect; sepals 4; petals usually 4; stamens numerous, free; ovary 3-locular, ovules numerous; style filiform, stigma small. Fruits capsules included in and adnate to hypanthium, whole of fused head becoming woody.

2 species eastern Australia and New Guinea, both occurring in south-eastern Queensland.

- |  |                          |
|--|--------------------------|
| 1. Heads pubescent at flowering; leaves hoary below                          | 1. <i>S. glomulifera</i> |
| Heads glabrous at flowering; leaves glabrous below, except on coppice growth | 2. <i>S. hillii</i>      |

1. *Syncarpia glomulifera* (Smith) Nied.

TURPENTINE

*Metrosideros glomulifera* Smith; *Syncarpia laurifolia* Tenore

Tree up to ca 40 m tall; bark fibrous, furrowed. Leaves often appearing in whorls of 4 from 2 pairs being close together; petioles 0.8–1.5 cm long; blades ovate or narrowly ovate, apex obtuse to obtusely acuminate, base cuneate to rounded, 4–10 cm × 1.3–3.5 cm, glabrous above, hoary below. Flowers 6–10 together fused into a head, heads subtended by 2–4 bracts, peduncles 1–3 cm long, heads pubescent at flowering; petals white, ca 3 mm long, pubescent. Fruiting heads 1.2–1.5 cm across.

Eastern parts of the region, in eucalypt communities in higher rainfall areas. Flowers spring–early summer. Timber hard, durable, resistant to marine borers, white ants and fire.

2. *Syncarpia hillii* F. M. Bailey

Tree up to ca 20 m tall; bark fibrous. Leaves often appearing in whorls of 4 from 2 pairs being close together; petioles 1–3.5 cm long; blades narrowly ovate to ovate, apex drawn out to fine or rounded tip, sometimes abruptly so, base cuneate or rounded, 6–15 cm × 1.5–9 cm, glabrous above and below, coppice growth hairy. Heads usually formed of 6 flowers in a whorl with 1 in centre, heads subtended by scale-like bracts, peduncles 1–2.5 cm long, heads glabrous at flowering; petals white, ca 3 mm long, pubescent. Fruiting heads 1.5–2.5 cm across. **Fig. 30D.**

Eastern parts of the region in higher rainfall areas. Flowers spring.

## 16. CHORICARPIA Domin

Trees. Leaves opposite, penninerved, pellucid punctate. Flowers small, numerous, sessile in dense globular heads but free from each other, or united at very base only, heads solitary or arranged in terminal panicles or clusters; hypanthium turbinate-campanulate; sepals 5; petals 5, minute or absent; stamens in single row, anthers versatile, longitudinally dehiscent; ovary 2-locular, ovules 1 per loculus, style filiform. Fruits capsules included in and adnate to persistent hypanthium.

2 species, both endemic in the central east coast of Australia, both occurring in south-eastern Queensland.

- |   |                          |
|---|--------------------------|
| 1. Filaments 5–8 mm long, ± glabrous; pedicels mostly 1.2 cm long or longer | 1. <i>C. leptopetala</i> |
| Filaments mostly 2–4 mm long, pubescent; pedicels 0.4–1 cm long             | 2. <i>C. subargentea</i> |

1. *Choricarpia leptopetala* (F. Muell.) Domin

*Syncarpia leptopetala* F. Muell.

Tree up to ca 20 m tall; young shoots and inflorescences ferruginous tomentose. Leaves with petioles 4–10 mm long; blades ovate-elliptic or ovate, apex acuminate, base cuneate, 4–14 cm × 1.5–5 cm, ferruginous tomentose or glabrous and silvery below. Flowers in globular heads ca 1 cm diameter at anthesis, pedicels 1.2–3 cm long; stamens numerous, filaments cream, 5–8 mm long, ± glabrous. Fruits ca 2 mm long. **Fig. 30E.**

Rainforest or fringing forest, often on poorer soils, of the eastern Moreton district. Flowers spring–summer.



Fig. 30 MYRTACEAE — A *Angophora subvelutina*, portion of fruiting stem x1; B–C *Lophostemon* spp. — B<sub>1</sub>–B<sub>2</sub> *L. confertus*, B<sub>1</sub> flower from above x1, B<sub>2</sub> flower from side x1; C *L. suaveolens*, flower from above x1; D<sub>1</sub>–D<sub>3</sub> *Syncarpia hillii*, D<sub>1</sub> portion of flowering stem x1, D<sub>2</sub> venation of leaf x6, D<sub>3</sub> fruit x1; E *Choricarpa leptopetala*, portion of flowering stem x1.

**2. *Choricarpia subargentea* (C. T. White) L. A. S. Johnson** GIANT IRONWOOD  
*Syncarpia subargentea* C. T. White

Tree up to 30 m tall; young shoots and inflorescences ferruginous tomentose. Leaves with petioles 5–10 mm long; blades elliptic to ovate, apex acuminate, sometimes shortly so, base cuneate, 4–14 cm × 1.5–7 cm, undersurface usually silvery. Flowers in globular heads *ca* 8 mm diameter at anthesis, pedicels 0.4–1 cm long; stamens numerous, filaments cream, 2–4 mm long, pubescent. Fruits *ca* 2 mm long.

Rainforest or fringing rainforest, often of drier types. Found in the eastern Wide Bay district with a few records in the Moreton district. Flowers spring–summer.

**17. LYSICARPUS** F. Muell.

Tree. Leaves opposite or in whorls of 3. Flowers male or bisexual, male flowers in irregular cymes, bisexual flowers often solitary; hypanthium campanulate; sepals 5; petals 5; stamens numerous, free or nearly so, in 2 or more series interrupted opposite sepals, inner ones shorter, few of outer ones with uniform indehiscent anthers, others with versatile anthers opening longitudinally; ovary 3-locular, ovules numerous, style filiform with capitate stigma. Fruits capsules, protruding from persistent hypanthium.

1 species endemic in eastern Queensland, occurring in south-eastern Queensland.

**1. *Lysicarpus angustifolius* (Hook.) Druce** BUDGEROO

*Tristania angustifolia* Hook.; *Lysicarpus ternifolius* F. Muell.

Tree up to 10 m tall; bark fibrous. Leaves with petioles 1–2 mm long; blades linear, 2–9 cm × 0.15–0.25 cm, glabrous above, densely hairy below. Male flowers in terminal or extreme upper axillary cymes; bisexual flowers solitary or 2 or 3 together on peduncles, sometimes in cymes; peduncles 0.3–1 cm long; pedicels 2–6 mm long; hypanthium 3–4 mm long, tomentose; sepals 1.5–2 mm long; petals *ca* 2 mm long, usually pubescent. Capsules 6–8 mm long. **Fig. 31A.**

Drier parts of the region, often in sandy soils. Flowers spring.

**18. XANTHOSTEMON** F. Muell.

Trees or shrubs. Leaves alternate or opposite. Flowers in dense terminal or axillary cymes or umbels or solitary; hypanthium adnate to ovary at base; sepals 4–5, often unequal; petals 4–5, spreading; stamens numerous, free, in 1 or more series, much exceeding petals, filaments often rigid, anthers opening longitudinally; ovary 2–6-locular. Fruits capsules seated on or partially or wholly enclosed in expanded hypanthium.

About 40 species from south-eastern Asia to Australia and New Caledonia; *ca* 10 species Australia; 1 species south-eastern Queensland.

**1. *Xanthostemon oppositifolius* F. M. Bailey** PENDA

Tree up to *ca* 15 m tall. Leaves opposite or occasionally alternate; petioles 1–1.5 cm long; blades ovate to oblong to elliptic, apex obtuse, base abruptly narrowed, 5–10 cm × 2–4.5 cm, glabrous. Flowers 2–5 in hoary umbels or cymes in axils of upper leaves, peduncles 1–3 cm long, pedicels 0.6–1.2 cm long; hypanthium *ca* 3 mm long, hoary; sepals *ca* 3 mm long, hoary; petals white, *ca* 5 mm long, pubescent; filaments *ca* 10 mm long; style glabrous. Capsules 3-valved, broad at base, narrowed to rounded tip, 0.8–1.2 cm × 0.7–1 cm.

Known from a few localities in the eastern Wide Bay district. Flowers late, winter–spring.

## 19. BACKHOUSIA J. D. Hook. & Harvey

Trees or shrubs. Leaves opposite, petiolate, penninerved. Inflorescences cymes, heads or umbels, axillary or arranged in terminal panicles; flowers 4–5-merous; hypanthium continued above ovary; sepals persistent; petals persistent, usually shorter than sepals; stamens numerous, free, in several whorls, anthers versatile, opening longitudinally; ovary 2-locular, ovules numerous, style filiform, stigma small. Fruits indehiscent or schizocarp.

7 species endemic in eastern Australia; 4 species south-eastern Queensland.

- |  |                           |   |
|--|---------------------------|---|
| 1. Sepals 2–3 times as long as wide, acute, all similar in size . . . . .                                  | 1. <i>B. myrtifolia</i>   |   |
| Sepals 1–2 times as long as wide, obtuse, commonly with 2 or more lobes smaller than others . . . . .      |                           | 2 |
| 2. Leaves narrowly ovate or rectangular; flowers sessile in axillary cymes or heads . . . . .              | 2. <i>B. angustifolia</i> |   |
| Leaves broadly ovate or elliptic; flowers with distinct pedicels . . . . .                                 |                           | 3 |
| 3. Leaves with strong lemon scent when crushed; sepals 5, 3 up to 5 mm long, 2 markedly smaller . . . . .  | 3. <i>B. citriodora</i>   |   |
| Leaves without lemon scent when crushed; sepals usually 4, 2 up to 2 mm long, 2 markedly smaller . . . . . | 4. <i>B. sp. 1.</i>       |   |

### 1. *Backhousia myrtifolia* J. D. Hook. & Harvey CARROL; GREY MYRTLE

Shrub or tree up to *ca* 15 m tall. Leaves with petioles 1–6 mm long; blades elliptic, apex acute or acuminate, base cuneate to truncate, 1.5–8 cm × 0.8–3 cm, villous at first, becoming glabrous. Inflorescences terminal or upper axillary panicles of umbels, up to *ca* 5 cm long; hypanthium *ca* 3 mm long, villous or sericeous; sepals yellowish green, petal-like, 4–5, acute, 6–9 mm × 2–3.5 mm, all about even in size; petals less than 3 mm long, deciduous; stamens usually longer than sepals. Fruits enclosed in persistent hypanthium. **Fig. 31B.**

Eastern parts of the region, in various types of rainforest. Flowers summer. Cultivated as an ornamental.

### 2. *Backhousia angustifolia* F. Muell.

Shrub or small tree up to 7 m tall. Leaves with petioles 1–2 mm long; blades narrowly elliptic or narrowly ovate, apex obtuse or acute, base cuneate or rounded, 1–4.5 cm × 0.3–0.8 cm, pubescent when young, becoming glabrous. Inflorescences pedunculate axillary heads, peduncles up to 1.5(–3) cm long; hypanthium *ca* 2 mm long, thinly pubescent; sepals 5, obtuse, 3 up to 3 mm long, 2 markedly smaller; petals less than 3 mm long, shorter than longest sepals, deciduous; stamens longer than sepals. Fruits enclosed in persistent hypanthium.

Found in depauperate rainforest of the Darling Downs and Burnett districts. Flowers mostly spring–summer.

A form from the Sundown National Park south-west of Stanthorpe has peduncles 2–3 cm long and the leaves have a distinct lavender odour when crushed. Further research may show this to warrant recognition as a distinct subspecies of ***Backhousia angustifolia*** or possibly even a distinct species.

### 3. *Backhousia citriodora* F. Muell.

### LEMON IRONWOOD

Shrub or tree up to 15 m tall. Leaves with petioles 0.5–1.5 cm long; blades ovate or narrowly ovate, apex acute, rarely obtuse or acuminate, base cuneate, 4–15 cm × 1–5 cm, pubescent when young, becoming glabrous. Inflorescences short dense panicles of umbels or single umbels in upper leaf axils, pedicels up to 2 cm long; hypanthium *ca* 2–3 mm long, densely pubescent; sepals 5, obtuse, 3 up to 5 mm long, 2 markedly smaller than others; petals longer than sepals, deciduous; stamens longer than sepals. Fruits enclosed in persistent hypanthium.

Rainforest, often fringing rainforest, in coastal parts of the region. Flowers mostly spring–summer. Cultivated as an ornamental.

**4. *Backhousia* sp. 1.**

*Backhousia sciadophora* auct. Qld. non F. Muell.

Tree up to 20 m tall. Leaves with petioles 2–6 mm long; blades elliptic, occasionally obovate, apex obtuse, base cuneate, 1.5–6 cm × 0.8–4 cm, densely pubescent at first, becoming glabrous. Inflorescences usually pedunculate umbels in upper leaf axils, sometimes short panicles of umbels, pedicels 0.3–1.5 cm long; hypanthium *ca* 1.5 mm long, thinly pubescent; sepals usually 4, 2 up to 2 mm long, 2 markedly smaller; petals not seen, apparently early deciduous; stamens longer than sepals. Fruits enclosed in persistent hypanthium.

Depauperate rainforest of the northern Wide Bay and Burnett districts. Flowers summer–autumn.

**20. OSBORNIA F. Muell.**

Shrubs of mangrove areas. Leaves opposite, exstipulate, simple, entire or irregularly crenate, glabrous, glandular, venation usually faint. Flowers 1–3 together in axils or terminal, sessile or shortly pedunculate, bracteoles pubescent outside, glabrous inside, deciduous; hypanthium turbinate, densely appressed pubescent; sepals 8, persistent; corolla absent; stamens numerous, free, anthers versatile, with terminal gland, dehiscing longitudinally; ovary imperfectly 2-locular, style short, stigma small, capitate. Fruits indehiscent, enclosed in persistent hypanthium; seeds 1–2.

1 species only, from the Philippines to New Guinea and Australia, occurring in south-eastern Queensland.

**1. *Osbornia octodonta* F. Muell.****MYRTLE MANGROVE**

Shrub up to 3 m tall. Leaves with petioles *ca* 1 mm long; blades obovate, apex emarginate, up to 4 cm × 2 cm. Bracts *ca* 3 mm long, thinly pubescent; bracteoles *ca* 3 mm long; hypanthium up to *ca* 6 mm long; sepals 1–2 mm long; stamens and style 2–3 mm long. Fruiting hypanthium slightly larger than flowering one. **Fig. 31C.**

In mangrove areas of the northern Wide Bay district. Flowers summer.

**21. PSIDIUM L.**

Shrubs or trees. Leaves opposite, conspicuously pinnately veined. Flowers usually large, solitary or few together, axillary or terminal; calyx undivided in bud, splitting or opening with 4–5 lobes; petals 4–5, free, spreading; stamens numerous; ovary 2- or more-locular, ovules numerous. Fruits berries, usually crowned by persistent calyx; seeds numerous.

About 140 species tropical America and West Indies; at least 2 species cultivated in Australia, sporadically naturalized; 2 species naturalized south-eastern Queensland.

- |   |                        |
|---|------------------------|
| 1. Leaves with lateral veins 12–20 on either side of midrib, impressed above; young branches 4-angled; flowers usually solitary . . .   | 1. <i>P. guajava</i>   |
| Leaves with lateral veins 6–10, rarely 12, on either side of midrib, not impressed above, often slightly raised; young branches not 4-angled, ± terete; flowers solitary or 3 in pedunculate dichasia | 2. <i>P. guineense</i> |

**1. \**Psidium guajava* L.****GUAVA**

Shrub or small tree up to *ca* 7 m tall. Leaves with petioles 4–8 mm long; blades elliptic or oblong, apex obtuse or ± acute, base rounded, 7–12 cm × 4–7 cm, sparsely hairy above and densely appressed silky hairy below when young, becoming less hairy with age, often becoming almost glabrous above; lateral veins 12–20 on either side of midrib, impressed above. Flowers usually solitary, occasionally 3 together, peduncles up to 2.5 cm long; sepals 0.7–1.5 cm long; petals white, up to *ca* 2 cm long; stamens *ca* 1 cm long. Fruits yellow, globose or pyriform, up to *ca* 5 cm long.

Native of tropical America and the West Indies; cultivated for its edible fruits, occasionally naturalized in eastern parts of the region. Flowers mostly spring–summer. The fruit is sweet and is good eating, fresh or in jams.

**2. \**Psidium guineense* Swartz**

GUAVA

Shrub up to *ca* 2.5 m tall. Leaves with petioles 0.4–1.2 cm long; blades elliptic or oblong, apex obtuse or acute, base rounded, 7–13 cm × 3–6 cm, lower surface with sparse to dense ± spreading hairs, upper surface ± densely hairy when young, becoming less hairy with age; lateral veins 6–10, rarely 12 on either side of midrib, not impressed above, often slightly raised. Flowers solitary or 3 in pedunculate dichasia, peduncles up to *ca* 2.5 cm long; sepals 0.5–1 cm long; petals white, 1–1.5 cm long; stamens *ca* 0.6–1 cm long. Fruits globose or obovoid, up to *ca* 2.5 cm long.

Native of tropical America and the West Indies; cultivated for its edible fruit, occasionally naturalized in eastern parts of the region. Flowers spring. The fruit is somewhat bitter and is used in jams.

**22. ARCHIRHODOMYRTUS (Nied.) Burret**

Trees or shrubs. Leaves opposite, petiolate, dorsiventral, punctate, pinnately nerved with distant intramarginal vein. Inflorescences axillary, 3–7-flowered cymes or flowers solitary; hypanthium turbinate to urceolate; sepals 5; petals 5; stamens numerous, free, in several series, filaments filiform, anthers versatile; ovary 2–3-locular, ovules 10 or more per loculus, stigma capitate or peltate. Fruits berries; seeds several.

5 species Australia and New Caledonia; 1 species Australia, occurring in south-eastern Queensland.

**1. *Archirhodomyrtus beckleri* (F. Muell.) A. J. Scott**

*Myrtus beckleri* F. Muell.; *Rhodomyrtus beckleri* (F. Muell.) L. S. Smith

Shrub or small tree up to 6 m tall, young branchlets thinly appressed hairy. Stipules linear, caducous; petioles 2–5 mm long; blades elliptic or ovate-elliptic, apex drawn out to blunt tip, base cuneate, 2–8 cm × 1–3.5 cm, glabrous, dark green and shiny above, paler below, venation not conspicuous. Inflorescences axillary, either 3- or 7-flowered cymes or flowers solitary, bracteoles caducous; hypanthium *ca* 3 mm long, appressed pubescent at first, at length ± glabrous; sepals 5, up to 5 mm long; stamens 3–4 mm long; ovary 3-locular, style *ca* 5 mm long. Fruits yellow to orange when ripe, globular, *ca* 5–8 mm diameter.

Rainforest, often in regrowth areas or in fringing rainforest of the eastern Moreton and Wide Bay districts. Flowers spring. Fruits ripe summer–autumn.

**23. RHODOMYRTUS (DC.) Reichenb.**

Small trees or shrubs. Leaves petiolate, penninerved or triplinerved. Flowers solitary, axillary or in 3–11-flowered cymes or racemes; hypanthium turbinate to ellipsoid or ± globular; sepals 4–5; petals 4–5; stamens numerous, in 3–6 series, filaments filiform, anthers versatile, loculi opening longitudinally; ovary 1–4-locular, ovules many, style filiform, stigma capitate. Fruits dry or fleshy berries; seeds few–many.

11 species south-eastern Asia to New Guinea, Solomon Is., New Caledonia and Australia; 3 species Australia; 1 species south-eastern Queensland.

**1. *Rhodomyrtus psidioides* (G. Don) Benth.**

NATIVE GUAVA

*Nelitris psidioides* G. Don

Shrub or small tree up to 12 m tall, young leaves and inflorescences densely hairy. Leaves with petioles 0.7–2 cm long; blades ovate-elliptic, ovate or oblong, apex acuminate, base cuneate, 5–20 cm × 2.5–6.5 cm, penninerved, lateral nerves 7–11, intramarginal nerve absent. Flowers usually in 3–11-flowered cymes or racemes, rarely solitary, bracts 5–8 mm long, deciduous, bracteoles *ca* 2–3 mm long; hypanthium campanulate, *ca* 5 mm long, villous or tomentose; sepals 5, 3–4 mm long, villous or tomentose, petals white or pink, 5, 7–10 mm long. Fruits yellowish, globular or ovoid, up to *ca* 3 cm long. **Fig. 31E.**

Rainforest and wet eucalypt forests of eastern parts of the region as far north as about Gympie. Flowers spring–summer. Fruits ripe March. The fruits are regarded as edible.



Fig. 31 MYRTACEAE — A<sub>1</sub>–A<sub>2</sub> *Lysicarpus angustifolius*, A<sub>1</sub> portion of flowering stem x1, A<sub>2</sub> fruit x1; B *Backhousia myrtifolia*, portion of flowering stem x1; C *Osbornia octodonta*, portion of fruiting stem x1; D *Austromyrtus dulcis*, stem with flowers and fruit x1; E *Rhodomyrtus psidioides*, portion of flowering stem x1.

## 24. AUSTROMYRTUS (Nied.) Burret

Trees or shrubs. Leaves opposite; stipules small and deciduous or absent; petiolate; blades entire. Flowers axillary, solitary or in racemes cymes or panicles, often forming fascicles in each axil; hypanthium turbinate, campanulate or urceolate; sepals 4–5, usually small and persistent; petals 4–5; stamens numerous in 2 or more rows, anthers versatile, opening longitudinally; ovary 2–3-locular, ovules 2–20 per loculus, style filiform, stigma small. Fruits berries; seeds 1 or few.

About 140 species tropical and subtropical parts of the world; *ca* 16 species Australia; 7 species south-eastern Queensland.

- |  |                             |
|--|-----------------------------|
| 1. Flowers 4-merous . . . . .  | 2                           |
| Flowers mostly 5-merous . . . . .  | 3                           |
| 2. Leaf blades glabrous . . . . .  | 1. <i>A. fragrantissima</i> |
| Leaf blades pubescent, at least on veins . . . . .   | 2. <i>A. sp. 1.</i>         |
| 3. Leaves, at least on undersurface, and branchlets with indumentum . . . . .                      | 4                           |
| Leaves and usually branchlets glabrous . . . . .   | 5                           |
| 4. Leaves with few oil glands, glands not translucent . . . . .                                    | 3. <i>A. inophloia</i>      |
| Leaves with dense translucent oil glands . . . . .   | 4. <i>A. dulcis</i>         |
| 5. Leaves very shiny above, oil glands sparse, usually not visible on upper leaf surface . . . . . | 5. <i>A. hillii</i>         |
| Leaves moderately shiny above, oil glands dense and visible on both surfaces . . . . .             | 6                           |
| 6. Sepals herbaceous, green . . . . .  | 6. <i>A. acmenoides</i>     |
| Sepals petaloid, white . . . . .   | 7. <i>A. bidwillii</i>      |

**1. *Austromyrtus fragrantissima* (F. Muell. ex Benth.) Burret** SWEET MYRTLE  
*Myrtus fragrantissima* F. Muell. ex Benth.

Shrub or small tree up to *ca* 6 m tall. Leaves with petioles 1.5–4 mm long; blades elliptic, apex obtuse to acute, apiculate, base cuneate, 2–7 cm × 0.8–2.5 cm, glabrous, oil glands usually obscure and scattered. Flowers solitary axillary or in axillary fascicles, occasionally in short racemes; hypanthium *ca* 1.5 mm long, pubescent; sepals 4, 1.5–2 mm long; petals white, 4, 2–3 mm long; stamens 2–3 mm long; style 3 mm long. Fruits yellow-orange, globular or ovoid, 4–6 mm long.

Rare in Queensland, known only from rainforest along Currumbin Ck. in the south-eastern Moreton district. Flowers spring.

**2. *Austromyrtus* sp. 1.**

*Austromyrtus lasioclada* auct. non (F. Muell.) L. S. Smith

Shrub or small tree up to *ca* 9 m tall. Leaves with petioles 4–10 mm long; blades elliptic, apex acute or acuminate, base cuneate, 3–10 cm × 1.5–3.5 cm, glabrous or with scattered hairs above, thinly villous below except midrib which is densely villous, oil glands distinct on lower surface. Flowers axillary, solitary or 2 together, or in axillary 3-flowered cymes; hypanthium up to *ca* 3 mm long, villous; sepals 4, 1–2 mm long; petals white, 4, 4–5 mm long; stamens up to 6 mm long; style up to 6 mm long. Fruits black, ovoid or subglobular, 6–10 mm long.

Rainforest on volcanic soils of the McPherson Ra. and also on the eastern side of the Blackall Ra. Flowers summer.

**3. *Austromyrtus inophloia* (J. F. Bailey & C. T. White) Burret**

*Myrtus inophloia* J. F. Bailey & C. T. White; *M. decaspermoides* Domin;  
*Austromyrtus decaspermoides* (Domin) Burret

Shrub or small tree up to *ca* 5 m tall. Leaves with petioles 1.5–3 mm long; blades ovate, apex acute to acuminate, base cuneate to rounded, 0.5–5 cm × 0.3–2 cm, thinly pubescent becoming glabrous above, thinly pubescent below, oil glands indistinct. Flowers axillary, solitary or in short racemes; hypanthium *ca* 1–1.5 mm long.

pubescent; sepals 5, *ca* 1.5 mm long; petals white, 5, 2–3 mm long; stamens 3–4 mm long; style up to *ca* 4 mm long. Fruits  $\pm$  globular, *ca* 4 mm long.

Rainforest from about Mt. Glorious in the Moreton district to Kin Kin in the Wide Bay district. Flowers spring.

**4. *Austromyrtus dulcis* (C. T. White) L. S. Smith** MIDGEN; MIDYIM

*Myrtus dulcis* C. T. White; *M. tenuifolia* Smith var. *latifolia* Maiden & Betche  
Shrubs often prostrate or decumbent, usually less than 50 cm tall. Leaves with petioles 1–2.5 mm long; blades ovate, apex acute to acuminate, apiculate, base cuneate, 0.9–3 cm  $\times$  0.3–1.8 cm, upper surface glabrescent, shiny, lower surface densely greyish pubescent with long and short hairs. Flowers usually single axillary, rarely in racemes or fascicles; hypanthium 1–1.5 mm long, densely pubescent; sepals 5, rarely 4, 1–2 mm long; petals white, 5, *ca* 3 mm long; stamens 4–5 mm long; style 4–5 mm long. Fruits white with dark spots, globular, 6–8 mm long. **Fig. 31D.**

Coastal sandy soils from about Fraser I. southwards. Flowers spring to autumn. Commonly cultivated as a ground cover plant in native gardens. The fruits are edible.

**5. *Austromyrtus hillii* (Benth.) Burret** SCALY MYRTLE

*Myrtus hillii* Benth.; *M. opaca* C. T. White; *Austromyrtus acutiuscula* Burret

Shrub or small tree up to 12 m tall. Leaves with petioles 1–5 mm long; blades ovate or elliptic, apex bluntly acuminate, occasionally obtuse, base cuneate, 1.8–6.5 cm  $\times$  0.7–3 cm, glabrous and shiny above, glabrous and dull below, oil glands usually not visible above, numerous below. Flowers usually single axillary, sometimes in axillary racemes; hypanthium *ca* 2 mm long, pubescent to  $\pm$  glabrous; sepals 5, 1.5–2 mm long; petals white, 5, 3–5 mm long; stamens 3–4 mm long; style 2–3 mm long. Fruits black, globular or oblongoid, 8–10 mm long.

Coastal areas and adjacent ranges of the Moreton and Wide Bay districts, usually in drier types of rainforest. Flowers spring–summer.

**6. *Austromyrtus acmenoides* (F. Muell.) Burret** SCRUB IRONWOOD

*Myrtus acmenoides* F. Muell.; *M. gonoclada* F. Muell. ex Benth.; *Austromyrtus gonoclada* (F. Muell. ex Benth.) Burret

Tall shrub or tree up to 18 m tall. Leaves with petioles 1–5 mm long; blades elliptic to ovate, apex acute to acuminate, base cuneate, rounded or truncate, 3–7 cm  $\times$  1.5–3 cm, glabrous, moderately glossy above, dull below, oil glands numerous above and below. Flowers axillary, solitary or in fascicles racemes or cymes; hypanthium *ca* 2 mm long, glabrous or shortly pubescent; sepals 5, 1.5–2 mm long; petals white, 5, 3–5 mm long; stamens 5–6 mm long; style 4–5 mm long. Fruits black,  $\pm$  globular, *ca* 6 mm long.

Rainforest usually of drier types, of the Moreton and Wide Bay districts. Flowers spring.

**7. *Austromyrtus bidwillii* (Benth.) Burret**

*Myrtus bidwillii* Benth.

Shrub or tree up to *ca* 25 m tall. Leaves with petioles 2–8 mm long; blades ovate to elliptic, apex acuminate, base cuneate, rounded or truncate, 3–11 cm  $\times$  1.5–4.5 cm, glabrous, moderately glossy above, dull below, oil glands dense above and below. Flowers usually in axillary racemes; hypanthium *ca* 1–1.5 mm long, glabrous; sepals 5, 0.5–1.5 mm long; petals white, 5, 3–5 mm long; stamens 2–6 mm long; style 3–6 mm long. Fruits black,  $\pm$  globular, 5–6 mm long.

Drier types of rainforest. Flowers spring, occasionally also autumn.

**25. PILIDIOSTIGMA Burret**

Shrubs or small trees. Leaves opposite; stipulate; petiolate; blades pinnately nerved with 1–2 distant intramarginal veins. Inflorescences axillary, 1-flowered or racemose; hypanthium turbinate, campanulate or cylindrical; sepals 4–5; petals 4–5; stamens numerous in 2–several series, anthers glandular, sub-basifixed, dehiscent

longitudinally; ovary 2–3-locular, ovules 1-many per loculus, style thick, stigma peltate. Fruits berries; seeds 1–8.

5 species all endemic in Australia; 2 species south-eastern Queensland.

- |  |   |   |   |                           |
|--|---|---|---|---------------------------|
| 1. Branchlets, petioles and midveins of leaves pubescent | . | . | . | 1. <i>P. rhytispermum</i> |
| Branchlets, petioles and midveins of leaves glabrous     | . | . | . | 2. <i>P. glabrum</i>      |

### 1. *Pilidiostigma rhytispermum* (F. Muell.) Burret

*Myrtus rhytispermum* F. Muell.

Shrub up to 3 m tall; branchlets pubescent. Leaves with petioles up to *ca* 2.5 mm long, pubescent; blades elliptic, occasionally obovate, apex obtuse, base cuneate or shortly attenuate, 1.5–3.5(–5) cm × 0.5–1.5(–2) cm, glabrous except for pubescent midrib. Flowers solitary, axillary, peduncles 1.5–3 cm long, bracteoles *ca* 0.8 mm long, ciliate; hypanthium turbinate, 3–4 mm long; sepals 5, *ca* 1 mm long; petals white, 5, up to 1 cm long; stamens up to *ca* 7 mm long; style up to 9 mm long. Fruits purple-black, 8–10 mm long.

Eastern Moreton and Wide Bay districts from about Brisbane north to about Gympie, usually in wet eucalypt forests or along creeks. Flowers mostly autumn. Fruits ripe late autumn to spring.

### 2. *Pilidiostigma glabrum* Burret

*Myrtus rhytispermum* F. Muell. var. *grandifolia* Benth.

Shrub or small tree up to 5 m tall, branchlets glabrous. Leaves with petioles up to *ca* 6 mm long; blades elliptic or sometimes elliptic-oblong or elliptic-ovate, apex acuminate, tip blunt or apiculate, base cuneate, 2–10 cm × 0.7–3.5 cm, glabrous. Flowers axillary, solitary or occasionally in pairs, peduncles up to *ca* 3 cm long; hypanthium turbinate-campanulate, 4–5 mm long; sepals 5, *ca* 1.5 mm long; petals white or pale pink, 5, 5–7 mm long; stamens up to 8 mm long; style up to 7 mm long. Fruits purple-black, *ca* 1.4 cm long.

Rainforest margins and wet eucalypt forests of the eastern Moreton and Wide Bay districts. Flowers mostly summer–autumn. Fruits usually ripe late winter–spring.

## 26. EUGENIA L.

Shrubs or trees, flower buds and vegetative buds pubescent, otherwise glabrous. Leaves opposite, entire, penniveined. Flowers in clusters at base of shoots; hypanthium campanulate; sepals 4, longer than hypanthium; petals 4, spreading; stamens numerous, anthers dorsifixed; ovary inferior, 2–3-locular, ovules several–many. Fruits berries; seeds 1–2.

About 1 000 species, tropical and subtropical regions of the world; 1 species Australia, occurring in south-eastern Queensland.

### 1. *Eugenia reinwardtiana* (Blume) DC.

*Myrtus reinwardtiana* Blume; *Eugenia carissoides* F. Muell.; *E. macrohila* C. T. White & Francis

Shrub or small tree up to *ca* 6 m tall. Leaves with petioles 1.5–6 mm long; blades very variable, ± orbicular to ovate to elliptic to ± rhomboid, apex rounded, base rounded to cuneate, margin somewhat recurved, 1.5–9 cm × 1–5 cm. Flowers solitary or few together, peduncles up to *ca* 1.8 cm long; hypanthium *ca* 2 mm long, silky pubescent; sepals 2.5–3 mm long, sparsely hairy; petals white, 3–6 mm long; stamens numerous, slightly shorter than petals. Fruits red, ± globular, *ca* 0.8–2.5 cm diameter.

Known from depauperate rainforest of the northern Burnett district. Flowers late summer to spring.

## 27. SYZYGIUM Gaertn.

Trees or shrubs, usually glabrous. Leaves opposite, entire, penniveined. Flowers in terminal or lateral panicles or cymes; hypanthium funnel shaped to campanulate; sepals 4, rarely 5, often persistent on fruit; petals 4, rarely 5, free and spreading or cohering and forming calyptra which is shed as flower expands; stamens conspicuous, numerous, free, anthers versatile, loculi parallel, opening by longitudinal slits; ovary inferior, 2–3-locular, ovules several—many, style slender, stigma small. Fruits berries or drupes; seed solitary, occasionally 2.

About 500 species from tropical and subtropical parts of the world; 55 species Australia; 9 species south-eastern Queensland.

- |   |                            |   |
|---|----------------------------|---|
| 1. Flowers and fruits borne in cymose panicles on old wood well below leaves; fruits white, globular, 3–6.5 cm diameter . . . . . | 1. <i>S. moorei</i>        |   |
| Flowers and fruits borne in inflorescences terminal or in upper leaf axils . . . . .  | . . . . .                  | 2 |
| 2. Petals imbricate in bud, slightly cohering and forming calyptra which is shed as flower opens . . . . .                        | 2. <i>S. francisii</i>     |   |
| Petals not forming calyptra, not shed as flower opens . . . . .   | . . . . .                  | 3 |
| 3. Hypanthiums 1–1.3 cm long; fruits red, obovoid, 1.3–2 cm long; styles <i>ca</i> 1.5 cm long, persistent in fruit . . . . .     | 3. <i>S. corynanthum</i>   |   |
| Hypanthiums less than 1 cm long; fruits and styles not as above . . . . .   | . . . . .                  | 4 |
| 4. Petals 8–10 mm long; stamens 2–3 cm long . . . . .   | 4. <i>S. hodgkinsoniae</i> |   |
| Petals less than 8 mm long; stamens up to 2 cm long . . . . .   | . . . . .                  | 5 |
| 5. Stamens 1–2 cm long . . . . .  | . . . . .                  | 6 |
| Stamens 0.2–0.9 cm long . . . . .   | . . . . .                  | 7 |
| 6. Petals 4–6 mm long; . . . . .  | 5. <i>S. australe</i>      |   |
| Petals <i>ca</i> 2 mm long; . . . . .   | 6. <i>S. johnsonii</i>     |   |
| 7. Hypanthiums campanulate, <i>ca</i> 3 mm long . . . . .   | 7. <i>S. oleosum</i>       |   |
| Hypanthiums funnel shaped, <i>ca</i> 5–7 mm long . . . . .  | . . . . .                  | 8 |
| 8. Petals <i>ca</i> 1.5–2.5 mm long; fruits obovoid, 0.9–1.2 cm × 0.7–1.1 cm . . . . .  | 8. <i>S. luehmanii</i>     |   |
| Petals 2.5–4.5 mm long; fruits depressed globular, 1.2–2 cm × 1.4–2.5 cm . . . . .  | 9. <i>S. crebrinerve</i>   |   |

1. *Syzygium moorei* (F. Muell.) L. A. S. Johnson

DUROBBY; ROBBY

*Eugenia moorei* F. Muell.

Tree up to 40 m tall, stem diameter up to 60 cm, occasionally somewhat flanged at base. Leaves with petioles 3–10 mm long; blades elliptic to oblong to oblong-obovate, apex shortly abruptly acuminate to rounded point, base cuneate, 8–23 cm × 3–9 cm, dark green and glossy above, paler below, main lateral veins 14–20 pairs, oil glands inconspicuous. Flowers in cymose panicles on older wood well below leaves, pedicels up to *ca* 5 mm long; hypanthiums campanulate, 5–6 mm long; sepals 4, 1–2 mm long; petals deep red to pink, 4, imbricate and somewhat cohering to form calyptra which is shed as flower opens; stamens deep red to pink, *ca* 8 mm long; style 1.2–2.4 cm long. Fruits whitish suffused with green, compressed globular, 3–6.5 cm diameter.

Restricted, in Queensland, to the Tallebudgera Ck. valley in the southern Moreton district. In Queensland the species is rare and is threatened as development of the valley occurs. Flowers summer. Fruits ripe winter. The fruits are edible. Cultivated as an ornamental.

2. *Syzygium francisii* (F.M. Bailey) L. A. S. JohnsonGIANT WATER GUM;  
FRANCIS' WATER GUM*Eugenia francisii* F. M. Bailey; *E. tomlinsii* Maiden & Betche

Tree up to 30 m tall, stem diameter up to 90 cm, usually buttressed at base. Leaves with petioles 4–9 mm long; blades narrowly ovate to ovate to elliptic, apex drawn out to rounded point, base cuneate, margin ± flat, often undulate, 3.5–8 cm × 1.2–4 cm,

dark glossy green above, paler below, main lateral veins 10–20 pairs, oil glands usually obscure, sparse. Flowers in panicles, pedicels up to *ca* 2 mm long; hypanthium campanulate, 3–4 mm long; sepals 4, *ca* 0.5 mm long; petals 4, orbicular, imbricate and cohering to form calyptra which is shed as flower opens; stamens 3–6 mm long. Fruits purplish blue to pale blue, depressed globular, 0.9–1.5 cm × 1.1–1.9 cm. **Fig. 32E.**

Rainforest of the Moreton and Wide Bay districts, north to about Imbil or possibly further north as it has also been found in the southern Port Curtis district, usually found on volcanic or alluvial soils. Flowers late spring–summer. Fruits ripe summer to winter. The pulp of the fruit is edible but mealy. Cultivated as an ornamental.

**3. *Syzygium corynanthum* (F. Muell.) L. A. S. Johnson**                      SOUR CHERRY  
*Eugenia corynantha* F. Muell.

Tree up to *ca* 30 m tall, stem diameter up to 90 cm, large trees slightly buttressed. Leaves with petioles 0.2–1.1 cm long, thick; blades narrowly elliptic to elliptic to obovate, apex acuminate or acute or obtuse, base cuneate or attenuate, margin recurved, 4–12 cm × 1.5–6 cm, dark green above, paler below, main lateral veins 9–15, rarely more, oil glands distinct, translucent. Flowers in panicles, pedicels 0–3 mm long, thick; hypanthium narrowly funnel shaped, 1–1.3 cm long; sepals 4, erect, 2–3 mm long; petals white, 4, 6–7 mm long; stamens showy, *ca* 1.2 cm long; style *ca* 1.5 cm long. Fruits red, pyriform or obovoid, 1.3–2 cm × 1.1–1.8 cm, with conspicuous persistent sepals on top surrounding persistent style.

Found in rainforest of the Moreton and Wide Bay districts to about as far north as Imbil, usually in communities on basaltic soils or in fringing rainforest on alluvial soils, not common. Flowers autumn to early spring. Fruits ripe spring. The fruits are edible but very sour.

**4. *Syzygium hodgkinsoniae* (F. Muell.) L. A. S. Johnson**                      SMOOTHBARK ROSE  
APPLE

*Eugenia hodgkinsoniae* F. Muell.

Tree up to *ca* 15 m tall, stem diameter up to 40 cm. Leaves with petioles 3–10 mm long; blades ovate to elliptic to obovate, apex abruptly drawn out to rounded point, base cuneate, margin flat or slightly recurved, 6–17 cm × 2–6 cm, upper surface dark green, slightly glossy, under surface dull pale green, main lateral veins 8–13 pairs, oil glands not visible in mature leaves. Flowers in cymose panicles, pedicels up to 1.5 cm long; hypanthium broad campanulate, up to *ca* 5 mm long; sepals 4, 3–4.5 mm long; petals white, 4, 8–10 mm long; stamens 2–3 cm long. Fruits red, ± globular, 1.5–4.5 cm diameter, crowned by persistent sepals.

Fringing rainforest of coastal parts of the Moreton and Wide Bay districts as far north as Kin Kin, on deep alluvial soils. In Queensland the species is threatened due to the destruction of its habitat. Flowers late summer–autumn. Fruits ripe spring.

**5. *Syzygium australe* (Wendl. ex Link) B. Hyland**                      SCRUB CHERRY; CREEK  
LILLY PILLY

*Eugenia australis* Wendl. ex Link; *Syzygium paniculatum* auct. non Gaertn.

Tree up to *ca* 24 m tall, stem diameter up to *ca* 60 cm, large trees sometimes shortly buttressed; young branchlets 4-angled, usually 4-winged. Leaves with petioles 2–10 mm long; blades narrowly elliptic to elliptic to obovate, apex acute to acuminate, with fine point, base cuneate, 2.5–9.5 cm × 1–3 cm, dark green and glossy above when fresh, paler below, main lateral veins mostly 12–25 pairs, prominent in dried leaves, oil glands inconspicuous. Flowers showy in panicles of 1–3 flowers, pedicels up to 10 mm long; hypanthium campanulate, *ca* 6 mm long; sepals green, 4, rarely 5, obtuse, 2–4 mm long; petals white, 4, rarely 5, 4–6 mm long, free, spreading; stamens showy, (0.8–)1.3–2 cm long. Fruits reddish pink to red, obovoid, 1.5–2.5 cm × 0.8–2 cm, crowned by persistent sepals.

Widespread in the region in rainforest, on a variety of soils. Flowers mainly summer–autumn. Fruits ripe autumn–winter. The pulp of the fruit is crisp and pleasant to eat, either raw or in jams or pies. Cultivated as an ornamental.

**6. *Syzygium johnsonii* (F. Muell.) B. Hyland***Eugenia johnsonii* F. Muell.; *E. petriei* C. T. White & Francis

Tree up to *ca* 30 m tall, stem diameter up to *ca* 70 cm, large trees often buttressed. Leaves with petioles 4–10 mm long; blades ovate to elliptic to obovate, apex abruptly narrowed to drawn out rounded tip, base cuneate, margin recurved, 5–12 cm × 2–7 cm, glossy above, paler below, main lateral veins 20–30 pairs, oil glands inconspicuous. Flowers in panicles, pedicels 4–8 mm long; hypanthium campanulate, *ca* 5 mm long; sepals 4, *ca* 1.5 mm long; petals 4, *ca* 2 mm long; stamens 1–1.2 cm long. Fruits red, globular, 1.2–2.5 cm diameter.

Rainforests of the northern Wide Bay district, especially on Fraser I., also recorded from the extreme north of the Burnett district. Flowers mainly winter to summer. Fruits ripe mainly summer–autumn. The fruits are edible but somewhat acidic.

**7. *Syzygium oleosum* (F. Muell.) B. Hyland**BLUE CHERRY; BLUE LILLY  
PILLY*Eugenia oleosa* F. Muell.; *E. coolminiana* C. Moore; *E. cyanocarpa* F. Muell. ex Maiden & Betche; *Syzygium coolminianum* (C. Moore) L. A. S. Johnson

Shrub or tree up to *ca* 15 m tall, stem diameter up to 30 cm. Leaves with petioles 2–10 mm long; blades oblong-elliptic to elliptic, apex drawn out to fine point, base cuneate, margin recurved, 3–11 cm × 1–5 cm, dark green and glossy above when fresh, paler below, main lateral veins 9–20 pairs, faint in fresh leaves, distinct in dried leaves, oil glands numerous, translucent, conspicuous, crushed leaves with lemon odour. Flowers in panicles, pedicels 0–4 mm long; hypanthium campanulate, *ca* 3 mm long; sepals reddish, 4, *ca* 1 mm long; petals white, 4, 2–3 mm long; stamens *ca* 7–9 mm long when fresh. Fruits purplish red changing to purplish blue when ripe, globose, 1–2 cm diameter.

Found in rainforest of all types on a variety of soils. Flowers spring–summer. Fruits ripe autumn–winter. The fruits have edible succulent flesh. Cultivated as an ornamental.

**8. *Syzygium luehmanii* (F. Muell.) L. A. S. Johnson**SMALL LEAVED WATER  
GUM*Eugenia luehmanii* F. Muell.; *Austromyrtus exaltata* (F. M. Bailey) Burret

Tree up to *ca* 35 m tall, stem diameter up to 1.2 m. Leaves with petioles 2–6 mm long; blades narrowly ovate to narrowly elliptic, apex abruptly drawn out to rounded point, base cuneate or rounded, margin recurved, 2.5–7 cm × 1–4 cm, dark green and glossy above, paler below, young leaves pink, main lateral veins 8–14 pairs, intramarginal vein conspicuous, oil glands numerous. Flowers in panicles, pedicels 0–2 mm long; hypanthium funnel shaped, *ca* 5 mm long; sepals 4 or 5, *ca* 0.7 mm long; petals 4–5, *ca* 1.5 mm long; stamens 2–5 mm long. Fruits rose-red, obovoid, flattened on top, 0.9–1.2 cm × 0.7–1.1 cm.

Usually found in coastal rainforest on deep sand, though sometimes found on volcanic soils. Flowers spring–summer. Fruits ripe late summer. Fruits edible. Cultivated as an ornamental.

**9. *Syzygium crebrinerve* (C. T. White) L. A. S. Johnson**PURPLE CHERRY;  
BLACK WATER GUM*Eugenia crebrinervis* C. T. White

Tree up to *ca* 35 m tall, stem diameter up to 100 cm, large trees usually prominently buttressed, young branchlets never winged. Leaves with petioles 0.4–1.2 cm long; blades narrowly elliptic to broadly elliptic, apex drawn out to narrow point, base cuneate to attenuate, margin recurved, 5–13 cm × 1.3–5 cm, rarely larger, dark green and shiny above, paler below, main lateral veins 30–60 pairs, closely spaced, oil glands widely spaced, translucent, conspicuous in fresh material. Flowers few–many in panicles, pedicels 2–5 mm long; hypanthium funnel shaped, 6–7 mm long, sepals reddish, 4, 1–2 mm long; petals whitish, 4, 2.5–4.5 mm long, spreading; stamens 4–7 mm long. Fruits purple, depressed globular, 1.2–2 cm × 1.4–2.5 cm. **Fig. 32F.**

Rainforest on basaltic soil from the McPherson Ra. north to Mt. Glorious. Pulp of fruit edible but dry and mealy with an acid taste. Flowers spring–summer.

**28. WATERHOUSIA B. Hyland**

Trees, glabrous. Leaves opposite, entire, penniveined. Flowers in terminal and upper axillary panicles; hypanthium turbinate; sepals 4–5; petals 4–5; stamens conspicuous, numerous, anthers versatile; ovary inferior, ovules pendulous from upper axile placentar. Fruits berries; seed usually solitary.

An endemic genus of 4 species; 1 species south-eastern Queensland.

**1. *Waterhousia floribunda* (F. Muell.) B. Hyland**      **WEeping LILLY PILLY;  
WEeping MYRTLE**

*Syzygium floribundum* F. Muell.; *Eugenia ventenatii* Benth.

Tree up to 30 m tall, stem diameter up to 80 cm, large trees often flanged at base, branches pendulous. Leaves with petioles 2–8 mm long; blades narrowly oblong-ovate to narrowly oblong-elliptic, apex drawn out to pointed or rounded tip, base cuneate, margin slightly recurved, 5.5–17 cm × 1.3–5 cm, dark green and glossy above, dull and paler below, main lateral veins 15–40 pairs, oil glands numerous, fairly distinct. Flowers in panicles, pedicels up to 3 mm long; hypanthium campanulate, *ca* 3 mm long; sepals 5, less than 1 mm long; petals white, 5, imbricate, mostly cohering slightly and forming calyptra which is shed when flower opens; stamens *ca* 3–7 mm long; style 4–10 mm long. Fruits greenish, ± depressed globular, 1.3–2 cm diameter, crowned by persistent calyx lobes.

Fringing rainforest of the region. Flowers late spring–summer. Fruits ripe summer to late autumn or occasionally winter. Cultivated as an ornamental.

**29. ACMENA DC.**

Trees or shrubs, usually glabrous. Leaves opposite, entire, penniveined. Flowers small in terminal or subterminal trichotomous panicles; hypanthium campanulate, extended above ovary, expanded near apex; sepals 4–6, mostly short, sometimes much reduced; petals white or creamy-white, 4–5, rarely 6, small and inconspicuous; stamens numerous, short, anthers minute, loculi ± globular, divaricate, opening by short transverse or apical slits or pores; ovary inferior, 2–3-locular, ovules several—many per loculus, style shorter than stamens, stigma small. Fruits berries or drupes; seed solitary.

About 15 species south-eastern Asia to Australia and the Solomon Is.; 7 species Australia, all endemic; 3 species south-eastern Queensland.

- |   |                          |
|---|--------------------------|
| 1. Intramarginal veins of leaves indistinct below, up to 1 mm from edge of leaf, outer partial intramarginal vein absent              | 1. <i>A. smithii</i>     |
| Intramarginal veins of leaves distinct below, 1–3 mm from edge of leaf, sometimes an outer intramarginal vein present at base of leaf | 2                        |
| 2. Fruits red, 2–4 cm diameter; leaves 3–6 times as long as wide  | 2. <i>A. brachyandra</i> |
| Fruits white, 1–1.8 cm diameter; leaves 1.5–3 times as long as wide   | 3. <i>A. hemilampra</i>  |

**1. *Acmena smithii* (Poiret) Merr. & Perry**      **LILLY PILLY**  
*Eugenia smithii* Poiret; *E. smithii* var. *minor* Maiden; *E. smithii* var. *coriacea* Domin; *Lomastelma smithii* (Poiret) J. H. Willis

A very variable species; bushy tree or tree up to 20 m tall, stem diameter up to 45 cm, sometimes branching from base into several stems or single stemmed and sometimes buttressed. Leaves with petioles 1.5–9 mm long; blades narrowly elliptic to broadly elliptic or narrowly obovate to obovate, apex narrowed, often abruptly, to narrow but rounded tip, occasionally acute, base cuneate, margin recurved, 2.5–12 cm × 0.6–5 cm, intramarginal vein obscure, up to 1 mm from edge, oil dots numerous. Hypanthium 3–4 mm × 2–3 mm; petals 0.8–1.3 mm long; stamens *ca* 1 mm long. Fruits white or purplish, globular, 0.8–1.5 cm diameter. **Fig. 32A, 32B.**

Rainforest of the region, widespread. Flowers late spring–early summer. Fruits ripe autumn–winter, edible. Cultivated as an ornamental.

**2. *Acmena brachyandra* (Maiden & Betche) Merr. & Perry** **RED APPLE**  
*Eugenia brachyandra* Maiden & Betche; *Acmena australis* (C. Moore) L. A. S. Johnson

Tree up to 35 m tall, stem diameter up to 90 cm, large trees often buttressed; outer bark grey or greyish brown. Leaves with petioles 2–10 mm long; blades oblong to elliptic to elliptic-obovate, apex acuminate to fine point, base narrowed, margin recurved, 7–16 cm × 2–5 cm, 3–6 times as long as wide, intramarginal vein distinct below, 1.2–3(–4) mm from edge, often with an outer intramarginal vein present along part of leaf, oil dots distinct and numerous in young leaves, indistinct in mature leaves. Hypanthium 2–3 mm × *ca* 3 mm; petals 1.2–1.8 mm long; stamens *ca* 1 mm long. Fruits red, globular, 2–4 cm diameter. **Fig. 32C.**

Rainforests of southern parts of the region, usually red basaltic soils. Flowers late spring–early summer. Fruits ripe autumn–winter, edible. Cultivated as an ornamental.

**3. *Acmena hemilampra* (F. Muell. ex F. M. Bailey) Merr. & Perry** **BROAD LEAVED LILLY PILLY**

*Eugenia hemilampra* F. Muell. ex F. M. Bailey

Tree up to 30 m tall, stem diameter up to 1.2 m, large trees sometimes buttressed; outer bark reddish brown, smooth. Leaves with petioles 2–9 mm long; blades broadly elliptic, apex narrowed, often abruptly, to broad obtuse tip, base cuneate, margin recurved, 5–13 cm × 2.5–4.5 cm, 1.5–3 times as long as broad, intramarginal vein distinct below, 1–1.5(–2) mm from edge, sometimes outer intramarginal vein present in lower part of leaf, oil dots variable in size, larger ones often visible without magnification. Hypanthium 3–5 mm × *ca* 2–3 mm; petals *ca* 1.5 mm long; stamens *ca* 1 mm long. Fruits white, globular, 1–1.8 cm diameter. **Fig. 32D.**

Rainforest on basaltic, sedimentary or sandy soils of the Moreton and Wide Bay districts. Flowers spring. Fruits ripe autumn–winter, edible.

**30. RHODAMNIA Jack**

Shrubs or trees. Leaves opposite, triplinerved. Flowers axillary, clustered or in few-flowered dichasia, rarely in racemes; hypanthium campanulate to subglobose, not produced above ovary; sepals 4–5, 4 in Australian species; petals 4–5, 4 in Australian species, spreading; stamens numerous, in 3–4 rows, filaments free, anthers dorsifixed, versatile, loculi opening longitudinally; style filiform, stigma peltate. Fruits berries.

23 species south-eastern Asia to New Guinea, Australia and New Caledonia; *ca* 10 species Australia; 6 species south-eastern Queensland.

- |   |                         |   |
|---|-------------------------|---|
| 1. Sepals deciduous . . . . .   | 1. <i>R. rubescens</i>  | 2 |
| Sepals persistent . . . . .   |                         |   |
| 2. Fruits depressed globose, 4–8-lobed . . . . .  | 2. <i>R. sp. 1.</i>     | 3 |
| Fruits globose, not lobed . . . . .   |                         |   |
| 3. Leaves green below; bark of branchlets coming away in small strips . . . . .                                 | 3. <i>R. maideniana</i> | 4 |
| Leaves whitish or greyish below; bark not coming away in small strips . . . . .                                 |                         |   |
| 4. Hypanthiums with dense matted hairs . . . . .  | 4. <i>R. argentea</i>   | 5 |
| Hypanthiums glabrous or with sparse to dense appressed silky hairs . . . . .                                    |                         |   |
| 5. Lateral nerves 4–8 mm inside leaf margin; plant of lowland forest on poorer soils . . . . .                  | 5. <i>R. acuminata</i>  |   |
| Lateral nerves 2–5 mm inside leaf margin; rainforest plant at altitudes above 700 m on basaltic soils . . . . . | 6. <i>R. sp. 2.</i>     |   |

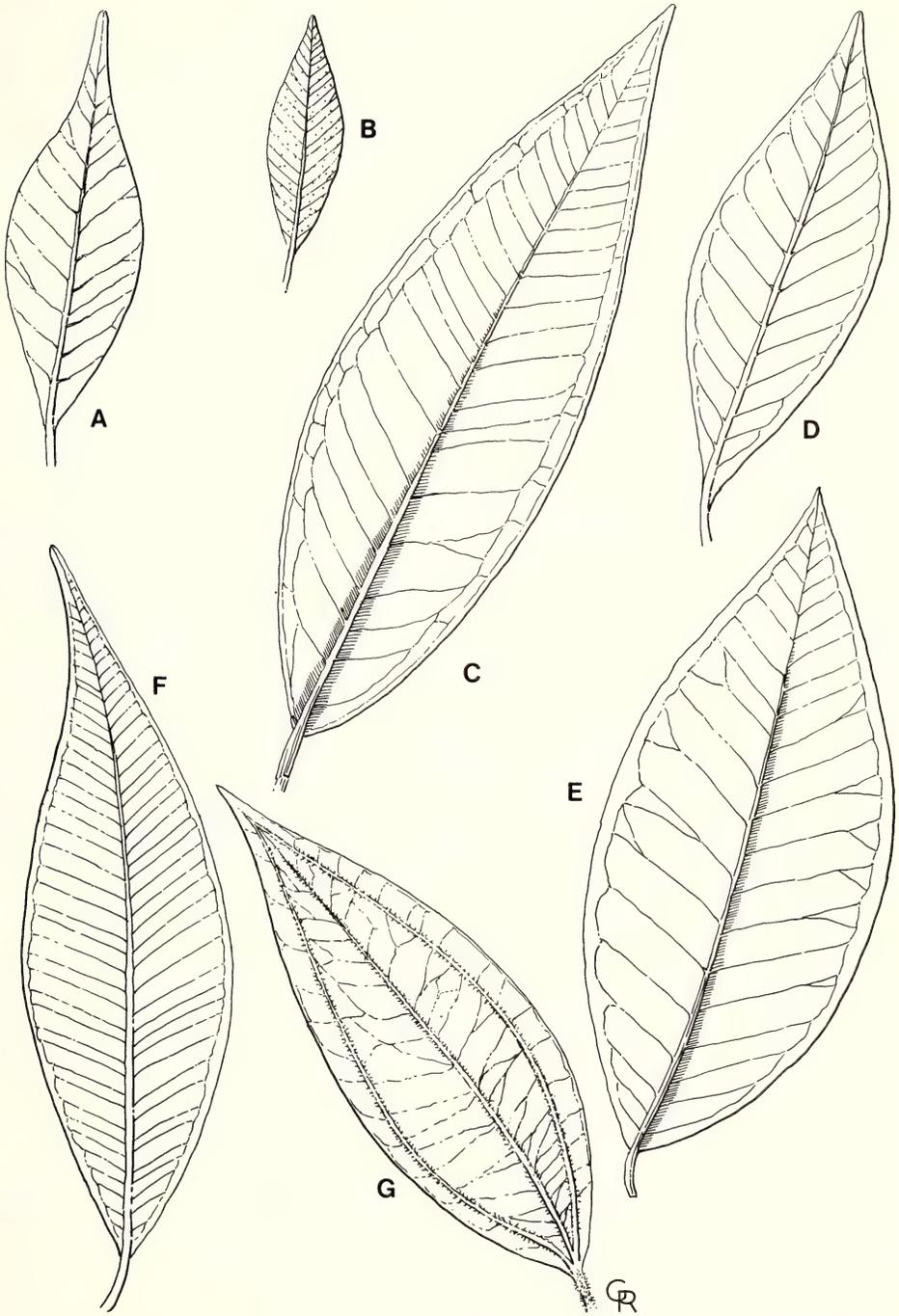


Fig. 32 MYRTACEAE — A–D *Acmena* spp., lower leaf surfaces, all x1 — A–B *A. smithii*, variations in leaf shape; C *A. brachyandra*; D *A. hemilampra*; E–F *Syzygium* spp., lower leaf surfaces, all x1 — E *S. francisii*; F *S. crebrinerve*; G *Rhodamnia rubescens*, undersurface of leaf x1.

**1. *Rhodamnia rubescens* (Benth.) Miq.**

SCRUB STRINGYBARK

*Monoxora rubescens* Benth.; *Rhodamnia trinervia* Blume

Shrub or tree 3–25 m tall. Leaves with petioles 4–9 mm long; blades narrowly ovate or elliptic, apex attenuate-acuminate, base cuneate or rounded, 5–10 cm × 1.7–5 cm, upper surface glabrous or with sparse hairs, undersurface sparsely to densely velvety hairy. Flowers usually 3 together on peduncles 0.5–2.5 cm long; hypanthium 3–4 mm long, sparsely to densely hairy; sepals 2–3 mm long, deciduous; petals white, 4–6 mm long. Fruits red turning glossy black, 4–6 mm diameter. **Fig. 32G.**

Common in rainforest of the eastern Moreton and Wide Bay districts north to about Gympie, also found in wet eucalypt forests, on a wide variety of soil types. Flowers spring.

**2. *Rhodamnia* sp. 1.***Rhodamnia costata* auct. non A. J. Scott, A. J. Scott

Small tree up to ca 8 m tall. Leaves with petioles 5–10 mm long; blades elliptic to ovate, apex rounded to acute-acuminate, base cuneate, 4–8 cm × 2–4 cm, glossy green above, dull and whitish below. Flowers in clusters of up to 10 flowers, usually on old wood below leaves, few in lower leaf axils, peduncles 2–4 mm long; hypanthium ca 1.5 mm long, sparsely hairy; sepals ca 1 mm long, persistent; petals white, ca 3 mm long. Fruits depressed globular, 4–8-ribbed, 6–10 mm broad. **Fig. 33A.**

Depauperate rainforests of the region. Flowers spring–summer.

**3. *Rhodamnia maideniana* C. T. White***Rhodamnia trinervia* Blume var. *glabra* Maiden & Betche

Shrub up to 5 m tall; bark on branchlets flaky or coming away in short strips. Leaves with petioles 4–7 mm long; blades narrowly ovate to ovate, apex usually attenuate with rounded tip, base cuneate, 3.5–7 cm × 1–3.5 cm, glabrous or almost so on both surfaces. Flowers in axillary clusters or three together at end of peduncle, peduncles up to ca 10 mm long; hypanthium ca 2 mm long; sepals ca 1 mm long, persistent; petals white or pale pink, 3–4 mm long. Fruits globose, 6–9 mm diameter.

Occasional in rainforests or wet eucalypt forests of the south-eastern Moreton district, usually on alluvial or basaltic soils.

**4. *Rhodamnia argentea* Benth**

WHITE MYRTLE

Tree up to ca 28 m tall. Leaves with petioles 3–6 mm long; blades elliptic, apex obtuse to acute or shortly acuminate, base cuneate, 5–11 cm × 2–5.5 cm, upper surface green, lower surface silvery-white. Flowers 3–5 together on axillary peduncles 5–8 mm long; hypanthium 1.5–2 mm long, densely tomentose, sepals 2–2.5 mm long, persistent; petals white, 3–4 mm long. Fruits black, globose, 6–10 mm diameter.

Rainforest of eastern parts of the region. Flowers spring.

**5. *Rhodamnia acuminata* C. T. White**

Tree up to ca 20 m tall. Leaves with petioles 0.6–1.3 cm long; blades ovate, apex acuminate, base cuneate or rounded, 5–14 cm × 1.8–7 cm, green above, greyish white below. Flowers 3 together on peduncles 3–10 mm long; hypanthium 1–2 mm long, glabrous or with sparse silky hairs; sepals 1.5–2 mm long, persistent; petals white, 4–5 mm long. Fruits globose, 4–8 mm diameter.

Lowland rainforest on poor soils. Flowers autumn.

**6. *Rhodamnia* sp. 2.***Rhodamnia costata* auct. non A. J. Scott, A. J. Scott

Trees up to 25 m tall. Leaves with petioles 4–6 mm long; blades ovate or narrowly ovate, apex acute to acuminate, base cuneate, 5.5–10 cm × 1.5–2.5 cm, green above, whitish below. Flowers 3–5 together on peduncles up to ca 1 cm long or inflorescences shortly racemose or paniculate; hypanthium ca 3 mm long, glabrous or with few hairs; sepals ca 2–3 mm long, persistent; petals white, 6–8 mm long. Fruits globose, 0.8–1.1 cm diameter. **Fig. 33B.**

Rainforest above 700 m altitude on basaltic soil of the southern Moreton district. Flowers spring–summer.

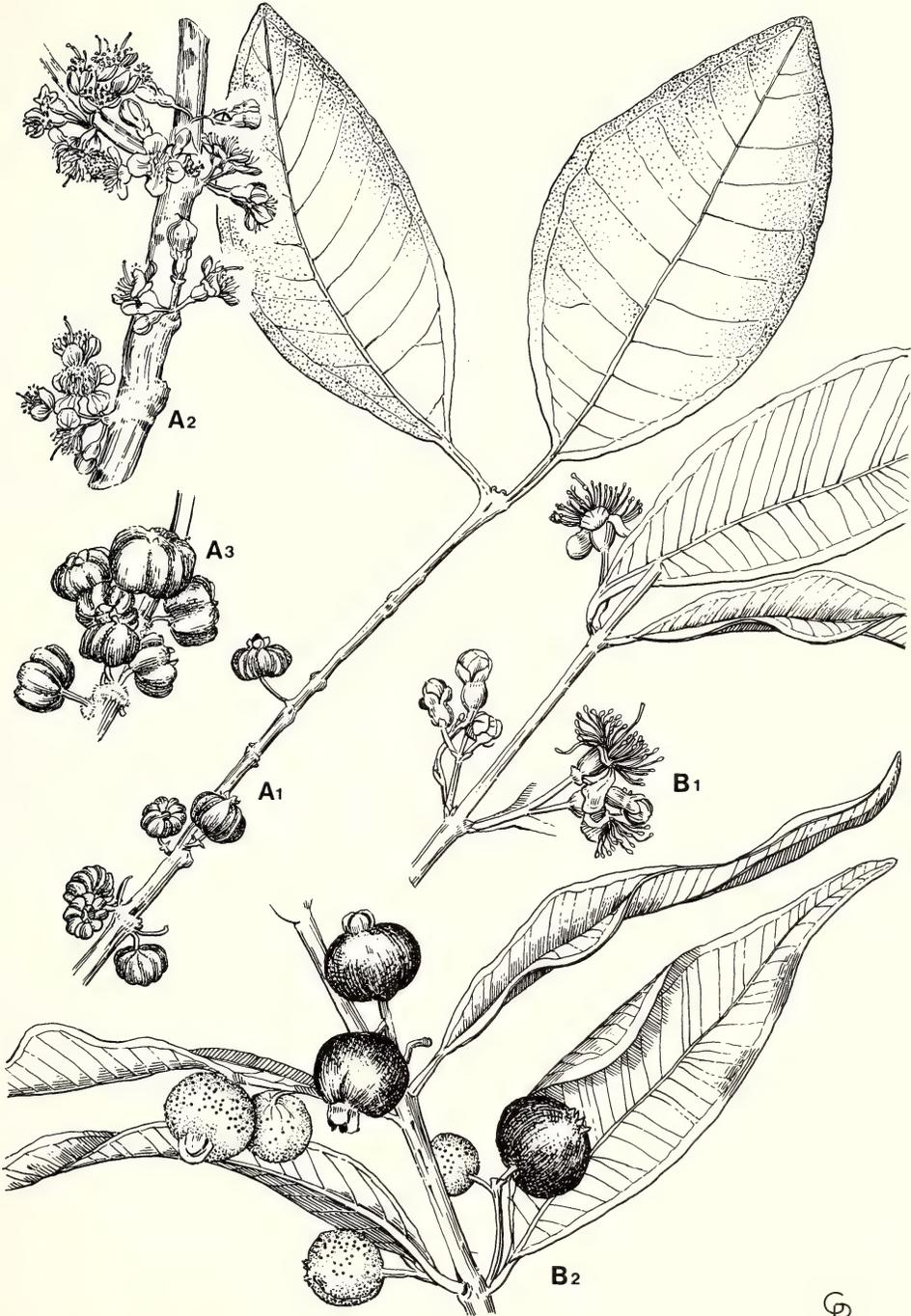


Fig. 33 MYRTACEAE — A-B *Rhodamnia* spp. — A<sub>1</sub>-A<sub>3</sub> *R. sp. 1.*, A<sub>1</sub> portion of fruiting stem x1, A<sub>2</sub> flowers x1, A<sub>3</sub> fruits x1; B<sub>1</sub>-B<sub>2</sub> *R. sp. 2.*, B<sub>1</sub> portion of flowering stem x1, B<sub>2</sub> portion of fruiting stem x1.

### 31. DECASPERMUM J. R. & G. Forster

Shrubs or trees. Leaves opposite; stipulate; petiolate; blades punctate, pinnately nerved, intramarginal vein present. Inflorescences racemose in Australian species; hypanthium globose or urceolate; sepals persistent, 3–5-merous; petals 3–5, punctate; stamens numerous, in several series, anthers globular, dorsifixed, dehiscent longitudinally, connective terminating in gland; ovary 3–12-locular, ovules 2–4 per loculus; style filiform, stigma capitate or peltate. Fruits berries, globular; seeds 2 per loculus.

30 species south-eastern Asia to Australia and the Pacific Is.; 1 species Australia, occurring in south-eastern Queensland.

#### 1. *Decaspermum humile* (G. Don) A. J. Scott

*Nelitris humilis* G. Don; *N. paniculata* var. *laxiflora* Benth.; *Myrtus sericocalyx* Domin; *Decaspermum laxiflorum* auct. non (Blume) Diels, (Benth) Domin

Shrub or tree up to 15 m tall. Stipules linear, caducous; petioles 3–5 mm long; blades elliptic or ovate, apex acuminate, base cuneate or shortly attenuate, margin recurved, 2–8 cm × 0.8–3 cm, silky hairy when young, becoming glabrous and shiny above, usually retaining some hairs below, venation usually inconspicuous. Inflorescences 2–9-flowered racemes, axillary but sometimes appearing terminal, pedicels up to *ca* 5 mm long, bracteoles silky hairy, caducous; hypanthium *ca* 1.5 mm long, silky hairy; sepals 4 or 5, *ca* 1 mm long, pubescent or glabrous; petals 4 or 5, 3–5 mm diameter; stamens 2–3 mm long; ovary usually 4-locular; style 2–3 mm long, stigma capitate. Fruits black, ± globose, 3–8 mm diameter; seeds 2–10.

Depauperate rainforest, usually on shallow soils in eastern parts of the region. Flowers summer–autumn. Fruits ripe late autumn to spring.

## 100. PUNICACEAE

Woody and sometimes spiny trees or shrubs. Leaves mostly opposite, subopposite or fascicled, exstipulate, simple. Flowers terminal, solitary or clustered, bisexual; calyx leathery, tubular, adnate to ovary, 5–7-lobed; petals 5–7, crumpled in bud; stamens numerous, epigynous; filaments slender, free, anthers 2-locular; ovary inferior, many-locular. Fruits spherical berries crowned by calyx limb; seeds numerous.

1 genus with 2 species from south-eastern Europe to northern India; 1 species possibly naturalized Australia, occurring in south-eastern Queensland.

### 1. PUNICA L.

Characters as for the family

#### 1. \**Punica granatum* L.

#### POMEGRANATE

Deciduous tree or shrub up to 6 m tall, there is also a cultivated dwarf form up to *ca* 50 cm tall. Leaves short-petioled; blades oblong or ovate, apex obtuse, 2–5 cm × 0.7–1.5 cm, glabrous. Flowers orange-red, 2.5–4 cm across. Fruits brownish yellow to red, *ca* 4–7 cm diameter, bearing persistent sepals; seeds numerous, surrounded by red or pink pulp.

Widely cultivated for ornamental purposes as well as for the edible fruits. Possibly not naturalized but found persisting in old gardens and occasionally in other places near habitation. Flowers spring–summer.

## 101. BARRINGTONIACEAE

Trees or shrubs. Leaves alternate, usually crowded at end of branches; exstipulate. Inflorescences mostly racemose, terminal or axillary, bisexual, actinomorphic; calyx lobes mostly 4–5 or rarely 2–3; petals free, usually 4, rarely 5 or absent; stamens

numerous, in several series, some often without anthers, filaments free or united at base; ovary inferior or rarely semi-inferior, mostly 2–4-locular, ovules 1–many per loculus. Fruits drupes or berry-like, crowned by  $\pm$  persistent sepals.

About 5 genera and 120 species from tropical Africa to the Malayan Peninsula, New Guinea and Australia; 2 genera with 5 species Australia; 1 genus with 1 species south-eastern Queensland.

### 1. PLANCHONIA Blume

Trees. Flowers in racemes or few together, mostly terminal, rarely axillary, bracts and bracteoles at base of calyx large, semi-persistent; calyx lobes 4; petals 4; stamens tubular at base, inner ones small, without filaments; ovary 3–4-locular, many ovules per loculus. Fruits fleshy-fibrous, 2–4-locular; seeds 2–many, horseshoe shaped.

About 8 species from south-eastern Asia to Australia; 1 species Australia, occurring in south-eastern Queensland.

#### 1. *Planchonia careya* (F. Muell.) Knuth

#### COCKATOO APPLE

*Barringtonia careya* F. Muell.; *Careya australis* F. Muell.

Tree attaining a large size but often seen 4–6 m tall. Leaves with petioles up to ca 5 cm long, winged; blades ovate and shortly acuminate to obovate and obtuse, base often tapering into wing of petiole, margins crenulate or entire, 3–14 cm  $\times$  2–7 cm, glabrous, venation distinct. Flowers few together in short terminal often leafy racemes, pedicels 1–2.5 cm long; calyx lobes 4, rounded, ca 5–8 mm long; petals up to 5 cm long; perfect stamens as long as petals; ovary 4-locular. Fruits broadly ovoid, 4 cm or more long, crowned by persistent calyx lobes.

Known from the north-eastern part of the Wide Bay district. Flowers mainly spring–summer. Fruits eaten by Aborigines.

## 102. MELASTOMATACEAE

Herbs, shrubs or trees, branches opposite. Leaves opposite or verticillate; exstipulate; blades simple, mostly with 3–9 longitudinal nerves. Flowers bisexual, usually showy, actinomorphic; calyx tubular, free or adnate to ovary, usually lobed; petals usually free, inserted at top of calyx tube; filaments free, anthers 2-locular, opening by 1 or 2 terminal pores or rarely in longitudinal slits; ovary inferior or semi-inferior, usually 2–many-locular. Fruits capsules or berries.

About 240 genera with 3000 species from the tropical and subtropical regions of the world; 6 genera with 9 species Australia; 1 genus with 1 species south-eastern Queensland.

### 1. MELASTOMA L.

Shrubs. Leaves 3- or more-nerved. Flowers terminal, solitary or few together in cymes; calyx lobes 5 or rarely 6, with or without alternate accessory lobes or teeth; petals as many as calyx lobes; stamens usually twice as many, rarely same number as petals, connective often extended or thickened; ovary usually 2–6-locular. Fruits capsules or berries, enclosed in calyx or combined with it.

About 70 species from eastern Asia and the Pacific region; 4 species Australia; 1 species south-eastern Queensland.

#### 1. *Melastoma affine* D. Don

#### BLUE TONGUE

*Melastoma polyanthum* Blume; *Melastoma denticulatum* Labill.; *Melastoma malabathricum* auct. non L.

Shrub up to 2 m tall, clothed with usually rigid hairs. Leaves with petioles 6–10 mm long; blades ovate, usually 6–11 cm  $\times$  2–4 cm, with 3 main longitudinal nerves and 2 finer intramarginal ones, usually dark green above, paler below. Flowers usually 5–11 together in short almost sessile terminal cymes; calyx tube 5–10 mm long; calyx lobes 5, ca 4 mm long; petals purple, mauve or rarely white, orbicular, ca 2 cm long;

stamens 10, dissimilar, anthers curved, appendaged. Fruits semi-succulent becoming dry,  $\pm$  globular, 6–8 mm long. **Fig. 34D.**

Common in swampy sandy areas of the Moreton and Wide Bay districts and also recorded from Mt. Perry in the Burnett district. Flowers spring to autumn with the main period in early summer. The pulp of the fruit is edible. Cultivated as an ornamental.

### 103. RHIZOPHORACEAE

Trees or shrubs, frequently on maritime shores; branches swollen at nodes. Leaves opposite; stipules interpetiolar, caducous; blades simple, leathery. Inflorescences axillary; flowers bisexual; calyx tube free or adnate to ovary, lobes 3–14, persistent, valvate; petals usually small, often notched, convolute or inflexed in bud; stamens equal to or usually longer than petals, often in pairs opposite petals on edge of, or at base of perigynous disc, anthers 2- or many-locular; ovary mostly inferior, 2–6-locular, or 1-locular by suppression of septa, style simple or rarely styles several, ovules 2 or more, inserted towards apex on inner angle of each loculus. Fruits mostly indehiscent, usually 1-seeded, or loculi 1-seeded.

16 genera with 120 species, tropical; 4 genera with 11 species Australia; 3 genera with 3 species south-eastern Queensland.

- |   |                      |   |
|---|----------------------|---|
| 1. Calyces 8–16-lobed . . . . .   | 1. <i>Bruguiera</i>  |   |
| Calyces 4–6-lobed . . . . .   |                      | 2 |
| 2. Leaf apices mucronate by extended midrib; lower leaf surface usually dotted; calyces 4-lobed . . . . . | 2. <i>Rhizophora</i> |   |
| Leaf apices obtuse or retuse; lower leaf surface never dotted; calyces 5–6-lobed . . . . .                | 3. <i>Ceriops</i>    |   |

#### 1. BRUGUIERA Lam.

Buttressed trees with knee-like pneumatophores, sometimes with aerial roots when young. Leaves decussate, entire, glabrous, often black dotted beneath. Inflorescences of 2–5 flowered peduncled cymes or flowers solitary; calyx accrescent, 8–15 lobed, lobes acute; petals each embracing pair of stamens, 2-lobed, rarely emarginate, caducous; stamens twice the number of petals, paired, epipetalous filaments filiform, unequal in length, anthers linear; disc distinctly cup shaped and adnate to calyx tube; ovary, adnate to lower part of calyx tube, 2–4-locular, 2 ovules per loculus, style filiform, stigma obscurely 2–4-lobed. Fruits included in or adnate to calyx tube, usually 1-locular, 1-, rarely 2-seeded; cotyledons basally connate, hypocotyl terete or obscurely ribbed, blunt, perforating apex of fruit and falling with it.

6 species tropical East Africa, Asia, Australia, Polynesia; 4 species Australia; 1 species south-eastern Queensland.

#### 1. *Bruguiera gymnorhiza* (L.) Lam.

ORANGE MANGROVE; LARGE FRUITED ORANGE MANGROVE

*Rhizophora gymnorhiza* L.; *Bruguiera rheedii* Blume; *B. australis* Arn.; *R. australis* (Arn.) Steudel

Leaves with petioles 2–6 cm long; blades elliptic-oblong, elliptic or obovate, apex acute or bluntly acuminate, base cuneate or rarely obtuse, 8.5–22 cm  $\times$  3–8 cm. Flowers generally nodding, solitary on pedicels 1–2.5 cm long; calyx 3–4 cm long; 12–14-, rarely 10–16-lobed, lobes 2–2.5 cm long, obliquely ascending in fruit, tube sometimes ribbed in upper part; petals 1.3–1.5 cm long, lobes 7–8 mm long, each with 3–4 bristles 2–3 mm longer than tip, outer margins fringed with long silky hairs; stamens 0.8–1.1 cm long; style *ca* 1.5 cm long, stigmatic arms filiform, *ca* 1 mm long. Fruits not ribbed; 2–2.5 cm long; hypocotyl 15–25 cm long. **Fig. 34F.**

Normally occurs in the most landward fringe of mangroves in firm well drained mud or sandy soil that is inundated by salt water a few times each month. Flower mainly autumn to spring.

## 2. RHIZOPHORA L.

Trees; stems supported by numerous branched stilt roots. Leaves decussate, glabrous, usually red dotted below, midrib protruding apically to form caducous mucro. Inflorescences of peduncled simple, di-, or trichotomously branched cymes; flowers bracteolate; calyx deeply 4-lobed, accrescent and reflexed in fruit; petals 4, narrowly ovate, caducous, inserted at base of disc; stamens 8–12, anthers sessile or with very short filaments, inserted on margin of disc, anthers areolate, multiloculate; ovary half inferior, 2-locular, each 2-ovulate, stigma simple or obscurely 2-lobed, style short or long. Fruits ovoid with roughened surface; seed 1, rarely 2–3, cotyledons connate into fleshy body continuous with, but set off from hypocotyl, in old fruits protruding from fruit, hypocotyl clavate, elongate, perforating apex and falling out of it.

7 species tropical coasts; 4 species Australia; 1 species south-eastern Queensland.

### 1. *Rhizophora stylosa* Griff. SPOTTED MANGROVE; RED MANGROVE; SPOTTED LEAVED RED MANGROVE

*Rhizophora mucronata* Lam. var. *stylosa* (Griff.) Schimper

Small tree. Leaves with petioles 1–3.5 cm long; blades broadly elliptic to oblong-elliptic, apex obtuse to subacute, mucronate, mucro up to 4 mm long, base cuneate, 6–14 cm × 3.5–8 cm. Inflorescences of usually 2–8 flowers, peduncles 1.3–3 cm long, pedicels 4–8 mm long; sepals 1.2–1.5 cm long; petals 8–10 mm long, densely pubescent along margin; stamens 8; ovary conical, style 1.5–4(–6) mm long, stout, bifid at apex. Fruits ovoid, 2–4 cm long; hypocotyl 30–65 cm long. **Fig. 34G.**

Usually on well drained soft muds in protected maritime areas, sometimes in sandy mud. Flowers mainly autumn.

There is some doubt whether the correct name has been applied to this taxon, as a distinct taxon which has generally more flowers per inflorescence, a slender style (4–)5–6 mm long arising from a flattened ovary and which grows only along sandy shores and coral areas in northern Queensland is also referred to as **R. stylosa**. True **R. mucronata** Lam. to which the southern taxon has been referred at times, reputedly has no style at all or only very short, but it does prefer soft muds as a habitat.

## 3. CERIOPS Arn.

Small to medium sized trees; stems with appressed stilt roots up to 1 m high. Leaves decussate, clustered at ends of twigs, entire, glabrous, not dotted. Inflorescences of solitary, subsessile to shortly peduncled, 4–many-, rarely 2-flowered condensed cymes, bracteoles 2 at flower base, partly connate, cupular; calyx deeply 5–6-lobed; petals 5 or 6, each embracing 2 stamens, inserted at margin of disc, sometimes basally cohering, apex emarginate or truncate, fringe-like, or with 3, rarely 2 clavate appendages; stamens twice number of calyx lobes, inserted in sinuations of disc; disc cupular, shallowly lobed, lobes episepalous; ovary half inferior, 3-locular, 2 ovules per loculus, style terete, simple, stigma simple or 2–3-lobed. Fruits ovoid, for the greater part superior; hypocotyl clavate, tapering to apex, ridged and sulcate.

2 species tropical coasts India, west Pacific region, both occurring in Australia; 1 species south-eastern Queensland.

### 1. *Ceriops tagal* (Perrottet) C. B. Robinson var. **australis** C. T. White YELLOW MANGROVE; YELLOW LEAVED SPURRED MANGROVE

Shrub or tree up to 15 m, rarely 25 m tall, base often with small stilt roots. Leaves with petioles 0.5–3.5 cm long; blades obovate, obovate-oblong, or rarely elliptic-oblong, apex obtuse or retuse, base cuneate, 3–11.5 cm × 1.4–7.5 cm. Inflorescences 4–12-, rarely 2-flowered; calyx tube *ca* 2 mm long, lobes erect in flower, widely spreading in fruit, 4–5 mm long; petals oblong, cohering basally, with uncinat hairs, *ca* 4 mm long; stamens 3–5 mm long, alternately longer and shorter; superior part of ovary *ca*

1.5 mm high, style 2 mm long. Fruits ovoid, 1.5–2.5 cm long, calyx lobes soon reflexed; hypocotyl club shaped, 15–25(–35) cm long, smooth. **Fig. 34E.**

Usually on well drained, often clayey soils in areas usually only inundated by a few high tides per month, in inner mangrove zone. Flowers mainly summer.

**C. tagal** var. **tagal**, which can be distinguished from **C. tagal** var. **australis** by the hypocotyl being fluted or sharply angled, is found in more northern areas of Queensland.

## 104. COMBRETACEAE

Trees, shrubs or lianas. Leaves opposite, verticillate, spiral or alternate; exstipulate; petiolate or rarely sessile; blades simple, entire, glands often present on leaf bases or petioles. Flowers in axillary or subcapitate spikes or racemes, or solitary or in pairs on axillary peduncles, bisexual or male; receptacle usually in 2 parts, lower surrounding and adnate to ovary, upper produced into tube terminating in calyx lobes; calyx lobes 4 or 5, rarely 6, 8 or absent; petals 4–5 or absent; stamens usually twice as many as petals, borne inside receptacle, usually in 2 series; ovary inferior, 1-locular, style 1. Fruits fleshy or dry, usually indehiscent, often variously winged or ridged.

About 20 genera with 600 species from tropical and subtropical areas; 4 genera with 36 species Australia; 2 genera with 2 species south-eastern Queensland.

- |  |                      |
|--|----------------------|
| 1. Petals present but caducous . . . . . | 1. <i>Lumnitzera</i> |
| Petals absent . . . . .                  | 2. <i>Terminalia</i> |

### 1. LUMNITZERA Willd.

Shrubs or small trees. Leaves spirally arranged,  $\pm$  sessile, fleshy, coriaceous, entire, glabrescent. Flowers in terminal or axillary spikes or racemes, actinomorphic, 5-merous; calyx persistent; petals caducous; stamens 5–10, anthers versatile; ovules 2–5, style filiform. Fruits compressed ellipsoid,  $\pm$  woody, crowned by persistent calyx.

3 species Africa, Asia, Malaysia to northern Australia and Polynesia; 3 species Australia; 1 species south-eastern Queensland.

#### 1. *Lumnitzera racemosa* Willd.

Shrub or small tree up to *ca* 8 m tall, branchlets appressed pubescent becoming glabrous with age. Leaf blades obovate, apex retuse, base cuneate, 2–9 cm  $\times$  1–2.5 cm. Inflorescences short axillary spikes, bracteoles 2, *ca* 1.5 mm long; receptacle tubular or narrowly urceolate, 6–8 mm long; calyx lobes *ca* 1 mm long; petals white, up to 4 mm long; stamens 10. Fruits 1–1.5 cm  $\times$  0.3–0.5 cm.

Landward edge of mangrove formations of the Wide Bay and Moreton districts. Flowers summer–autumn.

### 2. TERMINALIA L.

Shrubs or trees, deciduous, branching often sympodial. Leaves spirally arranged, crowded at ends of branchlets, blades entire. Inflorescences axillary spikes with male flowers usually towards apex, bisexual flowers towards base; flowers sessile, actinomorphic, 5-merous; male flowers with aborted ovary and lower receptacle resembling pedicels; calyx with lower tube adnate to ovary, upper expanding into shallow cup terminating in calyx lobes; petals absent; stamens 10, exerted; anthers dorsifixed, versatile; style simple, free, exerted, absent in some male flowers. Fruits drupe like with fleshy mesocarp or dry and leathery with 2 lateral wings.

About 250 species from tropical and subtropical areas of the world; 29 species Australia; 1 species south-eastern Queensland.

**1. *Terminalia porphyrocarpa* F. Muell. ex Benth.***Terminalia porphyrocarpa* var. (?) *eriantha* Benth.; *T. thozetii* Benth.

Tree up to 15 m tall. Leaves with petioles 0.8–1.7 cm long, pubescent; blades obovate to broadly obovate, apex obtuse or shortly acuminate, base  $\pm$  attenuate, 3.5–9 cm  $\times$  1.5–5 cm, discolourous, glabrescent above and below or thinly pilose below, pellucid punctate, glands common on primary veins, rare on petioles. Spikes dense, up to *ca* 6 cm long, bracts  $\pm$  linear, 1–4 mm long, caducous; male flowers 3–4 mm long, *ca* 5 mm diameter; bisexual flowers 6–7 mm long, *ca* 5 mm diameter; calyx *ca* 2 mm long; stamens *ca* 4 mm long; style glabrous. Mature fruits green, succulent, ovoid or globular, 1–2 cm  $\times$  0.8–1.5 cm, with or without narrow lateral angles, laterally compressed with 2 wings above and below when immature.

Known from the northern Wide Bay district. Flowers spring.

**105. ONAGRACEAE**

Herbs or rarely shrubs, often aquatic. Leaves opposite or alternate; stipules rarely present; blades simple, leaves subtending flowers usually much reduced and bract-like. Flowers often solitary, bisexual, actinomorphic; calyx adnate to ovary, often produced beyond it, calyx lobes 4–5; petals 2–5, free, rarely absent; stamens as many as or twice as many as calyx lobes; ovary inferior or rarely half superior, usually 2–6-locular, style simple. Fruits capsules, berries or nuts; seeds numerous or rarely solitary.

About 21 genera with 640 species from temperate and tropical parts of the world; 5 genera with *ca* 35 species Australia; 4 genera with 14 species south-eastern Queensland.

- |   |                     |
|---|---------------------|
| 1. Calyx tubes extending above ovaries . . . . .  | 2                   |
| Calyx tubes not extending above ovaries . . . . . | 3                   |
| 2. Fruits nut-like . . . . .                      | 1. <i>Gaura</i>     |
| Fruits 4-valved capsules . . . . .                | 2. <i>Oenothera</i> |
| 3. Seeds with tuft of long hairs at end . . . . . | 3. <i>Epilobium</i> |
| Seeds without tuft of hairs . . . . .             | 4. <i>Ludwigia</i>  |

**1. GAURA L.**

Herbs, sometimes woody near base. Leaves in rosette at base and alternate along stem. Flowers borne in leafy spikes or racemes, usually zygomorphic, usually 4-merous, rarely 3-merous; calyx tube produced beyond ovary, calyx lobes not persistent in fruit; petals white to pinkish; stamens 8, usually with scale at base of each filament; stigma deeply 4-lobed or rarely 3-lobed. Fruits indehiscent, woody.

About 21 species from Central and North America; 2 species naturalized Australia; 1 species south-eastern Queensland.

**1. \**Gaura parviflora* Hook.****CLOCKWEED**

Annual, erect, up to *ca* 60 cm tall. Rosette leaves obovate, base narrowing into winged petiole, margin usually slightly denticulate, 5–15 cm  $\times$  1–3 cm; stem leaves gradually reduced upwards, usually becoming almost sessile towards top, narrowly ovate to narrowly elliptic, apex acute to acuminate, margin entire or remotely denticulate, 3–10 cm  $\times$  1–2.5 cm. Flowers opening in evening, in terminal slender spikes which nod at tips and can become 30 cm long; calyx tube up to *ca* 7 mm long, calyx lobes 1.5–3 mm long; petals 1.5–3 mm long. Fruits 0.5–1.1 cm long, 4-nerved, obtusely 4-angled.

Native of western North America, introduced and naturalized in south-eastern Queensland where it is widespread. The species is a common weed in the Darling Downs district. Flowers found in all but the coldest months. It is a declared noxious weed under the Stock Routes and Rural Lands Protection Acts 1944–1967.

## 2. OENOTHERA L.

Annuals, biennials or perennials. Leaves mostly alternate. Flowers axillary, solitary, rarely in pairs, sometimes forming terminal racemes or spikes, actinomorphic; calyx tube usually produced above ovary, calyx lobes 4; petals 4; stamens 8, inserted at summit of calyx tube, anthers linear. Fruits capsules, usually opening from summit downwards loculicidally in 4 valves.

About 80 species all from the Americas; 8–10 species naturalized Australia, mostly escaped from garden culture; 8 species south-eastern Queensland.

- |   |                            |
|---|----------------------------|
| 1. Flowers white to pink or occasionally violet; capsules with ribbed hollow peduncles . . . . .                          | 2                          |
| Flowers yellow; capsules sessile . . . . .  | 4                          |
| 2. Capsules distinctly winged, wings 2–3 mm wide . . . . .  | 1. <i>O. tetraptera</i>    |
| Capsules 4-angled or if winged then wings less than 1 mm wide . . . . .   | 3                          |
| 3. Flowers up to <i>ca</i> 1.5 cm diameter; plants erect . . . . .  | 2. <i>O. rosea</i>         |
| Flowers 2–5 cm diameter; plants erect or procumbent . . . . .   | 3. <i>O. speciosa</i>      |
| 4. Flowers up to 1.5 cm diameter . . . . .  | 4. <i>O. indecora</i>      |
| Flowers more than 2 cm diameter . . . . .   | 5                          |
| 5. Stems with long scattered hairs with swollen red bases . . . . .   | 5. <i>O. erythrosepala</i> |
| Stem hairs without swollen red bases . . . . .  | 6                          |
| 6. Stems with few long or short hairs or almost glabrous towards the base . . . . .                                       | 6. <i>O. stricta</i>       |
| Stems densely hairy . . . . .   | 7                          |
| 7. Capsules linear-obovoid, 2–2.5 cm long; calyx tubes 4–10 cm longer than ovary; widespread . . . . .                    | 7. <i>O. affinis</i>       |
| Capsules linear-cylindrical, <i>ca</i> 4 cm long; calyx tubes 2–4 cm longer than ovary; plants of coastal sands . . . . . | 8. <i>O. drummondii</i>    |

1. \**Oenothera tetraptera* Cav.

## FOUR WINGED EVENING PRIMROSE

Perennial, decumbent to ascending with a few simple or sparsely branched stems up to *ca* 50 cm long, strigose and usually also with long spreading hairs. Basal leaves with petioles up to *ca* 1 cm long, blades obovate, apex usually acute, sinuate-pinnatifid into several ovate-oblong lobes, terminal one largest, occasionally blade entire, whole blade 3–10 cm × 0.8–3 cm, subglabrous to villous; cauline leaves reduced, usually ovate, apex acute to long acuminate, margin similarly divided as basal leaves, 1–5 cm long. Flowers opening in evening; calyx tube *ca* 1 cm longer than ovary, calyx lobes often reddish, 2–3.5 cm long, with minute free tips in bud, whole calyx usually strigose as well as villous; petals white to pink, darkening with age, 2–3.5 cm long. Capsules narrowed into ribbed hollow peduncle 0.5–2.5 cm long, body of capsule obovoid, 1–1.5 cm long, wings 2–3 mm wide, whole with long spreading hairs and short ± appressed ones.

Native of Central and South America; apparently naturalized around Toowoomba in the Darling Downs district and a few scattered localities in the southern Moreton district. Flowers spring to autumn.

2. \**Oenothera rosea* Aiton

## ROSE EVENING PRIMROSE

Perennial with several erect or ascending simple or branched stems up to *ca* 50 cm long. Leaves with petioles 0.5–2 cm long; blades obovate to narrowly obovate, subentire to coarsely sinuate-dentate or pinnatifid, apex obtuse, base narrowed, 2–5 cm × 1–2.5 cm, basal leaves largest, cauline leaves gradually reducing upwards, young leaves strigose, often becoming glabrous with age. Flowers in slender ± leafy racemes; calyx tube 4–6 mm longer than ovary, calyx lobes 5–8 mm long. Capsules passing into hollow ribbed peduncle 0.5–2 cm long, capsule body obovoid, 8–10 mm long, 4 angles often somewhat winged, wings scarcely 1 mm wide, capsule and peduncle strigose.

Native of the Americas; apparently naturalized in a few places in the Moreton district. Flowers apparently spring–summer.

**3. \**Oenothera speciosa* Nutt.**

## AN EVENING PRIMROSE

Perennial from running rootstock with erect to decumbent simple or branched stems up to *ca* 50 cm long. Basal leaves with petioles up to *ca* 2 cm long, blades narrowly obovate to obovate, usually sinuate-pinnatifid into ovate lateral lobes and larger terminal one, whole blade 1–8 cm × 0.5–2 cm; cauline leaves reducing upward, short petioled, blades oblong-ovate to ovate, lower ones usually ± deeply pinnatifid, upper ones pinnate-dentate or subentire, 2–8 cm × 0.5–3 cm. Flowers opening in evening; calyx tube 1–2.5 cm longer than ovary, strigose, calyx lobes 1–3 cm long with free tips in bud 0.5–4 mm long; petals white to pink, 1.5–4 cm long. Capsules up to *ca* 1.5 cm long, appearing 8-ribbed, passing into peduncle up to *ca* 5 mm long.

Native of the southern United States of America and Mexico; naturalized in a few widely spaced localities in south-eastern Queensland. It is occasionally grown as a garden plant. Flowers spring to autumn.

Most of the specimens from naturalized plants have a ± prostrate habit.

**4. \**Oenothera indecora* Cambess.**

## SMALL FLOWER EVENING PRIMROSE

Stems annual, arising from rhizome, erect, simple or branched, up to *ca* 50 cm long with fine soft indumentum and with scattered longer spreading hairs. Leaves in rosette petiolate, on stem sessile or very shortly petiolate; blades narrowly ovate to oblong-ovate, apex acute, basal leaves tapering to petiole, margins sinuate-dentate, somewhat crisped, 1.5–7 cm × 0.5–1 cm, subglabrous to finely pubescent. Calyx tube up to 1.4 cm longer than ovary, calyx lobes 6–8 mm long with free tips in bud 1–2 mm long; petals yellow turning red with age, 3–6 mm long. Capsules sessile, cylindrical, 1–2 cm × 0.2–0.3 cm, pubescent. **Fig. 34B.**

Native of South America; naturalized and widespread in the region, but not particularly common. Flowers spring to autumn.

**5. \**Oenothera erythrosepala* Borbas**

## AN EVENING PRIMROSE

Biennial up to *ca* 1.5 m tall; stems stout erect, plant strigose and with long spreading hairs arising from red bulbous bases. Leaves with petioles up to *ca* 5 mm long; blades ovate or oblong-ovate, apex acute, margins dentate, sometimes also sinuate, 2–7 cm × 0.5–3 cm, basal leaves sometimes broader, pubescent. Calyx often red or red striped, tube 3–5 cm longer than ovary, lobes 2–4.5 cm long, free tips in bud 3–5 mm long; petals yellow, 4–5 cm long. Capsules sessile, 2–2.5 cm × 0.5–0.7 cm, broadest at base.

Native of North America; naturalized around Stanthorpe in the Darling Downs district. Flowers apparently spring–summer.

**6. \**Oenothera stricta* Ledeb.**

## SWEET SCENTED EVENING PRIMROSE

*Oenothera odorata* auct. Qld. non Jacq.

Biennial or perennial, erect, simple or few-branched, up to 60 cm tall; stems finely pubescent to subglabrous below, frequently villous above. Basal leaves obovate to linear-obovate, apex acute, base narrowing to short winged petiole, margin denticulate to subentire, 5–8 cm × 0.5–1.2 cm, subglabrous or finely pubescent; cauline leaves sessile, narrowly ovate, apex acute, denticulate, 1.5–5 cm × 0.5–1.5 cm, subglabrous or finely pubescent. Calyx often reddish, tube 1.5–2.5 cm longer than ovary, pubescent, lobes 1–2 cm long, pubescent, with free tips in bud 2–3 mm long; petals yellow, ageing reddish, 1.2–2.5 cm long. Capsules cylindrical, 2–2.5 cm × *ca* 0.3 cm, enlarged in upper half, shortly villous.

Native of South America; naturalized in the eastern Darling Downs and Burnett districts. Flowers late winter to autumn.

**7. \**Oenothera affinis* Cambess.**

## LONG FLOWER EVENING PRIMROSE

*Oenothera longiflora* auct. Aust.

Perennial, erect, simple or branched, up to *ca* 1.2 m tall; stems softly pubescent and with longer spreading hairs. Leaves sessile, linear-ovate to narrowly ovate, apex acute to acuminate, margin remotely denticulate, 2–6(–12) cm × 0.4–0.8(–1.5) cm, gradually reduced up stem. Calyx tube 4–10 cm longer than ovary, softly pubescent, calyx lobes

2–2.8 cm long; petals yellow becoming reddish with age, 2.5–3.2 cm long. Capsules ± sessile, 2–3 cm × 0.4–0.6 cm, thicker in upper half.

Native of South America, naturalized and widespread but not common in south-eastern Queensland. Flowers spring–summer.

**8. \**Oenothera drummondii* Hook.**

**BEACH EVENING PRIMROSE**

Perennial with prostrate or decumbent mostly simple stems up to *ca* 50 cm long, densely pubescent as well as with longer soft grey hairs. Leaves with petioles 0.5–3 cm long; blades narrowly obovate to oblong-ovate, apex obtuse to acute, base narrowed, margin entire or remotely dentate, 1–7 cm × 0.5–1.5 cm, densely appressed villous. Calyx tube 2–4 cm longer than ovary, densely villous, calyx lobes 2–3 cm long, with free tips in bud 2–3 mm long; petals yellow, mostly 1–2 cm long. Capsules sessile, 2.5–4 cm × *ca* 0.2 cm, often curved, villous.

Native of Texas; naturalized along the seashore of the Moreton and Wide Bay districts. Flowers spring to autumn.

**3. EPILOBIUM L.**

Mostly perennial, creeping or erect herbs, sometimes woody at base; perennials multiplying vegetatively by leafy rosettes, runners, stolons, turions or by buds (gemmae) in leaf axils. Leaves opposite at base, upper ones alternate, sometimes all opposite or alternate. Flowers solitary in leaf axils but in species with alternate leaves flowers clustered into leafy inflorescences, each flower ± actinomorphic; calyx tubular with 4 deciduous lobes; petals 4, inserted at top of calyx tube; stamens 8, outer ones longer. Fruits capsules, slender, 4-locular; seeds usually many, each usually with terminal tuft of silky hairs.

About 215 species from mainly temperate areas of northern and southern hemispheres; 14 species Australia; 3 species south-eastern Queensland.

- |  |                              |
|--|------------------------------|
| 1. Plants with long spreading non-glandular hairs on stems and capsules, together with glandular and ± appressed hairs . . . . . | 1. <i>E. hirtigerum</i>      |
| Plants without long spreading non-glandular hairs, only glandular and/or ± appressed hairs present . . . . .                     | 2                            |
| 2. Seeds papillose in evident lines . . . . .  | 2. <i>E. ciliatum</i>        |
| Seeds not papillose in evident lines . . . . .   | 3. <i>E. billardierianum</i> |

**1. *Epilobium hirtigerum* Cunn.**

*Epilobium junceum* var. *hirtigerum* (Cunn.) Curtis; *E. junceum* auct. non G. Forster ex Sprengel, Benth.

Perennial 0.2–1.4 m tall, usually unbranched, often reddish tinged, with numerous leafy stolons from base, plant densely covered with long spreading hairs usually with layer of shorter hairs and glandular ones also present in inflorescence; stems often woody at base. Leaves mostly alternate, opposite at base, linear to narrowly ovate, apex acuminate, base acute to acuminate, margin usually serrate often towards top only, 1.5–6 cm × 0.2–0.8 cm. Calyx tube 5–9 mm long, calyx lobes 2.5–5.5 mm long; petals white or pink-purple, 2.5–8 mm long, often shorter than sepals. Capsules 3.5–6 cm long; seeds *ca* 1 mm long, with tuft of hairs 5–8 mm long and readily detached. **Fig. 34A.**

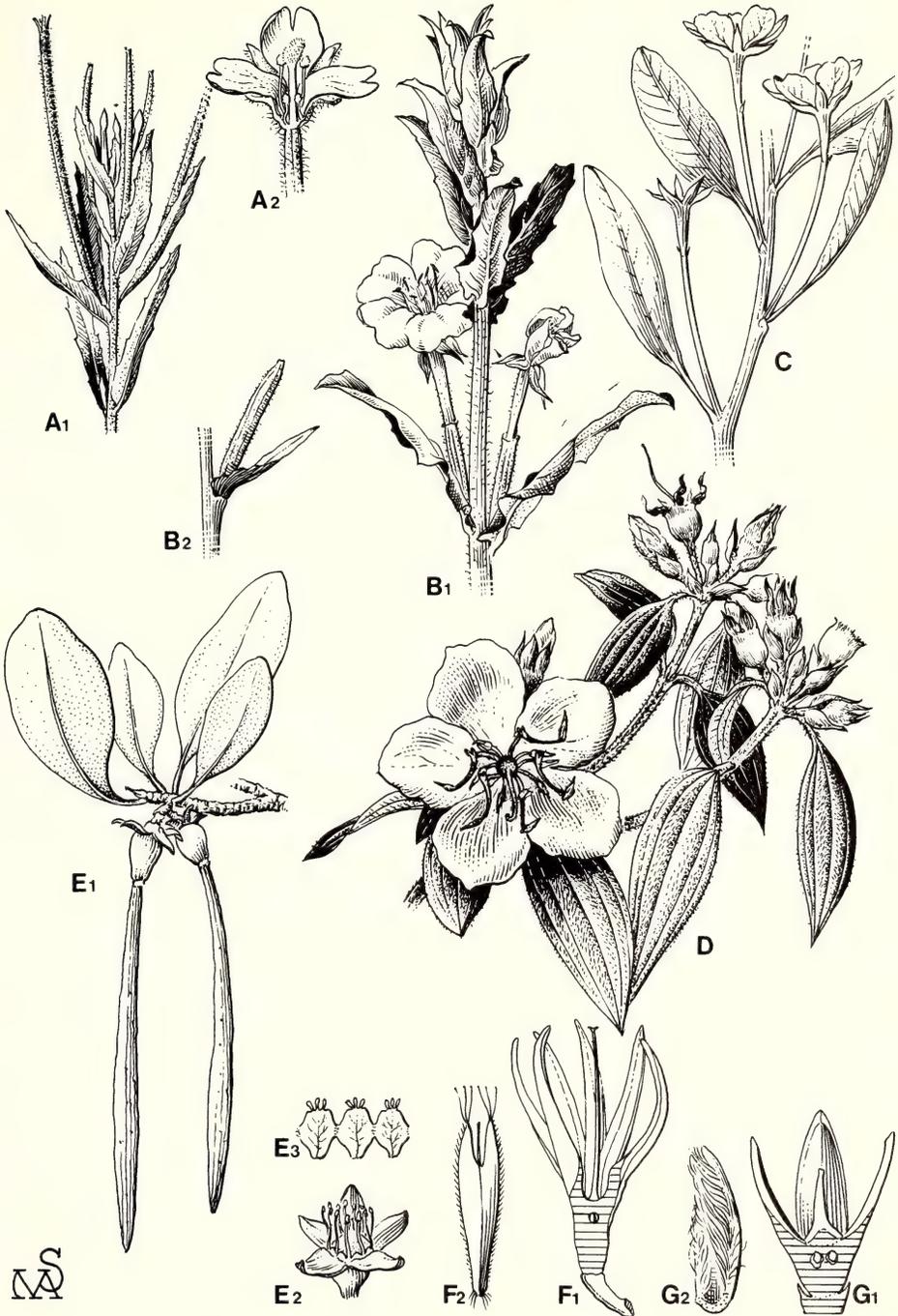
Known from the Moreton and Darling Downs districts usually in damp areas but sometimes on drier sites. Flowers late spring–early summer.

**2. \**Epilobium ciliatum* Raf.**

*Epilobium adenocaulon* Hausskn.

Perennial, erect, 0.15–1.95 m tall, propagating by leafy rosettes near base; stems hollow, strigose. Leaves mostly opposite, uppermost alternate, narrowly ovate, apex acuminate, base rounded, margin serrate, 3–4 cm × 0.7–3 cm. Calyx tube 0.5–1.4 cm long, calyx lobes 2–3.7 mm long; petals pink-purple, 3.5–5.5 mm long. Capsules 4.5–8.5 cm long; seeds 0.9–1.2 mm long, upper surface marked with conspicuous lines of papillae, with tuft of hairs 6–7 mm long and readily detached.

Native of North America; known from a single record from Deagon, a Brisbane suburb.



**Fig. 34** A–C ONAGRACEAE — A<sub>1</sub>–A<sub>2</sub> *Epilobium hirtigerum*, A<sub>1</sub> portion of fruiting stem  $\times 1$ , A<sub>2</sub> internal structure of flower  $\times 2$ ; B<sub>1</sub>–B<sub>2</sub> *Oenothera indecora*, B<sub>1</sub> portion of flowering stem  $\times 1$ , B<sub>2</sub> fruit  $\times 1$ ; C *Ludwigia peploides* subsp. *montevidensis*, portion of fertile stem  $\times 2/3$ ; D MELASTOMACEAE — D *Melastoma affine*, portion of flowering stem  $\times 2/3$ ; E–G RHIZOPHORACEAE — E<sub>1</sub>–E<sub>3</sub> *Ceriops tagal* var. *australis*, E<sub>1</sub> portion of fruiting stem  $\times 2/3$ , E<sub>2</sub> flower with corolla removed  $\times 1 1/2$ ; E<sub>3</sub> petals  $\times 2$ ; F<sub>1</sub>–F<sub>2</sub> *Bruguiera gymnorhiza*, F<sub>1</sub> L.S. of flower with petals and stamens removed  $\times 1$ , F<sub>2</sub> petal  $\times 2$ ; G<sub>1</sub>–G<sub>2</sub> *Rhizophora stylosa*, G<sub>1</sub> L.S. of flower with petals and stamens removed  $\times 1 1/2$ , G<sub>2</sub> petal  $\times 2$ .

### 3. *Epilobium billardierianum* Ser.

Perennial, erect, 15–95 cm tall, often well branched, often reddish tinged, with numerous stolons from base, plants strigose, often densely so in inflorescence where glandular and non-glandular hairs are often also present. Leaves mostly opposite, alternate near inflorescence, linear to elliptic to ovate, margin serrulate or serrate, 0.5–4 cm long, glabrous or strigose. Calyx tube up to *ca* 2 cm long, calyx lobes 2.5–7.5 mm long; petals pink-purple to white, 0.35–1.35 cm long. Capsules 3–7.5 cm long; seeds 0.7–1.1 mm long, papillose, with tuft of hairs 5–8 mm long.

Two subspecies occur in the region:

- |  |   |
|--|---|
| 1. Leaves narrowly ovate, 0.5–1.5 cm wide, with 4–12 teeth on each side . . . . .          | <i>E. billardierianum</i> subsp. <i>hydrophilum</i> |
| Leaves linear to narrowly elliptic, 0.5–0.7 cm wide, with 1–6 teeth on each side . . . . . | <i>E. billardierianum</i> subsp. <i>cinereum</i>    |

*Epilobium billardierianum* subsp. *hydrophilum* Raven & Englehorn is known from the southern Moreton district and from near Killarney in the Darling Downs district. It is usually in moist areas in eucalypt forest and along stream banks. *E. billardierianum* subsp. *cinereum* (A. Rich.) Raven & Englehorn (*E. cinereum* A. Rich.; *E. junceum* auct. non Forster ex Sprengel, Benth.) is widespread in the region usually in fairly moist areas in eucalypt forest or woodlands or in grasslands. Both subspecies flower summer.

## 4. LUDWIGIA L.

Large shrubs or slender herbs, erect or creeping and rooting at the nodes, sometimes aquatic and then underwater parts swollen and spongy. Leaves alternate or opposite; stipules absent or reduced. Flowers solitary, clustered or arranged in an inflorescence; calyx tube not produced above ovary, calyx lobes 3–7, persistent; petals as many as sepals or absent, yellow or white; stamens usually as many as or twice as many as sepals. Fruits capsules, dehiscent by a terminal pore or by flaps separating from valve-like top; seeds without tuft of hairs.

About 70 species mainly from the tropics and subtropics, best represented in South America; 5 species Australia; 2 species south-eastern Queensland.

- |   |  |
|---|--|
| 1. Plants erect, robust, often woody at base, never floating on water . . . . .                         | 1. <i>L. octovalvis</i>                            |
| Plants with sprawling non-woody stems, rooting at nodes, usually floating on surface of water . . . . . | 2. <i>L. peploides</i> subsp. <i>montevidensis</i> |

### 1. *Ludwigia octovalvis* (Jacq.) Raven

WILLOW PRIMROSE

*Oenothera octovalvis* Jacq.; *Jussiaea suffruticosa* L., *J. angustifolia* Lam.; *Ludwigia octovalvis* subsp. *sessiliflora* (M. Mich.) Raven

Robust well branched herb, sometimes woody at base or even shrubby, up to *ca* 1.3 m tall in Australia, subglabrous to densely hairy. Leaves alternate; petioles up to *ca* 10 cm long; blades narrowly ovate to ovate, occasionally  $\pm$  linear, apex attenuate, base broadly to narrowly cuneate, 2–14.5 cm  $\times$  0.4–4 cm. Flowers solitary in axils on peduncles shorter than calyx tube; calyx lobes 4, 0.6–1.5 cm long; petals yellow, 0.5–1.7 cm long; stamens 8. Capsules thin walled, 1.7–4.5 cm  $\times$  0.2–0.8 cm.

### 2. \**Ludwigia peploides* (Kunth) Raven subsp. *montevidensis* (Sprengel) Raven

WATER PRIMROSE

*Jussiaea montevidensis* Sprengel

Herbs with stems sprawling and rooting at nodes, glabrous or with soft spreading hairs. Leaves alternate; petioles 0.5–2.8 cm long with 2 dark green swollen stipules at base; blades oblong-elliptic to almost round or obovate, apex obtuse to acute, 1.5–6 cm  $\times$  0.5–2.7 cm. Flowers solitary in leaf axils on pedicels shorter than leaves; calyx tube about as long as calyx lobes, calyx lobes 5, 6–9 mm long, persistent; petals bright yellow, 1.1–1.3 cm long; stamens 10. Capsules 1.5–3 cm long. **Fig. 34C.**

Probably native of South America; naturalized and widespread in the region, often trailing out on the surface of freshwater with leaves floating and the flowers emergent, also found on damp soil where the plant may be semi-erect. Flowers found throughout the year but mainly in the warmer months.

## 106. HALORAGACEAE

Annual or perennial aquatic or terrestrial herbs or undershrubs. Leaves alternate, opposite or verticillate, exstipulate, submerged ones often much divided. Flowers solitary or in dichasia, often very small, bisexual or unisexual, actinomorphic; calyx tube adnate to ovary, calyx lobes 2–4 or absent; petals 2–4 or absent; stamens 2–8, rarely 1, anthers basifixed, 4-locular, opening lengthwise; ovary inferior, 1–4-locular, ovules as many as styles, styles 1–4. Fruits small, nuts or drupes, sometimes winged.

8 genera with *ca* 100 species, mainly Southern Hemisphere, particularly Australia; *ca* 8 genera with *ca* 84 species Australia; 3 genera with 18 species south-eastern Queensland.

- |  |                        |   |
|--|------------------------|---|
| 1. At least female flowers without petals . . . . .  | 1. <i>Myriophyllum</i> | 2 |
| All flowers with petals . . . . .  |                        |   |
| 2. Fruits 4-locular, rarely 2–3-locular, pericarp woody; flowers in usually 3–7-flowered dichasia in axils of alternate primary bracts . . . . . | 2. <i>Haloragis</i>    |   |
| Fruits 1-locular, pericarp membranous; flowers solitary, rarely 2–3 together in axils of alternate or opposite primary bracts . . . . .          | 3. <i>Gonocarpus</i>   |   |

### 1. MYRIOPHYLLUM L.

Aquatic herbs or herbs of damp areas near water. Submerged stems usually long and flexuose, bearing leaves pinnately divided into capillary lobes; leaves of emergent stems entire or variously pinnately divided, leaves intermediate between submerged and emergent leaves often occur. Flowers bisexual or unisexual, borne in axils of leaves on emergent portions of stems, solitary or 2 together, usually males at top of stem, bisexuals in middle, females below; male flowers with minute calyx tube usually with 4 sepals, sometimes sepals minute or absent, petals 4, longer than and alternating with sepals, stamens 2, 4 or 8, anthers 2-locular, longitudinally dehiscent; female flowers with calyx tube adnate to ovary, calyx lobes 4, minute or absent, petals minute or absent, ovary 4-locular with 1 ovule per loculus, rarely 2-locular with 2 ovules per loculus, styles same number as locules. Fruits furrowed between carpels, splitting into 4 or 2 nutlets, each with 1 seed.

About 50 species, worldwide; *ca* 20 species Australia; 7 species south-eastern Queensland.

- |   |                          |   |
|---|--------------------------|---|
| 1. Leaves alternate . . . . .   |                          | 2 |
| Leaves whorled . . . . .  |                          | 3 |
| 2. Leaves pinnately divided with 3–10 lobes . . . . .   | 1. <i>M. gracile</i>     |   |
| Leaves mostly entire, occasionally some with 1–3 lobes . . . . .  | 2. <i>M. sp. 1.</i>      |   |
| 3. Emergent leaves $\pm$ linear, entire or shallowly toothed . . . . .  |                          | 4 |
| Emergent leaves pinnately divided . . . . .   |                          | 5 |
| 4. Fruits purplish red, conspicuously tuberculate, about as broad as long . . . . .   | 3. <i>M. sp. 2.</i>      |   |
| Fruits straw coloured, $\pm$ smooth, longer than broad . . . . .  | 4. <i>M. variifolium</i> |   |
| 5. Emergent leaves divided $\frac{1}{2}$ – $\frac{2}{3}$ way to midrib, central part of leaf usually wider than lobes . . . . . | 5. <i>M. verrucosum</i>  |   |
| Emergent leaves divided to midrib, segments and midrib filiform . . . . .   |                          | 6 |
| 6. Emergent leaves green, with up to 7 segments on either side of leaf . . . . .  | 6. <i>M. sp. 3.</i>      |   |
| Emergent leaves glaucous, mostly with 10–14 segments on either side of leaf . . . . .   | 7. <i>M. aquaticum</i>   |   |

**1. *Myriophyllum gracile* Benth.**

Slender plants. Leaves alternate, emergent ones pinnately divided to midrib with up to 5 lobes on either side, whole leaf up to *ca* 1.6 cm long, often less than 1 cm long, individual lobes up to *ca* 4 mm long. Flowers solitary in axils; males with petals 2–3 mm long, stamens 8; females with 4 carpels.

Rarely collected. Known from shallow fresh water in the Darling Downs, Moreton and Wide Bay districts. Flowers apparently spring–summer.

**2. *Myriophyllum* sp. 1.**

Tufted or creeping herb, on mud or submerged, often forming a mat. Leaves alternate, emergent ones linear-elliptic, margin entire or occasionally some with 1–3 lobes, whole leaf 1.5–6 mm long. Flowers solitary in axils; males with petals 1.5–2.5 mm long, stamens 8; females minute, carpels 4. Fruits *ca* 0.5 mm long, tuberculate.

Found in shallow fresh water or on mud near water, not common but found in the Darling Downs, Wide Bay and Moreton districts. Flowers mostly spring–summer.

**3. *Myriophyllum* sp. 2.**

Herb with long submerged stems, emergent portion up to *ca* 20 cm long. Submerged leaves up to 4 cm long, lobes filiform, up to *ca* 1.5 cm long; emergent leaves in whorls of *ca* 6, linear, margin with few shallow teeth or entire, up to 3.5 cm long. Flowers solitary in axils; males with petals *ca* 3–4 mm long, stamens 8; females minute, carpels 4, stigmas reddish. Fruits purplish red, *ca* 0.5–0.8 mm long, about as long as broad, tuberculate.

Rarely collected. Known from the western Darling Downs district in fresh water up to 1 m deep, possibly to be found elsewhere in the region.

**4. *Myriophyllum variifolium* J. D. Hook.**

Herb with long submerged stems, emergent portion up to 20 cm long. Submerged leaves up to *ca* 3 cm long, lobes filiform, up to *ca* 1.5 cm long; emergent leaves in whorls of 6, margin entire, up to 3.5 cm long. Flowers solitary in axils; males with petals 2–3 mm long, stamens 8; females minute, carpels 4, stigmas whitish. Fruits straw coloured, *ca* 1 mm long, longer than broad,  $\pm$  smooth.

Rare, apparently from eastern parts of the region.

**5. *Myriophyllum verrucosum* Lindl.**

Herb with submerged stems up to 1 m long, or persisting on mud beside water as shoots up to *ca* 5 cm tall. Submerged leaves up to 1.5 cm long, lobes filiform, up to 6 mm long; emergent leaves greyish, in whorls of 3–4,  $\pm$  ovate in outline, pinnately divided  $\frac{1}{2}$ – $\frac{2}{3}$  way to midrib, 4–9 mm  $\times$  1.5–4 mm, undivided section along midrib wider than lobes. Flowers solitary in axils; males with petals *ca* 2.5 mm long, anthers 8; females minute, carpels 4. Fruits *ca* 1–1.5 mm long, smooth or tuberculate.

Widespread and moderately common in or near fresh water throughout the region. Flowers spring to autumn.

**6. *Myriophyllum* sp. 3.**

Herb. Submerged leaves up to 1.5 cm long, lobes filiform, up to 6 mm long; emergent leaves in whorls of 4–6, pinnately divided to midrib with up to 7 filiform lobes on either side of leaf, whole leaf up to *ca* 1.5 cm long, lobes up to *ca* 4 mm long. Flowers solitary in axils; males with petals *ca* 2 mm long, stamens 8; females minute, carpels 4. Fruits *ca* 0.8 mm long, tuberculate.

Known from the Moreton and eastern Darling Downs districts in fresh water. Flowers spring to autumn.

**7. \**Myriophyllum aquaticum* (Vell.) Verdc.**

PARROT'S FEATHER;  
BRAZILIAN WATER MILFOIL

*Enydria aquatica* Vell.; *Myriophyllum brasiliense* Cambess.

Perennial herb, often forming mat; stems creeping and rooting at nodes then ascending and emergent. Submerged leaves soon decaying to leave  $\pm$  bare stems; emergent leaves glaucous, in whorls of 4–6, pinnately divided to midrib into 10–14 pairs of

lobes, whole leaf up to 3.5 cm long, lobes up to *ca* 6 mm long. Male flowers not seen; females with sepals 1–1.5 mm long. Fruits not seen.

Native of South America; naturalized in streams of the eastern Moreton district. Flowers spring–summer.

## 2. HALORAGIS J. R. & G. Forster

Annual or perennial herbs or undershrubs. Leaves alternate or opposite, margin serrate or entire. Inflorescences indeterminant spikes or 3–7-, rarely 1-flowered dichasia in axils of alternate primary bracts, lateral inflorescences usually borne in axils of upper leaves; primary bracts leaf-like, grading into upper leaves at base of inflorescence, becoming reduced in size upwards; flowers 2–4-merous; petals same number as sepals; stamens mostly twice number of sepals, filaments short; styles same number as sepals, clavate, stigmas capitate. Fruits 4-, rarely 2–3-locular, pericarp ± woody.

26 species, mostly Australia, but also New Caledonia, New Zealand and the Juan Fernandez Is. off the coast of Chile; 21 species Australia; 4 species south-eastern Queensland.

- |  |  |   |
|--|--|---|
| 1. Leaves with petioles 0.2–1 cm long . . . . .                            | 1. <i>H. exaltata</i> var. <i>velutina</i> | 2 |
| Leaves sessile . . . . .   |  |   |
| 2. Leaf margins recurved; leaf blades up to <i>ca</i> 4 mm broad . . . . . | 2. <i>H. stricta</i>                       | 3 |
| Leaf margins flat; leaf blades 5 mm broad or broader . . . . .             |  |   |
| 3. Leaves 3-fid to multifid, divisions ± digitate . . . . .                | 3. <i>H. heterophylla</i>                  |   |
| Leaves entire, serrate or pinnatifid . . . . .                             | 4. <i>H. aspera</i>                        |   |

### 1. *Haloragis exaltata* F. Muell. subsp. *velutina* Orchard

*Haloragis alata* auct. non Jacq., F. M. Bailey

Subshrub, stems erect, red, slightly 4-angled, up to *ca* 1.5 m tall, covered with fine dense velvety tomentum. Leaves opposite; petioles 0.2–1 cm long; blades narrowly ovate, apex acute, base tapering, margin serrate with 30–40 small teeth or almost entire, 3–8 cm × 0.5–1.5 cm, both faces with fine dense velvety tomentum. Flowers 4-merous; sepals reddish, *ca* 0.6 mm long, persistent in fruit; petals reddish, hooded, 2.5–3.5 mm long; stamens 8, anthers 1.5–2 mm long. Fruits pyriform, faintly 4-ribbed opposite petals, slightly wrinkled, *ca* 2 mm long.

Known from as far north as the Burnett R. and as far west as the Bunya Mts., rare.

### 2. *Haloragis stricta* R. Br.

Perennial herb, taproot well developed; stems erect, 25–50 cm tall, usually with at least a few scabrid hairs, 4-ribbed. Leaves opposite, sessile, linear-ovate, tapering gradually to apex and base, margin recurved, entire or finely serrate, with up to 12 teeth each 1 mm long, 2–4 cm × 0.15–0.4 cm, usually with scabrid hairs at least on margins. Flowers 4-merous; sepals 0.6–0.9 mm × 0.4–0.6 mm; petals brownish, 2.4–3 mm × 0.4–0.7 mm; stamens 8, anthers (1.5–)2 mm long. Fruits ovoid to globular, *ca* 2.5–3.5 mm long.

Western Darling Downs district, rare.

### 3. *Haloragis heterophylla* Brongn.

### ROUGH RASPWEED

*Haloragis ceratophylla* Zahlbr. ex Endl.

Annual or perennial herb, perennating from deep lateral rootstock; stems herbaceous, erect, up to 50 cm tall, 4-ribbed, with scabrous hairs or rarely glabrous. Leaves opposite or alternate, sessile, 3-fid to multifid in upper half, divisions usually digitate, whole blade 1–3 cm × 0.5–2 cm, ± scabrous. Flowers 4-merous; sepals 0.8–1.2 mm × 0.3–0.5 mm; petals 2.2–2.8 mm × 0.6–0.8 mm; stamens 8, anthers red, *ca* 1.5(–2.4) mm long. Fruits pyriform, 1.5–2.5 mm long.

Widespread in the region, usually in swampy areas or along watercourses. Flowers mostly spring–summer.

**4. *Haloragis aspera* Lindl.**

RASPWEED

*Haloragis heterophylla* Brongn. var. *capreolicornis* Schindler; *H. heterophylla* var. *glaucofolia* Schindler; *H. heterophylla* var. *aspera* (Lindl.) Schindler; *H. heterophylla* var. *rigida* Schindler; *H. heterophylla* var. *pinnatifida* (A. Gray) Maiden & Betche; *H. ceratophylla* auct. non Zahlbr. ex Endl.

Perennial herb, perennating by deep underground stolons; stems annual, erect, up to 25 cm tall, scabrous. Leaves mostly alternate, sessile, narrowly ovate, apex acute, base tapered, margin thickened, entire or 1-16-toothed, 2-4(-5) cm × (0.5-)0.8-1.5 cm, upper and lower surface scabrous, hairs on margin often thicker. Flowers 4-merous; sepals 1.5-1.7 mm × 0.8-1 mm; petals red to green, 2-3 mm × 0.6-0.9 mm; stamens 8, anthers yellow, 1.3-2.3 mm long. Fruits globular to pyriform or ovoid, mostly 2.5-3 mm long.

Recorded from the Darling Downs and Moreton districts and possibly occurs elsewhere in the region, usually on heavy clay soils. It is a weed of cultivation in the Darling Downs district. Flowers found most of the year.

**3. GONOCARPUS Thunb.**

Annual or perennial herbs or small shrubs. Leaves alternate, opposite or rarely in whorls, sessile or petiolate. Inflorescences indeterminate spikes or racemes sometimes collected in panicles; flowers single, borne in axils of alternate, opposite or whorled primary bracts, primary bracts leaf-like, grading into upper leaves at base of inflorescence, secondary bracts borne on pedicels of flowers, much smaller than primary bracts, flowers 3-4-merous; stamens usually twice number of sepals, anthers 4-locular; ovary incompletely 3-4-locular, styles same number as sepals. Fruits 1-seeded, pericarp ± membranous.

36 species, mostly Australia and New Zealand but also found in New Guinea, Indonesia, Philippines, Taiwan and Japan; 31 species Australia; 7 species south-eastern Queensland.

- |  |   |   |
|--|---|---|
| 1. Primary bracts of inflorescences opposite in lower part, alternate above . . . . .  | 1. <i>G. teucrioides</i>                        | 2 |
| Primary bracts of inflorescences all alternate . . . . .   |   |   |
| 2. Stamens 4 . . . . .   | 2. <i>G. humilis</i>                            | 3 |
| Stamens 8 . . . . .  |   |   |
| 3. Most leaves alternate . . . . .   | 3. <i>G. elatus</i>                             | 4 |
| Leaves opposite but becoming alternate near inflorescence . . . . .  |   |   |
| 4. Fruits ± densely covered with papillae or tuberculate, 0.7-1 mm long, or if smooth between ridges then 0.7-0.9 mm long . . . . .                              |   | 5 |
| Fruits mostly 1-1.4 mm long, not papillose or tuberculate, usually with 2-3 oblique calluses between ribs, if smooth between ribs then 1.1-1.3 mm long . . . . . |   | 6 |
| 5. Plants glabrous; stems not 4-ribbed when fresh . . . . .  | 4. <i>G. micranthus</i>                         |   |
| Plants with at least a few scabrous hairs on leaves and stems; stems strongly 4-ribbed . . . . .   | 5. <i>G. chinensis</i> subsp. <i>verrucosus</i> |   |
| 6. Hairs of stems and leaves spreading; petioles 1.5-5 mm long . . . . .   | 6. <i>G. oreophilus</i>                         |   |
| Hairs of stems and leaves appressed; petioles up to 1.5 mm long . . . . .  | 7. <i>G. tetragynus</i>                         |   |

**1. *Gonocarpus teucrioides* DC.**

*Haloragis teucrioides* (DC.) Schlechtendal

Erect perennial herb or subshrub, mostly 20-35 cm tall; stems green to reddish, 4-angled, with moderate to dense spreading hairs. Leaves decussate; petioles 1-2 mm long; blades ovate, apex ± acute to obtuse, base rounded to cordate, margin thickened, serrate, 0.4-1.5(-2.5) cm × 0.3-1.3 cm. Flowers 4-merous; sepals 0.6-0.7 mm × 0.4-0.6 mm; petals 2.6-3.3 mm × 0.5-0.7 mm; stamens 8, anthers 1.7-2.5 mm long. Fruits ovoid, 1.4 mm long, 8-ribbed with 2-3 calluses between ribs.

Known from mountains in the southern Moreton district and from around Wyberba in the southern Darling Downs district, mostly in eucalypt open forests. Flowers mostly spring-summer.

**2. *Gonocarpus humilis* Orchard**

Prostrate or semiprostrate perennial herb; stems green to reddish, 30–70 cm long, weakly 4-ribbed, pilose. Leaves decussate; petioles 1–2 mm long; blades ovate, apex acute to obtuse, base rounded, margin serrate, 1–1.8 cm × 0.6–1.2 cm, upper surface with short ± appressed hairs, lower surface with longer spreading hairs. Flowers 4-merous; sepals green, *ca* 0.6 mm × *ca* 0.6 mm; petals yellow-green, 0.8–1.5 mm × *ca* 0.5 mm; stamens 4, anthers mostly 1–1.1 mm long. Fruits ovoid, 1.2–1.5 mm long, 8-ribbed with 2–3 oblique calluses between ribs.

Recorded once from Upper Tallebudgera in the Moreton district but possibly occurs elsewhere in the Moreton district and possibly also in the Wide Bay district. Flowers spring–summer.

**3. *Gonocarpus elatus* (Cunn. ex Fenzl) Orchard**

*Haloragis elatus* Cunn. ex Fenzl; *H. tenuis* Schindler

Erect or ascending perennial herb or subshrub mostly up to 35 cm tall; stems slightly 4–5-ribbed, with dense spreading hairs. Leaves alternate or few subopposite, ± sessile, linear-ovate to ovate, apex acute, base cuneate, margin entire or toothed, 0.5–3 cm × 0.1–0.5 cm, both surfaces with dense spreading hairs. Flowers 4-merous; sepals green, 0.6–0.8 mm × 0.4–0.5 mm; petals reddish brown with yellow-green margins, 2–2.7 mm × 0.6–0.7 mm; stamens 8, anthers 2–2.3 mm long. Fruits globose, 1–1.5 mm long, 8-ribbed, verrucose or smooth.

Recorded from Stanthorpe in the Darling Downs district. Flowers spring–early summer.

**4. *Gonocarpus micranthus* Thunb.**

*Haloragis micrantha* (Thunb.) R. Br. ex Sieber & Zucc.

Herbs; stems not ribbed, rooting at nodes, glabrous or rarely slightly scabrous. Leaves decussate; petioles 0.6–2 mm long; blades orbicular to ovate, sometimes cordate or narrowly ovate, apex obtuse to acute, base rounded or cordate, margin thickened, serrulate. Flowers 4-merous; sepals green, 0.4–0.5 mm × 0.3–0.4 mm; petals reddish, 0.8–1.5 mm × 0.2–0.4 mm; stamens 8, anthers 0.7–0.9 mm long. Fruits obovoid, 0.7–0.9 mm long, 8-ribbed, smooth between ribs or tuberculate.

Two subspecies occur in the region:

- |   |   |
|---|---|
| 1. Plants usually prostrate, 5–10 cm tall; leaves 0.3–0.7 cm × 0.1–0.6 cm; inflorescences branched once or unbranched, all inflorescence branches ± erect . . . . . | <i>G. micranthus</i> subsp. <i>micranthus</i>   |
| Plants erect, 25–60 cm tall; leaves 0.8–1.3 cm × 0.7–1.2 cm; inflorescences branched 2–3 times, final inflorescence branches ± horizontal . . . . .                 | <i>G. micranthus</i> subsp. <i>ramosissimus</i> |

*Gonocarpus micranthus* subsp. *micranthus* is known from a single record from the Moreton district. *G. micranthus* subsp. *ramosissimus* Orchard is widespread and common in the region, usually in eucalypt open forest and also from wallum heath along the coast. Both subspecies flower spring to early autumn.

**5. *Gonocarpus chinensis* (Lour.) Orchard subsp. *verrucosus* (Maiden & Betche) Orchard**

*Haloragis verrucosa* Maiden & Betche; *H. tetragyna* J. D. Hook. var. *micrantha* Benth.

Erect or ascending perennial herb; stems weak, sometimes rooting at lower nodes, 20–40 cm tall, strongly 4-ribbed. Leaves decussate, alternate near inflorescence, subsessile, linear to linear-ovate, apex acute, base rounded, margin thickened, ± recurved, serrate, 1–2.8 cm × 0.2–0.6 cm. Flowers 4-merous; sepals green, 0.6–0.8 mm × 0.4–0.5 mm; petals yellow to red, 1–1.5 mm × 0.3–0.5 mm; stamens 8, anthers 0.7–1.1 mm long. Fruits globular, 0.7–1 mm long, 8-ribbed, ± densely covered with papillae.

Widespread in the Moreton and Wide Bay districts, also recorded from the Darling Downs district, mostly in open wet swampy places. Flowers spring to autumn.

**6. *Gonocarpus oreophilus* Orchard**

Shrub 0.5–1.5 m tall; stems green to red-brown, 4-ribbed, densely clothed with  $\pm$  spreading hairs. Leaves decussate, becoming alternate in upper part; petioles 1.5–5 mm long; blades ovate to oblong, apex rounded, base cuneate, margin thickened, serrate, 0.7–3.5 cm  $\times$  0.3–1.4 cm, short or long hairs on both surfaces. Flowers 4-merous; sepals green, 0.6–0.7 mm long; petals red to yellow, 2–3 mm long; stamens 8, anthers 2–2.2 mm long. Fruits ovoid, 8-ribbed.

Rainforest or wet eucalypt forest of the McPherson Ra. and nearby mountains and from granite areas in the southern Darling Downs district at altitudes above 300 m. Flowers spring–summer.

**7. *Gonocarpus tetragynus* Labill.**

*Haloragis tetragyna* (Labill.) J. D. Hook.

Erect or ascending perennial herb, 15–30 cm tall, older plants spreading by horizontal stolons; stems reddish purple to green, very weakly 4-ribbed, appressed pubescent. Leaves decussate; petioles up to *ca* 1.5 mm long; blades narrowly ovate, apex acute, base cuneate to rounded, margin thickened, serrate, 0.5–1.5 cm  $\times$  0.15–0.6 cm, appressed hairy above and below. Flowers 4-merous; sepals green, 0.5–0.7 mm  $\times$  0.4–0.6 mm; petals green to reddish, 2–2.8 mm  $\times$  0.7–0.8 mm; stamens 8, anthers 1.7–2.1 mm long. Fruits 1–1.3 mm long, 8-ribbed, with 2–3 oblique calluses between ribs.

Widespread in the Moreton district and from around Stanthorpe in the Darling Downs district, also recorded from the eastern Wide Bay district, usually in eucalypt open forest. Flowers spring–summer.

**107. ALANGIACEAE**

Trees or shrubs, sometimes spiny. Leaves alternate, exstipulate, simple. Flowers in axillary cymes, bisexual, pedicels articulated; calyx truncate or with 4–10 teeth; petals 4–10, mostly linear, valvate, at length recurved, sometimes coherent at base; stamens same number as and alternate with petals or 2–4 times as many, free or slightly connate at base,  $\pm$  villous inside, anthers 2-locular, linear; ovary inferior, 1–2-locular, style simple, clavate or 2–3-lobed. Fruits drupaceous, crowned by sepals and disc, 1-seeded.

1 genus with 17 species from tropical Africa, southern and eastern Asia and eastern Australia; 1 species Australia, occurring in south-eastern Queensland.

**1. ALANGIUM Lam.**

Characters as for the family.

**1. *Alangium villosum* (Blume) Wangerin**

*Styrax villosum* Blume; *Alangium ferrugineum* C. T. White

Shrubs or trees up to *ca* 12 m tall; stem diameter up to *ca* 20 cm. Leaves with petioles 0.3–2 cm long; blades elliptic to oblong to narrowly ovate or ovate-oblong, apex acute-acuminate to subobtusate, base cuneate to cordate, asymmetrical, margin entire, 4–19 cm  $\times$  1.2–7.5 cm, glabrous to tomentose. Inflorescences 1–4-branched, peduncles 0.7–2.5 cm long; flowers 4–8-merous; calyx tube 1–2.5 mm long, calyx lobes 0.25–1 mm long; petals loosely coherent with each other and with filaments, up to 1.4 cm long; stamens as many as petals; ovary 1-locular. Fruits ellipsoid or globose to oblongoid in dry state, 1–1.7 cm  $\times$  0.6–1 cm, crowned by disc and calyx.

Two subspecies occur in the region:

1. Stems and petioles tomentose; inflorescences tomentose, 3–6-flowered *A. villosum* subsp. *tomentosum*
- Stems and petioles glabrous or sparsely shortly appressed hairy; inflorescences with short appressed hairs, 6–10-flowered *A. villosum* subsp. *polyosmoides*

*Alangium villosum* subsp. *tomentosum* (F. Muell.) Bloemb. (*Pseudalangium polyosmoides* F. Muell. var. *tomentosum* F. Muell.; *Marlea vitiensis* Benth. var. *tomentosa* (F. Muell.) Benth.; *A. villosum* var. *australe* Bloemb.) is found in rainforest of the Moreton and Wide Bay districts. *A. villosum* subsp. *polyosmoides* (F. Muell.) Bloemb. (*Pseudalangium polyosmoides* F. Muell.; *Marlea vitiensis* (A. Gray) Benth.) is found in rainforest of eastern parts of the region. Flowers of both subspecies have been found spring to autumn.

## 108. ARALIACEAE

Trees or shrubs, rarely herbs, sometimes climbers. Leaves usually alternate, simple or compound; stipules adnate to petiole, rarely free. Inflorescences of heads, umbels, spikes or racemes of flowers arranged in racemes, panicles or umbels, rarely flowers solitary; flowers usually small, usually bisexual but sometimes unisexual; petals 3–many, mostly 5; stamens usually same number as petals and alternate with them; ovary inferior, 1–many-locular. Fruits berries or drupes, indehiscent.

About 84 genera with 920 species, mostly tropical parts of the world; 11 genera with 30 species Australia; 4 genera with 10 species south-eastern Queensland.

1. Leaves simple . . . . .	1. <i>Astrotricha</i>	2
Leaves compound . . . . .		
2. Leaves digitately compound . . . . .	2. <i>Mackinlaya</i>	3
Leaves pinnately compound . . . . .		
3. Leaves with 3 leaflets . . . . .	3. <i>Cephalalaria</i>	
Leaves with more than 3 leaflets . . . . .	4. <i>Polyscias</i>	

## 1. ASTROTRICHA DC.

Shrubs often clothed with stellate tomentum. Leaves petiolate, simple, entire. Flowers in pedunculate umbels arranged in terminal panicles; calyx lobes 5; petals 5; stamens 5; ovary 2-locular, styles 2, distinct, at first erect, later recurved. Fruits flattened or thick.

An Australian endemic genus with 10 species; 5 species south-eastern Queensland.

1. Flowers glabrous or almost so . . . . .	2
Flowers hairy, often densely so . . . . .	4
2. Leaves more than 1 cm broad; fruits winged at least when mature . . . . .	1. <i>A. pterocarpa</i>
Leaves less than 1 cm broad; fruits not winged . . . . .	3
3. Flowers purple-black; plants of sandstone areas . . . . .	2. <i>A. biddulphiana</i>
Flowers creamish; plants of coastal sands . . . . .	3. <i>A. glabra</i>
4. Leaves of non-fertile parts of plant 2 cm or more broad . . . . .	4. <i>A. floccosa</i>
Leaves all less than 1.8 cm broad, mostly less than 1 cm broad . . . . .	5. <i>A. longifolia</i>

1. *Astrotricha pterocarpa* Benth.

Slender shrubs up to *ca* 3 m tall, often single-stemmed, above ground parts dying after flowering. Leaves with petioles up to *ca* 20 cm long, floccose-tomentose; blades narrowly ovate to ovate, apex acute, base cordate or rounded, 10–30 cm × 2.5–16 cm, largest on young stems, densely floccose-tomentose at least below. Panicles of umbels up to *ca* 1.5 m long, with narrow leafy bracts under main branches, umbels on peduncles up to *ca* 1 cm long, pedicels up to *ca* 1 cm long; flowers ± glabrous. Fruits not flattened, *ca* 6 mm long, slightly furrowed, winged though often not until fruit is mature, wings *ca* 4 mm broad.

Known from areas of decomposed sandstone in the Burnett and Wide Bay districts. Flowers apparently spring.

2. *Astrotricha biddulphiana* F. Muell.

Shrub up to *ca* 2 m tall; branchlets densely covered with close light brown stellate tomentum. Leaves with petioles 2–4 mm long; blades narrowly to broadly linear, apex obtuse or slightly apiculate, base rounded, margin slightly recurved, 3–5 cm × 0.2–0.5 cm, glabrous above, tomentose below. Panicles of umbels *ca* 23 cm long, umbels not numerous, peduncles slender, up to *ca* 5 cm long, pedicels up to *ca* 2 cm long; flowers purplish black, glabrous. Ripe fruits ± flattened, *ca* 6 mm long.

Known from Mt. Barney in the Moreton district and also from sandy areas of State Forest to the north of Chinchilla in the Darling Downs district. Flowers apparently spring.

**3. *Astrotricha glabra* (F. Muell.) Domin**

*Astrotricha longifolia* Benth. var. *glabra* F. Muell.; *A. longifolia* var. *glabrescens* F. M. Bailey

Shrub up to *ca* 2 m tall, glabrous or sometimes with sparse stellate hairs on stems and underside of leaves. Leaves with petioles 7–10 mm long; blades linear-ovate to narrowly ovate, apex acuminate, base rounded, 3–15 cm × 0.3–1.3 cm, glabrous or with few stellate hairs below. Panicles of umbels up to *ca* 20 cm long, umbels not numerous, peduncles up to *ca* 2 cm long, pedicels up to *ca* 10 mm long; flowers cream, glabrous. Fruits ± flattened, *ca* 4–6 mm long.

Known from Moreton I., Fraser I. and sandy coastal areas of the Cooloola region. Flowers apparently spring.

**4. *Astrotricha floccosa* DC.**

Shrub or small tree up to *ca* 9 m tall but often flowering at 1 m tall, young branches, inflorescences and underside of leaves clothed with dense floccose tomentum. Leaves with petioles 2–7 cm long; blades ovate to narrowly ovate, apex tapering to narrow point, base rounded or slightly cordate, larger ones sometimes almost peltate, 8–20 cm × 2–10 cm, leaves close to inflorescence sometimes smaller, upper ones reduced to small bracts, glabrous above. Panicles of umbels up to *ca* 30 cm long, umbels numerous, peduncles up to *ca* 2 cm long, pedicels up to *ca* 1 cm long; flowers cream; petals densely woolly tomentose outside. Fruits flattened, *ca* 5 mm long.

Known from the Moreton and Wide Bay districts but is most common in the south-eastern Moreton district. Flowers mainly spring, sometimes also autumn.

**5. *Astrotricha longifolia* Benth.**

Shrub up to *ca* 2 m tall, young branches, inflorescences and underside of leaves clothed with dense floccose tomentum. Leaves with petioles 0.5–2 cm long; blades linear-ovate to narrowly ovate, apex acute to acuminate, base rounded, 4–10 cm × 0.3–1.5 cm, upper ones reduced to bracts, glabrous above. Panicles of umbels up to *ca* 30 cm long, umbels numerous, peduncles 1–2 cm long, pedicels 0.8–1.2 cm long; flowers whitish; petals tomentose outside. Fruits flattened, *ca* 6 mm long.

Known from sandy areas of the Wide Bay and Moreton districts and from the Stanthorpe-Wallangarra area of the Darling Downs district. Flowers late winter to summer.

**2. MACKINLAYA F. Muell.**

Shrubs or trees. Leaves digitately compound. Flowers articulate on pedicels in large terminal compound umbels (2–4-umbellate); calyx with 5 prominent lobes; petals with long induplicate points; stamens 5; ovary 2-locular, styles 2. Fruits flattened, succulent.

About 12 species in south-eastern Asia and Australia; 2 species, both endemic, Australia; 1 species south-eastern Queensland.

**1. *Mackinlaya macrosciadia* (F. Muell.) F. Muell.**

*Panax macrosciadia* F. Muell.

Slender shrub up to 3 m tall, glabrous. Leaves with petioles sheathing at base, 10–20 cm long; petiolules 1–6 cm long; leaflet blades ovate or oblong, apex rounded to acute or apiculate, mucronate, base cuneate, often obliquely so, margin entire or sometimes toothed, 7–18 cm × 2–7 cm. Inflorescences 2-umbellate, peduncle 2–15 cm long, primary rays mostly 4–15 cm long, secondary rays mostly 1–1.5 cm long. Fruits green when immature, pale blue when ripe, *ca* 1 cm × 1.4 cm.

Known from rainforest of the northern Wide Bay district. Flowers spring to autumn.

**3. CEPHALARALIA Harms**

Shrubby climber. Leaves 3-foliolate. Flowers sessile in small pedunculate heads forming simple racemes or slender slightly branched panicles scarcely exceeding leaves; petals 5; stamens 5. Fruits rounded-ovoid, compressed, crowned by calyx.

1 species endemic in Australia, occurring in south-eastern Queensland.

**1. *Cephalalaria cephalobotrys* (F. Muell.) Harms***Panax cephalobotrys* F. Muell.; *Aralia cephalobotrys* (F. Muell.) Harms

Glabrous or sometimes sprinkled with appressed hairs especially on young parts and inflorescences. Leaves with petioles 4–10 cm long; petiolules 0.8–2.5 cm long, central one at least twice as long as lateral ones; leaflet blades oblong or narrowly ovate to ovate, apex acute-acuminate or apiculate, base ± rounded, 3–15 cm × 1.5–7 cm, usually paler on lower surface. Peduncles up to *ca* 2 cm long; flowers dark reddish purple. Fruits black and succulent when ripe, *ca* 5 mm long.

Found in rainforest or wet eucalypt forest of the Moreton and Wide Bay districts. Flowers autumn.

**4. POLYSCIAS J. R. & G. Forster**

Trees or shrubs. Leaves imparipinnate, leaflets opposite, entire or toothed. Flowers in paniculate umbels or paniculate racemes, unisexual; petals 5, rarely 4, valvate; stamens 5 or rarely 4, anthers 4-locular; ovary 2-locular. Fruits drupaceous.

About 100 species from tropical Asia to Australia and New Caledonia; 12 species Australia; 3 species south-eastern Queensland.

- |   |                            |   |
|---|----------------------------|---|
| 1. Flowers solitary in paniculate racemes . . . . .   | 1. <i>P. elegans</i>       |   |
| Flowers arranged in paniculate or racemose umbels . . . . .   |                            | 2 |
| 2. Shrub or small tree up to <i>ca</i> 5 m tall; leaves 1-pinnate or 2-pinnate, leaf axis up to 60 cm long, leaflets 2–12.5 cm long . . . . . | 2. <i>P. sambucifolius</i> |   |
| Tree up to <i>ca</i> 20 m tall; leaves all 1-pinnate, leaf axis 40–120 cm long, leaflets 7–25 cm long . . . . .                               | 3. <i>P. murrayi</i>       |   |

**1. *Polyscias elegans* (C. Moore & F. Muell.) Harms**

CELERY WOOD

*Panax elegans* C. Moore & F. Muell.; *Tieghemopanax elegans* (C. Moore & F. Muell.) R. Viguier

Tree up to 25 m tall, stem diameter up to 70 cm; fresh bark with faint odour of celery. Leaves 1–2-pinnate; leaf axes constricted where they are joined by petiolules; whole leaf often more than 60 cm long; petiolules 0.5–1.4 cm long; leaflet blades ovate, apex acuminate, mostly 5–12.5 cm × 2–6 cm, glabrous, crushed green leaflets with odour of celery. Flowers in terminal panicles of racemes, rachis minutely pubescent, pedicels *ca* 3–4 mm long. Fruits flattened, broader than long, *ca* 5–6 mm broad. **Fig. 36L.**

Found in rainforests of the region. Flowers autumn. The wood is suitable for models, inlays and cases but has little durability.

**2. *Polyscias sambucifolius* (Sieber ex DC.) Harms***Panax sambucifolius* Sieber ex DC.; *Tieghemopanax sambucifolius* (Sieber ex DC.) R. Viguier

Shrub or small tree up to *ca* 5 m tall. Leaves 1–2-pinnate, 10–60 cm long; leaflets exceedingly variable, petiolulate or sessile; leaflet blades ovate to linear, apex acute, margin entire, denticulate or lobed, 2–12.5 cm long, usually paler on undersurface. Flowers in terminal irregularly paniculate umbels. Fruits flattened, 4–6 mm broad.

Known from the McPherson Ra. and nearby mountains of the Moreton district and from the extreme south-eastern Darling Downs district. Flowers apparently summer.

**3. *Polyscias murrayi* (F. Muell.) Harms***Panax murrayi* F. Muell.; *Tieghemopanax murrayi* (F. Muell.) R. Viguier

Tree up to *ca* 20 m tall; stem diameter up to 25 cm, unbranched for up to 6 m and then few-branched. Leaves 1-pinnate, 40–120 cm long; petiolules 3–6 mm long; leaflet blades obliquely narrowly ovate, apex acuminate, margin entire or slightly denticulate, 7–25 cm × 2–7 cm, glabrous. Flowers in paniculate or racemose umbels. Fruits flattened, *ca* 4 mm broad.

Rarely collected in south-eastern Queensland but found in coastal rainforest. Flowers apparently summer–autumn.

## 109. APIACEAE (UMBELLIFERAE)

Including HYDROCOTYLACEAE into which the genera *Actinotus*, *Centella*,  
*Hydrocotyle*, *Platysace* and *Xanthosia* are sometimes placed.

Herbaceous plants, very rarely somewhat woody. Leaves alternate, usually much divided, sheathing at base. Flowers in simple or compound umbels or rarely capitate, bisexual, rarely unisexual; calyx adnate to ovary, 5-lobed; petals 5; stamens 5, alternate with petals; ovary inferior, 2-locular, styles 2, thickened at base. Fruits dry, 2-locular, divided into 2 mericarps, these often remaining suspended at top by divided thread-like central axis (carpophore); carpels mostly prominently ribbed and often with parallel resinous canals (vittae) which are seen in a transverse section of fruit.

About 350 genera with ca 3 230 species mainly from temperate areas or in the tropics mostly on mountains; ca 25 genera with 90 species Australia; 16 genera with 32 species south-eastern Queensland.

1. Leaves and bracts pungent pointed . . . . .	1. <i>Eryngium</i>	2
Leaves and bracts not pungent pointed . . . . .		
2. Flowers in simple umbels or heads, or flowers arranged in 3-6 clusters along common axis, or if umbels compound then leaves peltate . . . . .		3
Flowers in compound umbels, or umbels apparently clustered in axils; leaves not peltate . . . . .		9
3. Flowers numerous and surrounded by radiating involucrel bracts, the whole often resembling a daisy flower . . . . .	2. <i>Actinotus</i>	4
Flowers not arranged as above . . . . .		
4. Plants grass-like forming mats on mud along coastal rivers, often submerged at high tide . . . . .	3. <i>Lilaeopsis</i>	5
Plants not grass-like, not growing in tidal areas . . . . .		
5. Leaves deeply digitately 3-5-partite, each segment again deeply divided; if procumbent not rooting at nodes . . . . .	4. <i>Trachymene</i>	6
Leaves entire or 3-many-lobed or pinnately 3-many-divided, or if digitately divided then plants prostrate and rooting at nodes . . . . .		
6. Plants erect or diffuse, not rooting at nodes . . . . .		7
Plants prostrate and rooting at nodes . . . . .		8
7. Umbels of 2-3 flowers . . . . .	5. <i>Xanthosia</i>	
Umbels of several flowers . . . . .	13. <i>Apium</i>	
8. Involucrel bracts conspicuous, flowers 3-4 per umbel; leaves entire, often sinuate or crenate . . . . .	6. <i>Centella</i>	
Involucrel bracts inconspicuous, flowers usually numerous, occasionally few; leaves entire, lobed or deeply 3-partite, sometimes peltate . . . . .	7. <i>Hydrocotyle</i>	
9. Leaves entire, often very narrow, sometimes perfoliate . . . . .		10
Leaves not entire . . . . .		11
10. Leaves less than 1 cm broad . . . . .	8. <i>Platysace</i>	
Leaves 1 cm or more broad . . . . .	9. <i>Bupleurum</i>	
11. Fruits prickly or papillose-tuberculate . . . . .		12
Fruits not prickly nor papillose-tuberculate . . . . .		13
12. Fruits with small hair like spines on primary ridges and longer spines on secondary ridges . . . . .	10. <i>Daucus</i>	
Fruits with long papillose spines or fruits papillose-tuberculate . . . . .	11. <i>Torilis</i>	
13. Stems purple-spotted, robust; leaves up to 60 cm long . . . . .	12. <i>Conium</i>	
Stems not purple-spotted; leaves mostly less than 20 cm long, except in <b>Foeniculum</b> . . . . .		14
14. Involucrel bracts absent . . . . .	13. <i>Apium</i>	
Involucrel bracts present . . . . .		15

- |   |                       |    |
|---|-----------------------|----|
| 15. Leaves 3-foliolate or 3-lobed . . . . .                     | 5. <i>Xanthosia</i>   |    |
| Leaves 1-4-pinnate, leaflets many . . . . .                     |                       | 16 |
| 16. Flowers yellow . . . . .                                    | 14. <i>Foeniculum</i> |    |
| Flowers white . . . . .   |                       | 17 |
| 17. Leaves 1-2-pinnate, ultimate segments pinnatisect . . . . . | 15. <i>Ammi</i>       |    |
| Leaves 1-pinnate, leaflets serrate; submerged leaves if present |                       |    |
| 2-3-pinnate with linear leaflets . . . . .                      | 16. <i>Sium</i>       |    |

## 1. ERYNGIUM L.

Annuals, biennials or perennials, glabrous. Leaves alternate on stems, opposite or whorled under flowering branches or peduncles, entire to dissected, prominently veined and usually with rigid spiny lobes. Flowers sessile in compact pedunculate heads, outer bracts pungent pointed, inner bracts represented by small sometimes bladderly scales on common torus; sepals prominent, stiff, pungent, covering fruit. Fruits ovoid, scarcely compressed, covered with small bladderly scales, ribs 5, inconspicuous.

About 200 species from warm parts of the world, principally South America; *ca* 8 species Australia, 6 native; 3 species south-eastern Queensland.

- |  |                           |   |
|--|---------------------------|---|
| 1. Plants prostrate, stems having appearance of stolons . . . . .  | 1. <i>E. vesiculosum</i>  |   |
| Plants ± erect . . . . .   |                           | 2 |
| 2. Flower heads small, mostly of 6-8 flowers; floral leaves broad, deeply divided into 3-5 broad prickly-toothed lobes . . . . . | 2. <i>E. expansum</i>     |   |
| Flower heads large, of many flowers; floral leaves narrow or pinnatifid with linear-pungent lobes . . . . .                      | 3. <i>E. plantagineum</i> |   |

### 1. *Eryngium vesiculosum* Labill.

#### PROSTRATE BLUE DEVIL

Stem almost none, branches long, prostrate. Radical leaves obovate or oblong with coarse spreading spiny teeth, 4-15 cm × 0.5-1.5 cm including petiole; floral leaves shorter, cuneate or linear, with 3-5 pungent teeth. Peduncles radical or from nodes of branches; flower heads pale blue, *ca* 5-8 mm diameter, bracts greenish, 8-10, pungent, 0.8-2 cm long. Fruits covered with rounded bladderly scales.

Known from a few places around Stanthorpe in the Darling Downs district. Flowers mainly spring-summer.

### 2. *Eryngium expansum* F. Muell.

#### QUEENSLAND ERYNGO

Stems erect or diffuse, dichotomous, up to *ca* 60 cm long. Radical leaves oblong or almost obovate, narrowed into petiole, margin with coarse prickly teeth or lobes, 5-7.5 cm × 2-3.5 cm; floral leaves opposite, short and broad, deeply divided into 3, or rarely 5 divaricate cuneate prickly-toothed lobes, whole leaf mostly 1-3 cm × 1-3.5 cm. Peduncles axillary, very short; heads *ca* 4-6 mm diameter, mostly of 6-8 flowers, each flower less than 2 mm long. Fruits with rounded bladderly scales. **Fig. 36A.**

Widespread in the region, usually in damp places. Flowers mainly spring-summer.

### 3. *Eryngium plantagineum* F. Muell.

*Eryngium rostratum* auct. Qld. non Cav.

A very variable species. Stems ± erect, slender or stout, often branching at summit, up to *ca* 60 cm tall. Leaves chiefly radical, ovate and ± deeply divided into spiny divaricate segments, whole leaf up to *ca* 20 cm long and up to *ca* 2 cm broad, or leaves linear, flaccid and grass-like, entire or with few spiny spreading teeth or lobes near apex, compressed-hollow and marked with distant transverse partitions, 10-25 cm × 0.2-0.4 cm; floral leaves shorter, often reflexed. Peduncles 1-3 cm long, bearing cylindrical flower heads up to *ca* 2.5 cm long, rarely longer, bracts narrow, pungent, about 5 outer ones forming an involucre, only few of inner ones surpassing head. Fruits covered with blunt scales. **Fig. 36B.**

Widespread in the region, mainly in the Darling Downs district. Flowers mainly spring-summer.

## 2. ACTINOTUS Labill.

Herbs with perennial rootstock, or annual. Leaves ternately divided. Umbels simple, surrounded by radiating involucre of white or slightly coloured, often tomentose or woolly bracts, whole having appearance of flower of family Asteraceae; flowers numerous, crowded, outer often male; calyx lobed or truncate; petals 5 or absent; ovary 1-locular, styles 2. Fruits ovate, compressed, 1-seeded.

About 15 species from Australia and New Zealand; 15 species Australia, 14 endemic; 2 species south-eastern Queensland.

- |  |                        |
|--|------------------------|
| 1. Involucres of inflorescences 2.5–10 cm diameter . . . . .   | 1. <i>A. helianthi</i> |
| Involucres of inflorescences less than 2 cm diameter . . . . . | 2. <i>A. gibbonsii</i> |

### 1. *Actinotus helianthi* Labill.

### FLANNEL FLOWER

Erect annual or perennial 0.3–1.5 m tall, whole plant covered with soft dense white or brownish tomentum. Leaves with petioles 0.8–5 cm long; blades up to *ca* 5 cm long, twice 3-partite, with linear or oblong-linear mostly obtuse segments which are entire or again 2–3-lobed. Peduncles up to *ca* 8 cm long; involucre of 10–12 softly tomentose bracts, 2.5–10 cm diameter; flowers numerous and forming dense head, pedicels 3–4 mm long. Fruits *ca* 4 mm long, covered with silky hairs. **Fig. 36F.**

Known from the Stanthorpe-Wallangarra area of the Darling Downs district and from a few areas of the Moreton district, usually in sandstone or rocky areas. Flowers spring–summer.

### 2. *Actinotus gibbonsii* F. Muell.

Annual with decumbent or ascending stems up to *ca* 30 cm long, glabrous or slightly tomentose. Leaves almost sessile or on petioles up to *ca* 4 cm long; blades up to *ca* 2 cm long, twice 3-partite, final segments again 2–3-lobed. Peduncles  $\pm$  absent or up to *ca* 10 mm long; involucre of *ca* 9 bracts, 0.9–1.8 cm diameter; flowers forming small head. Fruits *ca* 2 mm long.

Known from a few scattered localities in the Darling Downs district. Flowers spring–summer.

## 3. LILAEOPSIS Green

Herbs usually found in swampy or marshy places alongside rivers or lakes, sometimes partially submerged; stems creeping. Leaves reduced, each consisting of hollow elongated axis with broad sheathing base, axis with transverse septa, usually more conspicuous in dried specimens. Umbels simple, terminal on slender peduncles at nodes. Fruits almost spherical or slightly flattened laterally, with 2–5 primary ribs, vittae present.

About 14 species from Australia, New Zealand and the Americas; 5 species Australia; 1 species south-eastern Queensland.

### 1. *Lilaeopsis polyantha* (Gandoger) H. Eichler

*Crantzia polyantha* Gandoger; *C. lineata* auct. non Nutt., Benth.; *Lilaeopsis novae-zealandiae* auct. non (Gandoger) A. W. Hill, S. T. Blake

Small herb. Leaves 1–6 cm long. Umbels 2–5-, usually 3–4-flowered, peduncles up to *ca* 1.3 cm long, pedicels *ca* 4–6 mm long. Fruits *ca* 1–1.5 mm  $\times$  1–1.5 mm, with 2 lateral ribs.

Collected from saline mud submerged at high tide from along the Caboolture R., Brisbane R. and Moggill Ck. a tributary of the Brisbane R. It is an inconspicuous plant forming small green mats seemingly overlooked by past collectors.

## 4. TRACHYMENE Rudge

Herbs, annual, biennial or with perennial rootstock. Leaves ternately divided or rarely toothed only. Flowers in simple umbels, terminal or leaf opposed; involucre of linear bracts usually shortly united at base; calyx teeth minute or rarely 1 or 2 rather longer

and subulate. Fruits laterally compressed, usually flat, notched at base, usually tubercular-muricate or villous, one carpel often differently or less muricate than other or abortive.

About 40 species south-eastern Asia to Australia, New Caledonia and Fiji; *ca* 30 species Australia; 2 species south-eastern Queensland.

- |  |                         |
|--|-------------------------|
| 1. Stems erect, rigid; leaves mostly radical from base . . . . . | 1. <i>T. incisa</i>     |
| Stems weak, procumbent or ascending, leafy . . . . .             | 2. <i>T. procumbens</i> |

### 1. *Trachymene incisa* Rudge

Stems from thick perennial rootstock, erect, up to *ca* 50 cm tall. Leaves chiefly radical or on lower part of stem; petioles up to *ca* 20 cm long; leaf blades mostly 2–4 cm long and broad, ± digitately 3- or 5-partite, segments again often much divided, leaves reduced in size or absent from base of peduncle. Peduncles up to *ca* 15 cm long, pedicels 4–7 mm long. Fruits *ca* 3 mm × 4 mm when ripe.

Common and widespread in the Moreton and Wide Bay districts, especially in wallum areas and is also found in the Stanthorpe area of the Darling Downs district. Flowers mostly summer.

### 2. *Trachymene procumbens* (F. Muell.) Benth.

*Didiscus procumbens* F. Muell.

Stems from perennial rootstock, procumbent or ascending, leafy. Leaves with petioles up to *ca* 5 cm long; blades 3-partite, each segment again deeply divided, whole blade up to 7 cm × 10 cm, sometimes glandular hairy near petiole. Peduncles up to *ca* 12 cm long, pedicels 0.3–0.6(–1.2) cm long. Fruits *ca* 3 mm × 4 mm when ripe.

Widespread in the region, except the Darling Downs district, not common. Flowers mostly summer–autumn.

## 5. XANTHOSIA Rudge

Herbs or small shrubs. Leaves toothed, lobed, dissected or pinnate, rarely entire. Umbels compound or simple, sometimes reduced to single flower; compound umbels usually with 3–4 rays and as many bracts; umbellules with 2–3 bracts and several flowers, flowers mostly almost sessile. Flowers without vittae.

About 20 species, all endemic in Australia; 2 species south-eastern Queensland.

- |                            |                      |
|----------------------------|----------------------|
| 1. Umbels simple . . . . . | 1. <i>X. pilosa</i>  |
| Umbels compound . . . . .  | 2. <i>X. diffusa</i> |

### 1. *Xanthosia pilosa* Rudge

Erect or diffuse shrub, usually 30–60 cm tall, whole plant except often upper surfaces of leaves clothed with long hairs intermixed with brown stellate tomentum or sometimes ± glabrous. Leaves with petioles up to *ca* 1.5 cm long; blades 3–7-lobed or pinnate, whole blade up to *ca* 5 cm long. Peduncles 1 or few together in axils, mostly 0.5–2.5 cm long or longer; flowers mostly 2–3 in umbels, pedicels up to *ca* 3 mm long; involucre bracts linear, 4–5 mm long. Fruits *ca* 2 mm × 2.5 mm.

Known from eastern parts of the Moreton and Wide Bay districts. Flowers spring.

### 2. *Xanthosia diffusa* C. T. White

Diffuse shrubs up to *ca* 1.5 m tall but mostly 30–80 cm tall, densely pilose. Leaves with petioles 1–1.5 cm long; blades 3-foliolate or more rarely 3-lobed; leaflets often 3-lobed, terminal leaflet 2–4 cm long, lateral leaflets 1.5–3 cm long with petiolules up to *ca* 1.5 cm long; upper surface with sparse long white hairs, and/or hispid; lower surface with white to rusty coloured stellate tomentum. Umbels compound, peduncles 1–5 cm long with 2 linear-ovate bracts *ca* 6 mm long at apex of peduncles; rays 3–4, up to *ca* 5 mm long; umbellules 6–9-flowered, pedicels up to *ca* 1 mm long; involucre bracts 3, white, petaloid, *ca* 7 mm × 4 mm. Fruits *ca* 2 mm long with at least a few hairs when young.

Known from the mountains of the southern Moreton district and from the vicinity of Wallangarra in the Darling Downs district. Flowers spring.

6. CENTELLA L.

Herbs or small shrubs, erect or stemless and then with long creeping runners which root at nodes. Leaves spirally arranged or rosulate, petioled, petiole base spathaceous. Umbels simple in Australian species or compound; involucre of few bracts, rarely absent; calyx minute; petals purple or reddish white. Fruits laterally compressed, manifestly ribbed.

About 40 species chiefly of the southern hemisphere; 1-2 species Australia; 1 species south-eastern Queensland.

1. *Centella asiatica* (L.) Urban

PENNYWORT

*Hydrocotyle asiatica* L.

Creeping perennial rooting at nodes. Leaves with petioles 1-20 cm long; blades broadly cordate or orbicular to reniform, margin entire, sinuate or crenate, 1-4 cm across, glabrous or pubescent. Flowers 3-4 in small heads or umbels, peduncles up to ca 4 cm long or almost absent; head or umbel subtended by an involucre of 2, rarely 3 conspicuous bracts each 1-1.5 mm long. Fruits laterally compressed, 2-3 mm long, with 3-4 ribs on each side with reticulations between. **Fig. 35A.**

Widespread, mainly in damp places, a common weed of lawns and gardens. Flowers most of the year.

7. HYDROCOTYLE L.

Herbs, either perennial with creeping stems rooting at nodes or annual with ± erect stems. Leaves stipulate and petiolate. Flowers usually in simple umbels or heads, bisexual or unisexual, small, bracts of involucre small or absent; sepals minute or absent; petals valvate in bud. Fruits flattened laterally, often ribbed.

About 100 species, cosmopolitan but especially abundant in the southern hemisphere; ca 30 species Australia; 7 species south-eastern Queensland.

- |  |                            |
|--|----------------------------|
| 1. Leaves peltate, blades orbicular . . . . .  | 2                          |
| Leaves not peltate . . . . .   | 3                          |
| 2. Flowers 2-5 in clusters, with 1-6 clusters spaced along common<br>sometimes branched rachis . . . . .   | 1. <i>H. verticillatus</i> |
| Flowers in compound umbels, each umbellule with many flowers . . . . .   | 2. <i>H. bonariensis</i>   |
| 3. Leaf blades divided to base into 3, rarely more segments . . . . .  | 3. <i>H. tripartita</i>    |
| Leaf blades undivided or if lobed then rarely more deeply than half<br>way . . . . .   | 4                          |
| 4. Flowers conspicuously pedicellate in umbels . . . . .   | 5                          |
| Flowers sessile or very shortly and inconspicuously pedicellate in<br>small dense heads . . . . .  | 6                          |
| 5. Leaf blades mostly 1.5-4 cm wide, hirsute above and below; plants<br>often found in open forests or grasslands . . . . .                            | 4. <i>H. laxiflora</i>     |
| Leaf blades mostly 5 cm or more wide, glabrous or with short ±<br>spreading hairs especially on veins below; plants of rainforest<br>margins . . . . . | 5. <i>H. pedicellosa</i>   |
| 6. Leaf blades mostly 1.2 cm or more wide, hirsute . . . . .   | 6. <i>H. acutiloba</i>     |
| Leaf blades up to 1.2 cm wide, glabrous or with a few hairs below . . . . .  | 7. <i>H. peduncularis</i>  |

1. *Hydrocotyle verticillata* Thunb.

SHIELD PENNYWORT

*H. vulgaris* auct. Aust. non L.

Stems creeping. Leaves peltate; petioles slender, up to ca 20 cm long; blades orbicular, margins crenate, mostly 2-5 cm diameter, glabrous. Flowers in clusters of 2-5, with 1-6 clusters arranged along simple or branched rachis, whole inflorescence including peduncle up to ca 10 cm or more long. Fruits ca 2 mm × 2.5 mm.

Known from freshwater swamp areas of Stradbroke I. Flowers probably spring to autumn.

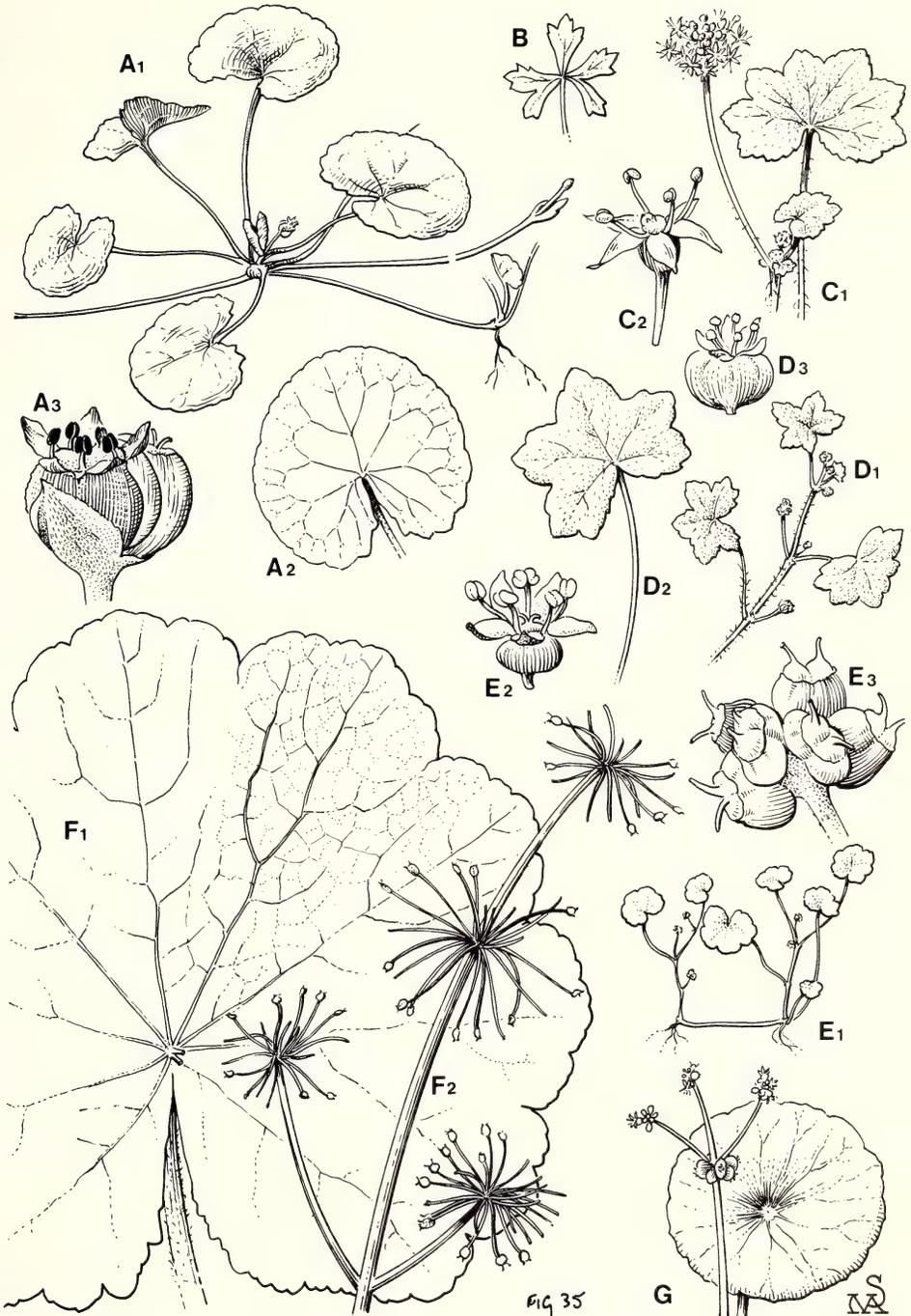


Fig. 35 APIACEAE — A<sub>1</sub>–A<sub>3</sub> *Centella asiatica*, A<sub>1</sub> habit x1, A<sub>2</sub> leaf x1, A<sub>3</sub> inflorescence x6; B–G *Hydrocotyle* spp. — B *H. tripartita*, leaf x1, C<sub>1</sub>–C<sub>2</sub> *H. laxiflora*, C<sub>1</sub> inflorescence and leaf x1, C<sub>2</sub> flower x6; D<sub>1</sub>–D<sub>3</sub> *H. acutiloba*, D<sub>1</sub> portion of flowering stem x1, D<sub>2</sub> leaf x1, D<sub>3</sub> flower x12; E<sub>1</sub>–E<sub>3</sub> *H. peduncularis*, E<sub>1</sub> habit x1, E<sub>2</sub> flower x12, E<sub>3</sub> fruits x12; F<sub>1</sub>–F<sub>2</sub> *H. pedicellosa*, F<sub>1</sub> leaf x1, F<sub>2</sub> inflorescence x1; G *H. bonariensis*, inflorescence and leaf x1.

**2. \**Hydrocotyle bonariensis* Lam.**

Stems creeping. Leaves peltate; petioles slender, described as reaching 37 cm long but in Queensland specimens seen up to *ca* 15 cm long; leaf blades orbicular, shallowly 12–19-lobed, margin of lobes crenate, described as reaching 12 cm diameter but in Queensland specimens seen *ca* 3 cm diameter. Umbels compound, 1–6 cm across. Fruits 1–2 mm × 2–4 mm. **Fig. 35G.**

Native of South America; collected twice in the region, once from a freshwater seepage on the beach near Kings Bore Road at Cooloola and once from a drainage ditch in an outer Brisbane suburb. It is naturalized and apparently common on sand or sandy soil near sea beaches in the Sydney region of New South Wales. Flowers probably spring to autumn.

**3. *Hydrocotyle tripartita* R. Br. ex A. Rich.**

PENNYWORT

Small, slender, sometimes densely matted, glabrous or sprinkled with few hairs. Leaves with petioles up to *ca* 4 cm long; blades divided to base or nearly so into 3 segments, each of segments sometimes also deeply divided or lobed, each segment up to *ca* 8 mm long, rarely longer. Peduncles filiform, shorter than leaves, occasionally almost absent, each with head of 3–6, rarely more small flowers. Fruits *ca* 1.5 mm broad. **Fig. 35B.**

Known from the Moreton district, on damp soil. Flowers spring to autumn.

**4. *Hydrocotyle laxiflora* DC.**

STINKING PENNYWORT

Stems creeping; flowering stems erect or ascending, up to *ca* 15 cm high, whole plant hirsute. Leaves with petioles up to *ca* 7 cm or more long; blades orbicular-cordate, shortly and broadly 5–11-lobed, margin of lobes crenate, mostly 1–3 cm diameter, occasionally up to *ca* 4 cm diameter. Flowers in umbels, bisexual or unisexual, peduncles variable, mostly up to 3 cm long, pedicels up to 8 mm long. Fruits 1–2 mm broad. **Fig. 35C.**

Known from a few places in the eastern Darling Downs and Moreton districts, often in open and dry places. Flowers spring to autumn.

**5. *Hydrocotyle pedicellosa* F. Muell.**

PENNYWORT

Stems slender, creeping, whole plant glabrous or occasionally sparingly pubescent on leaves, especially below. Leaves with petioles up to 30 cm long; blades orbicular-cordate or reniform, not or shallowly lobed, margin crenate, up to 10 cm diameter. Flowers in loose pedunculate umbels, umbels solitary or several arising at each node or sometimes flowers arranged in panicles of umbels, pedicels up to *ca* 10 mm long. Fruits *ca* 1.5 mm broad. **Fig. 35F.**

Known from rainforest margins on Mt. Glorious and the ranges of the southern Moreton district. Flowers spring to autumn.

**6. *Hydrocotyle acutiloba* (F. Muell.) N. A. Wakefield**

PENNYWORT

*Hydrocotyle hirta* R. Br. ex A. Rich. var. *acutiloba* F. Muell.

Stems, slender, creeping, whole plant hirsute. Leaves with petioles mostly 1–10 cm long; blades orbicular-cordate or reniform, 3–7-lobed, lobes mostly acute, margin of lobes crenate, whole blade mostly 1.2–3(–5) cm across. Flowers sessile or very shortly pedicellate in small dense heads, peduncles up to *ca* 1.5 cm long. Fruits *ca* 1 mm broad. **Fig. 35D.**

Widespread in the eastern part of the region, a common weed of shaded lawns and gardens. Flowers most of the year.

**7. *Hydrocotyle peduncularis* R. Br. ex A. Rich.**

Stems slender, creeping; whole plant glabrous or with a few hairs especially on lower surface. Leaves with petioles up to *ca* 3 cm long; blades orbicular-cordate or reniform, entire or shallowly, rarely deeply lobed, lobes rounded, whole blade 0.5–1.2 cm across. Flowers sessile or very shortly pedicellate in small dense heads, peduncles shorter than petiole. Fruits *ca* 1 mm broad. **Fig. 35E.**

Widespread in the region, a common weed of lawns and gardens. Flowers spring to autumn.

## 8. PLATYSACE Bunge

Shrubs. Leaves entire or lobed. Flowers small white, in terminal compound umbels with small involucre bracts; calyx teeth small, conspicuous, deciduous; petals induplicate-valvate in bud. Fruits slightly compressed laterally,  $\pm$  rough, without vittae.

An Australian endemic genus of 20 species; 3 species south-eastern Queensland.

- |  |                           |   |
|--|---------------------------|---|
| 1. Leaves linear-ovate to elliptic, ovate or obovate, more than 3 mm wide  | 1. <i>P. lanceolata</i>   |   |
| Leaves linear or subulate or elliptic-oblong to oblong, less than 3 mm wide  |                           | 2 |
| 2. Leaves more than 0.5 mm wide and up to 2 cm long; stems short and diffuse, usually $\pm$ glandular pubescent towards ends of branches | 2. <i>P. ericoides</i>    |   |
| Leaves less than 0.5 mm wide or if more than 0.5 mm wide then longer than 2 cm; stems decumbent, erect or ascending, glabrous            | 3. <i>P. linearifolia</i> |   |

### 1. *Platysace lanceolata* (Labill.) Druce

*Azorella lanceolata* Labill.; *Siebera billardieri* Benth.; *Trachymene billardieri* (Benth.) F. Muell.

Diffuse or erect shrub up to *ca* 1.5 m tall, glabrous or with minutely pubescent or scabrous stems. Leaves with petioles up to *ca* 2 mm long; blades linear-ovate to elliptic or ovate (in material from southern states sometimes orbicular or obovate), apex acute, tapering to base in Queensland specimens, margins entire, 1.5–7 cm  $\times$  0.4–0.7 cm, (smaller in southern states). Inflorescences usually not much larger than the leaves in Queensland specimens. Fruits *ca* 2 mm  $\times$  2 mm. **Fig. 36D.**

Widespread in the Moreton and Wide Bay districts and also from around Stanthorpe in the Darling Downs district, usually on granitic soils. Flowers mostly spring.

### 2. *Platysace ericoides* (Sieber ex DC.) C. Norman

*Trachymene ericoides* Sieber ex DC.; *Siebera ericoides* Benth.

Low diffuse shrub up to *ca* 30 cm tall,  $\pm$  glandular pubescent. Leaves variable, linear to subulate, mucronate, 0.5–2 cm  $\times$  0.06–0.1 cm, or elliptic-oblong or oblong, 2.5–6 mm  $\times$  1–2 mm. Umbels small and compact on peduncles less than 1 cm long. Fruits *ca* 2 mm long. **Fig. 36C.**

Widespread in the Moreton and Wide Bay districts and in granite areas of the Darling Downs district. Flowers found most of the year.

### 3. *Platysace linearifolia* (Cav.) C. Norman

*Azorella linearifolia* Cav.; *Siebera linearifolia* (Cav.) Benth.

Erect or spreading shrubs up to *ca* 1.5 m tall, glabrous. Leaves narrowly linear, occasionally subulate, 1–2.5 cm  $\times$  *ca* 0.05 cm or if subulate then greater than 2 cm long and occasionally up to 1 mm broad. Umbels with peduncles up to *ca* 2.5 cm long; rays slender, up to *ca* 1 cm long. Fruits *ca* 2 mm  $\times$  2 mm, about as long as wide with broad obtuse backs leaving only narrow groove at commissure, ribs scarcely conspicuous, rugose or tuberculate.

Known from the Moreton and Wide Bay districts, on sandy soil near the sea. Flowers most of the year.

## 9. BUPLEURUM L.

Annuals or perennials, glabrous. Leaves simple, entire or finely serrulate. Bracts present or absent, bracteoles present; petals with apex inflexed. Fruits terete, very variable, ridges 5, linear to winged or rarely inconspicuous; vittae 1–5.

150 species from Europe, Asia, Africa and North America; 3 species naturalized Australia; 1 species naturalized south-eastern Queensland.

**1. \*Bupleurum rotundifolium L.**

Erect annual; stems thick, up to *ca* 80 cm tall. Stem leaves obovate to elliptic, usually perfoliate at least towards base of plant, 3–8 cm × 1–2 cm; upper leaves ovate to orbicular. Bracteoles 5, yellowish green in flower, ovate to orbicular, apex apiculate, 0.5–1.5 mm × 0.5–1.5 cm; petals yellow. Fruits *ca* 3 mm long, smooth.

Native of Europe; collected as apparently naturalized from a few places in the Moreton and Darling Downs districts in the early part of this century but not collected recently.

**10. DAUCUS L.**

Annuals or biennials. Leaves 2–3-pinnate. Umbels terminal, compound, central flowers often sterile and reduced to purplish or blackish bristles, rays 3–many, bracts pinnatisect, pinnate or 3-fid; petals white, pink or yellowish, apex inflexed. Fruits with primary ridges bearing small hair-like spines, secondary ridges with longer spines in single row.

About 60 species from Europe, Africa, Asia and America; 2 species, 1 native and 1 naturalized Australia, both in south-eastern Queensland.

- |   |                           |
|---|---------------------------|
| 1. Umbels irregular, rays about 5, erect, outer bracts less than 5 mm long            | 1. <i>D. glochidiatus</i> |
| Umbels flat topped in flowering stage, rays numerous, outer bracts 10 mm or more long | 2. <i>D. carota</i>       |

**1. *Daucus glochidiatus* (Labill.) Fischer, C. A. Meyer & Ave-Lall.****AUSTRALIAN CARROT**

*Scandix glochidiata* Labill.; *Daucus brachiatus* Sieber ex DC.

Annual, ± hispid, variable in size and habit, 5–60 cm tall; stems erect or ascending, 1–several from base. Leaves in rosette at base, alternate on stem, 2-pinnate, 2–5 cm long; leaflets deeply pinnately lobed and with linear segments. Umbels irregularly compound, ± sessile or on peduncles up to *ca* 6 cm long with 2–5 unequal rays up to *ca* 3 cm long, umbellules 1–6-flowered, bracts of primary umbel pinnately divided, bracts of secondary umbel narrow, entire; petals pinkish, rarely red. Fruits ovoid, 3–5 mm long, spines of secondary ribs with reflexed barbellate tips. **Fig. 36G.**

Widespread and common in the region. Flowers and fruits mainly spring–early summer.

**2. \**Daucus carota* L.****WILD CARROT; COMMON CARROT**

Biennial, erect up to *ca* 1.2 m tall, ± hispid; taproot stout. Leaves in basal rosette and alternate on stem, 2–3-pinnate, up to *ca* 15 cm long, leaflets deeply pinnately lobed. Umbels compound with numerous rays and many-flowered umbellules, almost flat on top when flowering but rays usually becoming incurved in fruit; 1–several of central flowers of central umbellule sterile with red-purple petals, other flowers with white petals. Fruits oblong-ovoid, 3–4 mm long, only spines at top of fruit are barbellate.

Native of Europe, Asia and North Africa but now naturalized in many countries; recorded once from the Moreton district at Redbank Plains.

**11. TORILIS Adans.**

Annuals or rarely biennials; stems erect or procumbent. Leaves 1–2-pinnate, ultimate segments entire or toothed or pinnatifid. Umbels compound, terminal or leaf-opposed; sepals small, persistent; petals white or pinkish, apex inflexed. Fruits narrowly cylindrical to ovoid, grooves between ridges filled with spines or tubercles.

About 15 species from Mediterranean region to eastern Asia; 1 species naturalized Australia, occurring in south-eastern Queensland.

1. \**Torilis nodosa* (L.) Gaertn.

KNOTTED PARSLEY

*Tordylium nodosum* L.; *Caucalis nodosa* (L.) Scop.

Annual, usually procumbent; stems up to 50 cm long, retrorsely setose. Leaves 1-2-pinnate, segments toothed to pinnatifid, whole leaf up to ca 15 cm long. Umbels all leaf-opposed, rays 3-5, often hidden by flowers and fruits, bracts absent; petals minute. Fruits 2-3 mm long, usually composed of two differing mericarps, outer with long papillose patent spines arranged in 9 obscure rows; inner mericarp usually covered with short conical papillose tubercles. Fig. 36E.

Native of Europe and south-western Asia; reported as apparently naturalized in a few places in the eastern Darling Downs and western Moreton districts.

12. CONIUM L.

Annual or biennial. Leaves 2-4-pinnate; lobes serrate or pinnatifid. Umbels compound, bracts and bracteoles present; sepals absent; petals white. Fruits broadly ovate to suborbicular in outline, laterally compound, glabrous, ridges prominent; vittae absent.

4 species from temperate Europe, western Asia and southern Africa; 1 species naturalized Australia, occurring in south-eastern Queensland.

1. \**Conium maculatum* L.

HEMLOCK; POISON HEMLOCK; SPOTTED HEMLOCK; CARROT FERN

Aromatic herb up to ca 2 m tall; stems usually purple-spotted, striate, glabrous. Basal leaves up to 4-pinnate, up to 50 cm x 40 cm with hollow petioles up to 60 cm long; lobes oblong-ovate to triangular, pinnatifid, coarsely serrate or crenate-serrate, 1-2 cm long. Umbels compound, peduncles mostly up to 5 cm long but sometimes longer, rays 6-15, mostly less than 3.5 cm long, bracts and bracteoles 3-6, foliaceous; petals with incurved points. Fruits broadly ovoid, ca 3 mm long, with 5 prominent undulate ribs. Fig. 36J.

Native of Europe and Western Asia; naturalized in south-eastern Queensland, most commonly found in southern parts of the Moreton district and south-eastern parts of the Darling Downs district. Flowers mainly spring-summer. It is a declared noxious weed under the Stock Routes and Rural Lands Protection Acts, 1944-1967. All parts of the plant are poisonous to both humans and stock.

13. APIUM L.

Annuals, biennials or perennials. Basal and lower cauline leaves 1-pinnate, upper cauline leaves sometimes ternate. Umbels compound, terminal or leaf-opposed, without involucre of bracts or bracteoles; flowers white; sepals minute or absent; petals usually with inflexed apices. Fruits with 5 prominent ribs and 1 vitta under each furrow.

Above 30 species, cosmopolitan; 3 species, 2 naturalized, Australia, all occurring in south-eastern Queensland.

- 1. Leaves with filiform to linear segments . . . . . 1. *A. leptophyllum*
- Leaves with obovate-cuneate to linear-ovate segments, often incised . . . . . 2
- 2. Stems prostrate or ascending, rarely erect; leaves 1-2-pinnatisect, segments obovate to linear-ovate . . . . . 2. *A. prostratum*
- Stems erect; leaves 1-pinnatisect, segments lobed and crenate-serrate . . . . . 3. *A. graveolens*

1. \**Apium leptophyllum* (Pers.) F. Muell.

SLENDER CELERY

*Pimpinella leptophylla* Pers.; *Cyclospermum leptophyllum* (Pers.) Sprague

Annual, glabrous, usually erect, 10-70 cm tall. Leaves 2-pinnatisect, up to ca 10 cm long; leaflets filiform to linear, up to ca 1.5 cm long, but mostly less than 1 cm long, from less than 0.5 mm to ca 1 mm broad. Umbels simple or compound, sessile or pedunculate, peduncles up to ca 3 cm long, bracts and bracteoles absent, rays 3-5,

1–2.2 cm long, pedicels 2–8 mm long. Fruits ovoid, 1–3 mm long, with 5 prominent thick ribs almost concealing furrows. **Fig. 36K.**

Probably native of the Americas but now a pantropical weed; widespread in south-eastern Queensland. Flowers spring–early summer.

**2. *Apium prostratum* Labill. ex Vent.**

SEA CELERY

*Apium australe* auct. Aust. non Thouars

Perennial with thick rootstock; stems prostrate or ascending, rarely erect. Leaves 1–2-pinnatisect, segments 3-partite or leaves ternate, differing greatly in form and of two main types but with whole range of intermediates; broad leaved variants with segments rather thick, sessile or petiolulate, broadly obovate-cuneate, bluntly 3-lobed or deeply divided and lobes again toothed; narrow leaved variants with segments narrowly elliptical to linear-ovate, entire or toothed; occasionally ± erect plants with large much dissected leaves may also be found; whole leaf 1–6 cm long. Umbels compound, sessile or on short peduncles, rays 3–8, often unequal in length, 0.5–2.5 cm long, pedicels up to *ca* 4 mm long. Fruits *ca* 1.5 mm long, with 5 prominent thick ribs almost concealing furrows.

Found in the Moreton and Wide Bay districts, mainly close to the ocean but sometimes along waterways. Flowers apparently spring–summer.

**3. \**Apium graveolens* L.**

GARDEN CELERY

Biennial, erect, aromatic, up to *ca* 1 m tall. Leaves pinnatisect into 3–5 ovate-cuneate segments, each deeply 3-lobed, up to *ca* 18 cm long. Umbels sessile or on peduncles up to *ca* 1.2 cm long, rays up to 16, up to *ca* 2.5 cm long, pedicels 1–6 mm long. Fruits suborbicular to ellipsoid, *ca* 1.5 mm × 1.5–2 mm.

Native of Europe and Asia, introduced to Australia and cultivated as a vegetable; recorded once as apparently naturalized in the Burnett district, possibly also may be found around Stanthorpe in the Darling Downs district.

## 14. FOENICULUM Miller

Erect, tall perennials or biennials, occasionally annual; rootstock stout. Leaves dissected into linear segments and with long sheathing bases. Umbels compound, without bracts; sepals represented by thickened rim at summit of torus; petals yellow, truncate and rolled inwards. Fruits oblong, glabrous with several prominent ribs.

About 3 species from Europe and temperate Asia; 1 species naturalized Australia, occurring in south-eastern Queensland.

**1. \**Foeniculum vulgare* Miller**

FENNEL

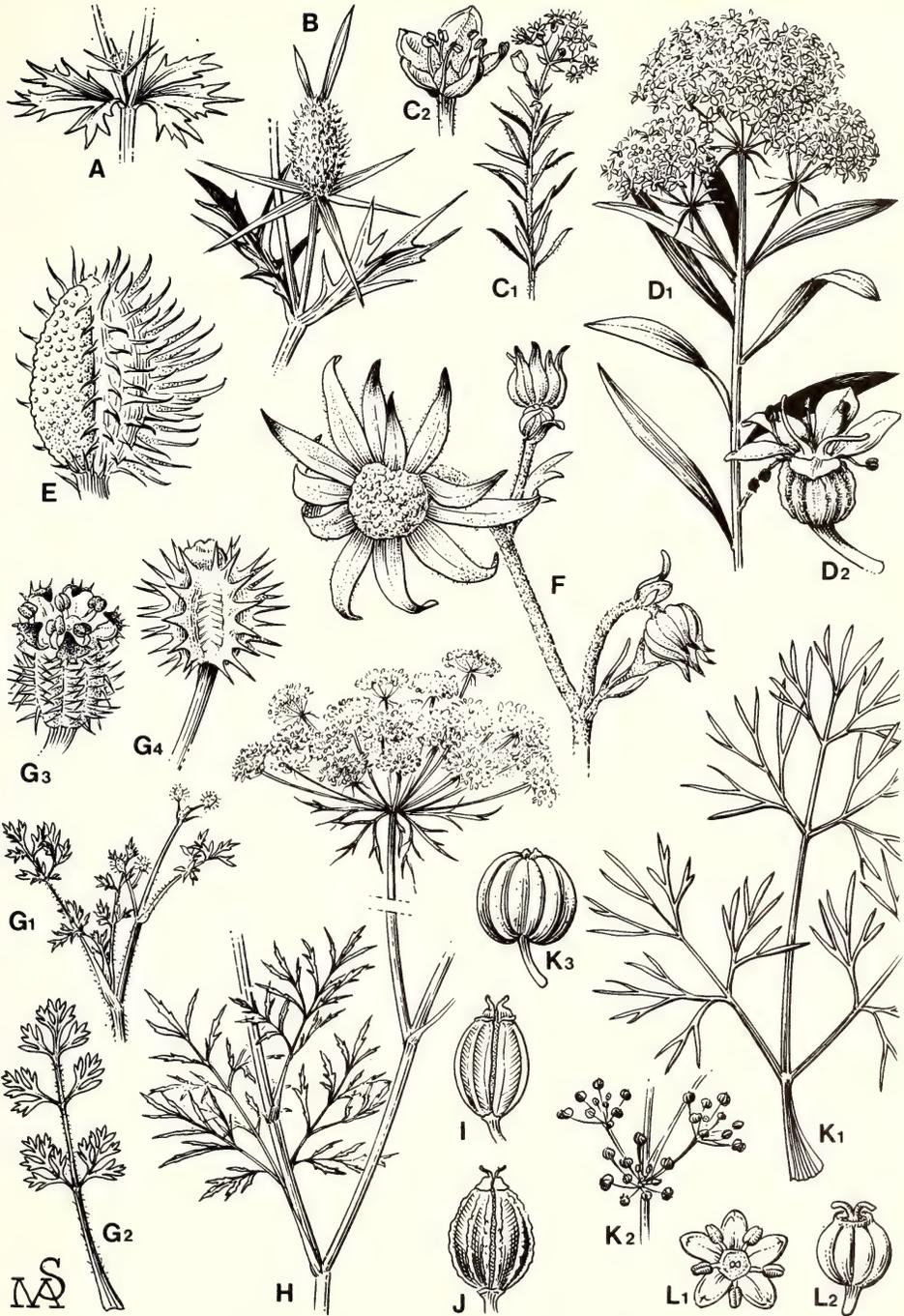
Biennial or annual, aromatic, 1–2 m tall. Radical leaves triangular to ovate, 3–4-pinnate, up to *ca* 30 cm × 15 cm, sometimes longer, ultimate segments filiform, up to 4 cm × 0.05 cm; stem leaves few, similar to basal but smaller. Umbels large, peduncles up to *ca* 12 cm long, rays 8–30, 1–6 cm long, pedicels 1–7 mm long; flowers numerous per umbellule. Fruits ovoid-oblong, 4–4.5 mm long. **Fig. 36I.**

Native of Europe and temperate Asia, cultivated to a limited extent for its aromatic leaves and stems; naturalized in a number of places in the region but is most common in the eastern Darling Downs district. Flowers summer.

## 15. AMMI L.

Annuals or biennials, or sometimes apparently perennial. Leaves 1–3-pinnate. Umbels compound, bracts pinnatisect, bracteoles usually simple; sepals very small or absent; petals white or yellowish, outer larger, apex inflexed. Fruits ovoid or ovoid-oblongoid, slightly compressed laterally, constricted at commissure, glabrous, dorsal and lateral ridges filiform, prominent; vitta solitary.

10 species from the Azores, Madeira, Mediterranean region and temperate western Asia; 1 species widely naturalized Australia, occurring in south-eastern Queensland.



**Fig. 36** A–K APIACEAE — A–B *Eryngium* spp. — A *E. expansum*, portion of flowering stem x1; B *E. plantagineum*, portion of flowering stem x1; C–D *Platysace* spp. — C<sub>1</sub>–C<sub>2</sub> *P. ericoides*, C<sub>1</sub> portion of flowering stem x1, C<sub>2</sub> flower x6; D<sub>1</sub>–D<sub>2</sub> *P. lanceolata*, D<sub>1</sub> portion of flowering stem x1, D<sub>2</sub> flower x6; E *Torilis nodosa*, fruit x6; F *Actinotus helianthi*, portion of flowering stem x1; G<sub>1</sub>–G<sub>4</sub> *Daucus glochidiatus*, G<sub>1</sub> portion of flowering stem x1, G<sub>2</sub> leaf x1, G<sub>3</sub> flower x12, G<sub>4</sub> fruit x6; H *Ammi majus*, portion of flowering stem x1/2; I *Foeniculum vulgare*, fruit x4; J *Conium maculatum*, fruit x4; K<sub>1</sub>–K<sub>3</sub> *Apium leptophyllum*, K<sub>1</sub> leaf x1, K<sub>2</sub> inflorescence x1, K<sub>3</sub> fruit x6; L ARALIACEAE — L<sub>1</sub>–L<sub>2</sub> *Polyscias elegans*, L<sub>1</sub> flower x3, L<sub>2</sub> fruit x2.

1. \**Ammi majus* L.

BISHOP'S WEED; MEADOWSWEET

Erect perennial, up to ca 1 m tall. Leaves 1-2-pinnate, 3-15 cm x 2-10 cm, glabrous, ultimate segments 1-2-pinnatisect; lobes of basal and lower cauline leaves obovate or elliptic, margin serrate, 1-3 cm x 0.4-2 cm; middle cauline leaves with much smaller narrowly ovate, acute, serrate to dentate lobes; upper cauline leaves with linear to linear-filiform and entire lobes. Peduncles up to ca 10 cm long, rays 10-80, spreading-erect, slender in flower and fruit, mostly 1-5 cm long, umbellules many-flowered, bracteoles subulate, about equalling pedicels, fruiting pedicels slender, mostly 4-7 mm long; flowers white. Fruits 1.5-2 mm long, ridges prominent and pale. Fig. 36H.

Native of Europe, northern Africa and western Asia, originally cultivated in Queensland as a garden plant called MEADOWSWEET; now naturalized and a common weed along roadsides and on waste land throughout the region. Flowers spring-summer.

16. SIUM L.

Perennials with fibrous roots, sometimes aquatic. Aerial leaves 1-pinnate with broad leaflets; submerged leaves when present 2-3-pinnate. Inflorescences of compound umbels, bracts and bracteoles present; sepals often minute; petals white. Fruits ovoid, ovoid-oblong or ellipsoid, slightly compressed laterally, ridges slender or broad; vittae present.

10-15 species cosmopolitan except South America and Australia; 1 species naturalized Australia, occurring in south-eastern Queensland.

1. \**Sium latifolium* L. var. *univittatum* J. M. Black

WATER PARSNIP

Glabrous perennial swamp plant up to ca 1 m tall. Submerged leaves 2-3-pinnate with linear leaflets; aerial leaves 1-pinnate, leaflets mostly 8-18, rarely up to 32, in opposite pairs, ovate or narrowly ovate, apex acute, base oblique, margin serrate, 2-10 cm x 0.5-3 cm. Inflorescences terminal, primary rays 20-30, up to ca 2 cm long. Fruits ellipsoid, 3-4 mm long.

Native of Europe; occasionally found apparently naturalized in swamp areas or beside creeks in the eastern Darling Downs and western Moreton districts.

110. EPACRIDACEAE

Shrubs or small trees. Leaves alternate, rarely opposite, often crowded, exstipulate. Flowers bisexual, rarely unisexual, bracteate; calyx 4-5-lobed, persistent; corolla 5-lobed, hypogynous, lobes imbricate or valvate, rarely lobes coherent and then tube opening transversely near persistent base; stamens usually 4-5; hypogynous disc or glands usually present; ovary superior, 1-10-locular, ovules 1-many, style simple. Fruits capsules or drupes; seeds with straight embryo in the middle of fleshy endosperm.

30 genera with 400 species Indochina through to New Zealand, Hawaii and South America, chiefly Australia; 30 genera with ca 330 species Australia; 11 genera with 39 species south-eastern Queensland.

- 1. Corollas pubescent inside, sometimes sparsely so . . . . . 2  
    Corollas glabrous inside . . . . . 8
- 2. Anthers long exerted from corolla tube . . . . . 1. *Styphelia*  
    Anthers wholly or partly included in corolla tube . . . . . 3
- 3. Corolla tubes with 5 red glandular scales below middle, alternating  
    with stamens . . . . . 2. *Melichrus*  
    Corolla tubes without glandular scales alternating with stamens . . . . . 4
- 4. Leaves usually more than 1 cm wide; ovaries 10-locular, pyrenes  
    separable . . . . . 3. *Trochocarpa*  
    Leaves less than 1 cm wide; ovaries 1-10-locular, but pyrenes not  
    separable . . . . . 5

- |  |  |    |
|--|--|----|
| 5. Corolla lobes imbricate in bud, or if appearing valvate then lobes papillose inside in lower half and with reflexed tufts of hairs closing throat<br>Corolla lobes valvate in bud . . . . .   | 4. <i>Brachyloma</i> . . . . .               | 6  |
| 6. Leaves rigid, appearing 5-striate below due to margins, midrib and intercostal area being raised; corolla lobes glabrous<br>Leaves rigid or thin, not appearing 5-striate below; corolla lobes with some indumentum . . . . .                             | 5. <i>Lissanthe</i> . . . . .                | 7  |
| 7. Apex of corolla lobes with tuft of initially reflexed then erect hairs, and reflexed hairs closing throat<br>Whole corolla lobe pubescent (though <i>L. margarodes</i> pubescent only on margins), not with reflexed tuft of hairs only at apex . . . . . | 6. <i>Acrotriche</i><br>7. <i>Leucopogon</i> |    |
| 8. Corolla lobes valvate in bud; ovaries 1-, rarely 2-locular, 1 ovule per loculus; fruits drupes . . . . .<br>Corolla lobes imbricate or contorted in bud; ovaries 5-locular, ovules several per loculus; fruits capsules . . . . .                         | 8. <i>Monotoca</i> . . . . .                 | 9  |
| 9. Leaves with sheathing base which falls off with leaf . . . . .<br>Leaves petiolate, sessile or stem-clasping but never sheathing . . . . .  | 9. <i>Sprengelia</i> . . . . .               | 10 |
| 10. Corolla lobes imbricate but not contorted in bud; styles glabrous . . . . .<br>Corolla lobes imbricate and contorted in bud; styles pubescent . . . . .  | 10. <i>Epacris</i><br>11. <i>Woolfsia</i>    |    |

## 1. STYPHELIA Smith

Erect or spreading shrubs. Leaves sessile or subsessile, rigid. Flowers axillary, usually solitary, bracteate; corolla tube  $\pm$  cylindrical, elongate, with 5 tufts of hairs inside below middle, lobes linear, valvate in bud, pubescent inside, revolute; filaments filiform, anthers exerted, versatile, linear; ovary 5-locular, ovule 1 per loculus, style filiform, stigma exerted. Fruits drupes; seeds 5 or fewer by abortion.

11 species endemic in Australia; 1 species south-eastern Queensland.

### 1. *Styphelia viridis* Andr.

*Styphelia viridis* var. *breviflora* Benth.

Shrub up to *ca* 1.5 m tall, rarely more. Leaves with petioles 1–1.5 mm long; blades narrowly elliptic to narrowly oblong-obovate, apex obtuse but pungent pointed, base cuneate to truncate, margin flat or recurved, 1–3.3 cm  $\times$  0.2–0.8 cm, paler or somewhat glaucous on underside. Flowers on axillary bracteate pedicels 2–2.5 mm long; sepals acute or blunt, 0.6–1.2 cm long; corolla pale yellowish green, translucent, tube 1.5–2 cm long, lobes 0.8–1.2 cm long, revolute, pubescent inside; stamens projecting from tube up to 1.2 cm, anthers *ca* 3.5 mm long; style 2.8–3.2 cm long. Fruits ellipsoid, 6–8 mm long. **Fig. 37A.**

Sand or sandy wallum areas or as part of heathy understorey in open forest, also sandy areas of Darling Downs district. Flowers spring and autumn.

A few specimens with short obtuse sepals and short corolla tube have been called *S. viridis* var. *breviflora* Benth. but there is no apparent discontinuity in the population to justify varietal status for them.

*S. triflora* Andr., a species from southern Australia sometimes cultivated in Queensland can be distinguished from the above by its smooth, not scabrous leaf margins and its pink with yellow flowers.

## 2. MELICHRUS R. Br.

Erect or procumbent shrubs; branchlets softly pubescent, leaf base scars conspicuous. Leaves sessile. Flowers solitary, axillary, sessile, bracts numerous; sepals imbricate, obtuse; corolla urceolate or rotate, lobes valvate in bud, often pubescent inside; glands

prominent, reddish, globular or pyriform, dense, attached to 5 scales inserted at base of tube alternating with stamens; ovary 5-locular, ovule 1 per loculus, style short. Fruits drupes.

4 species endemic in Australia; 3 species south-eastern Queensland.

- |  |  |          |
|--|--|----------|
| <p>1. Leaves sprinkled with long hairs, often ciliate on margins, tips with fine point but not pungent nor rigid; corollas shorter than or scarcely exceeding the calyces<br/>Leaves glabrous or shortly pubescent, not ciliate, tips pungent pointed; corollas exceeding calyces</p>  | <p>1. <i>M. procumbens</i></p>                               | <p>2</p> |
| <p>2. Leaf margins papery; leaves 1.5–3.2 cm long, 5–8 times as long as wide, crowded and adpressed against stem, sometimes lowermost leaves spreading<br/>Leaf margins translucent, or whitish when dried, but not papery; leaves 0.6–2.5 cm long, 3–6 times as long as wide, mostly spreading, adpressed and crowded only at tip of branchlets</p> | <p>2. <i>M. adpressus</i></p> <p>3. <i>M. urceolatus</i></p> |          |

### 1. *Melichrus procumbens* (Cav.) Druce

*Ventenatia procumbens* Cav.; *Melichrus rotatus* (F. Muell.) R. Br.

Procumbent shrub. Leaves sessile, crowded, linear-ovate to narrowly ovate, apex acuminate but not pungent, margin ciliate, 0.6–2.4(–2.7) cm × 0.12–0.35(–0.4) cm, flat, lower surface paler, with long soft white hairs, occasionally very few, striate with longitudinal veins raised below. Flowers with sepals 5–7 mm long, long silky hairs outside; corolla cream, tube 3–4 mm long, lobes 3–4 mm long, with few hairs. Fruits red, depressed globular, 4–5 mm diameter with numerous vertical ridges.

Moreton district from Brisbane environs south, also granite areas of the Darling Downs district, in shallow soil overlying sandstone or granite. Flowers late winter–spring.

### 2. *Melichrus adpressus* Cunn. ex DC.

Erect shrub up to 1.5 m tall. Leaves sessile, crowded, adpressed to stem, narrowly ovate, apex acuminate, pungent, margins papery, *ca* 0.3–0.4 mm wide towards base of blade, 1–3.2 cm × 0.2–0.6 cm, paler below, striate with raised longitudinal veins below. Flowers with sepals 7–8 mm long, pubescent towards apex; corolla creamy-white, tube *ca* 5.5 mm long, lobes *ca* 2.5 mm long, lobes and throat pubescent inside. Fruits sharply demarcated into greenish brown smooth upper half, dark wrinkled lower half, ± globular, 4–5 mm diameter.

Sandstone areas of the Moreton and Darling Downs district. Flowers late winter–spring and autumn.

### 3. *Melichrus urceolatus* R. Br.

Erect shrub up to 1.5 m tall, but usually less than 1 m tall. Leaves mostly spreading but adpressed towards tip of branchlets, sessile, ovate to narrowly ovate, apex acuminate, pungent, margin translucent, thinner than rest of leaf but not papery, slightly serrulate, (0.4–)0.6–1.7(–2.5) cm × 0.2–0.45(–0.6) cm, paler beneath, striate with longitudinal veins raised beneath. Flowers with sepals 5–7 mm long, usually pubescent; corolla greenish white or cream, tube 4–5 mm long, lobes 2–2.5 mm long, lobes and throat with long hairs. Fruits with upper half greenish brown, smooth or slightly wrinkled, lower half dark wrinkled but no sharp line of demarcation, ± globular, 4–6 mm diameter. **Fig. 37B.**

Throughout the region in sandy soil overlying sandstone, and in granite areas of the Darling Downs district. Flowers autumn to spring.

There are a number of taxa grouped under this name. They include: a small leaved and small flowered form with leaves 4–8 mm × 0.5–3.5 mm and corolla with tube 2.5–3 mm long, lobes 1.5–2 mm long, from sandy areas of the Darling Downs district; a large robust form, with leaves 1.5–2.5 cm × 0.4–0.6 cm, curved up and outwards from stems particularly on flowering stems, from granite areas of the Darling Downs district; and a form with pungent pointed leaves pubescent with short macroscopic as well as microscopic hairs often on upper surface as well as below, mainly in western districts. These forms require further study to ascertain whether they deserve formal recognition.

### 3. TROCHOCARPA R. Br.

Shrubs or trees. Leaves usually petiolate. Inflorescences spicate, terminal or axillary; flowers subtended by 1 bract and 2 bracteoles; corolla tube cylindrical or campanulate, glabrous or pubescent inside, lobes recurved, glabrous or pubescent inside; filaments inserted near throat, filiform; ovary small, 10-locular, ovule 1 per loculus, style thick, short, stigma small. Fruits drupes.

14 species North Borneo, Celebes, New Guinea and eastern Australia; 7 species Australia; 1 species south-eastern Queensland.

#### 1. *Trochocarpa laurina* (R. Br. ex Rudge) R. Br.

*Cyathodes laurina* R. Br. ex Rudge

Shrub or small tree up to *ca* 9 m tall. Leaves with petioles 2–7 mm long; blades elliptic, occasionally obovate or ovate, apex acute to bluntly acuminate, base cuneate, margin flat or slightly recurved, 3–9 cm × 1–3.5 cm, paler beneath, 5–7 longitudinal nerves visible both surfaces. Inflorescences terminal spikes, rachis 1–3.5 cm long, glabrous; sepals *ca* 1.5 mm long; corolla white, tube 1.5–2 mm long, upper half pubescent inside with reflexed hairs, lobes *ca* 1 mm long, pubescent inside on lower half. Fruits blackish, depressed globular, *ca* 6–8 mm long, succulent. **Fig. 37C.**

Coastal districts in eucalypt open forest in moderately sheltered situations, or on rainforest margins or light rainforest. Flowers spring–summer.

### 4. BRACHYLOMA Sonder

Shrubs. Leaves ± sessile, glabrous. Flowers solitary, axillary, peduncles short, bracts few or absent, bracteoles 2; corolla tube short, glabrous inside except for 5 clusters of hairs *ca* 1 mm long descending tube alternating with stamens, lobes glabrous; filaments very short, inserted near throat, anthers attached near middle; ovary 5–10-locular, ovule 1 per loculus, style short, stigma small. Fruits drupes, somewhat fleshy; seeds small, flat.

7 species endemic in Australia; 2 species south-eastern Queensland.

- |   |                           |
|---|---------------------------|
| 1. Leaves ± flat; flowers on peduncles <i>ca</i> 1 mm long; sepals and corolla lobes acute, corolla lobes usually papillose . . . . . | 1. <i>B. daphnoides</i>   |
| Leaves ± convex; flowers on peduncles <i>ca</i> 2.5 mm long; sepals and corolla lobes obtuse, glabrous . . . . .                      | 2. <i>B. scortechinii</i> |

#### 1. *Brachyloma daphnoides* (Smith) Benth.

DAPHNE HEATH

*Styphelia daphnoides* Smith

Shrub up to 1.5 m tall. Leaves with petioles up to 0.5 mm long; blades oblong-ovate, elliptic or occasionally obovate, sometimes broadly so, apex acute to acuminate, rarely obtuse, base cuneate rounded or truncate, margin flat or very slightly recurved, 0.35–1.5 cm × 0.15–0.45 cm, ± glabrous, slightly glaucous or paler below. Flowers solitary on shortly pubescent peduncles 0.5–1 mm long, bracteoles directly below flower; sepals acute, *ca* 1.5 mm long; corolla white, tube 3.5–4.5 mm long, hair clusters inserted in throat, lobes narrowly triangular, 2–3 mm long, usually papillose in lower half; ovary 5-locular. Fruits globular or depressed globular, *ca* 4 mm diameter. **Fig. 37D.**

Coastal districts on sand or sandy soils, mainly in wallum heath, or in heathy understorey in open forest, also in Darling Downs district. Flowers spring, occasionally a second flush in autumn.

#### 2. *Brachyloma scortechinii* F. Muell.

Shrub up to *ca* 60 cm tall. Leaves ± sessile, narrowly oblong or narrowly oblong-obovate, apex rounded, apiculate, margin recurved, 0.6–1.2 cm × 0.1–0.25 cm, pale green below. Flowers solitary on glabrous peduncles *ca* 2–2.5 cm long, bracteoles 1–1.5 mm below flower; sepals *ca* 1.5 mm long; corolla pale translucent green, tube bulbous, *ca* 4 mm long, hair clusters inserted *ca* 1 mm below throat, lobes obtuse,

broad, *ca* 1.5 mm long; ovary 7–10-locular. Fruits depressed globular, 6–9 mm diameter.

Coastal wallum or areas of deep sands in the Cooloola-Noosa area, and offshore sand islands, and also has been recorded from Woongoolba area south of Brisbane, in wallum. Flowers autumn, and sometimes late winter.

## 5. LISSANTHE R. Br.

Erect shrubs. Leaves shortly petiolate, rigid. Inflorescences short, spicate or racemose, terminal or axillary, rachis terminated with rudimentary flower; corolla tube glabrous or pubescent inside above middle, lobes valvate in bud, later spreading or recurved, usually glabrous; filaments inserted at throat, short, filiform; ovary 5-locular, ovule 1 per loculus, style usually short, stigma small. Fruits drupes.

2 species endemic in Australia; 1 species south-eastern Queensland.

### 1. *Lissanthe strigosa* (Smith) R. Br.

*Styphelia strigosa* Smith

Shrub up to 1.5 m tall, usually much less. Leaves with petioles 0.5–1 mm long; blades linear-ovate, or linear-oblong to narrowly ovate, apex acuminate, pungent pointed, base cuneate, margin thickened below, 0.6–1.5 cm  $\times$  0.075–0.15(–0.2) cm, discolourous, midrib, margin and longitudinal intercostal areas raised, appearing 5-striate below. Inflorescences racemose, rachis up to *ca* 5 mm long, white pubescent; flowers 2–several on pubescent pedicels *ca* 1 mm long, bract and bracteoles at base of pedicels; sepals *ca* 1 mm long; corolla white, tube 2–4 mm long, lobes 1–1.5 mm long, often with scattered hairs on lower half and throat; ovary white pubescent, style 2–2.5 mm long, white pubescent in lower half. Fruits depressed globular, *ca* 2–3 mm diameter, style persistent. **Fig. 37E.**

Rocky areas or on sandstone or granite derived soils in open forest. Flowers mainly spring.

## 6. ACROTRICHE R. Br.

Rigid intricately branched shrubs. Leaves crowded, shortly petiolate. Flowers small in sessile or shortly pedunculate clusters or spikes, axillary or on old wood below leaves, each flower sessile within 1 small subtending bract and 2 bracteoles; calyx lobes 5, imbricate; corolla tube usually exceeding calyx, lobes 5, valvate in bud, spreading, with tuft of hairs on inside near tip at first reflexed later erect, and another tuft of hairs at base closing throat; filaments inserted at top of corolla tube between hairs, anthers dorsifixed, included at first then hanging down on outside between lobes; ovary 2–10-locular, ovule 1 per loculus. Fruits drupes, globular or depressed, sometimes mesocarp slightly pulpy, endocarp hard.

12 species endemic in Australia; 1 species south-eastern Queensland.

### 1. *Acrotriche aggregata* R. Br.

Erect or sprawling shrub up to 3 m tall, but usually less than 1 m tall, young branchlets pubescent. Leaves with petioles 0.5–2 mm long; blades ovate, elliptic or obovate, or narrowly so, apex acute to pungent, base obtuse, margin entire or serrulate towards apex, (0.7–)0.9–2(–2.8) cm  $\times$  (0.15–)0.2–0.6 cm, shining green and glabrous above, minutely papillose below so that surface appears pale or glaucous. Flowers 4–7 in axillary clusters or spikes; sepals *ca* 1 mm long; corolla pale greenish to white, tube 1.5–3.5 mm long, lobes 1–1.5 mm long, hairs at tip and throat white. Fruits red, depressed globular, 4–7 mm diameter, succulent. **Fig. 37F.**

Recorded from rocky or sandstone areas on poor sandy soils as understory shrub in eucalypt open forest. Flowers winter–spring, often again in autumn.

F. M. Bailey in "Qd. Fl." 3:937 (1900) lists *A. divaricata* R. Br. as occurring in south-eastern Queensland, but we have no records of this species from the region. It can be distinguished by the absence of papillae on the undersides of the leaves.

## 7. LEUCOPOGON R. Br.

Shrubs, rarely small trees. Leaves  $\pm$  sessile or shortly petiolate, usually glabrous. Inflorescences terminal and/or axillary, usually spicate but sometimes racemose, rachis terminated by rudimentary flower; flowers subtended by 1 bract and 2 bracteoles close under calyx, or at some distance when racemose; corolla usually white, glabrous below lower third inside, lobes valvate in bud, later spreading or recurved, triangular, apex acute, usually pubescent overall inside; filaments inserted at throat, short, filiform, anthers usually without sterile tips; ovary usually glabrous, 2–20-locular, ovule 1 per loculus, style usually glabrous, stigma small. Fruits drupes, seeds small.

150 species Malaysia, Australia, New Caledonia; 140 species Australia, almost all endemic; 22 species south-eastern Queensland.

This genus is currently under revision as there are a number of intergrading species and in some cases more than one taxon under one name. The following key and descriptions deal with the species recognized at present.

- |   |                             |
|---|-----------------------------|
| 1. Inflorescences racemes . . . . .   | 2                           |
| Inflorescences spikes, or flowers 1–2 together . . . . .  | 5                           |
| 2. Leaves oblong, slightly or strongly convex, glaucous beneath . . . . .   | 1. <i>L. pedicellatus</i>   |
| Leaves linear, very narrowly elliptic or elliptic, flat or slightly concave, green beneath . . . . .                          | 3                           |
| 3. Leaves linear or linear-ovate, 1 mm or less wide . . . . .   | 2. <i>L. pluriloculatus</i> |
| Leaves very narrowly elliptic or very narrowly obovate to elliptic or obovate, 1–6 mm wide . . . . .                          | 4                           |
| 4. Leaves very narrowly elliptic to narrowly obovate, apex acuminate, pungent pointed; sepals <i>ca</i> 1.5 mm long . . . . . | 3. <i>L. pleiospermus</i>   |
| Leaves elliptic to obovate, apex mucronate but not pungent pointed; sepals <i>ca</i> 2–2.75 mm long . . . . .                 | 4. <i>L. sp. 1.</i>         |
| 5. Inflorescences of lax, terminal or terminal and upper axillary spikes of 5–18 distant flowers . . . . .                    | 5. <i>L. lanceolatus</i>    |
| Inflorescences of $\pm$ dense spikes of up to <i>ca</i> 10 flowers or 1–3 flowers together in axils . . . . .                 | 6                           |
| 6. Inflorescences of terminal or terminal and upper axillary dense spikes . . . . .   | 7                           |
| Inflorescences wholly axillary, usually not in uppermost axils, of short spikes or 1–3 flowers . . . . .                      | 12                          |
| 7. Leaves distinctly petiolate . . . . .  | 8                           |
| Leaves $\pm$ sessile, petioles if present, obscure and less than 0.5 mm long . . . . .  | 9                           |
| 8. Leaf margins hispid, rarely with only few teeth; corolla lobes <i>ca</i> 2 mm long; plants of wallum heaths . . . . .      | 6. <i>L. virgatus</i>       |
| Leaf margins smooth; corolla lobes 2.5–3 mm long; plants of mountain tops of border ranges and Granite Belt . . . . .         | 7. <i>L. melaleucooides</i> |
| 9. Leaves flat or slightly convex, more than 1.2 cm $\times$ 0.25 cm . . . . .  | 8. <i>L. parviflorus</i>    |
| Leaves with strongly recurved or revolute margins, less than 1 cm $\times$ 0.2 cm . . . . .                                   | 10                          |
| 10. Sepals recurved at apex . . . . .   | 9. <i>L. recurvisepalus</i> |
| Sepals erect, not recurved at apex . . . . .  | 11                          |
| 11. Sepals up to <i>ca</i> 2 mm long, margin ciliolate, otherwise glabrous; plants of coastal heathy areas . . . . .          | 10. <i>L. ericoides</i>     |
| Sepals up to <i>ca</i> 3 mm long, margin ciliate, usually puberulent outside; plants of Granite Belt areas . . . . .          | 11. <i>L. microphyllus</i>  |
| 12. Corolla tubes more than 2 mm longer than sepals . . . . .   | 13                          |
| Corolla tubes shorter than or only slightly longer than sepals . . . . .  | 16                          |

- |  |                               |    |
|--|-------------------------------|----|
| 13. Leaves strongly convex, pubescent . . . . .  | 12. <i>L. rupicola</i>        | 14 |
| Leaves $\pm$ flat or slightly concave, glabrous . . . . .  | . . . . .                     |    |
| 14. Leaves crowded and $\pm$ appressed, usually on upper branches only   | 13. <i>L. neo-anglicus</i>    | 15 |
| Leaves spreading, not crowded, usually over most branches . . . . .  | . . . . .                     |    |
| 15. Leaves oblong with thick pungent point; corolla lobes <i>ca</i> 4 mm long  | 14. <i>L. mitchellii</i>      |    |
| Leaves narrowly oblong with fine pungent point; corolla lobes <i>ca</i> 3 mm long . . . . .  | 15. <i>L. juniperinus</i>     |    |
| 16. Leaves rigid, $\pm$ oblong or obovate, apex abruptly contracted into rigid pungent point longer than 1 mm . . . . .                                | . . . . .                     | 17 |
| Leaves rigid or not, narrowly ovate or narrowly elliptic, mucronate or acuminate but not with pungent point longer than 1 mm . . . . .                 | . . . . .                     | 18 |
| 17. Leaves spreading, usually over most branchlets; flowers usually 2 together, pendulous . . . . .  | 16. <i>L. biflorus</i>        |    |
| Leaves crowded and appressed, usually on uppermost branchlets only; flowers usually solitary, erect, amongst leaves . . . . .                          | 13. <i>L. neo-anglicus</i>    |    |
| 18. Leaves $\pm$ appressed to stem, less than 0.5 cm long, mostly less than 0.35 cm long . . . . .   | . . . . .                     | 19 |
| Leaves spreading, 0.4–2 cm long . . . . .  | . . . . .                     | 20 |
| 19. Leaves ovate to elliptic; sepals with attenuate apex . . . . .   | 17. <i>L. confertus</i>       |    |
| Leaves elliptic to obovate, angular, recurved; sepals with obtuse apex . . . . .   | 18. <i>L. sp. 2.</i>          |    |
| 20. Leaves linear-elliptic or linear-ovate, 0.4–0.7 cm long, apex subulate; corolla lobes subulate . . . . .   | 19. <i>L. deformis</i>        |    |
| Leaves generally narrowly elliptic or obovate, 0.4–2 cm long, apex acute, acuminate or mucronate; corolla lobes triangular . . . . .                   | . . . . .                     | 21 |
| 21. Young branchlets villous; leaves strongly convex; flowers solitary or paired . . . . .   | 20. <i>L. margarodes</i>      |    |
| Young branchlets shortly pubescent; leaves flat, or if convex then twisted above obscure petiole; inflorescences short spikes of 1–7 flowers . . . . . | . . . . .                     | 22 |
| 22. Leaf blades twisted above obscure petiole; sepals 1.5–2 mm long . . . . .  | 21. <i>L. muticus</i>         |    |
| Leaf blades not twisted, $\pm$ sessile; sepals 2.5–4 mm long . . . . .   | 22. <i>L. leptospermoides</i> |    |

### 1. *Leucopogon pedicellatus* C. T. White

Shrub up to *ca* 1 m tall, branchlets shortly pubescent. Leaves with petioles up to 1 mm long; blades thick, convex, narrowly oblong to oblong-elliptic, apex obtuse or subacute, mucronate, base  $\pm$  truncate, margin recurved, 0.7–3 cm  $\times$  0.15–0.6 cm, discolourous, glaucous beneath. Inflorescences terminal or terminal and upper axillary racemes as long as or longer than leaves, pedicels 1–2 mm long; sepals ovate, obtuse, 1.5–2 mm long, often pubescent outside; corolla white, scented, tube slightly longer than sepals, lobes 1.5–2 mm long, densely pubescent; style *ca* 1 mm long. Fruits red, depressed globose, *ca* 3 mm  $\times$  *ca* 6 mm, succulent. **Fig. 37G.**

Usually in areas of wallum heath or shrublands on sandy soils or sandstone hills. Flowers mainly spring.

A form with very rigid revolute leaves, larger flowers with densely hirsute lobes and dark crimson fruits has been recorded from Mt. Barney. This may be a new species.

### 2. *Leucopogon pluriloculatus* F. Muell.

Branching shrub *ca* 75 cm tall; branchlets  $\pm$  glabrous. Leaves generally crowded towards ends of branches; petioles 0.5–1 mm long; blades linear-ovate to linear, apex subulate, pungent pointed, base contracted, margin often recurved, 0.4–1.1 cm  $\times$  0.05–0.1 cm, younger leaves sometimes shortly puberulent. Inflorescences short

terminal and upper axillary racemes *ca* as long as leaves, pedicels 1–2 mm long; sepals ovate, obtuse, often mucronate, 1.5–2 mm long, often pubescent at base; corolla white, tube 3–5 mm long, lobes 2–2.5 mm long, curly pubescent inside; style *ca* 4 mm long, puberulent. Fruits depressed globose, *ca* 2.5 mm high.

Recorded from stony ridges in shallow soil of Darling Downs district, e.g. Gurulmundi, Tara areas. Flowers winter–spring.

### 3. *Leucopogon pleiospermus* (F. Muell.) Benth.

*Styphelia pleiosperma* F. Muell.

Shrub up to *ca* 1 m tall, young branches shortly pubescent. Leaves thick, slightly concave; petioles 0.5–2 mm long; blades very narrowly elliptic to narrowly obovate, apex acuminate, pungent pointed, base cuneate to  $\pm$  truncate, margin translucent or papery towards apex, 0.5–2 cm  $\times$  0.1–0.5 cm. Inflorescences racemes of several flowers *ca* as long as leaves, pedicels 1–1.5 mm long; sepals broadly ovate, obtuse, sometimes mucronulate, *ca* 1.5 mm long; corolla white, tube 1.5–2 mm long, lobes *ca* 1.5 mm long, densely pubescent inside; style stout, 0.75 mm long. Fruits globose.

Sandy or very poor soils of Darling Downs district, e.g. Gurulmundi and Barakula areas. Flowers late winter–spring.

### 4. *Leucopogon* sp. 1.

Dense shrub *ca* 2 m tall, young branchlets villous. Leaves with petioles 0.5–2 mm long; blades elliptic or sometimes obovate, apex acute to obtuse, mucronate, base cuneate to truncate, margin slightly recurved, (0.75–)1.2–2.3 cm  $\times$  (0.2–)0.3–0.6 cm. Inflorescences of terminal racemes of 3–5 flowers, often with 1 at base in uppermost leaf axil, rachis shorter than leaves, pedicels 1–2 mm long; sepals ovate, bluntly acute, 2–2.5 mm long, pubescent apically; corolla white, tube 1.75–2 mm long, lobes 1.5–2 mm long, pubescent all over inside; anthers without sterile tips; style stout, *ca* 1 mm long. Fruits not seen.

Recorded from Lamington Plateau on the McPherson Ra. Flowers spring.

### 5. *Leucopogon lanceolatus* (Smith) R. Br.

*Styphelia lanceolata* Smith

Shrub up to *ca* 3 m tall, branchlets glabrous or shortly puberulent, to villous. Leaves  $\pm$  sessile, narrowly elliptic or narrowly ovate, apex acute or attenuate, base attenuate or narrowly cuneate, or truncate, margin  $\pm$  flat, 0.6–9 cm  $\times$  0.15–0.9 cm. Inflorescences of terminal or terminal and upper axillary spikes of 5–18 flowers, rachis usually longer than leaves,  $\pm$  glabrous; sepals ovate, obtuse to acute, 1.5–2 mm long; corolla white, tube *ca* 1.5–2 mm long, lobes 1.5–2 mm long, densely pubescent inside; anthers with sterile tips; style *ca* 1 mm long.

Two varieties occur in the region:

- |  |   |
|--|---|
| 1. Leaves (1.5–)2.5–9 cm $\times$ (0.3–)0.4–0.9 cm; inflorescences of 7–18 flowers; sepals obtuse to subacute, <i>ca</i> 2 mm long; corolla tubes <i>ca</i> 2 mm long, lobes <i>ca</i> 2 mm long | <i>L. lanceolatus</i> var. <i>lanceolatus</i> |
| Leaves 0.6–2 cm $\times$ 0.15–0.4 cm; inflorescences of 5–11 flowers; sepals acute, 1.5–2 mm long; corolla tubes 1.5–2 mm long, lobes 1.5–2 mm long  | <i>L. lanceolatus</i> var. <i>gracilis</i>    |

*L. lanceolatus* var. *lanceolatus* (Fig. 37H.) is found on mountain peaks of the border ranges and in the Granite Belt area of the Darling Downs district. *L. lanceolatus* var. *gracilis* Benth. (*L. pimeleoides* Cunn. ex DC.) occurs in coastal wallum heath areas, often in open forest. In areas such as Helidon and Crow's Nest intermediate forms occur. Both flower late winter–spring, sometimes again in autumn, or sporadically throughout the year.



Fig. 37 EPACRIDACEAE — A *Styphelia viridis*, part of flowering branchlet x1; B<sub>1</sub>–B<sub>2</sub> *Melichrus urceolatus*, B<sub>1</sub> part of flowering branchlet x1, B<sub>2</sub> L.S. of flower showing gland bearing scales at base of corolla x3; C *Trochocarpa laurina*, part of flowering branchlet x1; D<sub>1</sub>–D<sub>2</sub> *Brachyloma daphnoides*, D<sub>1</sub> part of flowering branchlet x1½, D<sub>2</sub> L.S. of flower showing terminal style and papillose corolla lobes x3; E<sub>1</sub>–E<sub>3</sub> *Lissanthe strigosa*, E<sub>1</sub> part of flowering branchlet x1, E<sub>2</sub> underside of leaf showing prominent veins x6, E<sub>3</sub> flower x3; F<sub>1</sub>–F<sub>2</sub> *Acrotriche aggregata*, F<sub>1</sub> part of flowering branchlet x1, F<sub>2</sub> flower showing hair tufts on corolla lobe apices and throat x6; G–H *Leucopogon* spp. — G<sub>1</sub>–G<sub>2</sub> *L. pedicellatus*, G<sub>1</sub> part of flowering branchlet x1, G<sub>2</sub> flower showing pedicel x6; H *L. lanceolatus* var. *lanceolatus*, part of flowering branchlet x1.

**6. *Leucopogon virgatus* (Labill.) R. Br.***Styphelia virgata* Labill.

Twiggy subshrub, branchlets glabrous. Leaves with petioles 1–1.5 mm long; blades  $\pm$  appressed to stem, thick, slightly concave, narrowly triangular to narrowly ovate, apex attenuate, base truncate, margin with short hooked hairs, 0.4–2.8 cm  $\times$  0.07–0.35 cm. Inflorescences dense terminal or terminal and upper axillary spikes; sepals ovate, obtuse or mucronulate, 2.5–3 mm long, sometimes puberulent outside; corolla white, tube *ca* 2 mm long, lobes *ca* 2–2.5 mm long, densely long pubescent; anthers with sterile tips; style *ca* 0.5 mm long. Fruits  $\pm$  globose.

Recorded from coastal wallum heaths. Flowers late winter–spring.

**7. *Leucopogon melaleuroides* Cunn. ex DC.**

Shrub up to *ca* 2 m tall, young branchlets shortly pubescent to puberulent. Leaves with petioles 0.5–1.5 mm long; blades linear-oblong or linear-ovate, apex acute, base truncate, margin flat, 0.6–2.5 cm  $\times$  0.07–0.25 cm. Inflorescences  $\pm$  terminal spikes as long as or slightly longer than leaves; flowers several; sepals ovate, obtuse, sometimes mucronate, 2.5–3.5 mm long; corolla white, tube 2–3 mm long, lobes 2.5–3.5 mm long, densely long pubescent; style stout, *ca* 1 mm long. Fruits  $\pm$  globose, *ca* 2.5 mm long. **Fig. 38A.**

Mountain peaks of the border ranges and in Granite Belt area, in stony soils. Flowers late winter to summer.

**8. *Leucopogon parviflorus* (Andr.) Lindl.***Styphelia parviflora* Andr.; *Leucopogon richei* R. Br.

Shrub up to 2.4 m tall, but usually much smaller, branchlets sometimes pubescent. Leaves  $\pm$  sessile, narrowly obovate to obovate, apex acute, mucronate, base truncate, margin  $\pm$  flat or slightly recurved, 1–2.5 cm  $\times$  0.25–0.6 cm, discolourous, 3 major longitudinal nerves impressed above. Inflorescences of terminal or terminal and upper axillary spikes usually shorter than leaves; flowers several; sepals ovate, acute, *ca* 2 mm long; corolla white, tube 1.5–2 mm long, lobes *ca* 1.5–2 mm long, densely long pubescent inside; anthers with sterile tips; style stout, *ca* 0.5 mm long. Fruits white or yellowish, ovoid, *ca* 4 mm long, succulent.

Moderately common in coastal sandy heath. Flowers late winter–spring, often again in autumn.

**9. *Leucopogon recurvisepalus* C. T. White**

Shrub, young branchlets villous. Leaves  $\pm$  sessile, very narrowly oblong to very narrowly triangular, apex acuminate, base truncate, margin often recurved or revolute, 0.4–1.2 cm  $\times$  0.07–0.15 cm, undersurface often shortly pubescent. Inflorescences of few-flowered dense axillary spikes shorter than to as long as leaves; sepals very narrowly ovate, apex attenuate, recurved abruptly 0.5–1 mm from tip, 3–4 mm long, villous outside; corolla white, tube 2–2.5 mm long, lobes *ca* 2.5 mm long, densely long pubescent inside; style 1 mm long. Fruits ellipsoid, ribbed.

Sandstone ridges or stony hills of the coastal districts, e.g. near Beerwah and Plunkett. Flowers summer–autumn.

**10. *Leucopogon ericoides* (Smith) R. Br.***Styphelia ericoides* Smith

Subshrub or shrub up to 1 m tall. Leaves  $\pm$  sessile, oblong to oblong-elliptic, apex abruptly acuminate, mucronate, base truncate, margin revolute, 4–10 mm  $\times$  1–2 mm. Inflorescences of axillary spikes of 1–5, rarely –7 flowers, shorter than leaves; sepals ovate, mucronate, 1.5–2 mm long; corolla white or pinkish, tube as long as or slightly longer than sepals, lobes 1.75–2 mm long, densely pubescent inside; ovary puberulent, style *ca* 1 mm long. Fruits  $\pm$  cylindrical, *ca* 2.5 mm long, puberulent. **Fig. 38B.**

Sandy wallum heath along the coast and offshore islands. Flowers late winter–spring, and autumn.

**11. *Leucopogon microphyllus* (Cav.) R. Br.***Perogo microphylla* Cav.

Twiggy shrub, young branches pubescent. Leaves  $\pm$  sessile, oblong or oblong-ovate, apex obtuse mucronate, or acute, base truncate, margin hispid, recurved or revolute, 1.5–7 mm  $\times$  0.75–2 mm, pubescent beneath. Inflorescences of upper axillary dense spikes as long as or longer than leaves; flowers 5–7; sepals narrowly ovate, apex attenuate, 2.5–3 mm long, pubescent outside; corolla white, tube *ca* 1.5 mm long, lobes *ca* 2–2.5 mm long, usually recurved when open, densely long pubescent; style less than 0.5 mm long.

Recorded from Granite Belt area, usually in seepage areas or among rocks or crevices. Flowers late winter to summer.

**12. *Leucopogon rupicola* C. T. White**

Dense shrub, branchlets villous. Leaves thick, convex; petioles 0.5–0.75 mm long; blades narrowly oblong to narrowly oblong-obovate, apex abruptly acuminate, pungent pointed, base truncate, margin recurved to revolute, 0.5–1.4 cm  $\times$  0.1–0.25 cm, finely pubescent beneath, hispid above. Flowers axillary, usually solitary, peduncles *ca* 1 mm long; sepals ovate, mucronate, 3–3.5 mm long; corolla white, tube *ca* 4.5 mm long, lobes *ca* 2–2.5 mm long, densely pubescent inside; ovary puberulent, style *ca* 7 mm long. Fruits ellipsoid, slightly striate.

Rocky outcrops of the coastal districts, e.g. Mt. Beerwah, Mt. Walsh near Biggenden. Flowers spring.

**13. *Leucopogon neo-anglicus* F. Muell. ex Benth.**

Multi-stemmed shrub. Leaves  $\pm$  crowded at ends of branches, appressed to stem, slightly concave,  $\pm$  sessile, blades rigid, oblong to oblong-obovate, apex abruptly acuminate, pungent pointed, base truncate to cordate, 0.4–1(–1.5) cm  $\times$  0.15–0.4(–0.6) cm. Flowers axillary, solitary, almost sessile; sepals ovate, or narrowly ovate, acuminate, 4–4.5(–5.5) mm long; corolla white, tube 4–5(–8) mm long, lobes 3.5–4.5 mm long, densely long pubescent; style 6–6.5 mm long, puberulent. Fruits ellipsoid, *ca* 2.5–3 mm long. **Fig. 38D.**

Growing on granite or sandstone outcrops of region, e.g. Crow's Nest area, Granite Belt area. Specimens with larger dimensions in brackets from high peaks in border ranges, e.g. Mt. Maroon. Flowers late winter–spring and autumn.

**14. *Leucopogon mitchellii* Benth.**

Shrub up to *ca* 1.5 m tall, branchlets glabrous. Leaves rigid,  $\pm$  sessile, slightly concave or flat, oblong or oblong-obovate, apex abruptly acuminate, pungent point 1–2 mm long, base truncate to cordate, 0.6–2 cm  $\times$  0.15–0.5 cm, discolourous. Flowers usually solitary or up to 3, reduced rachis *ca* 1.5 mm long; sepals ovate, mucronate, *ca* 3–4 mm long; corolla white or pinkish, tube 6–9 mm long, lobes 2.5–4 mm long, densely long pubescent inside; style 7–10 mm long, stigma peltate. Fruits ellipsoid to  $\pm$  cylindrical, *ca* 5 mm long.

Darling Downs district and other inland areas mainly on poor or sandstone derived soils. Flowers late winter–spring.

**15. *Leucopogon juniperinus* R. Br.****PRICKLY HEATH**

Usually spreading shrub up to 1 m tall, young branchlets pubescent. Leaves  $\pm$  sessile, narrowly oblong or narrowly obovate, apex abruptly acuminate, pungent pointed, base  $\pm$  truncate, 0.6–1.6 cm  $\times$  0.1–0.25 cm, lower surface paler than upper. Flowers axillary, usually solitary, reduced rachis 1–1.5 mm long; sepals ovate, mucronate, 3–4 mm long; corolla white or translucent, tube 6–8 mm long, lobes *ca* 3 mm long, curly pubescent inside; style 7–10 mm long, stigma peltate. Fruits dull yellow, ellipsoid, 4–5 mm long. **Fig. 38C.**

Common in the coastal districts in eucalypt open forest usually on poor or stony soils. Flowers mainly late winter–spring, but sporadically throughout the year.

**16. *Leucopogon biflorus* R. Br.**

Shrub up to *ca* 1.5 m tall. Leaves rigid,  $\pm$  sessile, oblong or oblong-obovate, apex abruptly acuminate, pungent pointed, base truncate, margin flat, 0.7–2.1 cm  $\times$  0.15–0.4 cm, discolourous. Flowers axillary, usually paired, or 1–6, pendulous, on reduced rachis up to 3 mm, rarely up to 6 mm long; sepals ovate, obtuse, 3–4 mm long; corolla white or pinkish, tube 3–4 mm long, lobes *ca* 3 mm long, densely pubescent inside only at tips and margins; style 4–6 mm long, stigma peltate. Fruits ovoid, 3.5–4 mm long.

Sandstone outcrops or on poor soils under eucalypt forest throughout the region, but not along beaches. Flowers mainly late winter to summer.

A form with puberulent style *ca* 3–4 mm long and smaller flowers occurring mainly in the Moreton district may be a distinct taxon.

**17. *Leucopogon confertus* Benth.**

Shrub up to *ca* 75 cm tall, young branchlets shortly pubescent. Leaves sessile,  $\pm$  appressed to stem, ovate to elliptic, apex obtuse or acute, mucronate, base cuneate to contracted, margin flat to recurved, 1.5–4(–5) mm  $\times$  1–1.5 mm, slightly pubescent or scabrous. Flowers axillary, solitary on pedicels up to 1 mm long; sepals narrowly ovate, apex attenuate, 2.5–3 mm long; corolla white, tube 1.5–1.75 mm long, lobes *ca* 1.5 mm long, densely pubescent inside; style stout, *ca* 0.5 mm long. Fruits not seen.

Shallow sandy soils near Inglewood in the Darling Downs district. Flowers winter.

**18. *Leucopogon* sp. 2.**

Twiggy shrub up to 75 cm tall, young branchlets shortly pubescent. Leaves appressed to stem,  $\pm$  sessile, elliptic to obovate or angular, slightly concave, apex usually abruptly acuminate, mucronate, recurved, base contracted, 1.5–3.5(–4.5) mm  $\times$  1–2.5 mm, slightly pubescent beneath. Flowers axillary, solitary,  $\pm$  sessile; sepals ovate, obtuse, fimbriate, 2–2.75 mm long; corolla white, tube *ca* 1.7 mm long, lobes *ca* 1.5 mm long, densely pubescent inside; style stout, *ca* 1 mm long. Fruits narrowly ellipsoid, *ca* 2.5–3 mm long.

Shallow soil overlying sandstone in the Darling Downs district, e.g. areas north of Chinchilla. Flowers late winter and autumn.

**19. *Leucopogon deformis* R. Br.**

Shrub, branchlets puberulent. Leaves thick,  $\pm$  sessile; blades narrowly ovate to narrowly elliptic, apex acuminate, base cuneate, margin sometimes hispid,  $\pm$  flat, or leaf slightly concave, 4–7 mm  $\times$  0.75–1.25 mm. Flowers axillary, solitary or paired, reduced rachis *ca* 1 mm long; sepals oblong, abruptly acuminate, *ca* 3.5 mm long; corolla white, tube 1.5–2 mm long, lobes subulate, 2–3 mm long, thinly pubescent; ovary pubescent in upper half, style 2.5–3 mm long. Fruits  $\pm$  cylindrical, *ca* 2.5 mm long, pubescent in upper half.

Usually in drier coastal sands as constituent of understorey in shrubby woodland or *Banksia* forest. Flowers autumn.

**20. *Leucopogon margarodes* R. Br.**

Usually tall shrub, branchlets pubescent to villous. Leaves convex,  $\pm$  sessile, narrowly obovate to obovate, apex obtuse to subacute, mucronate, base cuneate, margin recurved to revolute, 0.4–1.4 cm  $\times$  0.1–0.3 cm, usually shortly pubescent beneath, eventually  $\pm$  glabrous, sometimes hispidulous above. Flowers axillary, solitary or paired, on reduced rachis 1–2 mm long; sepals ovate, acute, 2–2.5 mm long, sometimes villous; corolla white, tube *ca* 1 mm long, lobes 2–2.75 mm long, densely pubescent inside, sometimes sparsely villous outside; ovary pubescent, style *ca* 1.5 mm long. Fruits compressed obovoid with tapered apex, 5–6 mm long, longitudinally striate.

Growing on deep sands along the coast and offshore islands, in shrubby understorey under eucalypt forest, e.g. Cooloolo sand mass, Moreton I. etc. Flowers late winter–spring and autumn.

**21. *Leucopogon muticus* R. Br.**

Shrub up to *ca* 2 m tall, young branchlets finely pubescent. Leaves with obscure petioles 0.5–1 mm long; blades obovate, apex acute or obtuse, mucronate, base attenuate, margin  $\pm$  flat, or leaf slightly convex, 0.9–2.8 cm  $\times$  0.2–0.5 cm, sometimes finely pubescent beneath. Inflorescences of axillary spikes generally shorter than leaves; flowers 4–7; sepals ovate, obtuse mucronate, 1.5–2 mm long, sometimes slightly pubescent outside; corolla white, tube 1.5–2 mm long, lobes 1.5–2 mm long, densely long pubescent; ovary puberulent, style *ca* 1 mm long, stigma peltate. Fruits  $\pm$  cylindrical, *ca* 2.5 mm long. **Fig. 38E.**

Sandstone or granite derived soils of the region, e.g. Granite Belt, Crow's Nest and Plunkett areas. Flowers mainly winter to summer, often autumn as well.

**22. *Leucopogon leptospermoides* R. Br.**

Shrub, young branchlets pubescent. Leaves  $\pm$  sessile, narrowly obovate, narrowly elliptic or narrowly oblong-elliptic, apex acuminate, base truncate, margin  $\pm$  flat, 0.4–2 cm  $\times$  0.1–0.35 cm, sometimes puberulent above. Inflorescences of axillary spikes up to as long as leaves; flowers 1–5; sepals ovate, mucronate, 2.5–4 mm long; corolla white, tube 1.5–2 mm long, lobes *ca* 2–2.5 mm long, densely long pubescent inside; style *ca* 1 mm long. Fruits ovoid, *ca* 3–3.5 mm long.

Wallum heaths along the coast or on poor sandy soils of the coastal areas. Flowers late winter–spring, but often sporadically throughout the year.

**8. MONOTOCA R. Br.**

Shrubs or small trees. Leaves shortly petiolate. Inflorescences usually spicate or racemose, axillary to terminal; flowers small, sessile or pedicellate, with 1 bract and 2 bracteoles close under calyx; corolla tube  $\pm$  campanulate, lobes usually 5, valvate in bud, later spreading, glabrous; filaments inserted at throat, short, filiform; ovary 1-, rarely 2-locular, ovule 1 per loculus, style short, stigma small. Fruits drupes; seed 1.

5 species endemic in Australia; 1 species south-eastern Queensland.

**1. *Monotoca scoparia* (Smith) R. Br.****PRICKLY BROOM HEATH**

*Styphelia scoparia* Smith

Subshrub, shrub or small tree up to 5 m tall, young tips pubescent. Leaves with petioles 0.5–1 mm long; blades  $\pm$  convex, narrowly oblong, obovate or narrowly oblong-elliptic to elliptic, apex obtuse, pungent pointed or apiculate, base broadly cuneate to truncate, margin recurved, 0.5–2.3 cm  $\times$  0.1–0.5 cm, discolourous, glaucous or glaucescent below, venation visible below. Flowers 1–2 in clusters, or few in very short spikes, rachis less than 5 mm long, pubescent; sepals *ca* 1 mm long; corolla white, tube 1–1.5 mm long, lobes acute, 1–1.5 mm long. Fruits white, ellipsoid, 2–2.5 mm long, somewhat succulent. **Fig. 38F.**

Sandy wallum and heath areas of the coastal districts, or on sandy soil overlying sandstone as component of understorey in open forest in the coastal and Darling Downs districts. Flowers autumn–winter.

F. M. Bailey in "Qd. Fl." 3:938 (1900) listed *M. elliptica* R. Br. as occurring in the region, but the Queensland Herbarium has no records of this species from the region. It can be distinguished from the above by flowers being usually in racemes.

**9. SPRENGELIA Smith**

Erect or small diffuse shrubs. Leaves concave, stem clasping above base, acute or acuminate, base sheathing, deciduous, often membranous, concealing branches. Flowers solitary, usually terminal, bracts foliaceous; corolla tube short, sometimes absent, lobes imbricate, later spreading; anthers connivent or cohering around style; ovary 5-locular, ovules several per loculus, style filiform, inserted in tubular depression in ovary. Fruits capsules, loculicidally dehiscent.

3 species endemic in eastern Australia; 1 species south-eastern Queensland.

**1. *Sprengelia sprengelioides* (R. Br.) Druce**

*Ponzeletia sprengelioides* R. Br.

Slender shrub up to *ca* 1 m tall, rarely more. Leaves crowded, sessile, stem clasping at base then spreading, obovate, apex acuminate, 0.3–1.2 cm × 0.2–0.6 cm, glabrous. Flowers terminal or upper axillary; sepals with broad papery margin, 6–8 mm long; corolla white, tube 1.5–2.5 mm long, lobes 3.5–6 mm long; ovary glabrous, style 3–5 mm long. Fruits depressed globular, *ca* 2.5 mm diameter. **Fig. 38G.**

Coastal wallum heath areas, often in moister parts. Flowers late winter–spring.

**10. EPACRIS Cav.**

Heath-like shrubs. Leaves articulate, shortly petiolate, usually glabrous. Flowers solitary, axillary, shortly pedunculate, bracteate; corolla lobes imbricate in bud, later ± spreading, glabrous; filaments short, inserted in throat, anthers attached above middle; ovary 5-locular, ovules several per loculus, placentation axile, style inserted in tubular depression in apex of ovary. Fruits capsules, loculicidally dehiscent; seeds numerous.

40 species Australia, New Caledonia, New Zealand; 30–35 species Australia; 5 species south-eastern Queensland.

- |  |                          |   |
|--|--------------------------|---|
| 1. Corolla tubes longer than 1.2 cm . . . . .                                    | 1. <i>E. longiflora</i>  | 2 |
| Corolla tubes shorter than 1.2 cm . . . . .                                      |                          |   |
| 2. Corolla tubes longer than 5 mm . . . . .                                      | 2. <i>E. obtusifolia</i> | 3 |
| Corolla tubes shorter than 5 mm . . . . .  |                          |   |
| 3. Corolla lobes acute; styles <i>ca</i> 3.5 mm long . . . . .                   | 3. <i>E. pulchella</i>   | 4 |
| Corolla lobes obtuse; styles 0.5–1.5 mm long . . . . .                           |                          |   |
| 4. Leaves without raised veins below; styles 1–1.5 mm long . . . . .             | 4. <i>E. microphylla</i> |   |
| Leaves with 3 longitudinal veins raised below; styles 0.5–0.75 mm long . . . . . | 5. <i>E. breviflora</i>  |   |

**1. *Epacris longiflora* Cav.**

**FUCHSIA HEATH**

Erect or diffuse subshrub or shrub up to 1.5 m tall, young tips pubescent. Leaves with petioles up to 0.5 mm or rarely 1 mm long; blades broadly ovate or ovate, apex acuminate, pungent pointed, base obtuse, truncate, or usually cordate, (0.5–)0.6–1(–1.8) cm × (0.15–)0.25–0.6(–1) cm. Flowers solitary on pubescent pedicels *ca* 1.5–2 mm long, bracts scattered along pedicel; sepals 4–6 mm long; corolla tube reddish or reddish purplish, ± cylindrical, 1.3–1.7 cm long, lobes cream, acute, 3–4 mm long; style 1.8–1.9 cm long, stigma exserted. Fruits depressed globose, sunken in centre, *ca* 3 mm diameter.

Recorded from Springbrook, Mt. Lindesay and Mt. Barney in rocky areas or on cliff tops, in heath or open forest. Flowers mainly winter to early summer.

**2. *Epacris obtusifolia* Smith**

**COMMON HEATH**

Erect shrub up to 1.5 m tall, young tips pubescent. Leaves ascending; petioles 0.5–1 mm long; blades concave, thick, ovate, elliptic or narrowly elliptic-oblong, apex blunt, often incurved, base cuneate, 0.4–1.1 cm × 0.1–0.3 cm, ± 3 longitudinal veins raised below. Flowers fragrant, solitary on bracteate pedicels 1.5–2 mm long; sepals 4.5–5 mm long; corolla white, tube ± cylindrical, *ca* 6 mm long, lobes 2–2.5 mm long; style 4.5–5 mm long. Fruits ± globular, *ca* 3 mm diameter. **Fig. 38J.**

Coastal districts including offshore sand islands in swampy wallum areas, also in Lamington National Park in swampy patches overlying trachyte, and in Girraween National Park near Wallangarra. Flowers late winter–spring.



**Fig. 38** EPACRIDACEAE — A-E *Leucopogon* spp. — A *L. melaleucoides*, part of flowering branchlet x1; B *L. ericoides*, part of flowering branchlet x1; C *L. juniperinus*, part of flowering branchlet x1; D *L. neo-anglicus*, part of flowering branchlet x1; E *L. muticus*, part of flowering branchlet x1; F *Monotoca scoparia*, part of flowering branchlet x1; G *Sprengelia sprengelioides*, part of flowering branchlet x1; H-J *Epacris* spp. — H<sub>1</sub>-H<sub>2</sub> *E. pulchella*, H<sub>1</sub> part of flowering branchlet x1, H<sub>2</sub> leaf x6; I<sub>1</sub>-I<sub>2</sub> *E. microphylla*, I<sub>1</sub> leaf x6, I<sub>2</sub> flower showing obtuse corolla lobes x6; J *E. obtusifolia*, leaf x6; K<sub>1</sub>-K<sub>2</sub> *Woollisia pungens*, K<sub>1</sub> part of flowering branchlet x1, K<sub>2</sub> L.S. of flower showing style arising from central depression in ovary x4.

**3. *Epacris pulchella* Cav.****WALLUM HEATH**

Erect shrub up to *ca* 75 cm tall, young branchlets pubescent. Leaves with petioles *ca* 0.5 mm long; blades broadly ovate or occasionally ovate, apex acuminate, base cordate to stem clasping, occasionally rounded, 2.5–7(–9) mm × 2–4.5 mm. Flowers solitary on bracteate pedicels 0.5–1.5 mm long; sepals subulate, 3–3.5 mm long; corolla white or pinkish, tube 3–3.5 mm long, lobes acute, 3.5–4.5 mm long; style *ca* 3.5 mm long. Fruits ellipsoid, *ca* 2 mm diameter. **Fig. 38H.**

Coastal wallum areas or as a component of heathy understorey in *Banksia* open forest, also on offshore sand islands. Flowers spring and autumn.

**4. *Epacris microphylla* R. Br.****CORAL HEATH**

Erect shrub up to 2.4 m tall, but usually less than 1 m tall, young tips pubescent. Leaves ascending, imbricate; petioles *ca* 0.5 mm long; blades concave, ovate to rhombic, apex acuminate, pungent pointed, base truncate to subcordate, 2–6 mm × 1.5–4 mm. Flowers solitary on bracteate peduncles *ca* 1–1.5 mm long; sepals ± blunt, (2–)3–3.5 mm long; corolla white to cream, or sometimes pinkish in bud, tube (1.5–)2.5–3 mm long, lobes obtuse, *ca* (2–)2.5 mm long; style 1–1.5 mm long. Fruits ± globular, *ca* 2 mm diameter. **Fig. 38I.**

Coastal districts on swampy wallum flats on sandy soil or in heathy understorey in open forest and also in granite areas near Stanthorpe and Wallangarra in the Darling Downs district. Flowers late winter–spring, also autumn.

Specimens from the Darling Downs district differ from the coastal ones in having ± acute sepals 2–2.5 mm long, and corolla tube 1.5–2 mm long, with lobes slightly longer than the tube. However they match specimens of *E. microphylla* from adjoining areas in New South Wales and probably represent a slightly different form of the species.

**5. *Epacris breviflora* Stapf****DRUMSTICK HEATH**

Shrub up to 1.5 m tall, but commonly less than 0.5 m tall, young tips pubescent. Leaves ascending; petioles 0.5–1 mm long; blades ovate to elliptic, apex acuminate, pungent pointed, base cuneate to rounded, 3.5–8(–9.5) mm × 1.5–4(–5.5) mm, paler beneath, 3 longitudinal veins raised below. Flowers solitary on bracteate peduncles *ca* 1 mm long; sepals 3–4 mm long; corolla white, tube campanulate, 2–3 mm long, lobes obtuse, 3–4 mm long; style 0.5–0.75 mm long. Fruits ± globular, 2–3 mm diameter.

Recorded from swamp at foot of South Bald Rock near Wallangarra. Flowers spring.

The leaves are somewhat shorter and narrower than those from New South Wales but the plants are otherwise similar.

**11. WOOLLSIA F. Muell.**

Shrubs. Leaves crowded. Flowers sessile, solitary, upper axillary, bracts numerous, imbricate; corolla lobes imbricate, contorted in bud, crisped when open; filaments free or partly adnate to corolla tube, anthers slender, dorsifixed; ovary depressed globular, 5-locular, ovules few per loculus, style inserted in depression in ovary. Fruits capsules, loculicidally dehiscent.

1 species endemic in Australia, occurring in south-eastern Queensland.

**1. *Woollisia pungens* (Cav.) F. Muell.**

*Epacris pungens* Cav.; *Lysinema pungens* (Cav.) R. Br.

Shrub up to 2 m tall, but usually *ca* 1 m tall, young branchlets white woolly pubescent. Leaves crowded, generally spreading; petioles 0.5–1 mm long; blades ovate, apex long acuminate, base rounded to cordate (0.35–)0.6–1.3 cm × (0.15–)0.3–0.6 cm. Flowers fragrant, bracts numerous; sepals 8–10 mm long; corolla white, tube narrow, 0.8–1.4 cm long, lobes spreading, 4–5 mm long; style 0.8–1.4 cm long, pubescent, stigma shortly 3–5-lobed. Fruits depressed globular, *ca* 2.5 mm diameter. **Fig. 38K.**

Deep sands or sandy coastal wallum areas, or in rocky mountainous areas. Flowers mainly spring and autumn, but sporadically throughout the year.

## 111. MYRSINACEAE

Trees or shrubs. Leaves alternate, rarely opposite or subverticillate, simple. Flowers in fascicles, umbels, racemes or panicles, mostly bisexual; sepals free or connate; corolla tubular, rarely petals free; stamens same number as and opposite petals, filaments usually adnate to corolla, rarely free, anthers opening lengthwise or by apical pores; ovary superior, 1-locular, style simple. Fruits berries or drupes.

About 35 genera with 1 000 species from tropical and subtropical parts of the world; 6 genera with *ca* 25 species Australia; 5 genera with 9 species south-eastern Queensland.

- |  |                         |   |
|--|-------------------------|---|
| 1. Plants of maritime habitats; anther loculi divided into compartments by transverse partitions . . . . . | 1. <i>Aegiceras</i>     |   |
| Plants of maritime habitats; anther loculi not divided by transverse partitions . . . . .                  |                         | 2 |
| 2. Petals free or only slightly coherent at base; climbers . . . . .                                       | 2. <i>Embelia</i>       | 3 |
| Petals fused into at least short tube; not climbers . . . . .  |                         | 3 |
| 3. Flowers in sessile clusters or umbels, usually on old wood . . . . .                                    | 3. <i>Rapanea</i>       |   |
| Flowers in racemes, panicles or corymbs, sometimes in umbels but then pedunculate . . . . .                |                         | 4 |
| 4. Anthers dorsifixed . . . . .  | 4. <i>Tapeinosperma</i> |   |
| Anthers basifixed . . . . .  | 5. <i>Ardisia</i>       |   |

## 1. AEGICERAS Gaertn.

Maritime trees or shrubs. Leaves opposite or  $\pm$  spirally arranged. Flowers in umbels or racemes, 5-merous; calyx deeply divided; corolla lobes equalling tube or somewhat longer; stamens exerted, filaments cohering at base, anthers divided into compartments by transverse partitions. Fruits cylindrical, incurved, opening as seed grows in 1-2 longitudinal slits; seed 1, germinating in fruit.

2 species, tropical areas of the world; 1 species Australia, occurring in south-eastern Queensland.

1. *Aegiceras corniculatum* (L.) Blanco

## RIVER MANGROVE

*Rhizophora corniculata* L.; *Aegiceras majus* Gaertn.

Glabrous shrub or small tree up to *ca* 4 m tall. Leaves alternate; blades obovate to rounded, apex obtuse, base rounded, 3-11 cm  $\times$  1.8-6 cm, usually covered in salt secreting glands. Inflorescences axillary and terminal umbels, subsessile or on peduncles up to *ca* 8 mm long, pedicels 0.8-1.2 cm long; flowers white, fragrant; calyx 5-6 mm long; corolla lobes 5-6 mm long. Fruits up to *ca* 7.5 cm long. **Fig. 39A.**

Common mangrove of the central or landward sections of mangrove areas, also along creek and riverbanks in upper tidal reaches. Prefers poorly drained soils that are shallowly inundated by most high tides. Flowers summer-autumn. An important source of honey and pollen for bees.

## 2. EMBELIA N.L. Burm.

Shrubs, mostly climbing. Leaves alternate; blades with brown or red dots or streaks, glabrous. Flowers terminal or in axils of fallen or present leaves, in clusters racemes or panicles, 4-5-, rarely 6-merous; calyx deeply divided; petals free or shortly united at base, often papillose or pubescent on inner margin; filaments  $\pm$  adnate to petals. Fruits drupes; seed 1.

130 species from tropical and subtropical areas from Africa, eastern Asia to Australia and the Pacific Is.; 1 species endemic in Australia, occurring in south-eastern Queensland.

1. *Embelia australiana* (F. Muell.) Mez

*Choripetalum australianum* F. Muell.

Tall woody climber. Leaves ovate-elliptic or obovate, apex obtuse or shortly acuminate, base cuneate, margin entire and  $\pm$  undulate, 3-10 cm  $\times$  1.5-5 cm,

prominently veined. Flowers in loose axillary racemes; calyx lobes 4, *ca* 1 mm long; petals 4, *ca* 2 mm long; stigma broad. Drupes red, globular, *ca* 6 mm diameter, hard.

Found on the edges of rainforest of the Moreton and Wide Bay districts as far west as the Bunya Mts. Flowers summer–autumn. Fruits autumn.

### 3. RAPANEA Aubl.

Shrubs or small trees. Leaves entire or rarely toothed, with coloured dots or streaks. Flowers in umbels or clusters, sessile in axils or at nodes, usually on old wood; calyx free, 4–5-lobed; corolla deeply 4–5-lobed; stamens inserted at base of corolla lobes, filaments very short; style short, with capitate or fringed stigma. Fruits drupes, mostly fleshy, mesocarp drying and disappearing with age leaving hard endocarp exposed.

About 200 species from tropical and subtropical parts of the world; *ca* 11 species Australia; 4 species south-eastern Queensland.

- |   |                          |   |
|---|--------------------------|---|
| 1. Corolla lobes shorter than corolla tube . . . . .  | 1. <i>R. variabilis</i>  |   |
| Corolla lobes longer than corolla tube . . . . .  |                          | 2 |
| 2. Lobes of corolla strongly inflexed at top forming a hood; petioles up to <i>ca</i> 0.4 cm long | 2. <i>R. subsessilis</i> |   |
| Lobes of corolla scarcely or not inflexed at top; petioles 0.8–1.5 cm long . . . . .              |                          | 3 |
| 3. Tips of branchlets densely ferruginous hairy . . . . .   | 3. <i>R. howittiana</i>  |   |
| Tips of branchlets ± glabrous, not ferruginous hairy . . . . .                                    | 4. <i>R. porosa</i>      |   |

#### 1. *Rapanea variabilis* (R. Br.) Mez

*Myrsine variabilis* R. Br.

Glabrous tree up to 12 m tall. Leaves with petioles 0.5–1.2 cm long; blades obovate-oblong, obovate, elliptic, narrowly elliptic or narrowly oblong, apex obtuse to acute, rarely shortly acuminate, base cuneate to attenuate, margin entire or irregularly toothed, 3–9 cm × 0.3–3.5 cm. Flowers in clusters, pedicels 3–5 mm long; flowers *ca* 2 mm long; corolla lobes shorter than corolla tube. Drupes globular, 4–6 mm diameter. **Fig. 39B.**

Common in rainforest and depauperate rainforest of the region. Flowers winter–spring.

#### 2. *Rapanea subsessilis* (F. Muell.) Mez

*Myrsine subsessilis* F. Muell.; *Myrsine crassifolia* auct. non R. Br.

Shrub or small tree mostly up to *ca* 3 m tall, rarely up to 5 m tall. Leaves with petioles up to *ca* 4 mm long; blades elliptic or narrowly elliptic or sometimes obovate-elliptic, apex acute or acuminate, base cuneate or sometimes rounded, margin entire, 6–14 cm × 1.5–4.5 cm, glabrous. Flowers in clusters, pedicels 1–2 mm long; flowers *ca* 1.8 mm long; corolla lobes longer than corolla tube, strongly inflexed at top, forming hood. Drupes globular, 4–6 mm diameter.

Rainforests of the eastern half of the Moreton and Wide Bay districts, moderately common. Flowers winter–spring.

#### 3. *Rapanea howittiana* (F. Muell.) Mez

*Myrsine howittiana* F. Muell.

Shrub or tree 1–6 m tall, branchlets densely appressed ferruginous tomentose at least at tips. Leaves with petioles 0.8–1.5 cm long; blades elliptic to obovate, apex obtuse, occasionally emarginate, base cuneate, margin entire, 4–10 cm × 2–4 cm. Flowers in clusters, pedicels 2–4 mm long; flowers 3–3.5 mm long; corolla lobes longer than corolla tube, not inflexed at top. Drupes globular, *ca* 6 mm diameter.

Known in Queensland from a single specimen collected in 1891 from Wellington Point, now a bayside suburb of Brisbane.

**4. *Rapanea porosa* (F. Muell.) Mez***Myrsine porosa* F. Muell.; *Rapanea crassifolia* auct. non (R. Br.) Mez

Tree up to ca 10 m tall, branchlets  $\pm$  glabrous. Leaves with petioles 0.4–1 cm long; blades elliptic-oblong or elliptic-obovate, apex obtuse or narrowed to rounded tip, base cuneate, margin entire, 6–16 cm  $\times$  2–6.5 cm. Flowers in clusters, pedicels 2–3 mm long; flowers 2–3.5 mm long; corolla lobes longer than corolla tube, not or scarcely inflexed at top. Drupes globular, ca 6 mm diameter.

Not common, rainforests of the northern Wide Bay and Burnett districts. Flowers spring.

**4. TAPEINOSPERMA J. D. Hook.**

Trees or shrubs. Leaves alternate; blades with coloured dots or streaks. Inflorescences terminal or axillary panicles and racemes or rarely umbelliform corymbs; flowers mostly 5-merous; calyx deeply divided; corolla usually deeply lobed; anthers dorsifixed. Fruits drupes; seed 1.

40 species New Guinea, Australia and Pacific Is.; 2 species endemic in Australia; 1 species south-eastern Queensland.

**1. *Tapeinosperma pseudojambosa* (F. Muell.) Mez***Ardisia pseudojambosa* F. Muell.

Tree up to ca 9 m tall, glabrous. Leaf blades obovate, apex acuminate, base attenuate, margin entire or obscurely sinuate, 5–15 cm  $\times$  1.5–6 cm. Inflorescences terminal panicles of umbels or short racemes; calyx ca 1.5 mm long; corolla  $\pm$  rotate, lobes ca 2 mm long; anthers subsessile, apex exceeding corolla lobes. Drupes globular, ca 8 mm diameter.

Not common, rainforest of eastern parts of the region. Flowers summer–autumn and spring.

**5. ARDISIA Swartz**

Small trees or shrubs, sometimes climbing. Leaves spirally arranged or sometimes  $\pm$  verticillate, with pellucid or coloured dots or streaks. Flowers in panicles, corymbs or umbelliform or non-umbelliform racemes; calyx deeply divided, 5-lobed; corolla deeply divided, 5-lobed; stamens free, filaments short, anthers erect. Fruits drupes; seed 1.

About 400 species from warm areas of the world; 7 species Australia; 2 species south-eastern Queensland.

- |  |                     |
|--|---------------------|
| 1. Leaf margins conspicuously shallowly crenate; calyces 1.1–2 mm long; shrubs 1–2 m tall                      | 1. <i>A. crispa</i> |
| Leaf margins not conspicuously crenate, sometimes undulate; calyces less than 1 mm long; trees up to 10 m tall | 2. <i>A. bakeri</i> |

**1. \**Ardisia crispa* (Thunb.) DC.***Bladhia crispa* Thunb.

Shrub 1–2 m tall. Leaf blades elliptic-obovate, apex acuminate, base cuneate or attenuate, margin shallowly crenate, 6–12 cm  $\times$  2–3.5 cm. Inflorescences umbellate at ends of articulate peduncle-like branches 4–7 cm long; flowers white, 7–8 mm diameter. Fruits red, globose, 5–7 mm diameter.

Native of China, Taiwan and Japan, occasionally cultivated as a garden plant; reported once apparently naturalized in the northern Moreton district. Flowers autumn.

**2. *Ardisia bakeri* C. T. White**

Tree up to 10 m tall. Leaf blades ovate-elliptic, apex acuminate or obtuse, base cuneate or attenuate, margin entire or very slightly crenate, sometimes undulate, 5–12.5 cm  $\times$  1.3–2.5 cm, glabrous. Inflorescences short axillary racemes; corolla creamy white with dark purple spots, ca 3 mm long, lower half of inner surface marked with dense rusty coloured hairs. Fruits red,  $\pm$  globose, ca 7 mm diameter.

Known from the Springbrook Plateau in the southern Moreton district. Flowers spring.

## 112. PRIMULACEAE

Perennial or annual herbs, rarely undershrubs. Leaves all basal or sometimes cauline, alternate, opposite or verticillate; stipules absent; blades simple or variously lobed. Flowers solitary or paniculate or umbellate, bisexual, actinomorphic, rarely zygomorphic; calyx persistent; corolla tubular, lobes usually 5; stamens inserted opposite petals; ovary superior or half inferior, 1-locular, style simple. Fruits capsules, variously dehiscent, many-seeded.

About 20 genera with 1000 species, cosmopolitan but especially the temperate northern hemisphere; 5 genera with *ca* 8 species Australia; 2 genera with 4 species south-eastern Queensland.

- |  |                     |
|--|---------------------|
| 1. Ovaries superior; fruits circumscissile; stems quadrangular . . . . . | 1. <i>Anagallis</i> |
| Ovaries half inferior; fruits 5-valved; stems terete . . . . .           | 2. <i>Samolus</i>   |

### 1. ANAGALLIS L.

Annuals or perennials with creeping procumbent or diffuse stems. Leaves opposite or alternate. Flowers pink, red or blue, axillary, solitary; calyx free, deeply 5-lobed; corolla rotate or campanulate, deeply 5-lobed; stamens 5. Capsules circumscissile.

About 28 species mainly from Europe, Africa and South America, 1 pantropical; 2 species, 1 naturalized, Australia, both occurring in south-eastern Queensland.

- |                              |                       |
|------------------------------|-----------------------|
| 1. Leaves opposite . . . . . | 1. <i>A. arvensis</i> |
| Leaves alternate . . . . .   | 2. <i>A. sp. 1.</i>   |

#### 1. \**Anagallis arvensis* L.

PIMPERNEL; SCARLET PIMPERNEL; BLUE PIMPERNEL

Small annual herbs with weak quadrangular stems. Leaves opposite, sessile, ovate, margin entire, 0.5–2 cm × 0.3–1 cm, glabrous. Peduncles longer than leaves; flowers orange-red, red or blue; calyx lobes up to *ca* 7.5 mm long; corolla rotate, 6–10 mm diameter. Capsules 3–5 mm diameter. **Fig. 39C.**

Native of Europe; naturalized in the region, common and widespread. Flowers mostly spring–summer. The species is poisonous to stock but is usually not eaten.

This is a very variable species and infraspecific names have been published, but a revision of the genus in Australia is needed to ascertain whether any of these names can be applied to Australian material.

#### 2. *Anagallis* sp. 1.

*A. pumila* auct. non Swartz, Benth.

Stems erect, simple or branched above, up to *ca* 15 cm tall. Leaves alternate, sessile, elliptic to broadly ovate, apex acute, 3–6 mm long. Peduncles up to *ca* 6 mm long; calyx lobes 1.5–2 mm long.

In south-eastern Queensland collected once from near Mundubbera in the Burnett district, also recorded from northern Queensland.

### 2. SAMOLUS L.

Annuals or perennials. Leaves alternate. Flowers white, in loose terminal racemes; calyx campanulate, tube partially adhering to ovary, lobes 5; corolla tube short or broad, lobes 5, spreading, with 5 small or filiform scales alternating with lobes; stamens 5. Capsules half inferior, free part opening in 5 valves opposite calyx lobes.

About 15 species, cosmopolitan but especially the southern hemisphere; 3 species Australia; 2 species south-eastern Queensland.

- |   |                         |
|---|-------------------------|
| 1. Stem leaves thin, obovate to ovate, mostly more than 5 mm broad . . . . .                                  | 1. <i>S. valerandii</i> |
| Stem leaves rather thick, linear or narrowly ovate or narrowly obovate, seldom more than 4 mm broad . . . . . | 2. <i>S. repens</i>     |

**1. *Samolus valerandii* L.****BROOKWEED**

Erect glabrous herb. Leaves in basal tuft, petiolate, spreading, blades obovate to ovate, 2–7 cm × 1–2 cm; cauline leaves similar in shape to basal leaves but smaller. Flowers in terminal racemes up to *ca* 20 cm long, pedicels ascending, mostly 1–2 cm long with bract  $\frac{1}{3}$ – $\frac{1}{2}$  way along; calyx *ca* 2 mm long, lobes *ca* 1 mm long; corolla *ca* 2.5 mm long. Capsule valves strongly reflexed after dehiscence. **Fig. 39D.**

Widespread in the Moreton district and also known from the Wide Bay and eastern Darling Downs and Burnett districts, usually found on creek or river banks. Flowers spring to autumn.

**2. *Samolus repens* (J. R. & G. Forster) Pers.**

Perennial with tufted rootstock; stems 10–30 cm long, variable, erect and bearing flowers or arched and stoloniferous or creeping and rooting at nodes. Leaves rather thick, glabrous; basal leaves petiolate, blades obovate or oblong, up to *ca* 3 cm × 0.5 cm including petiole; cauline leaves linear, narrowly ovate or narrowly obovate, mostly 1–2 cm × 0.15–0.4 cm. Pedicels up to *ca* 2.5 cm long without bracts except subtending one, which is often adnate to pedicel so as to appear inserted on it; flowers variable in size but up to *ca* 10 mm in diameter.

Found in coastal areas of the Moreton and Wide Bay districts, sometimes in salt marshes. Flowers spring–summer.

**113. PLUMBAGINACEAE**

Herbs, undershrubs or climbers. Leaves spirally arranged or rosulate; stipules absent. Flowers often in unilateral inflorescences or subumbellate, bisexual, actinomorphic; calyx often conspicuously ribbed, often membranous between lobes or teeth; corolla mostly gamopetalous; stamens 5, opposite petals or corolla lobes and  $\pm$  adnate to tube; ovary superior, 1-locular. Fruits indehiscent or opening irregularly.

About 19 genera with 775 species, cosmopolitan; 3 genera with *ca* 6 species Australia; 3 genera with 3 species south-eastern Queensland.

- |   |                      |   |
|---|----------------------|---|
| 1. Styles 1, divided into 5 stigmatose branches . . . . .           | 1. <i>Plumbago</i>   |   |
| Styles 5, distinct . . . . .  |                      | 2 |
| 2. Herbs with radical leaves . . . . .                              | 2. <i>Limonium</i>   |   |
| Shrubs with spirally arranged leaves with sheathing bases . . . . . | 3. <i>Aegialitis</i> |   |

**1. PLUMBAGO L.**

Perennials, herbs or undershrubs. Leaves spirally arranged. Flowers  $\pm$  sessile in simple, terminal or axillary spikes; calyx tubular with 5 prominent ribs ending in short teeth,  $\pm$  glandular-muricate; corolla tubular with 5 spreading lobes; style filiform with 5 filiform branches stigmatic from base. Fruits included in calyces.

12 species from warmer regions of the world; 1 species Australia, occurring in south-eastern Queensland.

**1. *Plumbago zeylanica* L.**

Shrub up to *ca* 1 m tall, with long weak branches, sometimes half climbing, glabrous except for short glandular-viscid bristles on inflorescence and especially on calyx. Leaves with petioles up to *ca* 1 cm long, often winged, dilated at base into stem clasping ring or sometimes forming prominent auricles; blades ovate, apex acute, obtuse or acuminate, 1.5–8 cm × 0.8–4 cm. Flowers white or blue, each sessile within 1 small broadly ovate-acuminate bract and 2 much smaller bracteoles; calyx 8–10 mm long; corolla tube slender, up to *ca* 2 cm longer than calyx, lobes obovate, apiculate, *ca* 0.8–1.2 cm long; stamens included in corolla tube.

Widespread but not common in the region. Flowers summer–autumn.

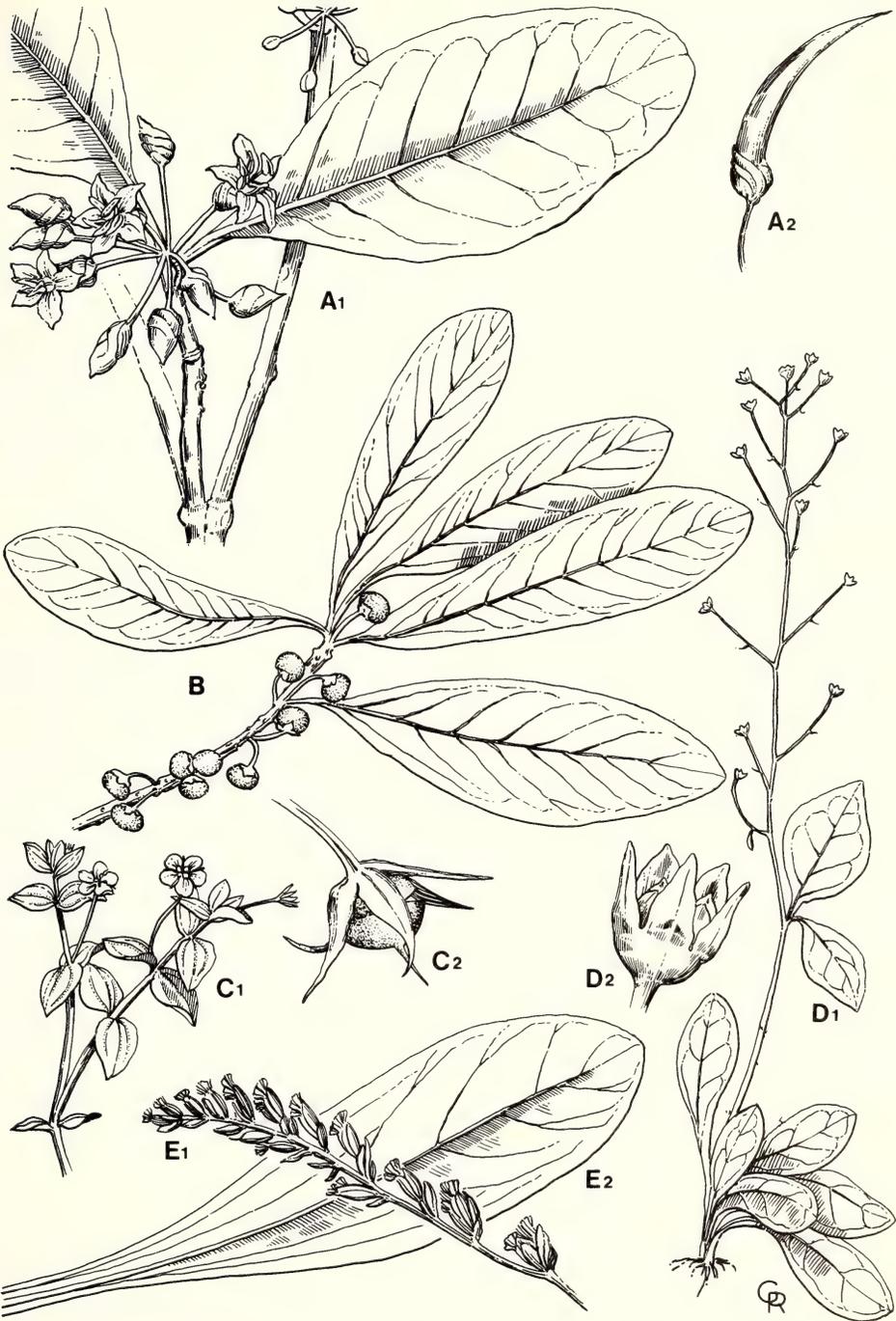


Fig. 39 A-B MYRSINACEAE — A<sub>1</sub>-A<sub>2</sub> *Aegiceras corniculatum*, A<sub>1</sub> portion of flowering stem x1, A<sub>2</sub> fruit x1; B *Rapanea variabilis*, portion of fruiting stem x1; C-D PRIMULACEAE — C<sub>1</sub>-C<sub>2</sub> *Anagallis arvensis*, C<sub>1</sub> portion of flowering stem x1, C<sub>2</sub> fruit x4; D<sub>1</sub>-D<sub>2</sub> *Samolus valerandii*, D<sub>1</sub> flowering plant x1, D<sub>2</sub> fruit x4; E PLUMBAGINACEAE — E<sub>1</sub>-E<sub>2</sub> *Limonium australe*, E<sub>1</sub> portion of inflorescence x1, E<sub>2</sub> leaf x1.

## 2. LIMONIUM Miller

Herbs. Leaves usually radical. Flowers solitary or 2–3 together in spikelets forming 1-sided spikes, arranged in dichotomous or trichotomous panicles, or rarely in simple spikes; calyx  $\pm$  expanded at top into dry membranous coloured and slightly 5-lobed limb, each lobe traversed by green or dark nerve; petals 5, slightly united at base; styles free, ending in linear-terete stigmas. Fruits included in calyces.

About 300 species, cosmopolitan; 3 species Australia, 1 native; 1 species south-eastern Queensland.

### 1. *Limonium australe* (R. Br.) Kuntze NATIVE SEA LAVENDER *Taxanthera australis* R. Br.: *Statice australis* (R. Br.) Sprengel

Glabrous perennial from short thick rootstock. Leaves all radical; petioles winged, up to *ca* 6 cm long; blades obovate-oblong, 2–9 cm  $\times$  1–3 cm. Scape angular, 20–45 cm high, repeatedly forked so as to form broad corymbose panicle, with small green bract under each branch, sometimes barren branches present at base of panicle; flowers numerous, *ca* 4–6 mm long; calyx petaloid, *ca* 1 mm long when flower first opens, lengthening to 4–6 mm long as fruit develops, ribs hairy, calyx lobes pale pink or white, ribs usually hairy on outside, produced into short points or almost obtuse; petals yellow, rather longer than calyx when flowers first open but eventually enclosed in calyx. **Fig. 39E.**

Found in the northern Wide Bay district on coastal mud flats or on sandy soil close to the sea. Flowers spring–summer.

## 3. AEGIALITIS R. Br.

Shrubs. Leaves petiolate, blades broad. Flowers nearly sessile along branches of dichotomous panicles; calyx tubular with 5 prominent ribs ending in short teeth with induplicate margins; petals 5, slightly cohering at base; stamens slightly adhering to base of petals. Fruits narrowly elongated, exserted from calyx.

2 species from south-eastern Asia to tropical Australia; 1 species Australia, occurring in south-eastern Queensland.

### 1. *Aegialitis annulata* R. Br. CLUB MANGROVE

Mangrove shrub up to *ca* 2 m tall, branches marked with annular scars of fallen leaves. Leaves with petioles sheathing, winged, up to *ca* 8 cm long; blades coriaceous, broadly ovate or almost orbicular, apex obtuse, margin entire, 3–8 cm  $\times$  1.5–6 cm, with numerous fine parallel veins diverging from midrib. Panicles with few rigid branches scarcely exceeding leaves; flowers very shortly pedicellate, solitary within erect concave bracts which enclose calyx and are nearly as long, with two much smaller bracteoles at base of calyx; calyx mostly 6–7 mm long, ribs smooth; petals white, shortly exceeding calyx. Fruits linear, incurved, up to *ca* 4.5 cm  $\times$  0.2–0.25 cm.

Found in mangrove communities in coastal areas in the northern Wide Bay district. Flowers spring.

## 114. SYMPLOCACEAE

Trees or shrubs. Leaves alternate, exstipulate, blades simple. Flowers axillary or terminal, solitary or in spikes racemes or fascicles, actinomorphic; sepals 5, connate; petals 3–11,  $\pm$  connate; stamens 4–many, inserted on corolla, free or variously united, in 1–4 series; ovary inferior or semi-inferior, 2–5-locular, style slender. Fruits berries or drupes, crowned by calyx lobes, 1–5-locular; seed 1 per locus.

1 genus with *ca* 250 species, eastern Asia to Fiji and Australia and North and South America; *ca* 16 species Australia; 4 species south-eastern Queensland.

## 1. SYMPLOCOS Jacq.

Characters as for the family.

- |   |                          |   |
|---|--------------------------|---|
| 1. Branchlets and buds glabrous . . . . .                       | 2. <i>S. thwaitesii</i>  | 2 |
| Branchlets and buds hairy . . . . .                             |                          |   |
| 2. Hairs on branchlets and buds erect, 1–2 mm long . . . . .    | 2. <i>S. sp. 1.</i>      | 3 |
| Hairs on branchlets and buds appressed, 0.4–1 mm long . . . . . |                          |   |
| 3. Flowers in spikes; leaves coriaceous . . . . .               | 3. <i>S. stawellii</i>   |   |
| Flowers in racemes; leaves chartaceous . . . . .                | 4. <i>S. baeuerlenii</i> |   |

1. *Symplocos thwaitesii* F. Muell.

*Symplocos cochinchinensis* (Lour.) S. Moore subsp. *thwaitesii* (F. Muell.) Nootboom;  
*S. cochinchinensis* var. *thwaitesii* (F. Muell.) Nootboom

Small tree up to *ca* 5 m tall. Leaves with petioles 0.5–1(–1.5) cm long; blades mostly narrowly elliptic, apex acute to bluntly acuminate, base cuneate, margin usually dentate, occasionally entire, 9–16 cm × 2–2.5 cm. Inflorescences basally branched spikes racemes or panicles, 8–15 cm long, totally glabrous, pedicels 0–8 mm long; calyx lobes 1.5–2 mm long; corolla 6–7 mm long; stamens *ca* 100. Fruits ± ovoid, 0.6–1.1 cm × 0.4–0.8 cm.

Rainforests of the region, uncommon. Flowers spring.

2. *Symplocos* sp. 1.

Shrub or small tree up to 5 m tall. Leaves with petioles 2–4 mm long; blades elliptic to obovate, sometimes narrowly so, apex obtuse or obtusely acuminate, base cuneate to attenuate, margin serrulate, 4–9 cm × 1–2.5 cm. Inflorescences spikes up to 2 cm long; calyx lobes 0.5 mm long; corolla *ca* 2 mm long; stamens *ca* 25. Fruits ovoid, *ca* 6 mm × 4 mm.

Known from depauperate rainforest of the Moreton district. Flowers spring.

3. *Symplocos stawellii* F. Muell.

*Symplocos cochinchinensis* (Lour.) S. Moore var. *stawellii* (F. Muell.) Nootboom

Tree up to 30 m tall, trunk up to 80 cm diameter. Leaves with petioles 0.5–2.5 cm long; blades elliptic, apex acute to bluntly acuminate, base mostly broadly cuneate, margin entire to denticulate or crenulate, 5–16 cm × 1–17 cm. Inflorescences often branched spikes up to *ca* 6 cm long, rarely longer, rachis puberulent or glabrous; calyx lobes 0.25–0.75 mm long; stamens 25–50. Fruits ellipsoid-ovoid, 5–7 mm × 2–3.5 mm.

Known from rainforest of the eastern parts of the region, not common. Flowers spring and autumn.

4. *Symplocos baeuerlenii* R. T. Baker

Shrub or small tree up to 8 m tall. Leaves with petioles 0–4.5 mm long; blades narrowly elliptic, apex acuminate, base attenuate, margin dentate, 2.5–7.5 cm × 0.7–2 cm, glabrous, reticulation coarse, ± prominent beneath. Inflorescences axillary racemes less than 1 cm long, rarely flowers solitary, pedicels *ca* 0.5 mm long; calyx glabrous, tube 1–1.5 mm long, lobes *ca* 0.75 mm long; corolla *ca* 3 mm long; stamens 15–25. Fruits ellipsoid, *ca* 6 mm long. **Fig. 41B.**

Not common, known from in or near rainforest of the Moreton district. Flowers winter–spring.

## 115. SAPOTACEAE

Trees or shrubs with milky juice. Leaves usually alternate, rarely opposite, usually exstipulate, simple. Flowers in fascicles, bisexual, actinomorphic; calyx 4–8-lobed; corolla 4–8-lobed; stamens epipetalous, staminodes sometimes present; ovary superior, several-locular, ovules 1 per loculus, style simple. Fruits usually rather hard berries, rarely capsules, 1–many-locular; seeds with bony or papery often shiny testa.

37–75 ill-defined genera with *ca* 800 species from tropical areas of the world; 6 genera with 28 species Australia; 3 genera with 10 species south-eastern Queensland.

- |  |                          |   |
|--|--------------------------|---|
| 1. Flowers with staminodes present . . . . . | 1. <i>Planchonella</i>   |   |
| Flowers without staminodes . . . . .         |                          | 2 |
| 2. Testa of seeds hard and woody . . . . .   | 2. <i>Amorphospermum</i> |   |
| Testa of seeds papery . . . . .              | 3. <i>Niemeyera</i>      |   |

### 1. *PLANCHONELLA* Pierre

Trees or shrubs. Leaves scattered, alternate or opposite, sometimes crowded towards ends of branches. Flowers solitary or in clusters in axils, rarely in clusters along  $\pm$  leafless shoots; flowers 5-, rarely 4- or 6-merous; stamens as many as corolla lobes and opposite them, staminodes alternate with stamens; ovary 5-, rarely 4-, or 6-locular. Fruits berries, sometimes dryish or woody, 1–6-seeded.

100 species Seychelles, south-eastern Asia, Australia, New Zealand, Pacific Is. and South America; 22 species Australia; 7 species south-eastern Queensland.

- |  |                          |   |
|--|--------------------------|---|
| 1. Sepals glabrous inside . . . . .  |                          | 2 |
| Sepals pubescent inside, sometimes only at apex . . . . .                          |                          | 5 |
| 2. Fruits $\pm$ globose . . . . .  | 1. <i>P. pohlmaniana</i> |   |
| Fruits not globose . . . . .   |                          | 3 |
| 3. Leaves 1–1.5 times as long as wide . . . . .                                    | 2. <i>P. cotinifolia</i> |   |
| Leaves greater than 1.5 times as long as wide . . . . .                            |                          | 4 |
| 4. Angle between secondary nerves and midrib 55°–75° . . . . .                     | 3. <i>P. myrsinoides</i> |   |
| Angle between secondary nerves and midrib 35°–45° . . . . .                        | 4. <i>P. eerwah</i>      |   |
| 5. Fruits obovoid, 1-seeded; petioles 0.2–0.3 cm long . . . . .                    | 5. <i>P. laurifolia</i>  |   |
| Fruits ovoid, ellipsoid or globose, 2–5-seeded; petioles 0.2–1.5 cm long . . . . . |                          | 6 |
| 6. Pedicels 0.5–0.8 cm long; sepals 2.5–3.2 mm wide . . . . .                      | 6. <i>P. chartacea</i>   |   |
| Pedicels 0.8–1.5 cm long; sepals 3.5–5 mm wide . . . . .                           | 7. <i>P. australis</i>   |   |

#### 1. *Planchonella pohlmaniana* (F. Muell.) Pierre ex Dubard

YELLOW  
BOXWOOD; ENGRAVER'S WOOD

*Achras pohlmaniana* F. Muell.; *Sideroxylon pohlmanianum* (F. Muell.) F. Muell.; *Sersalisia pohlmaniana* (F. Muell.) Domin; *Sersalisia dugulla* (F. M. Bailey) Domin; *Pouteria pohlmaniana* (F. Muell.) Baehni

Tree up to *ca* 20 m tall, stem diameter up to *ca* 60 cm. Leaves alternate but often clustered at tips of branchlets; petioles 0.5–2.5 cm long; blades narrowly oblong-obovate to narrowly obovate to obovate, apex obtuse or obtusely acuminate, base narrowed, 7–20 cm  $\times$  1.5–6 cm, glabrous or sparsely hairy above and below, secondary nerves 7–9, ascending at angle of 30°–60°, rarely up to 85° to midrib. Flowers in clusters of 4–12 in leaf axils; sepals 3.5–4 mm long, pubescent outside, glabrous inside; corolla 3–4.5 mm long; ovary hirsute. Fruits green,  $\pm$  globose, 1.2–3 cm diameter; seeds 5, 1–1.2 cm long.

Rainforest of the eastern part of the region. Flowers mainly spring but some flowers found most of the year. Timber suitable for engraving or carving.

#### 2. *Planchonella cotinifolia* (A. DC.) Dubard

*Hormogyne cotinifolia* A. DC.; *Sideroxylon cotinifolium* (A. DC.) Engler; *Sersalisia cotinifolia* (A. DC.) F. Muell.; *Pouteria cotinifolia* (A. DC.) Baehni

Shrubs or trees 2–10 m tall. Leaves scattered; petioles 0.5–3 mm long; blades obovate, orbicular, elliptic or spatulate, apex obtuse or obtusely acuminate, base narrowed, 0.4–5 cm  $\times$  0.3–3.8 cm. Flowers axillary, solitary or in clusters of 2–5; sepals 1.5–2.5 mm long, glabrous inside; corolla 7–8 mm long. Fruits green to black, ellipsoid-ovoid, 1–1.5 cm long; seeds 1–4, *ca* 1 cm long.

Two varieties occur in the region:

1. Mature leaves glabrous; pedicels glabrous; sepals glabrous outside; ovary glabrous; fruits always 1-seeded *P. cotinifolia* var. *cotinifolia*  
 Mature leaves with yellowish woolly hairs below, glabrous or with sparse whitish hairs above; pedicels hairy; sepals yellowish woolly hairy outside; ovary pilose; fruits 1–4-seeded *P. cotinifolia* var. *pubescens*

*P. cotinifolia* var. *cotinifolia* is known from depauperate rainforest of the Moreton, Wide Bay and Burnett districts. *P. cotinifolia* var. *pubescens* van Royen is known from the Burnett district. Both varieties apparently flower spring to autumn.

### 3. *Planchonella myrsinoides* (Cunn. ex Benth.) S. T. Blake

*Achras myrsinoides* Cunn. ex Benth.; *Achras howeana* F. Muell.; *Sideroxylon myrsinoides* (Cunn. ex Benth.) F. Muell.; *Planchonella howeana* (F. Muell.) Pierre; *Sersalisia myrsinoides* (Cunn. ex Benth.) Domin; *Sersalisia howeana* (F. Muell.) Domin; *Pouteria myrsinoides* (Cunn. ex Benth.) Baehni; *Pouteria howeana* (F. Muell.) Baehni

Shrubs or trees 2–10 m tall. Leaves scattered; petioles 0.4–1.4 cm long; blades ovate-oblong, elliptic to obovate, apex obtuse or retuse or sometimes shortly obtusely acuminate, base cuneate, 2–10 cm × 0.8–5 cm, woolly hairy above, tomentose below when young, glabrous when mature, secondary nerves 6–10, ascending at an angle of 55°–75° to midrib. Flowers axillary, solitary or in few-flowered clusters; sepals 3.5–6 mm long, hairy outside, glabrous inside; corolla 0.5–1.1 cm long; ovary densely tomentose. Fruits obliquely fusiform to ovoid, 1.5–3 cm long; seeds 1–3, 1.2–2.2 cm long.

Rainforest and dry rainforests of the Moreton, Wide Bay and Burnett districts. Flowers mainly spring but some flowers found all year around.

### 4. *Planchonella eerwah* (F. M. Bailey) van Royen

*Sideroxylon eerwah* F. M. Bailey; *Sersalisia eerwah* (F. M. Bailey) Domin; *Pouteria eerwah* (F. M. Bailey) Baehni

Tree up to ca 10 m tall. Leaves alternate; petioles 0.2–1 cm long; blades obovate to spatulate, apex obtusely or acutely acuminate, base tapered into petiole, 4–14 cm × 1.2–6.5 cm, glabrous, secondary nerves 5–8, ascending at an angle of 35°–45° to midrib. Flowers few in axillary clusters; sepals ca 2.5 mm long, glabrous or hairy outside, glabrous inside; corolla ca 4 mm long; ovary with dense appressed silky hairs. Fruits dark reddish purple, obovoid or globose, somewhat oblique, 3–6 cm long; seeds 1–5, 2.5–3 cm long. **Fig. 40A.**

Known only from a few localities in the southern Wide Bay district and southern Moreton district. Flowers spring.

### 5. *Planchonella laurifolia* (A. Rich.) Pierre

BLUSH COONDOO

*Sersalisia laurifolia* A. Rich.; *Sideroxylon laurifolium* Engl.; *Pouteria richardii* (F. Muell.) Baehni

Tree up to ca 15 m tall. Leaves scattered; petioles 2–3 cm long; blades elliptic, elliptic-oblong or obovate, apex obtuse or shortly obtusely acuminate, base broadly cuneate, often unequal, 9–21 cm × 3–7.5 cm, glabrous, secondary nerves 6–16, ascending at an angle of 60°–75° to midrib. Flowers in few-many-flowered axillary clusters; sepals 1.5–3 mm long, hairy inside and outside; corolla 3–4.5 mm long; ovary with 5 bundles of yellowish or whitish hairs at base. Fruits obovoid, 1–2.2 cm long; seed 1, 0.9–1.5 cm long.

Rainforest of eastern parts of the region. Flowers mainly autumn to spring.

### 6. *Planchonella chartacea* (F. Muell. ex Benth.) H. J. Lam

*Achras chartacea* F. Muell. ex Benth.; *Sideroxylon chartaceum* F. Muell.; *Sersalisia chartacea* (F. Muell.) Domin

Shrub or tree 5–32 m tall. Leaves scattered or clustered at tips of branchlets; petioles 0.7–1.2 cm long; blades obovate or spatulate, apex obtusely or acutely acuminate,

base tapering, (4-)9-20 cm × (1.5-)3-6 cm, glabrous, secondary nerves 7-15, ascending at an angle of 55°-60° to midrib. Flowers in axillary clusters of 3-7; sepals 3.5-4.5 cm long, hairy outside and at apex inside; corolla 3.5-4.5 mm long; ovary densely hirsute. Fruits ovoid or globose, 1.5-2.2 cm long; seeds 2-5, 0.9-2 cm long.

Rainforest of eastern parts of the region. Flowers apparently autumn.

**7. *Planchonella australis* (R. Br.) Pierre** WILD PLUM; BLACK APPLE;  
YELLOW BUTTONWOOD

*Achras australis* R. Br.; *Sideroxylon australis* (R. Br.) F. Muell.; *Sersalisia australis* (R. Br.) Domin; *Pouteria australis* (R. Br.) Baehni

Tree up to 45 m tall. Leaves mostly scattered; petioles 0.2-1.5 cm long; blades obovate, ovate, elliptic or oblong, apex obtuse, acute or obtusely or acutely acuminate, base cuneate, 6-16 cm × 2-6 cm, glabrous, secondary nerves 10-13, ascending at an angle of 50°-75° to midrib. Flowers solitary or in few-flowered clusters, axillary or rarely in clusters along leafless or almost leafless axillary shoot; sepals 3.5-5 mm long, hairy inside and outside; corolla 3-5 mm long; ovary densely tomentose. Fruits purplish black, ovoid, ellipsoid or globose, 1-5.2 cm long; seeds 5, rarely fewer, up to ca 4 cm long. **Fig. 40B.**

Rainforest of eastern parts of the region. Flowers spring-summer. The fruits can be used to make preserves.

**2. AMORPHOSPERMUM F. Muell.**

Trees. Inflorescences axillary, calyx 5-6-lobed; corolla lobes 5-6, rarely 8; stamens as many as corolla lobes, opposite corolla lobes, staminodes absent; ovary 1-3-locular, style short, stigma minute. Fruits ± globular with thin exocarp; seeds ± globular, seed coat woody, hilum wart-like.

2 species endemic in eastern Australia, both occurring in south-eastern Queensland.

- |   |                        |
|---|------------------------|
| 1. Reticulations inconspicuous above and below; young parts exude copious milky latex when cut or broken                        | 1. <i>A. antilogum</i> |
| Reticulations conspicuous, more prominent below than above; young parts exude watery or slightly milky latex when cut or broken | 2. <i>A. whitei</i>    |

**1. *Amorphospermum antilogum* F. Muell.**

*Lucuma amorphosperma* (F. Muell.) F. M. Bailey; *Chrysophyllum antilogum* (F. Muell.) Vink

Tree up to 18 m tall. Leaves with petioles 0.3-1.8 cm long; blades broadly ovate or oblong to obovate, apex emarginate or rounded to obtuse or acute or shortly acuminate, base acuminate, (1.5-)6-16 cm × (0.8-)2-6.5 cm, glabrous above, rusty brown or yellowish brown or greyish hairy below at first, eventually often ± glabrous, reticulations faint above and below. Inflorescences up to 15-flowered; style 3.5-4 mm long. Fruits purplish to light brown, ± globular, 2.5-4 cm × 2.5-4 cm, glabrous; seed 1.

Rainforest of the Moreton and Wide Bay districts from about Brisbane northwards. Flowers mainly spring to autumn. Timber suitable for small turnery.

**2. *Amorphospermum whitei* Aubr.**

Tree, branchlets densely ferruginous hairy. Leaves with petioles 0.5-1 cm long; blades obovate to oblong, apex acuminate, base cuneate to almost obtuse, margin ± undulate, 5-18 cm × 2-6 cm, densely ferruginous hairy on both surfaces when young, soon ± glabrous. Inflorescences of 4-15 flowers; calyx ca 2 mm long; style ca 3.5 mm long. Fruits ± globular, ca 3 mm diameter.

Known in the region from a single specimen from the upper Tallebudgera Ck. in the south-eastern Moreton district.

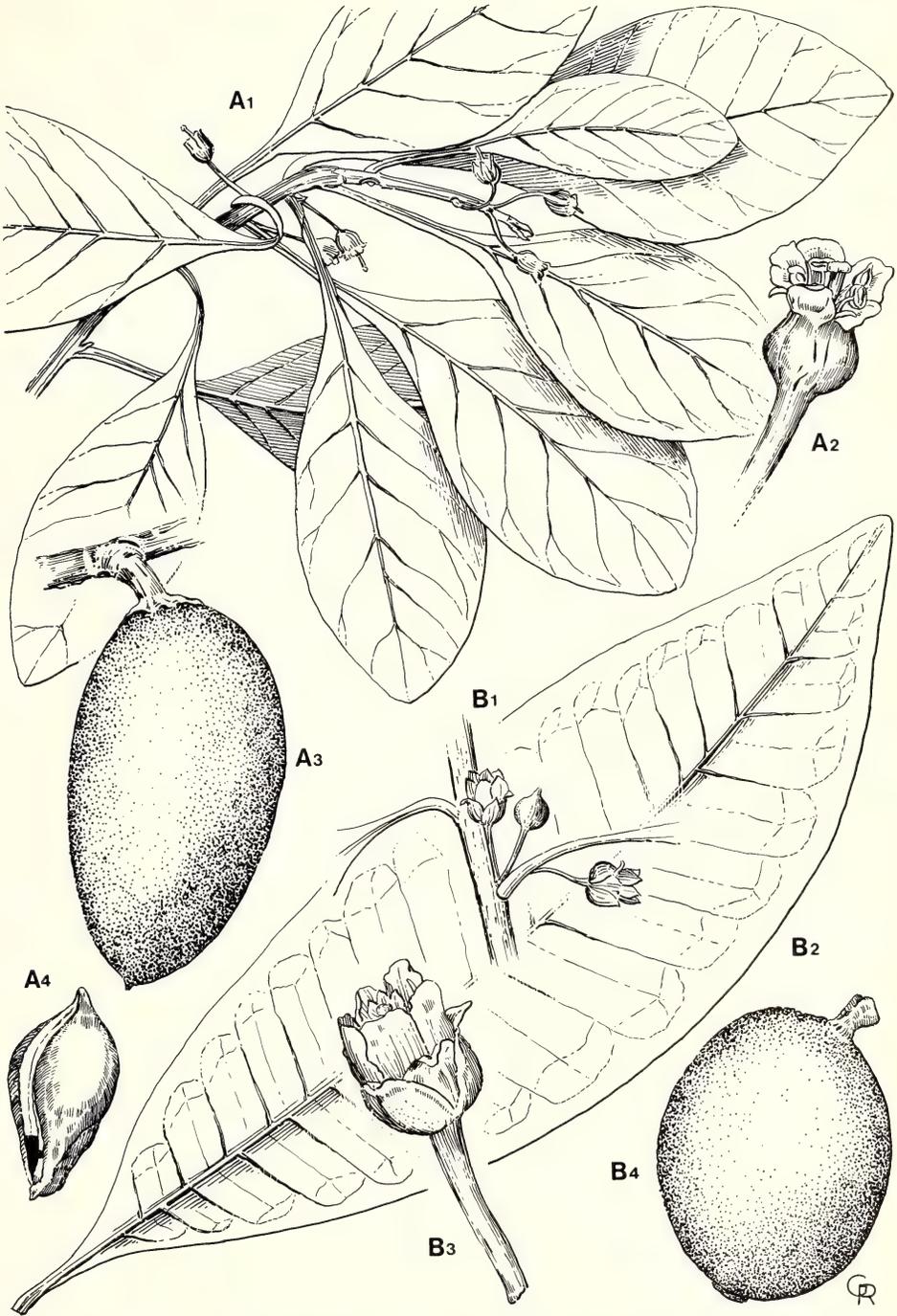


Fig. 40 SAPOTACEAE — A–B *Planchonella* spp. — A<sub>1</sub>–A<sub>4</sub> *P. eerwah*, A<sub>1</sub> portion of flowering stem x1, A<sub>2</sub> flower x3, A<sub>3</sub> fruit x1, A<sub>4</sub> seed x1; B<sub>1</sub>–B<sub>4</sub> *P. australis*, B<sub>1</sub> inflorescence x1, B<sub>2</sub> leaf x1, B<sub>3</sub> flower x3, B<sub>4</sub> fruit x1.

## 3. NIEMEYERA F. Muell.

Trees. Inflorescences axillary; calyx 5-lobed; corolla lobes 5; stamens 5, opposite corolla lobes, staminodes absent; ovary 5-locular, style short, stigma minute. Fruits ± globular to ovoid, with thin exocarp; seeds ovoid, seed coat papery, hilum flat.

2 species endemic in Australia; 1 species south-eastern Queensland.

1. *Niemeyera chartacea* (F. M. Bailey) C. T. White

*Lucuma chartacea* F. M. Bailey; *Chrysophyllum chartaceum* (F. M. Bailey) Vink

Trees up to 20 m tall. Leaves with petioles 0.5–1 cm long; blades narrowly obovate to oblong-obovate, apex acuminate to rounded, base cuneate, margin undulate, 4.5–14 cm × 1.5–4 cm, young leaves and twigs with rusty coloured dense appressed hairs, soon glabrous. Inflorescences with 4 or more flowers; calyx ca 2 mm long; style ca 3 mm long. Fruits black, ovoid, ca 2–2.5 cm × 1–1.3 cm.

Known from rainforest of the eastern Moreton and Wide Bay districts from about Mt. Glorious northwards. Rarely collected. Flowers recorded summer–autumn.

## 116. EBENACEAE

Trees or shrubs, often dioecious. Leaves alternate, rarely opposite, exstipulate. Flowers unisexual; calyx 3–6-lobed; corolla 3–7-lobed; male flowers with vestigial ovary, stamens mostly 2–4 times number of corolla lobes, filaments free or united in pairs, anthers 2-locular, opening longitudinally; female flowers with or without staminodes, ovary superior, 3- or more-locular, ovules 1–2 per loculus. Fruits ± succulent berries.

About 3 genera with 520 species from tropical regions; 1 genus with ca 500 species Australia; 1 genus with 5 species south-eastern Queensland.

## 1. DIOSPYROS L.

Trees or tall shrubs. Leaves alternate, usually 2-ranked, exstipulate, margin entire. Flowers unisexual, actinomorphic; male flowers 1–several together in axillary clusters, female flowers 1 or more together, or sometimes male and female inflorescences cymose with 3–15 flowers; calyx and corolla lobes 3–5; stamens 3–26 in male flowers; females with staminodes, ovary superior, 3–6-locular. Fruits berries.

About 500 species, widespread in warm parts of the world; ca 9 species Australia; 5 species south-eastern Queensland.

- |  |                          |   |
|--|--------------------------|---|
| 1. Calyx and corolla lobes 5 . . . . .   | 1. <i>D. pentamera</i>   | 2 |
| Calyx and corolla lobes 3 or 4 . . . . .   |                          |   |
| 2. Calyx and corolla lobes 4 . . . . .   | 2. <i>D. australis</i>   | 3 |
| Calyx and corolla lobes 3, rarely 4 . . . . .  |                          |   |
| 3. Ovaries 6-locular; stamens 8–26; fruiting calyces markedly increasing in size with age . . . . .  | 3. <i>D. fasciculosa</i> | 4 |
| Ovaries 3-locular; stamens 3–10; fruiting calyces not markedly increasing in size with age . . . . . |                          |   |
| 4. Female inflorescences cymose, usually 3–15-flowered . . . . .                                     | 4. <i>D. sp. 1.</i>      |   |
| Female inflorescences simple, 1-flowered or rarely 2-flowered . . . . .                              | 5. <i>D. ferrea</i>      |   |

1. *Diospyros pentamera* (Woolfs & F. Muell.) F. Muell. MYRTLE EBONY;  
BLACK MYRTLE

*Cargillia pentamera* Woolfs & F. Muell.

Tree up to ca 40 m tall, stem diameter up to ca 60 cm; branchlets zig-zag. Leaves with petioles 2–5 mm long; blades coriaceous, narrowly ovate to ovate to elliptic-oblong, apex narrowed to acute or obtuse tip, base cuneate, 3–10 cm × 1–3.5 cm, young leaves

sparsely appressed hairy, becoming  $\pm$  glabrous with age. Male flowers several together, 4-merous, calyx *ca* 2 mm long, pubescent, corolla *ca* 4 mm long, silky hairy; female flowers solitary, 5-merous, calyx tube *ca* 2 mm long, lobes *ca* 2–3 mm long, corolla 3–4 mm long. Fruits  $\pm$  globular, *ca* 8–10 mm diameter.

Rainforest of the region. Flowers spring–summer. Wood suitable for golf club heads, flooring, inlays, hard turnery etc.

## 2. *Diospyros australis* (R. Br.) Hiern

## BLACK PLUM

*Cargillia australis* R. Br.

Shrub or small tree up to *ca* 15 m tall. Leaves with petioles 4–6 mm long; blades coriaceous, ovate-oblong or oblong-elliptic, apex obtuse, base cuneate, 3.5–12 cm  $\times$  1.5–4 cm, young leaves densely appressed hairy below, less densely so above, becoming glabrous. Male flowers several together, 4-merous, calyx *ca* 2 mm long, corolla *ca* 5 mm long, silky hairy; female flowers solitary or few together, 4-merous calyx tube *ca* 1.5–2 mm long, lobes *ca* 1 mm long, corolla *ca* 5 mm long, silky hairy. Fruits ovoid, *ca* 9–10 mm long. **Fig. 41A.**

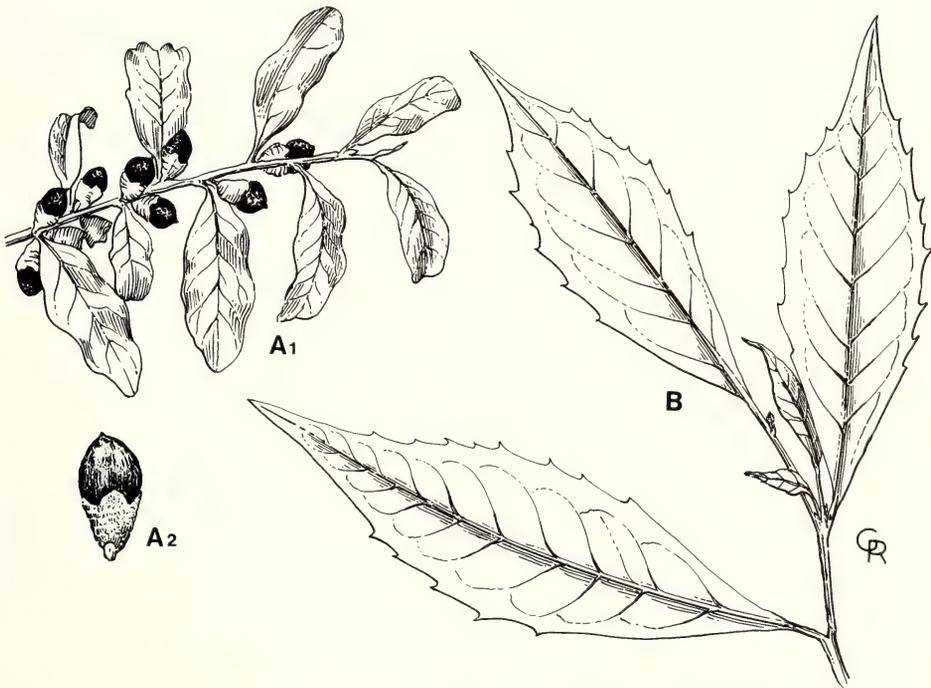
Widespread in the region in rainforest and depauperate rainforest. Flowers mainly spring–summer.

## 3. *Diospyros fasciculosa* (F. Muell.) F. Muell.

*Maba fasciculosa* F. Muell.

Tree up to *ca* 20 m tall, stem diameter up to *ca* 40 cm. Leaves with petioles 0.5–1.2 cm long; blades ovate-oblong or elliptic-oblong, 5–20 cm  $\times$  1.5–7 cm, young leaves sparsely hairy at least below. Male flowers 3-merous, several together in dichotomous cymes, calyx *ca* 2 mm long, corolla *ca* 4–6 mm long; female flowers 3-merous, calyx *ca* 2 mm long, corolla *ca* 4–6 mm long, sparsely hairy. Fruiting calyces 1–1.5 cm diameter; fruits  $\pm$  globular, 0.7–1.5 cm diameter.

Rainforest of the Moreton and Wide Bay districts. Flowers mainly spring. Wood suitable for flooring, small turnery etc.



**Fig. 41** A EBENACEAE — A<sub>1</sub>–A<sub>2</sub> *Diospyros australis*, A<sub>1</sub> portion of fruiting stem x1, A<sub>2</sub> fruit x2; B SYMPLOCACEAE — B *Symplocos bauerlenii*, leaves x1.

**4. *Diospyros* sp. 1.**

*Diospyros ellipticifolia* (Stokes) Bakh, forma *australiensis* Bakh.

Small tree. Leaves with petioles 2–3 mm long; blades elliptic-oblong or ovate-oblong, apex mostly drawn out to acute or rounded tip, sometimes acute or obtuse, base rounded, 2.5–8 cm × 1–2.5 cm, young leaves sparsely appressed hairy, becoming ± glabrous with age. Male flowers not seen; female flowers 3 or more in cymose inflorescences. Fruiting inflorescences mostly with single fruit but rachis with lateral scars; fruits ± ovoid, 6–10 mm long, silky hairy.

Rainforest of north-eastern Moreton district and eastern Wide Bay district.

The taxon described above probably represents an unnamed species or at least a new subspecies of ***Diospyros elliptica*** (J. R. & G. Forster) P. S. Green (*Diospyros ellipticifolia* (Stokes) Bakh. nom. illeg.)

**5. *Diospyros ferrea* (Willd.) Bakh.**

Shrubs or small trees up to ca 8 m tall. Leaves variable. Male flowers 3-merous in small clusters, calyx ca 2.5–3 mm long, corolla ca 4 mm long, silky hairy; female flowers solitary, 3-merous, calyx ca 2.5–3 mm long, lobed to about middle, corolla ca 4 mm long, silky hairy. Fruits ovoid, 0.8–1.2 cm × 0.5–0.9 cm.

Two varieties occur in the region:

- |                                 |           |                                       |
|---------------------------------|-----------|---------------------------------------|
| 1. Leaves 2.5–7.5 cm × 2–3.5 cm | . . . . . | <i>D. ferrea</i> var. <i>geminata</i> |
| Leaves 1–3 cm × 0.5–2.5 cm      | . . . . . | <i>D. ferrea</i> var. <i>humilis</i>  |

***Diospyros ferrea* var. *geminata*** (R.Br.) Bakh. (*Maba geminata* R.Br.) is found in rainforest in eastern and northern parts of the region. Flowers apparently summer. ***D. ferrea* var. *humilis*** (R.Br.) Bakh. (*Maba humilis* R. Br.) is widespread in the region in depauperate rainforest. Flowers spring-summer. Ripe fruits were eaten by aborigines.

**117. OLEACEAE**

Trees, shrubs or climbers. Leaves opposite or rarely alternate, exstipulate, simple or pinnate. Flowers bisexual, rarely unisexual, actinomorphic; calyx lobed or dentate, rarely absent; petals absent or present, free or connate, often 4; stamens usually 2; ovary superior, 2-locular, ovules usually 2 per loculus, style simple with capitate or bifid stigma. Fruits capsules, berries or drupes.

29 genera with ca 900 species, cosmopolitan; 5 genera with 32 species Australia; 4 genera with 14 species south-eastern Queensland.

- |  |           |                     |   |
|--|-----------|---------------------|---|
| 1. Corolla lobes 5 or more   | . . . . . | 1. <i>Jasminum</i>  |   |
| Corolla lobes less than 5  | . . . . . |                     | 2 |
| 2. Fruits berries  | . . . . . | 2. <i>Ligustrum</i> |   |
| Fruits drupes  | . . . . . |                     | 3 |
| 3. Corollas with short tube and 4 lobes                                | . . . . . | 3. <i>Olea</i>      |   |
| Corollas of 4 free petals which may be connected in 2 pairs by stamens | . . . . . | 4. <i>Notelaea</i>  |   |

**1. JASMINUM L.**

Shrubs or climbers. Leaves opposite or rarely alternate, either pinnate with 3 or more leaflets or apparently simple, reduced to 1 leaflet. Flowers in axillary or terminal panicles or cymes, rarely solitary; corolla tube cylindrical, lobes 5–8, spreading; stamens 2, included in tube; ovules 1 per loculus, style minutely 2-lobed. Fruits berries, 2-lobed almost to base with 2 seeds, or entire by abortion of a loculus, with 1 seed.

About 300 species from tropical and subtropical areas, except the Americas; 8 species Australia, 5–6 endemic; 4 species south-eastern Queensland.

The species are all known as NATIVE JASMINES.

- |   |                             |
|---|-----------------------------|
| 1. Leaves simple (1-foliolate)  | 2                           |
| Leaves 3-foliolate  | 3                           |
| 2. Stems, petioles and undersides of leaves puberulent to finely velutinous; leaves 2–5 cm wide; calyx lobes stout, 0.4–1.2 cm long                               | 1. <i>J. sp. 1</i>          |
| Stems, petioles and undersides of leaves glabrous or if with a few hairs then leaves less than 1 cm wide; calyx lobes up to 0.4 cm long, rarely up to 0.5 cm long | 2. <i>J. simplicifolium</i> |
| 3. Stems, petioles and leaves pubescent–tomentose; inflorescences mostly 1–5-flowered   | 3. <i>J. dallachii</i>      |
| Stems, petioles and leaves glabrous or minutely puberulent; inflorescences mostly 5–50-flowered   | 4. <i>J. didymum</i>        |

### 1. *Jasminum* sp. 1.

Shrub or vine; stems puberulent or thinly velutinous. Leaves simple; petioles 0.5–1.5 cm long, puberulent or finely velutinous; blades ovate to broadly ovate-elliptic, apex acute, or acuminate to obtuse, base cuneate, margin entire, 4–10 cm × 2–5 cm, glabrous above, finely puberulent to glabrous below, venation raised, reticulate above and below, 1–2 intramarginal veins present. Inflorescences terminal on shoots, 3–9 flowered, pedicels 1–2 cm long; calyx minutely puberulent, tube 2–3 mm long, lobes 5–6, stout, 0.4–1.2 cm long; corolla unknown. Fruits *ca* 1.2 cm broad.

Known in the region from a single collection from Mt. Glorious near Brisbane, also known from northern Queensland.

### 2. *Jasminum simplicifolium* G. Forster

Two subspecies occur in the region:

- |  |  |
|--|--|
| 1. Calyx lobes up to 1 mm long, equal to or shorter than tube; leaves 1 cm or more broad | (a) <i>J. simplicifolium</i><br>subsp. <i>australiense</i> |
| Calyx lobes more than 1 mm long, longer than tube; leaves mostly less than 1 cm broad    | (b) <i>J. simplicifolium</i><br>subsp. <i>suavissimum</i>  |

#### (a) *Jasminum simplicifolium* subsp. *australiense* P. S. Green

*Jasminum volubile* Jacq.; *J. simplicifolium* auct. Aust. non G. Forster

Scrambling shrub or climber; stems glabrous. Leaves simple; petioles 0.5–1 mm long, rarely longer; blades broadly ovate to ovate to narrowly ovate or elliptic, apex acute or obtuse, sometimes ± acuminate, base rounded or acute, margin entire, (2–)3–7(–9) cm × 1–5(–6) cm, glabrous, 2 lateral veins present. Inflorescences terminal on shoots, cymose-paniculate, 11–many-flowered, pedicels mostly 2–6 mm long; calyx tube up to *ca* 2 mm long, lobes 5–8, mostly 0.25–1 mm long; corolla white, fragrant, tube mostly 8–10 mm long, lobes 5–8, mostly 6–8 mm long. Fruits *ca* 1.2 cm × 1 cm.

Widespread and moderately common in the region, mostly in depauperate rainforest. Flowers spring to autumn.

#### (b) *Jasminum simplicifolium* subsp. *suavissimum* (Lindl.) P. S. Green

*Jasminum suavissimum* Lindl.

Subshrub or trailing scrambler; stems glabrous or minutely puberulent. Leaves simple; petioles 1–2 mm long; blades linear or very narrowly ovate or very narrowly elliptic, apex acute, base slightly rounded, margin entire, (1–)2.5–5(–7) cm × 0.15–0.5(–1) cm, glabrous, venation obscure. Inflorescences terminal, cymose, 1–7-, rarely 9-flowered, pedicels 0.5–2 cm long; calyx tube 1–2 mm long, lobes 5–6, 1.5–4(5) mm long; corolla white, fragrant, tube mostly 8–10 mm long, lobes mostly 7–8, rarely fewer, mostly 7–9 mm long. Fruits 7–8 mm × 6–7 mm. **Fig. 42A.**

Widespread and moderately common in open eucalypt communities in coastal parts of the region. Flowers spring–summer.

**3. *Jasminum dallachii* F. Muell.**

*Jasminum didymum* G. Forster var. *pubescens* Benth.; *J. singuliflorum* F. M. Bailey; *J. didymum* var. *dallachii* (F. Muell.) Domin

Scrambling or twining shrub or climber; stems pubescent or tomentose. Leaves 3-foliolate; petioles mostly 0.4–1.5 cm long, tomentose; petiolule of terminal leaflet mostly 0.5–1 cm long; leaflet blades broadly ovate, ovate or elliptic, apex acute or subacuminate, apiculate, base obtuse or truncate, margin entire, mostly 1–4.5 cm × 1–3 cm, terminal larger, all leaflets tomentose, venation impressed above, raised below, domatia present in axils of primary veins. Inflorescences axillary, cymose, 1–5-, rarely 7-flowered, pedicels 4–5 mm long; calyx tube 1–2 mm long, lobes 5, 0.5–1 mm long; corolla red or purplish outside, whitish on inner surface of lobes, tube 8–9 mm long, lobes 5, 3–5 mm long. Fruits 6 mm × 5 mm. **Fig. 42C.**

Rainforest of the Moreton and Wide Bay districts at altitudes above 200 m. Flowers winter-spring.

**4. *Jasminum didymum* G. Forster**

Three subspecies occur in the region:

- |   |   |   |
|---|---|---|
| 1. Most leaflets less than 1 cm broad . . . . .                               | (a) <i>J. didymum</i> subsp. <i>lineare</i>   | 2 |
| Most leaflets 1.5 cm or more broad . . . . .                                  |   |   |
| 2. Terminal leaflet more than 4 cm long; pedicels 0.6–1 mm diameter . . . . . | (b) <i>J. didymum</i> subsp. <i>didymum</i>   |   |
| Terminal leaflet up to 4 cm long; pedicels up to 0.5 mm diameter . . . . .    | (c) <i>J. didymum</i> subsp. <i>racemosum</i> |   |

**(a) *Jasminum didymum* subsp. *lineare* (R. Br.) P. S. Green**

*Jasminum lineare* R. Br.

Prostrate or straggling shrub or climber; young stems glabrous or puberulent. Leaves 3-foliolate; petioles mostly 0.3–2 cm long; petiolule of terminal leaflet mostly 0.4–1 cm long; leaflet blades linear or broadly linear, apex acute, apiculate, base attenuate, mostly 2–10 cm × 0.3–0.8 cm, terminal one larger than laterals. Inflorescences axillary, mostly 5–15-flowered, with flowers alternately distichous or sometimes cymose-subcorymbose; calyx tube *ca* 1.5 mm long, lobes 5, ± obscure or up to 1 mm long; corolla whitish, tube mostly 4–8 mm long, lobes mostly 5, 2.5–4.5 mm long. Fruits globose, 1–1.2 cm diameter.

Occasional in western parts of the region in open woodland, often on red sands and loams. Flowers found most of the year.

**(b) *Jasminum didymum* subsp. *didymum***

*Jasminum didymum* var. *typicum* Domin

Scandent shrub or climber; young stems glabrous or puberulent. Leaves 3-foliolate; petioles mostly 1–2.5 cm long; petiolule of terminal leaflet mostly 1–1.5 cm long; leaflet blades broadly ovate or broadly elliptic or ovate, apex acute or rounded, base rounded or ± attenuate, 3–10 cm × 2.5–6.5 cm, terminal one larger than laterals. Inflorescences axillary or terminal on side shoots, cymose-paniculate, 15–many-flowered; calyx tube 1.5 mm long, entire or with 5 obscure teeth or lobes; corolla white, tube 6–10 mm long, lobes mostly 5, 4–6 mm long. Fruits globular, 1–1.2 cm diameter.

Not common in the region, found in coastal parts of the Wide Bay and Moreton districts in depauperate rainforest or on rainforest margins, usually on stabilized sand or skeletal soils. Flowers late summer to spring.

**(c) *Jasminum didymum* subsp. *racemosum* (F. Muell.) P. S. Green**

*Jasminum racemosum* F. Muell.

Creeping shrub or climber; young stems glabrous or puberulent. Leaves 3-foliolate; petioles mostly 0.5–1 cm long; petiolule of terminal leaflet mostly 4–6 mm long; leaflet blades narrowly ovate to ovate, occasionally ± orbicular, apex acute or obtuse,

rounded-apiculate, base acute to rounded, mostly 1–4 cm × 0.5–2.5 cm. Inflorescences axillary, cymose-paniculate, mostly 9–many-flowered; calyx tube 0.5–1 mm long, entire or with 5 obscure teeth; corolla white, tube mostly 5–8 mm long, lobes mostly 5–6, mostly 3–4 mm long. Fruits globular, *ca* 8 mm diameter. **Fig. 42B.**

Widespread and moderately common in the region, mostly in depauperate rainforest. Flowers summer–autumn.

Intermediates between the above subspecies are frequent.

## 2. LIGUSTRUM L.

Shrubs or rarely trees. Leaves opposite, entire. Flowers numerous in terminal panicles; calyx small, 4-toothed; corolla tube short, lobes 4, spreading; stamens 2; ovules 2 per loculus, style short. Fruits berries; seeds 4 or fewer.

About 40–50 species from Europe, eastern and southern Asia to Australia; 1 endemic and 2 naturalized species Australia; 2 species south-eastern Queensland.

- |   |                      |
|---|----------------------|
| 1. Plants glabrous . . . . .                                  | 1. <i>L. lucidum</i> |
| Inflorescences, young branches and leaves pubescent . . . . . | 2. <i>L. sinense</i> |

### 1. \**Ligustrum lucidum* Aiton

TREE PRIVET; LARGELEAF PRIVET;  
BROADLEAF PRIVET

Shrub or small tree up to *ca* 10 m tall, glabrous. Leaves ovate to elliptic to narrowly ovate, apex acute-acuminate, base rounded, 5–13 cm × 3–5.5 cm. Panicles up to *ca* 20 cm long; corolla white, tube *ca* 1 mm long, lobes *ca* 2 mm long; stamens exserted. Berries bluish black, *ca* 8 mm long.

Native of China and Japan, cultivated in the region often as a hedge or windbreak; naturalized in the Moreton district, mainly in or near rainforest. Flowers spring–summer. Suspected of poisoning cattle and children but there is no proof of toxicity.

### 2. \**Ligustrum sinense* Lour.

CHINESE PRIVET; SMALL LEAVED PRIVET

Shrub or small tree up to *ca* 3 m tall, inflorescences, young branches and leaves pubescent. Leaves elliptic to narrowly ovate, apex acute-acuminate, base cuneate, 2.5–5 cm × 1.5–2.5 cm, leaves on flowering branchlets smaller. Panicles up to *ca* 10 cm long; corolla white, tube *ca* 0.5 mm long, lobes up to *ca* 2 mm long. Berries *ca* 5 mm long.

Native of China, often cultivated; naturalized in the Moreton and Wide Bay districts. Flowers late winter–spring.

## 3. OLEA L.

Shrubs or trees. Leaves opposite, entire. Inflorescences axillary or rarely terminal panicles or clusters; calyx lobes 4; corolla with short tube and 4 lobes; styles short. Fruits drupes; seed solitary or rarely 2.

About 20 species from the Mediterranean region, Africa, eastern Asia, Australia and New Zealand; 1 native and 1–2 naturalized species Australia; 1 species south-eastern Queensland.

### 1. *Olea paniculata* R. Br.

AUSTRALIAN OLIVE; NATIVE OLIVE

Tree up to 30 m tall, stem diameter up to 70 cm, plant glabrous, branchlets lenticellate. Leaves with petioles 0.8–1.2 cm long; blades narrowly ovate to elliptic, apex acuminate, base rounded-cuneate, margin entire, 5–14 cm × 1.5–6 cm. Inflorescences panicles; flowers *ca* 5 mm diameter; calyx *ca* 1.5 mm diameter; corolla lobes *ca* 2 mm long. Drupes ovoid, *ca* 1 cm long. **Fig. 42E.**

In or near rainforest of the region. Flowers found most of the year. Timber suitable for fine carvings, inlays, hard turnery and flooring.

## 4. NOTELAEA Vent.

Shrubs or trees. Leaves opposite, simple. Inflorescences axillary, bracts soon deciduous; flowers bisexual; calyx lobes 4; corolla of 4 free petals which may be joined in 2 pairs by stamens, the pairs  $\pm$  free, enclosing stamens; stamens 2; stigma 2-lobed. Fruit drupes; seed solitary.

9 species endemic in Australia; 7 species south-eastern Queensland.

- |   |   |
|---|---|
| 1. Venation of leaves obscure above . . . . .   | 2   |
| Venation of leaves conspicuous and $\pm$ reticulate above . . . . .   | 3   |
| 2. Leaves less than 8 mm broad . . . . .  | 1. <i>N. linearis</i>                       |
| Leaves more than 8 mm broad . . . . .   | 2. <i>N. johnsonii</i>                      |
| 3. Leaf venation below $\pm$ as prominent as that above . . . . .   | 4   |
| Leaf venation below more obscure than above . . . . .   | 6   |
| 4. Secondary veins all $\pm$ evenly, finely and prominently reticulate, not clearly merging with the marginal thickening of the blade; ripe fruit clearly longer than broad . . . . . | 3. <i>N. venosa</i>                         |
| Secondary veins coarsely reticulate, merging with the marginal thickening of the blade; ripe fruits only slightly longer than broad . . . . .   | 5   |
| 5. Leaf margins entire, except for juvenile or sucker growth; shrubs or trees up to 7 m tall . . . . .  | 4. <i>N. longifolia</i> forma <i>glabra</i> |
| Leaf margins crenulate, sometimes shallow and irregular; shrubs 0.5–1 m tall . . . . .  | 5. <i>N. ovata</i>                          |
| 6. Inflorescences 4–8 cm long; fruits 1.8–2 cm long . . . . .   | 2. <i>N. johnsonii</i>                      |
| Inflorescences up to 3 cm long; fruits up to 1 cm long . . . . .  | 7   |
| 7. Inflorescences glabrous or occasionally with few scattered hairs at base; corolla lobes 2–3 mm long; bushy shrubs up to ca 2 m tall  | 6. <i>N. punctata</i>                       |
| Inflorescences puberulous, especially towards base; corolla lobes 1.4–2 mm long; shrubs or trees up to ca 10 m tall . . . . .   | 7. <i>N. microcarpa</i>                     |

1. *Notelaea linearis* Benth.

Shrub 1–2 m tall, branchlets  $\pm$  glabrous. Leaves with petioles 1–3(–4) mm long; blades linear or rarely very narrowly ovate, apex acute, base narrowed into petiole, margin entire, 2–11.5 cm  $\times$  0.15–0.7 cm, punctate especially below, glabrous, venation completely obscure. Inflorescences 0.4–1 cm long, glabrous to puberulous; calyx 0.5–1 mm long; corolla lobes ca 2 mm long. Drupes white or blue, ovoid, 5–7 mm  $\times$  4–5 mm.

On siliceous soils in eucalypt forests of the southern Darling Downs and Moreton districts. Flowers spring.

2. *Notelaea johnsonii* P. S. Green

Shrub or small tree up to 6 m tall, branchlets minutely puberulous to glabrous. Leaves with petioles 0.2–1.2 cm long; blades usually elliptic or narrowly elliptic, apex  $\pm$  acute, base acute or obtuse, margin entire or somewhat crenulate, 4–12 cm  $\times$  1–5 cm, sometimes  $\pm$  punctate, glabrous, primary veins usually visible, secondary veins usually obscure. Inflorescences 4–8 cm long, minutely puberulous or at least with few hairs when young; calyx 0.7–1 mm long; corolla lobes 1.2–1.5 mm long. Drupes bluish black, obliquely ellipsoid, 1.8–2 cm  $\times$  0.9–1 cm.

Known from rainforest of the McPherson Ra. in the southern Moreton district and south-eastern Darling Downs district. Flowers apparently spring–summer.

3. *Notelaea venosa* F. Muell.

*Notelaea longifolia* Vent. var. *pedicellaris* Domin

Bushy shrub or small tree 1.5–6 m tall, rarely taller, branchlets glabrous or puberulous. Leaves subsessile or with petioles 0.5–3 cm long, rarely longer; blades narrowly ovate to elliptic, apex acute, base acute or rounded or subcordate, margin entire or shallowly crenulate especially in upper part, 4–17 cm  $\times$  1–6 cm, larger in

juveniles, obscurely punctate, often minutely puberulous when young, later glabrous, venation raised, finely and evenly reticulate especially below. Inflorescences 1–7 cm long, glabrous; calyx 0.5 mm long; corolla lobes 1.5–2.5 mm long. Drupes usually dark purple to blackish, ellipsoid-ovoid, 1.1–1.5 cm × 0.8–1 cm.

Known from mountain tops of the southern Moreton district. Flowers spring to autumn.

Further study may show that the Queensland taxon is a distinct variety.

#### 4. *Notelaea longifolia* Vent. forma **glabra** P. S. Green

*Notelaea longifolia* var. *decomposita* Domin

Shrub or tree up to 7 m tall, rarely taller, whole plant glabrous. Leaves with petioles 0.2–2.5 cm long; blades narrowly ovate to ovate or elliptic, apex acute to ± attenuate, base acute to obtuse, margin entire, rarely obscurely crenulate, 3.5–16 cm × 1–5.5 cm, venation raised and reticulate. Inflorescences 1–2.5 cm long, lengthening after anthesis; calyx 0.5–1 mm long; corolla lobes 1.5–2.5 mm long. Drupes dark purple or bluish black, 1–1.6 cm × 0.8–1.2 cm. **Fig. 42D.**

Widespread in the eastern part of the region. Flowers found most of the year.

#### 5. *Notelaea ovata* R. Br.

*Notelaea longifolia* Vent. var. *ovata* (R. Br.) Domin

Shrub 0.5–1 m tall, young stems densely puberulous. Leaves with petioles 0.1–1 cm long; blades very broadly ovate to ovate to narrowly ovate, occasionally elliptic to broadly elliptic, apex acute or occasionally acuminate, base rounded or sometimes subcordate, or ± acute, margin crenulate, 2.5–14 cm × 1.2–6 cm, punctate, glabrous or minutely puberulous when young, venation raised and reticulate. Inflorescences 1–3.5 cm long, ± puberulous especially towards base; calyx 0.5–1 mm long; corolla lobes 1.5–2.5 mm long. Drupes ovoid, 1–1.2 cm × 0.8–1 cm.

Found in eastern parts of the region, often on sandy coastal soils and on sandstone hills and ridges. Flowers found most of the year.

#### 6. *Notelaea punctata* R. Br.

Bushy shrub up to ca 2 m tall, branchlets glabrous or minutely puberulous when young. Leaves with petioles 0.2–1 cm long; blades narrowly ovate to narrowly elliptic to elliptic, apex ± acute, base acute or cuneate, margin ± entire, 3.5–13 cm × 1–5 cm, punctate above and below, glabrous, venation raised and clearly visible above, less clearly so below. Inflorescences 1–3 cm long, ± glabrous; calyx 0.5–1 mm long; corolla lobes 2–3 mm long. Drupes ovoid, 7–9 mm × 5–6 mm.

Uncommon, known from the Moreton, Burnett and Wide Bay districts in eucalypt forests and woodlands on sandy soils on sandstone plateaux and ranges. Flowers found most of the year.

#### 7. *Notelaea microcarpa* R. Br.

NATIVE OLIVE

Shrub or tree up to 10 m tall, branchlets puberulous when young. Leaves with petioles 1–10 mm long; blades narrowly ovate to linear-ovate, apex acute or obtuse, apiculate, base cuneate to attenuate, margin entire, 2–15 cm × 0.3–3 cm, scattered punctate, venation raised and reticulate above, less so below. Inflorescences 0.5–2 cm long, puberulous especially towards base or rarely ± glabrous; calyx 0.3–0.6 mm long; corolla lobes 1.4–2 mm long. Drupes dark blue, blackish or purple, ovoid, 7–10 mm × 5–8 mm.

Two varieties occur in the region:

- |   |           |   |
|---|-----------|---|
| 1. Leaves glabrous or only with scattered hairs above and below | . . . . . | <i>N. microcarpa</i> var. <i>microcarpa</i> |
| Leaves densely velvety hairy, especially below                  | . . . . . | <i>N. microcarpa</i> var. <i>velutina</i>   |

*N. microcarpa* var. *microcarpa* is widespread and moderately common in the region. *N. microcarpa* var. *velutina* (F. M. Bailey) P. S. Green (*N. longifolia* Vent. var. *velutina* F. M. Bailey) is restricted to the south-eastern Darling Downs district. Flowers found most of the year.

Hybridization occurs between some of the above species, often making positive identification difficult.



Fig. 42 OLEACEAE — A–C *Jasminum* spp. — A *J. simplicifolium* subsp. *suavissimum*, portion of flowering stem x1; B *J. didymum* subsp. *racemosum*, portion of flowering stem x1; C *J. dallachii*, portion of flowering stem x1; D<sub>1</sub>–D<sub>2</sub> *Notelaea longifolia* forma *glabra*. D<sub>1</sub> portion of flowering stem x1, D<sub>2</sub> flower x6; E<sub>1</sub>–E<sub>2</sub> *Olea paniculata*, E<sub>1</sub> inflorescence x1, E<sub>2</sub> fruiting stem x1.

## 118. LOGANIACEAE

Shrubs or trees, sometimes climbers or herbs. Leaves opposite or entire, connected at base by a line or stipular sheath. Flowers in terminal or axillary cymes or panicles, or solitary, bracts small or large; calyx 4–5-lobed or 4–5-partite; corolla tubular, lobes 4–5; stamens 4–5, inserted in corolla tube, anthers 2-locular, opening lengthwise; ovary superior, rarely semi-inferior, 2–3-locular, style simple or 2-lobed. Fruits capsules, septicidally 2–3-valved, sometimes loculicidally valved; seeds sometimes winged.

7 genera with 130 species, tropics and a few warm areas of the world; 4 genera with *ca* 13 species Australia; 1 genus with 2 species south-eastern Queensland.

### 1. LOGANIA R. Br.

Herbs, undershrubs or shrubs. Flowers usually small, often unisexual, bracts small; calyx 5-fid, rarely 4-fid; corolla campanulate or with cylindrical tube, lobes 5, rarely 4; stamens 5, rarely 4, inserted in tube; ovary 2-locular, style simple, stigma capitate or oblong, undivided. Capsules septicidally dehiscent.

25 species Australia, New Caledonia and New Zealand; *ca* 22 species Australia; 2 species south-eastern Queensland.

- |  |                        |
|--|------------------------|
| 1. Flowers in axillary cymes or panicles . . . . . | 1. <i>L. albiflora</i> |
| Flowers solitary, axillary . . . . .               | 2. <i>L. pusilla</i>   |

#### 1. *Logania albiflora* (Andr.) Druce

*Euosma albiflora* Andr.; *Logania floribunda* R. Br.

Erect shrub up to *ca* 2 m tall. Leaves with petioles up to *ca* 1 cm long; blades narrowly ovate or  $\pm$  linear, apex acute to acuminate, base attenuate, margin flat or recurved, 2–6 cm  $\times$  0.2–1.4 cm, green above, pale beneath. Flowers in axillary trichotomous cymes or panicles, usually much shorter than leaves, rarely reduced to  $\pm$  simple racemes; calyx up to 1 mm long; corolla white, 2–3 mm long. Capsules *ca* 4 mm long.

Known from the Moreton, Darling Downs and Burnett districts mainly in open forest in granite or basalt areas, not common. Flowers spring.

#### 2. *Logania pusilla* R. Br.

Herb up to *ca* 15 cm tall. Leaves with petioles 2–4 mm long; blades obovate to elliptic to oblong, apex obtuse to acute, base cuneate to attenuate, margin entire, 0.8–1.5 cm  $\times$  0.4–0.7 cm, green above, pale beneath. Flowers solitary, axillary, sessile or peduncles up to 2 mm long; calyx 3–4 mm long; corolla white, 4–8 mm long. Capsules *ca* 4 mm long.

Known from a few collections in the vicinity of Brisbane. Flowers apparently spring.

## 119. BUDDLEJACEAE

Trees or shrubs, rarely herbs, indumentum when present glandular, stellate or lepidote. Leaves opposite or verticillate, entire or coarsely dentate, united at base by stipular line. Flowers in cymes racemes panicles or heads; calyx 4-lobed; corolla tubular, lobes 4; stamens 4, inserted in corolla tube, filaments free or anthers sessile, anthers 2-locular, opening lengthwise; ovary superior, 2-locular, rarely 4-locular, style single, stigma capitate, entire or 2-lobed. Fruits usually capsules, rarely drupes or berries; seeds often winged or produced at each end.

About 10 genera with 150 species from tropical and warm temperate regions; 1 genus with 1 species Australia, occurring in south-eastern Queensland.

**1. BUDDLEJA L.**

Shrubs or small trees, hairy and glandular. Leaves often thick, often wrinkled, frequently dentate or crenate. Cymes many-flowered, variously grouped into terminal and lateral panicles; corolla lobes spreading; stamens inserted in mouth of corolla. Capsules oblong, septicidally dehiscent; seeds small and numerous.

About 100 species from tropical and subtropical areas, especially eastern Asia; 1 species naturalized Australia, occurring in south-eastern Queensland.

**1. \**Buddleja madagascariensis* Lam.**

BUDDLEIA

*Nicodemia madagascariensis* (Lam.) R. Parker

Straggling shrub up to *ca* 6 m tall, branchlets densely tomentose. Leaves with petioles mostly 1.5–2.5 cm long; blades ovate-oblong, apex acuminate, base rounded or cordate, margin entire, 7–15 cm × 2–5 cm, dark green and glabrous above, densely white or yellowish tomentose below. Panicles up to *ca* 25 cm long; flowers yellow. Fruits berries.

Native of Madagascar, widely cultivated, persisting in old gardens and possibly naturalized in a few places in the southern Moreton district. Flowers spring.

**120. STRYCHNACEAE**

Trees or shrubs, often climbing, branchlets sometimes with spines or tendrils. Leaves opposite, entire. Flowers usually in cymes or corymbose panicles, rarely solitary, bracts small; calyx 5–4-lobed or-partite; corolla tube usually short, lobes 4–5; stamens 4–5, anthers 1–2-locular, opening lengthwise; ovary superior, 2-locular, style usually short, stigma capitate or 2-lobed. Fruits drupes or berries.

4 genera with 250 species tropical and subtropical parts of the world; 1 genus with 3 species Australia; 1 genus with 1 species south-eastern Queensland.

**1. STRYCHNOS L.**

Usually lianas, sometimes shrubs or trees, usually with axillary tendrils and sometimes with axillary thorns. Leaves mostly with 3–5, rarely 7 longitudinal nerves. Inflorescences terminal or axillary thyrsoid panicles; flowers 5-, rarely 4-merous; calyx deeply divided; corolla rotate to salverform; stamens exerted; ovary 2-locular, style cylindrical, stigma slightly 2-lobed. Fruits berries with rind usually hard.

About 200 species mostly from tropical parts of the world; 3 species Australia; 1 species south-eastern Queensland.

**1. *Strychnos axillaris* Colebr.**

*Strychnos pilosperma* F. Muell.; *S. arborea* W. Hill

Liana, or in Australia shrub or tree up to *ca* 19 m tall with stem diameter of *ca* 30 cm, often armed with slender spines up to *ca* 2.5 cm long. Leaves rhomboid to suborbicular or elliptic to lanceolate, apex acute to acuminate, base cuneate to rounded, margin entire, 1.5–8 cm × 1–6 cm (larger overseas), 3–5-nerved at base. Inflorescences terminal and axillary; flowers 5-merous; calyx 1–2 mm long; corolla 3–4-mm long, bearded inside at base. Berries orange to red, globular in Australia, *ca* 7–10 cm diameter.

Rainforest and depauperate rainforest of the region, moderately common. Flowers mostly spring and autumn.

## 121. SPIGELIACEAE

Annual or perennial herbs, rarely shrublets, indumentum sometimes stellate. Leaves opposite, connected by an interpetiolar line or small stipule. Flowers in cymes or unilateral spikes, rarely solitary or fasciculate or subumbellate; calyx 2–5-partite or -lobed; corolla tubular, lobes 4–5; stamens 4–5, inserted in corolla tube, anthers 2-locular, dehiscing lengthwise; ovary superior, 2-locular, ovules numerous, style bifid or 2-lobed, stigmas capitate. Fruits capsules, dehiscing septically or by a transverse circular slit.

3 genera with *ca* 90 species Madagascar, tropical Asia to northern Australia and warm North and South America; 2 genera with *ca* 26 species Australia; 1 genus with 5 species south-eastern Queensland.

### 1. MITRASACME Labill.

Annual or perennial herbs. Leaves opposite or rosulate, ± sessile, connected at base by a membrane. Flowers solitary axillary, or in terminal and/or axillary inflorescences; calyx 4-, rarely 2-lobed; corolla urceolate, campanulate or salverform, often bearded in mouth, lobes 4; stamens inserted in lower half of corolla tube; styles 2, usually free at base, connate in upper part. Fruits capsules, opening by apical circular slits; seeds numerous, minute.

About 40 species, Ceylon to Japan, Australia, New Zealand, New Caledonia and the Caroline Is.; *ca* 38 species Australia, *ca* 30 endemic; 5 species south-eastern Queensland.

The genus is in need of revision.

- |   |                         |
|---|-------------------------|
| 1. Flowers solitary, axillary . . . . .   | 2                       |
| Flowers in distinct terminal inflorescences . . . . .   | 4                       |
| 2. Stems glabrous, 4-ribbed or angled, at least when fresh; seeds coarsely reticulate . . . . .               | 1. <i>M. indica</i>     |
| Stems hairy or papillose, terete; seeds finely reticulate . . . . .   | 3                       |
| 3. Annuals; corollas 5–7 mm long . . . . .  | 2. <i>M. alsinoides</i> |
| Perennials; corollas 4–5 mm long . . . . .  | 3. <i>M. paludosa</i>   |
| 4. Calyces and pedicels with at least a few coarse or fine hairs; seeds smooth or finely reticulate . . . . . | 3. <i>M. paludosa</i>   |
| Calyces and pedicels glabrous; seeds minutely tuberculate . . . . .   | 5                       |
| 5. Leaves mostly up to <i>ca</i> 2 mm broad, margin recurved . . . . .  | 4. <i>M. polymorpha</i> |
| Leaves mostly greater than 2 mm broad, often in rosette, margin flat . . . . .                                | 5. <i>M. pygmaea</i>    |

#### 1. *Mitrasacme indica* Wight

Annual; stems weak, up to *ca* 15 cm tall, 4-angled or 4-winged, glabrous. Leaves narrowly ovate or ovate, apex acute, 3–7 mm × 1.5–2 mm, glabrous. Flowers solitary in upper axils, pedicels 3–7 mm long in flower, up to 2.5 cm long in fruit; calyx 1.5–2 mm long, lobes about equal to tube, glabrous; corolla white, 3–4 mm long, lobes 1–1.5 mm long. Capsules subglobular, *ca* 2 mm diameter; seeds coarsely reticulate.

Known from the Wide Bay and Burnett districts, not common. Flowers autumn (in specimens seen).

#### 2. *Mitrasacme alsinoides* R. Br.

Annual; stems weak, up to *ca* 18 cm tall, terete, shortly hairy papillose. Leaves ovate or narrowly ovate, apex acute, 2–10 mm × (1.5–)2–5 mm, glabrous or with few hairs. Flowers solitary in upper axils, pedicels filiform, 0.4–1.2 cm in flower, up to *ca* 3 cm long in fruit; calyx 2–3 mm long, lobes about equal to tube; corolla white, 5–7 mm long, lobes 2–2.5 mm long. Capsules subglobular, *ca* 2 mm diameter; seeds finely reticulate.

Widespread in the eastern part of the region, usually in damp sandy soils, probably also to be found elsewhere in the region. Flowers mostly spring to autumn.

**3. *Mitrasacme paludosa* R. Br. sens. lat.**

Perennial; stems prostrate, ascending or  $\pm$  erect, up to *ca* 15 cm tall,  $\pm$  hispid hairy or papillose. Leaves linear-ovate or linear-oblong to narrowly ovate or narrowly oblong, apex acute, margin usually recurved, 4–10 mm  $\times$  0.7–2.5 mm, glabrous to pubescent. Flowers in small terminal leafy umbels, also in some upper axils, pedicels up to 1 cm long in flower, up to 1.5 cm long in fruit, with short to long sparse to dense hairs; calyx 1.5–2.5 mm long, usually with at least few hairs outside, lobes about equal to tube; corolla usually white, rarely mauve, *ca* 4–5 mm long, lobes *ca* 2 mm long. Capsules subglobular, *ca* 2 mm diameter; seeds smooth or minutely reticulate.

Widespread in the region, usually on sandy soils. Flowers mostly spring to autumn.

Further research may show a number of taxa included under the above description.

**4. *Mitrasacme polymorpha* R. Br.**

Perennial, but sometimes flowering first year; stems  $\pm$  erect, usually much branched from base, up to *ca* 15 cm tall, hirsute or scabrous, hairs usually spreading. Leaves linear-ovate to oblong or elliptic, apex acute, margin recurved, 0.4–1.5 cm  $\times$  0.1–0.3 cm, sparsely to densely hairy. Peduncles terminal, simple or sparingly branched, up to *ca* 10 cm long, bearing an irregular umbel of 3–6 flowers, glabrous, pedicels up to *ca* 4 cm long, glabrous; calyx 2–4 mm long, glabrous, lobes about equal to tube; corolla white, *ca* 6–7 mm long, lobes *ca* 3–3.5 mm long. Capsules subglobular, *ca* 2–3 mm diameter; seeds minutely tuberculate.

Recorded in the region from Moreton I.

**5. *Mitrasacme pygmaea* R. Br.**

*Mitrasacme pygmaea* var. *malaccensis* (Wight) Hara; *M. malaccensis* Wight

Annual; stems erect, up to *ca* 4 cm long but mostly less than 1.5 cm long, sometimes almost absent, with short spreading hairs. Leaf pairs spaced, upper 2 pairs sometimes whorled at base of inflorescence, in small specimens nearly all leaves radical; blades ovate, elliptic or linear-ovate, apex obtuse to acute, margin flat, 0.2–1.9 cm  $\times$  0.1–0.6 cm, glabrous or hairy. Inflorescences terminal, umbellate-paniculate, peduncles up to *ca* 12 cm long, glabrous or with sparse short hairs, pedicels up to *ca* 1 cm long in flower, up to 2 cm long in fruit; calyx 1.5–2.5 mm long, glabrous except sometimes for bristles along margin, lobes about equal to tube; corolla white or pinkish, *ca* 3–5 mm long, lobes 1.5–2.5 mm long. Capsules subglobular, *ca* 1.5–2 mm diameter; seeds densely minutely tuberculate.

Widespread but not common in the region, not known from the Darling Downs district. Flowers mostly summer–autumn.

**122. GENTIANACEAE**

Annual or perennial herbs. Leaves opposite, exstipulate, often connate at base. Flowers bisexual, actinomorphic, mostly shiny and brightly coloured; calyx tubular or of separate sepals; corolla with 4–12 lobes; stamens same number as corolla lobes and alternate with them, inserted on tube; ovary superior, mostly 1-locular, rarely 2-locular, style simple. Fruits often capsules.

About 80 genera with 900 species worldwide; *ca* 6 genera with 10 species Australia; 1 genus with 2 species south-eastern Queensland.

**1. CENTAURIUM Hill**

Annual, erect, glabrous herbs; stems slender, quadrangular. Leaves sessile, lowest often forming rosette. Flowers in cymes, cymose panicles or corymbs; calyx 4–5-lobed; corolla tube cylindrical, lobes 5, spreading; stamens inserted in throat of corolla tube;

ovary 1-locular, stigma ± 2-lobed. Capsules narrowly oblong, enclosed in persistent calyx or slightly exceeding it.

About 50 species, worldwide except tropical and southern Africa; 3 species, 2 naturalized, Australia; 2 species south-eastern Queensland.

- 1. Flowers on pedicels 1.5–5 mm long, forming loose leafy racemes along branches of dichotomous cymes
  - Flowers subsessile in dense or loose corymbose dichotomous cymes
- 1. *C. spicatum*
  - 2. *C. erythraea*

**1. *Centaurium spicatum* (L.) Fritsch**

**SPIKE CENTAURY**

*Gentiana spicata* L.; *Erythraea australis* R. Br.; *Centaurium australe* (R. Br.) Druce  
Erect herb up to 35 cm tall. Leaves sessile, elliptic-ovate, ovate or oblong, apex subacute to acute, 0.8–3 cm × 0.3–1 cm. Flowers on pedicels 1.5–5 cm long, forming loose leafy racemes along branches of dichotomous cyme, each fork of cyme 1-flowered; calyx 6–10 mm long, divided about halfway; corolla pink or reddish, tube usually slightly longer than calyx, lobes mostly 3–4 mm long.

Widespread in the region, but most common in eastern parts. Flowers spring–early summer.

**2. \**Centaurium erythraea* Rafn**

**COMMON CENTAURY**

*Erythraea centaurium* (L.) Pers.; *Centaurium minus* Garsault; *C. umbellatum* Gilib.  
Erect herb up to ca 25 cm tall. Leaves obovate to elliptic-oblong, apex rounded to acute, 1–5 cm × 0.5–1.5 cm. Flowers subsessile, in dense or loose leafy corymbose dichotomous cymes; calyx 8–10 mm long, often divided almost to base; corolla pinkish red, tube longer than calyx, lobes mostly 5–6 mm long.

Native of Europe; naturalized in the region, common in eastern parts and also around Stanthorpe. Flowers spring–early summer.

**123. MENYANTHACEAE**

Annual or perennial freshwater herbs, often stoloniferous. Leaves alternate, radical or cauline, exstipulate; petioles sheathed at base; blades simple in Australia. Inflorescences fascicles or panicles in Australia; flowers bisexual, actinomorphic; calyx persistent, deeply dissected into usually 4–5 lobes or ± polysepalous; corolla gamopetalous, fugacious, tube short, lobes spreading, usually 4–5, valvate or induplicate-valvate in bud, usually with entire or fringed wings and with transverse fringe of hairs near base, sometimes hairy or keeled on inner surface; stamens as many as corolla lobes, epipetalous; ovary superior to semi-inferior, 1-locular with 2–5 parietal placentas and usually with 4–5 hair-tipped nectary lobes as base, style simple, stigmas 2–5. Fruits indehiscent or 4-valved capsules; seeds few–numerous, endospermic.

5 genera with ca 49 species from cold temperate to tropical regions of the world; 3 genera with ca 29 species Australia; 2 genera with 5 species south-eastern Queensland.

- 1. Leaves floating or semi-erect; flowers in pairs or in unilateral fascicles along horizontal to semi-erect usually floating stems; capsules mostly indehiscent and submerged, sometimes valves present when plants on mud
  - Leaves erect; flowers in erect open panicles; capsules aerial, opening by 4 apical valves
- 1. *Nymphoides*
  - 2. *Villarsia*

**1. NYMPHOIDES Séguier**

Leaf blades semi-erect or usually floating, often dorsiventral and dotted and purplish beneath. Flowers either in fascicles along petiole-like stem with each fascicle subtended by floating leaf, or else in well spaced to close grouped pairs along stems distinct from petioles. Capsules usually indehiscent and ripening underwater on recurved pedicels, sometimes valvular when infructescences are aerial.

About 32 species in most tropical and temperate regions of the world; ca 16 species Australia; 4 species south-eastern Queensland.

- Flowers in well spaced to close grouped pairs along stems distinct subtending leaf blade as if arising from petiole; corollas white with yellow tube . . . . . 1. *N. indica*
- Flowers in well spaced to close grouped pairs along stems distinct from petioles; corollas yellow . . . . . 2
2. Leaves crenate; corolla lobes with fringed longitudinal keel on inner surface; seeds compressed-ellipsoid, non-carunculate . . . . . 2. *N. crenata*
- Leaves entire; corolla lobes not keeled; seeds  $\pm$  globular or compressed-globular, with pale circular caruncle . . . . . 3
3. Aquatic except when stranded; leaves, stems and inflorescences usually floating; capsules usually 4–6 mm long, submerged; seeds  $\pm$  globular but laterally compressed, smooth or with scattered to close-set tubercles, moderately carunculate . . . . . 3. *N. geminata*
- On saturated soils or in shallow water only; leaves, stems and inflorescences erect or semi-erect; capsules usually 3.5 mm or less long, aerial; seeds  $\pm$  globular, densely velvety pubescent with fine tapered tubercles, strongly carunculate . . . . . 4. *N. exiliflora*

### 1. *Nymphoides indica* (L.) Kuntze

*Menyanthes indica* L.; *Limnanthemum indicum* (L.) Thwaites

Perennial; stems up to 2 m long, floating,  $\pm$  continuous with petioles. Leaves with petioles 1–3(–5) cm long; blades  $\pm$  circular, base deeply cordate with narrow sinus or basal lobes slightly overlapping, margin entire, (4–)8–30(–40) cm long. Flowers mostly 20–50 per fascicle, occasionally as few as 3 per fascicle, pedicels (0.1–)4–8(–1.1) cm long; calyx 4–8 mm long; corolla white with yellow or orange tube, (1.5–)2–3(–4) cm diameter, lobes 5, occasionally 4–7, usually densely hairy over inner surface and edges, not winged or keeled; stigmas 2, occasionally 3. Capsules (4–)5–8 mm long, about equal to or slightly shorter than calyx; seeds straw coloured,  $\pm$  globular but somewhat laterally compressed, (1–)1.2–1.6(–2.1) mm long, smooth or with scattered thick tubercles, caruncle absent.

Widespread in the region, in fresh water up to 3.5 m deep in swamps, lakes and stock tanks. Flowers any season, mostly spring to autumn.

### 2. *Nymphoides crenata* (F. Muell.) Kuntze

*Limnanthemum crenatum* F. Muell.

Perennial; stems up to 3 m long, floating, distinct from petioles. Leaves with petioles 8–42 cm long on basal leaves, less on stem leaves; blades of basal leaves broadly ovate to  $\pm$  circular, base deeply cordate with narrow sinus, margin crenate, (3–)4–12(–20) cm long; blades of stem leaves often only 1.5–2 cm long, sometimes broader than long and shallowly cordate with broad sinus. Flowers in spaced pairs along short inflorescences, or inflorescences condensed to clusters of 8–14 flowers subtended by 2–4, or occasionally 1, stem leaves; pedicels 4–10(–14) cm long; calyx 0.55–1(–1.6) cm long; corolla bright yellow to orange-yellow with sometimes paler yellow tube, (2–)2.5–4(–5) cm diameter, lobes 5, occasionally 4–6, with broad fringed wings and keel; stigmas 5, rarely less, each with vertical fringed wing. Capsules (4–)6–8(–9) mm long, usually *ca*  $\frac{2}{3}$ – $\frac{3}{4}$  as long as calyx; seeds straw coloured to light tan-brown, ellipsoid but strongly laterally compressed, (0.45–)0.6–0.9(–1.2) mm long, smooth or with scattered short blunt tubercles, caruncle absent.

Known from the Darling Downs district, in permanent still or flowing fresh water up to 1 m deep in swamps and creeks; prevalent in intermittently inundated depressions including swampy paddocks and roadside ditches. The Queensland Herbarium also has one early collection from South Brisbane. Flowers any season, mostly spring to autumn.

### 3. *Nymphoides geminata* (R. Br.) Kuntze

*Villarsia geminata* R. Br.; *Limnanthemum geminatum* (R. Br.) Griseb.

Apparently annual; stems up to 100 cm long when floating, distinct from petioles, often reduced to few cm long on plants on mud. Leaves with petioles (1–)6–60 cm long; blades  $\pm$  circular or occasionally very broadly ovate, base deeply cordate with narrow sinus or basal lobes slightly overlapping, margin entire, (0.8–)1.5–5(–6) cm

long. Flowers in spaced pairs along short inflorescences or pairs grouped to form loose clusters on plants on mud, pedicels (1-)4-7(-15) cm long; calyx (3-)4-6 mm long; corolla yellow, (1.2-)1.5-2.5(-3.3) cm diameter, lobes 5, occasionally 6, with broad fringed wings, not keeled; stigmas 2-3. Capsules (3-)4-6(-6.5) mm long, from slightly shorter than to slightly longer than calyx; seeds finally black,  $\pm$  globular to slightly ellipsoid-globular, laterally compressed, 0.6-0.95 mm long, smooth or with scattered to close-set tubercles, caruncle pale, usually thin, circular.

Known from the Darling Downs and Moreton districts in shallow fresh water up to 40 cm deep in swamps, small clear streams and rivulets; persists on saturated soils above receding waterlines. Flowers spring to autumn.

This species has been referred to as *Nymphoides* sp. aff. *N. exiliflora* but is not closely related to *N. exiliflora*.

#### 4. *Nymphoides exiliflora* (F. Muell.) Kuntze

*Villarsia exiliflora* F. Muell.; *Limnanthemum exiliflorum* (F. Muell.) Benth.

Annual; stems (4-)12-54(-64) cm long, erect or semi-erect. Leaves with petioles (1-)6-30 cm long; blades broadly ovate to  $\pm$  broadly deltoid, base  $\pm$  truncate to moderately cordate with usually broad shallow sinus, margin entire, (0.7-)1.2-3 cm long. Flowers in spaced pairs along stem or pairs sometimes grouped in loose clusters, pedicels (0.8-)1-3(-4.5) cm long, very slender, almost thread-like; calyx 2.5-3.5(-4) mm long; corolla yellow, (0.7-)1-1.5(-1.7) cm diameter, lobes 5 occasionally 4-6, with broad fringed wings, not keeled; stigmas 2-3. Capsules 2.5-3.5(-4) mm long, slightly shorter than calyx; seeds finally grey-brown or black,  $\pm$  globular, 0.5-0.8 mm long, densely velvety pubescent with fine tapered tubercles, caruncle pale, thick and prominent, circular.

Known from the Wide Bay and Moreton districts in water saturated areas or clear shallow fresh water up to 5 cm deep, rarely up to 20 cm deep, in low heath or sedge swamps on sandy soils. Flowers spring to autumn.

## 2. VILLARSIA Vent.

Leaf blades erect in south-eastern Queensland or floating. Flowers in open panicles in south-eastern Queensland or dense heads. Capsules opening by 4 valves in south-eastern Queensland or indehiscent.

About 14 species South Africa, south-eastern Asia and Australia; 12 species Australia; 1 species south-eastern Queensland.

### 1. *Villarsia exaltata* (Solander ex Sims) G. Don

*Menyanthes exaltata* Solander ex Sims; *Villarsia reniformis* auct. non R. Br., F. M. Bailey pro parte

Perennial; stolons absent; stems erect, (0.25-)0.45-1.5 m tall, raised well above basal leaves. Leaves with petioles (9-)12-40(-60) cm long; blades erect above water,  $\pm$  elliptic to broadly ovate, base obtuse to shallowly cordate or rarely truncate, margin entire or rarely somewhat dentate, (4-)6-12(-13.5) cm long,  $\pm$  thick textured with matt surfaces. Pedicels 0.4-1.3(-1.8) cm long, erect; calyx 0.5-1.3 cm long, lower  $\frac{1}{3}$ - $\frac{1}{2}$  adnate to capsule; corolla yellow, 1.6-3 cm diameter, lobes 5, occasionally 4, with broad entire wings, not keeled; stigmas 2-3. Capsules 0.5-1.3 cm long,  $\pm$  equal to calyx; seeds grey-black when mature, broadly ellipsoid, somewhat laterally compressed, (1.5-)1.7-2.6(-3) mm long, with scattered to moderately dense blunt prominent tubercles, or rarely tubercles lacking, caruncle pale, thick and prominent, circular.

Known from the Wide Bay and Moreton districts in fresh water up to 60 cm deep in permanent or temporary swamps in wallum country. Flowers spring to autumn.

## 124. APOCYNACEAE

Trees, shrubs or climbers, rarely perennial herbs. Leaves opposite or verticillate, rarely alternate, exstipulate, simple, entire. Flowers bisexual, actinomorphic; calyx often glandular inside, 5-, rarely 4-lobed, imbricate; corolla tubular, lobes 5, rarely 4, contorted or rarely valvate; stamens 5, rarely 4, inserted in tube, filaments free, rarely united, without coronal appendage, anthers often sagittate, free or connivent around stigma, rarely adherent to it, 2-locular, connective often produced apically; disc usually present, annular, cupular or of separate glands; ovary superior, 1-locular with 2 parietal placentas, or 2-locular with placentas adnate to septa or carpels 2 and free, or connate only at base with ventral placentas in each carpel, style 1, split at base or entire, thickened and stigmatose below apex, ovules 2 or more per carpel. Fruits entire or dehiscent or of 2 separate carpels, berries drupes or follicles; seeds mostly with endosperm and large straight embryo, often winged or appendaged with long silky hairs (coma).

180 genera with 1500 species, mostly tropical but a few temperate; 16 genera with 67-73 species Australia; 12 genera with 29 species south-eastern Queensland.

1. Tall or slender climbers or twiners, rarely scandent unarmed shrubs		2
Herbs, ± erect shrubs or trees		3
2. Anthers connivent into cone around stigma; fruits dry dehiscent	1. <i>Parsonsia</i>	
Anthers free from stigma; fruits succulent, indehiscent	2. <i>Melodinus</i>	
3. Herbs		4
Woody shrubs or trees		6
4. Anthers free; flowers blue	3. <i>Vinca</i>	
Anthers connivent into cone; flowers pink, mauve, white or yellowish		5
5. Flowers solitary or paired; seeds without coma	4. <i>Catharanthus</i>	
Flowers in cymes or panicles; seeds with coma (usually become vines)	1. <i>Parsonsia</i>	
6. Leaves spirally arranged on branchlets		7
Leaves opposite or whorled on branchlets		8
7. Inflorescences with large coloured caducous bracts; calyces without basal glands inside	5. <i>Cerbera</i>	
Inflorescences without large coloured caducous bracts; calyces with numerous basal glands inside	6. <i>Thevetia</i>	
8. Calyces with basal glands inside	7. <i>Ervatamia</i>	
Calyces without basal glands inside		9
9. Fruits entire, 2-locular; shrubs usually with opposite axillary spines	8. <i>Carissa</i>	
Fruits separating into 2 distinct carpels, though 1 sometimes aborting, or carpels slightly connate; shrubs or trees never with axillary spines		10
10. Fruits dry, dehiscent; seeds with coma	9. <i>Alstonia</i>	
Fruits succulent, indehiscent; seeds without coma		11
11. Leaves regularly 3-4-verticillate, rarely opposite; fruits berries, either 2-5-seeded and moniliform or small, 1-seeded by abortion	10. <i>Alyxia</i>	
Leaves usually opposite but occasionally whorled; fruits large drupes with fibrous, smooth or sculptured endocarp		12
12. Fruits with loosely fibrous or spiny endocarps (in south-eastern Queensland species calyx lobes 1-1.5 mm long)	11. <i>Neisosperma</i>	
Fruits with smooth bony endocarps (in south-eastern Queensland species calyx lobes ca 3 mm long)	12. <i>Ochrosia</i>	

1. **PARSONSIA** R. Br.

Tall woody climbers or twiners. Leaves opposite, penninerved. Inflorescences axillary or terminal cymes; calyx deeply 5-lobed with basal glands inside; corolla salverform, tube short hairy at top inside, throat scales absent, lobes 5,  $\pm$  overlapping to the right in bud; stamens inserted about middle of tube, filaments fairly long, often strongly intertwined, pubescent, anthers partly exerted, adhering to stigma, sagittate; disc of 5 free scales; ovary 1, 2-locular, glabrous, ovules numerous, style glabrous, collared, top of stigma entire or 2-lobed. Follicles terete, carpels separating at maturity; seeds numerous with long comas.

100 species, southern China, south-eastern Asia, Indomalaysia, Australia, New Zealand, Philippines, Polynesia; *ca* 20 species Australia; 16 species south-eastern Queensland.

- |   |                              |
|---|------------------------------|
| 1. Leaves pubescent or puberulent at least on underside . . . . .   | 2                            |
| Leaves glabrous, glaucous or rarely with few sparse hairs on midrib . . . . .   | 8                            |
| 2. Hairs rusty or brownish coloured . . . . .   | 3                            |
| Hairs not rusty or brownish coloured . . . . .  | 5                            |
| 3. Inflorescences small, dense, pedicels 0.5–1 mm long; corolla lobes bearded inside for $\frac{1}{2}$ – $\frac{3}{4}$ of their length . . . . .  | 1. <i>P. velutina</i>        |
| Inflorescences usually large, compound, pedicels 2–5 mm long; corolla lobes bearded inside at base only . . . . .   | 4                            |
| 4. Calyx lobes acute, <i>ca</i> 1.5 mm long; corolla tubes <i>ca</i> 1.5 mm long, lobes acute, 2.5–3 mm long; undersurface of leaves usually pubescent, usually with minute domatia as broad cavities in axils of primary veins . . . . . | 2. <i>P. fulva</i>           |
| Calyx lobes subulate, <i>ca</i> 1.5–2 mm long; corolla tubes <i>ca</i> 2 mm long, lobes subulate, 2.5–3 mm long; leaves at most puberulent, without domatia . . . . .   | 3. <i>P. largiflorens</i>    |
| 5. Corolla tubes $\pm$ globose, <i>ca</i> 3 mm long . . . . .   | 4. <i>P. ventricosa</i>      |
| Corolla tubes $\pm$ cylindrical, <i>ca</i> 1–2.5 mm long . . . . .  | 6                            |
| 6. Leaves acute or obtuse but always with short rigid point; corolla tubes 1–2 mm long and lobes 2.5–3.5 mm long . . . . .  | 5. <i>P. lanceolata</i>      |
| Leaves with acuminate tips; corolla tubes <i>ca</i> 2.5 mm long and lobes 3.5–4 mm long or tubes 1–1.5 mm long and lobes 7–9 mm long . . . . .  | 7                            |
| 7. Corolla tubes <i>ca</i> 2.5 mm long, lobes 3.5–4 mm long . . . . .   | 6. <i>P. tenuis</i>          |
| Corolla tubes 1–1.5 mm long, lobes 7–9 mm long . . . . .  | 7. <i>P. eucalyptophylla</i> |
| 8. Leaf margins crisped, recurved and appearing scalloped . . . . .   | 8. <i>P. lilacina</i>        |
| Leaf margins flat, recurved or slightly undulate, but not crisped . . . . .   | 9                            |
| 9. Stems with large corky outgrowths even on relatively young growth . . . . .  | 9. <i>P. lenticellata</i>    |
| Stems without large corky outgrowths . . . . .  | 10                           |
| 10. Leaves with reticulate venation raised prominent both surfaces when dry, $\pm$ glaucous beneath . . . . .   | 11                           |
| Leaves without raised prominent reticulate venation both surfaces when dry, though sometimes glaucous . . . . .   | 12                           |
| 11. Corolla tubes 2.5–3.5 mm long, lobes 4–5.5 mm long . . . . .  | 10. <i>P. straminea</i>      |
| Corolla tubes 7.5–8 mm long, lobes 2.5–3 mm long . . . . .  | 11. <i>P. sp. 1.</i>         |
| 12. Corolla lobes 5 mm or more long . . . . .   | 13                           |
| Corolla lobes less than 4.5 mm long . . . . .   | 15                           |
| 13. Sap copious, milky; corolla lobes bearded inside on lower $\frac{1}{3}$ – $\frac{1}{2}$ . . . . .   | 12. <i>P. latifolia</i>      |
| Sap clear or watery, turbid but not milky white; corolla lobes bearded at base or throat only . . . . .   | 14                           |
| 14. Calyx lobes <i>ca</i> 1 mm long; corolla tubes <i>ca</i> 1 mm long, lobes acute, 5–5.5 mm long; anthers 2–2.5 mm long . . . . .   | 13. <i>P. plaesiophylla</i>  |
| Calyx lobes <i>ca</i> 2.5–3 mm long; corolla tubes <i>ca</i> 2–2.5 mm long, lobes obtuse, 6–7 mm long; anthers 3–3.5 mm long . . . . .  | 14. <i>P. rotata</i>         |

- |   |                            |    |
|---|----------------------------|----|
| 15. Corolla tubes $\pm$ globose, <i>ca</i> 3 mm long . . . . .  | 4. <i>P. ventricosa</i>    | 16 |
| Corolla tubes slender, $\pm$ cylindrical, up to 2.5 mm long . . . . .   |                            |    |
| 16. Corolla lobes <i>ca</i> 1.5 mm long, hooded, apiculate . . . . .  | 15. <i>P. induplicata</i>  | 17 |
| Corolla lobes <i>ca</i> 2.5 mm long or longer . . . . .   |                            |    |
| 17. Leaves with acute or obtuse apex with short rigid point;<br>inflorescences dense with pedicels 1–3 mm long; corollas<br>glabrous inside | 5. <i>P. lanceolata</i>    |    |
| Leaves acuminate, sometimes abruptly so; inflorescences lax with<br>pedicels 3–6 mm long; corolla lobes bearded at base . . . . .           |                            | 18 |
| 18. Calyx lobes acuminate, <i>ca</i> 2.5 mm long, glabrous; corolla lobes<br>acute; anthers <i>ca</i> 2 mm long . . . . .                   | 16. <i>P. leichhardtii</i> |    |
| Calyx lobes subulate, 1.5–2 mm long, pubescent; corolla lobes<br>subulate; anthers <i>ca</i> 2.5 mm long . . . . .                          | 3. <i>P. largiflorens</i>  |    |

### 1. *Parsonsia velutina* R. Br.

*Parsonsia nesophila* F. M. Bailey

Ferruginous pubescent climber with slightly sticky yellowish sap. Leaves with pubescent petioles 0.7–2.5(–3) cm long; blades ovate, juveniles often sinuate-lobed, apex acuminate, base cordate or broadly lobed, margin slightly recurved, (3–)6–13(–17.5) cm  $\times$  (2–)4–7.5(–9.5) cm, dark green, pubescent to puberulent above, paler, ferruginous pubescent below, reticulation visible below, domatia absent. Inflorescences small, dense, axillary, ferruginous pubescent, pedicels 0.5–1.5 mm long; calyx lobes obtuse to subacute, 1–2.5 mm long, pubescent outside; corolla cream, pubescent outside, tube *ca* 1–2 mm long, lobes ovate with membranous margin *ca* 1.5–2.5 mm long, bearded inside *ca* lower  $\frac{3}{4}$ ; filaments *ca* 1.5 mm long, anthers *ca* 2 mm long. Fruits tapered to each end, *ca* 10–15 cm  $\times$  *ca* 1 cm, pubescent.

Usually in depauperate rainforests of the region. Flowers spring to autumn.

### 2. *Parsonsia fulva* S. T. Blake

Stout canopy liana, ferruginous pubescent, sap copious, watery, yellowish or brownish. Leaves with pubescent petioles 1.5–5.5 cm long; blades ovate, juveniles often sinuate-lobed, apex acuminate or obtuse, rarely acute, base broadly cuneate,  $\pm$  truncate, or shallowly cordate on sterile shoots, margin slightly recurved, 6.5–17(–22) cm  $\times$  3.5–12(–13) cm, dark green above, paler below, glabrous or puberulent, venation visible above, ferruginous pubescent below especially on venation, reticulate venation prominent below, minute domatia often in vein axils, but difficult to see due to indumentum. Inflorescences large many-flowered ferruginous pubescent panicles, usually terminal and upper axillary, pedicels 2–5 mm long; calyx lobes acute, *ca* 1.5 mm long, densely pubescent; corolla cream to yellowish, pubescent outside, tube *ca* 1.5 mm long, lobes acute, 2.5–3 mm long, bearded at base within; filaments less than 1 mm long, anthers 2–2.5 mm long. Follicles  $\pm$  terete, 15–24 cm  $\times$  *ca* 0.8 cm, velvety ferruginous pubescent. **Fig. 43D.**

Rainforest of the Moreton district mainly on mountains, e.g. McPherson Ra., Mt. Glorious. Flowers late spring to autumn.

### 3. *Parsonsia largiflorens* (F. Muell. ex Benth.) S. T. Blake

*Lyonsia largiflorens* F. Muell. ex Benth.

Tall woody climber, glabrous or young shoots minutely pubescent. Leaves with petioles 1.5–2.5 cm long; blades ovate to oblong-ovate, apex abruptly acuminate, base rounded to subcordate, margin slightly undulate, recurved, 6.5–16 cm  $\times$  4–8.5 cm, glabrous or ferruginous puberulent mainly along veins below, dark green above, paler below, reticulation coarse, visible both surfaces when dry. Inflorescences axillary many-flowered pubescent panicles, pedicels 3–5 mm long; calyx lobes subulate, 1.5–2 mm long, pubescent, corolla creamish, pubescent outside, tube *ca* 2 mm long, lobes subulate, 2.5–3 mm long, bearded at base; filaments 1–1.5 mm long, anthers *ca* 2.5 mm long. Follicles 12–13 cm  $\times$  *ca* 1–1.5 cm, tapered at both ends.

Rainforest or depauperate rainforest. Flowers spring–summer.

**4. *Parsonsia ventricosa* F. Muell.**

Slender glabrous or sparsely pubescent climber, sap brownish, watery. Leaves with petioles 0.5–1.3 cm long; blades ovate or occasionally oblong-elliptic, apex long tapered acuminate, base rounded, truncate to somewhat cordate, margin slightly recurved, 3.5–9.5(–13.5) cm × 1.3–4.5(–5) cm, dark green above, paler below, glabrous or sparsely pubescent, reticulate venation visible below, looping downwards between ascending primary lateral veins. Inflorescences small, few–several-flowered, almost umbellate, pedicels 3–6 mm long, pubescent; calyx lobes ± acute, 1–1.5 mm long, pubescent; corolla white or cream, tube ± globose, *ca* 3 mm long, lobes acute, 3.5–4 mm long, bearded at base within; filaments *ca* 1 mm long, anthers *ca* 3 mm long, with thickened dorsal surface and spreading basal lobes. Follicles slender, tapered at both ends, *ca* 9–14 cm long. **Fig. 43G.**

Rainforest of the coastal districts and Great Dividing Ra. Flowers summer–autumn.

**5. *Parsonsia lanceolata* R. Br.**

Tall woody climber with large tuberous unpalatable roots, sap nearly colourless, watery. Leaves with petioles 0.2–1.3 cm long; blades ovate or narrowly so, elliptic or oblong, apex acute or obtuse with short rigid point, base cuneate to truncate, margin recurved, 2.5–13 cm × 0.5–7 cm, dark green, glabrous or puberulent above, paler, glabrous or velvety pubescent below, lateral venation visible, looping. Inflorescences dense pubescent several–many-flowered terminal and axillary panicles, pedicels 1–2.5 mm long; calyx lobes acute to acuminate, 1.5–2(–3) mm long, pubescent; corolla creamy, often puberulent outside, glabrous inside, tube 1–1.5(–2) mm long, lobes 2.5–3(–3.5) mm long; filaments 1–1.5(–2) mm long, anthers *ca* 2.5 mm long. Follicles slender, tapered both ends, *ca* 7–13 cm long. **Fig. 43E.**

Depauperate rainforest or brigalow closed forest throughout the region. Flowers summer–autumn.

**6. *Parsonsia tenuis* S. T. Blake**

Slender twiner with little sap. Leaves with petioles 4–10 mm long; blades narrowly ovate to ovate, apex acuminate, base rounded, margin recurved, 2.8–9.5 cm × 0.7–2.8 cm, upper surface dark green, glabrous or puberulent, midrib raised, lower surface pale, velvety pubescent, midrib and primary lateral veins raised. Inflorescences few–several-flowered, pubescent panicles, pedicels 3–5 mm long; calyx lobes acuminate, 1.5–2 mm long, pubescent; corolla white to cream, tube *ca* 2.5 mm long, lobes 3.5–4 mm long, puberulent outside, bearded inside at base; filaments very short, anthers prominently ridged, *ca* 3 mm long. Fruits slender, 6–9 cm long.

McPherson Ra. in rainforest or ANTARCTIC BEECH (*Nothofagus moorei* (F. Muell.) Krasser) forest. Flowers spring.

**7. *Parsonsia eucalyptophylla* F. Muell.**

GARGALOO

*Lyonsia eucalyptophylla* (F. Muell.) F. Muell. ex Benth. (as '*L. eucalyptifolia*')

Tall woody vine, glabrous or minutely pubescent. Leaves with pubescent petioles 0.4–5 cm long; blades linear-ovate to occasionally ovate, apex acuminate to acute, base cuneate, rounded or occasionally cordate, margin recurved, (3.5–)6.5–22 cm × 0.4–5.5(–7) cm, dark green above, paler, pubescent and often glaucous beneath, midrib sunken above. Inflorescences axillary many-flowered pubescent panicles, pedicels 3–7 mm long; calyx lobes acute, 1–1.5 mm long, pubescent; corolla cream to yellowish, scented, pubescent, tube 1–1.5 mm long, lobes acute, revolute, 7–9 mm long, bearded inside at throat; filaments *ca* 4–5 mm long, anthers *ca* 3 mm long. Follicles narrowly ovoid, up to *ca* 8 cm long. **Fig. 43A.**

Through most of the region growing on trees and shrubs in open forest or woodland. Flowers late spring to autumn. Commonly eaten by sheep and cattle as drought fodder, apparently without ill effect.

**8. *Parsonsia lilacina* F. Muell.**

*Lyonsia lilacina* (F. Muell.) F. Muell. ex Benth.

Slender twiner, stems pubescent with short retrorse hairs, sap scanty, whitish, somewhat sticky. Leaves with petioles 2–6 mm long; blades elliptic to oblong-ovate, apex acuminate, base cordate, margin crisped, 1.7–6.2 cm × 0.6–3.5 cm, dark green

above, pale below, midrib raised above and below, reticulation prominent above when dry, only primary lateral veins visible below. Inflorescences axillary several-flowered puberulent panicles, pedicels 4–6 mm long; calyx lobes *ca* 1 mm long, glabrous; corolla creamish, tube 2.5–3 mm long, lobes 2.5–3 mm long,  $\pm$  glabrous or sparsely bearded inside at throat; filaments *ca* 1 mm long, anthers *ca* 2.5 mm long. Follicles linear-terete, 13–18 cm long. **Fig. 43C.**

Rainforest of the coastal districts, e.g. Mt. Glorious, Montville, Kin Kin areas. Flowers spring.

**9. *Parsonsia lenticellata* C. T. White**

Slender wiry twiner, branchlets very finely pubescent, with light coloured bark with numerous prominent lenticels, sap yellowish or brownish, watery. Leaves with petioles 2.5–7 mm long; blades narrowly ovate, apex acuminate, base rounded, margin slightly recurved, 4–9.5 cm  $\times$  0.3–1.6 cm, glabrous or slightly scabrous, dark green above, paler to whitish beneath, venation obscure, midrib and primary lateral veins visible beneath. Inflorescences small, compact, several-flowered, pedicels 3–4 mm long; calyx lobes acute, 1.5–2 mm long, glabrous to scabridulous; corolla white to cream, faintly scented, tube *ca* 1.5 mm long, retrorse pubescent, lobes acute, *ca* 1.5 mm long; filaments very short, anthers *ca* 2 mm long. Follicles somewhat compressed, 6–8 cm long. **Fig. 43B.**

Coastal districts in depauperate rainforest. Flowers summer–autumn.

**10. *Parsonsia straminea* (R. Br.) F. Muell.**

**MONKEY ROPE**

*Lyonsia straminea* R. Br.; *L. reticulata* F. Muell. ex Benth.

Tall robust vine with clear yellow sap, sometimes clinging with adventitious roots. Leaves with petioles 0.5–3.2 cm long; blades ovate or sometimes oblong, elliptic or rarely obovate, apex acuminate, acute or occasionally obtuse, base cuneate to rounded, margin recurved, 4.5–20 cm  $\times$  1.5–8 cm, dark green, glabrous above, lower surface glaucous or whitish, glabrous or very sparsely pubescent, reticulation raised, prominent both surfaces when dry. Inflorescences usually large lax compound terminal or upper axillary pubescent panicles, pedicels 1–3(–4) mm long,  $\pm$  pubescent; calyx lobes  $\pm$  acute, *ca* 1.5–2 mm long, pubescent; corolla cream or pinkish, scented, puberulent outside, tube 2.5–3.5 mm long, lobes acute, 4–5.5 mm long, bearded on lower half, and upper half of tube inside; filaments *ca* 3–3.5 mm long, anthers 3–4 mm long. Follicles often thick, woody, 10–16 cm  $\times$  *ca* 1 cm. **Fig. 43H.**

Rainforest or open forest of the region as far west as the eastern Darling Downs and Burnett districts. Flowers spring to autumn. Suspected of poisoning stock but there is no definite evidence of toxicity.

**11. *Parsonsia* sp. 1.**

Slender climber with yellowish watery sap. Leaves with petioles 3.5–7 mm long; blades ovate, apex sharply acuminate, base rounded to truncate, margin slightly recurved, 2–4.2 cm  $\times$  1–2.2 cm, dark green, glabrous above, glaucous beneath, prominent raised reticulation both surfaces when dry. Inflorescences terminal or axillary, several-flowered, pedicels 3–5 mm long, glabrous; calyx lobes acute, 3.5–4 mm long, glabrous or minutely puberulent; corolla pubescent outside, tube 7.5–8 mm long, minutely papillose in upper part inside, very shortly pubescent in lower part inside, lobes acute, 2.5–3 mm long,  $\pm$  glabrous inside; filaments *ca* 7 mm long, anthers *ca* 3 mm long. Follicles very slender, tapered to base, 9–11 cm long.

Rocky areas and cliffs, e.g. Mt. Perry. Flowers autumn.

**12. *Parsonsia latifolia* (Benth.) S. T. Blake**

*Lyonsia latifolia* Benth.

Tall  $\pm$  glabrous climber, sap milky white, viscid, copious. Leaves with petioles 1.5–5(–6) cm long; blades ovate or triangular-ovate, sometimes broadly so, apex shortly acuminate or acute, mucronate, base broadly cuneate,  $\pm$  truncate to subcordate, margin slightly irregular, 4–12(–20) cm  $\times$  2.5–6.5(–12) cm, dark green above, dark green or only slightly paler below, glabrous. Inflorescences terminal

many-flowered minutely pubescent panicles, pedicels 3–5 mm long, pubescent; calyx lobes subacute, 1–1.5 mm long,  $\pm$  pubescent; corolla cream, puberulent to glabrous outside, tube 1–1.5 mm long, lobes acute, 5–6 mm long, bearded on lower half inside; filaments *ca* 2.5–3 mm long, anthers 3–4 mm long. Follicles thick, woody, *ca* 12–15 cm long.

Rainforest of the coastal districts. Flowers spring–summer.

**13. *Parsonsia plaesiophylla* S. T. Blake**

*Lyonsia oblongifolia* Benth. non *Parsonsia oblongifolia* Merr.

Tall stout liana; young branchlets finely pubescent, otherwise glabrous, sap turbid, watery. Leaves with petioles 1–3.5 cm long; blades oblong to obovate, apex obtuse or retuse, mucronate, base cuneate to rounded, margin recurved, 4–11 cm  $\times$  1.5–4.5 cm, thick, dark green above, pale or glaucous below, reticulation visible above, prominent below when dry. Inflorescences dense terminal and axillary many-flowered pubescent cymes, pedicels 3–5 mm long, pubescent; calyx lobes acute, *ca* 1 mm long, pubescent; corolla cream, scented, tube *ca* 1 mm long, lobes acute, 5–5.5 mm long, bearded at base; filaments 2–2.5 mm long, anthers 2–2.5 mm long. Follicles narrowly ovoid, *ca* 8 cm or more long.

Recorded from Mt. Perry area of the Burnett district, usually in depauperate rainforest. Flowers spring–summer.

**14. *Parsonsia rotata* Maiden & Betche**

Glabrous slender climber, bark brownish or grey with coarse close outgrowths, sap clear,  $\pm$  colourless, slightly sticky. Leaves with petioles 0.4–2 cm long; blades oblong-elliptic to occasionally ovate or obovate, apex abruptly acuminate, base rounded or cuneate, margin slightly recurved, 4.2–11 cm  $\times$  1.8–4.6 cm, glabrous, dark glossy green above, pale beneath, midrib and occasionally primary lateral veins visible above, only midrib visible beneath. Inflorescences axillary, small, dense, few–several flowered, glabrous, pedicels 5–7 mm long; calyx lobes *ca* 2.5–3 mm long, glabrous; corolla cream to yellowish, tube *ca* 2–2.5 mm long, bearded at throat, lobes obtuse, 6–7 mm long; filaments *ca* 3 mm long, anthers *ca* 3–3.5 mm long. Follicles thick, woody, *ca* 15 cm  $\times$  2 cm.

Rainforest and depauperate rainforest of the coastal districts. Flowers summer–autumn.

**15. *Parsonsia induplicata* F. Muell.**

*Lyonsia induplicata* (F. Muell.) F. Muell. ex Benth.

Slender  $\pm$  glabrous climber with scanty sap. Leaves with petioles 3–10 mm long; blades narrowly ovate to ovate, apex acuminate, base cuneate to rounded, margin slightly recurved, 2.5–8.5 cm  $\times$  0.5–2.7 cm, dark green above, pale or sometimes purplish beneath, primary lateral veins visible, looping beneath. Inflorescences several-flowered lax sparsely pubescent panicles, pedicels 3–4 mm long; calyx lobes acuminate, 1.5–2 mm long, sparsely pubescent; corolla white, creamy or pale purplish, tube 2–2.5 mm long, lobes hooded, apiculate, 1–1.5 mm long, sparsely pubescent outside, densely pubescent in lower third inside and throat; filaments *ca* 1–1.25 mm long, anthers *ca* 1.75–2 mm long. Fruits terete, *ca* 6 cm long.

McPherson Ra. in rainforest. Flowers spring.

**16. *Parsonsia leichhardtii* F. Muell.**

Twiner, glabrous or branches and inflorescences minutely pubescent. Leaves with petioles (0.4–)0.7–2.5 cm long; blades ovate, or occasionally narrowly so, apex acuminate, base truncate or cuneate, margin very slightly recurved, slightly sinuate, (3.5–)4.5–10.5 cm  $\times$  (1.4–)2.5–5.5 cm,  $\pm$  glabrous and darker above, midrib, primary lateral looping veins and some reticulation visible beneath against lighter background. Inflorescences of lax often axillary dichotomous cymes, pedicels 3–6 mm long, pubescent; calyx lobes acuminate, *ca* 2.5 mm long, glabrous; corolla cream to yellowish, tube *ca* 2–2.5 mm long, lobes acute, 2.5–3 mm long, bearded at base; filaments very short, anthers *ca* 2 mm long. Follicles narrowly ovoid, *ca* 7–8 cm  $\times$  *ca* 2 cm. **Fig. 43F.**

Depauperate rainforests throughout the region. Flowers spring.

## 2. MELODINUS J. R. & G. Forster

Tall woody climbers with milky sap. Leaves opposite, penninerved. Inflorescences of terminal or axillary cymes; calyx 5-lobed, without basal glands; corolla salverform, tube widened at insertion of stamens, glabrous inside, throat with 5 scales, lobes overlapping to left; stamens inserted about middle of corolla tube, included, filaments very short, anthers free from stigma; ovary 2-locular, glabrous, ovules numerous, style short, glabrous, stigma with bifid apex. Fruits large globose succulent berries; seeds numerous, ecomose.

50 species Indomalaysia, Australia, Pacific Is.; 7 species endemic in Australia; 2 species south-eastern Queensland.

- |  |                          |
|--|--------------------------|
| 1. Leaves pubescent on undersurface, rarely only on midrib and lateral veins; flowers with acute lobes . . . . . | 1. <i>M. acutiflorus</i> |
| Leaves glabrous; flowers with obtuse lobes . . . . .   | 2. <i>M. australis</i>   |

### 1. *Melodinus acutiflorus* F. Muell.

Puberulent vine or sometimes scandent shrub. Leaves with petioles 3–8 mm long; blades ovate to elliptic, apex acuminate, sometimes bluntly so, base cuneate to rounded, margin slightly recurved, 3.3–11 cm × 1.2–4 cm, dark green above, paler, usually pubescent beneath. Inflorescences of 3–5 flowers on axillary pubescent peduncles 0.3–1.3 cm long, pedicels 2–3 mm long; calyx 3–4 mm long, ciliate on margin; corolla white to cream or slightly pinkish, tube 4–5 mm long, lobes acute, 6–7 mm long, glabrous. Fruits purplish or scarlet, ovoid to globose, succulent, *ca* 3 cm diameter. **Fig. 43J.**

Rainforest of the coastal districts, e.g. D'Aguilar Ra., Great Dividing Ra., McPherson Ra. Flowers mainly spring to autumn.

A form growing on the McPherson Ra. (e.g. Springbrook, Mt. Roberts) often has both pubescent and nearly glabrous leaves on the same plant. On closer study this may prove a distinct taxon.

### 2. *Melodinus australis* (F. Muell.) Pierre

*Chilocarpus australis* F. Muell.

Glabrous vine. Leaves with petioles 2–6 mm long; blades ovate to elliptic, sometimes somewhat oblong, apex usually bluntly acuminate, base cuneate to rounded, margin sometimes undulate, 4.3–10(–12.5) cm × 1.2–4.6(–6.5) cm, glabrous. Inflorescences 5–9-flowered racemes or rarely almost sessile cymes, pedicels 2–4 mm long; calyx 1–1.5 mm long; corolla white to yellowish, tube 3–4.5 mm long, lobes broad, obtuse, 2–2.5 mm long, rarely longer. Fruits orange to red, ± oblong to obovoid, *ca* 4–6 cm long when mature. **Fig. 43I.**

Rainforests of the region, mainly in wetter areas, e.g. Mt. Tamborine, Great Dividing Ra., Caboolture. Flowers spring to autumn.

## 3. VINCA L.

Low creeping dwarf shrubs or herbaceous perennials usually with trailing vegetative shoots and ascending flowering stems. Leaves opposite. Flowers solitary in leaf axils, long pedicellate; calyx 5-lobed; corolla usually blue, salverform, tube less than 4 times as long as calyx, gradually widened, without scales but with zone of hairs above insertion of stamens and low ridge connecting lobes at mouth, lobes oblique, as long as tube, overlapping to left in bud; stamens inserted halfway up corolla tube, filaments bent abruptly at base, anthers with connective expanded above into flap-like appendage; disc of 2 scales alternate with carpels; carpels 2, ovules 4–8 per carpel. Follicles spreading.

5 species Europe, northern Africa, western Asia; 1 species naturalized Australia, occurring in south-eastern Queensland.



**Fig. 43** APOCYNACEAE — A–H *Parsonsia* spp. — A<sub>1</sub>–A<sub>2</sub> *P. eucalyptophylla*, A<sub>1</sub> part of flowering stem x1, A<sub>2</sub> flower showing long corolla lobes and twisted filaments x3; B<sub>1</sub>–B<sub>2</sub> *P. lenticellata*, B<sub>1</sub> section of stem showing bumpy outgrowths x1, B<sub>2</sub> flower x3; C<sub>1</sub>–C<sub>2</sub> *P. lilacina*, C<sub>1</sub> leaf x1, C<sub>2</sub> flower x3; D<sub>1</sub>–D<sub>2</sub> *P. fulva*, D<sub>1</sub> flower x3, D<sub>2</sub> seed showing coma x1; E<sub>1</sub>–E<sub>2</sub> *P. lanceolata*, E<sub>1</sub> leaf x1, E<sub>2</sub> fruit x1; F *P. leichhardtii*, flower showing globose corolla lobes bearded at base x3; G *P. straminea*, flower showing globose corolla tube x3; H *P. straminea*, fruits x2/3; I–J *Melodinus* spp. — I *M. australis*, flower with obtuse corolla lobes x3; J *M. acutiflorus*, fruiting branchlet x1; K<sub>1</sub>–K<sub>2</sub> *Vinca major*, K<sub>1</sub> leaf x1, K<sub>2</sub> flower split down one side to show free stamens x1/2.

1. \**Vinca major* L.

## BLUE PERIWINKLE

Perennial with long prostrate rooting barren stems, few cilia at nodes and on decurrent lines below petioles. Leaves with petioles 0.6–1.2 cm long; blades ovate, apex acute, base rounded to  $\pm$  truncate, margin ciliate, 2–6.7 cm  $\times$  1.4–4.5 cm, shining, midrib and often veins pubescent above. Flowers solitary axillary on stiff flowering stems, peduncles 2–3 cm long, shorter than leaves; calyx lobes 1.2–1.5 cm long, ciliate; corolla blue, tube 1.3–1.8 cm long, lobes broad, spreading, 1.5–2 cm long; stamens included, filaments bent and pubescent at base; carpels 2, distinct, style swollen at apex into pubescent ring with 5-angled stigma. Follicles 2, divergent, cylindrical; seeds several. **Fig. 43K.**

Native of Mediterranean region; naturalized in Darling Downs district. Flowers late winter–spring. Suspected overseas of being poisonous to horses.

## 4. CATHARANTHUS G. Don

Perennial, rarely annual herbs or subshrubs with milky sap. Leaves opposite, exstipulate, penninerved, axillary glands numerous in a fringe. Flowers axillary, solitary or paired; calyx small, very deeply 5-lobed, without basal glands; corolla salverform, tube slender cylindrical, widened at top round stamens, lobes 5, large, overlapping to left in bud; stamens 5, included, filaments very short, anthers connivent in cone, covering stigma but free from it, oblong with sagittate base; disc of 2 long glands alternating with ovaries; ovaries 2, ovules numerous, 2-seriate, style glabrous, stigma with reflexed frill at base, densely pubescent at top. Follicles 2, erect or spreading, cylindrical; seeds numerous, ecomose.

5 species tropics, especially Madagascar; 1 species cultivated and naturalized in parts of Australia, occurring in south-eastern Queensland.

1. \**Catharanthus roseus* (L.) G. Don

## PINK PERIWINKLE

*Vinca rosea* L.; *Lochnera rosea* (L.) H. Reichenb.

Perennial ascending herb *ca* 30–60 cm tall, sap milky. Leaves with petioles 0.2–1.1 cm long; blades obovate or oblong-obovate, apex obtuse, mucronate, base cuneate, margin flat, 2–7 cm  $\times$  0.7–3 cm, glabrous to shortly pubescent, glossy green above. Flowers in axillary pairs on separate pedicels *ca* 2 mm long; calyx segments 3–5 mm long; corolla pink or sometimes mauve or white, tube slender, *ca* 2–2.5 cm long, enlarged and then constricted just below lobes, throat with ring of hairs, lobes *ca* 2–2.5 cm long, with large glandular swellings on inside; stamens inserted around stigma in swollen part of tube, filaments very short. Fruits  $\pm$  erect, cylindrical, striated and often pubescent, 2–3 cm long; seeds black, usually oblong, minutely pitted and verrucose, *ca* 2–2.5 mm long.

Native of Madagascar; cultivated and naturalized in coastal districts near habitation, rubbish dumps, roadsides. Flowers late winter to autumn. Suspected of being poisonous to stock, but no definite evidence of toxicity.

## 5. CERBERA L.

Lactiferous trees. Leaves spirally arranged, crowded at tops of branches, penninerved, turning black on drying. Inflorescences of terminal cymes, bracts large, coloured, caducous; calyx deeply 5-lobed, without basal glands; corolla salverform, tube with widening near top or lower down, 5 longitudinal antheriferous ridges inside, throat with 5 scales, lobes 5, overlapping to left; filaments very short, anthers included in widening of corolla tube, free from stigma; ovaries 2, free, glabrous, ovules inserted on far-intruding thick placentas, style glabrous, stigma discoid, shortly bifid. Fruits 1 or 2 large drupes, ellipsoid or globose with thick woody fibrous endocarp; seeds 1 per loculus, ecomose.

6 species tropical coasts of Indian and west Pacific Oceans; 2 species Australia; 1 species south-eastern Queensland.

**1. *Cerbera manghas* L.***Cerbera odollam* Gaertn. var. *mugfordii* F. M. Bailey

Shrub or tree up to 10 m tall with thick branches, latex present. Leaves with petioles 1.2–2.5 cm long; blades oblong-obovate, apex obtuse or abruptly acuminate, base cuneate, margin recurved, 7.5–23 cm × 2–6 cm, bright glossy green, midrib raised beneath, lateral veins numerous, ± paired, parallel, ± at right angles to midrib, curving slightly upwards towards margin, connecting with intramarginal vein. Flowers several–numerous, bracts obtuse, *ca* 2 cm long; calyx lobes *ca* 1.5 cm long; corolla white with pink to red tinge, perfumed, tube widening near top, 2.5–3 cm long, lobes 1.5–2.5 cm long. Fruits ellipsoid, *ca* 7 cm × 5 cm. **Fig. 44A.**

Recorded from Freshwater Ck. near Double Island Pt., north of Noosa. Flowers spring. Kernel of fruit contains an irritant toxic poison.

**6. THEVETIA L.**

Erect much-branched shrub with milky sap. Leaves spirally arranged, rather dense, penninerved. Inflorescences terminal and leaf-opposed cymes; calyx deeply 5-lobed, basal glands numerous inside; corolla much widened above narrow base, with 5 narrow long-pubescent scales at base of widening, lobes 5, overlapping to left in bud; stamens inserted at top of narrow part of tube, filaments very short, anthers concealed by corolla scales, appressed to, but free from stigma; disc annular; ovary 2-carpellate, 2-locular, ovules 2 per loculus on much intruded placenta, stigma with conical apex, no collar. Drupes depressed globose, pyrene 1, woody, 2-locular, mostly 1-seeded; seeds wingless, ecomose.

9 species tropical America, West Indies; 1 species cultivated and naturalized Australia, occurring in south-eastern Queensland.

**1. *Thevetia peruviana* (Pers.) K. Schum****YELLOW OLEANDER***Cerbera peruviana* Pers.; *Thevetia neriifolia* Adr. Juss. ex Steudel

Usually shrub 2.5–3.5 m tall, but sometimes tree up to 10 m tall. Leaves with obscure petioles 2–4 mm long; blades linear-elliptic to linear-obovate, apex attenuate, base long attenuate, margin recurved, 5.5–15 cm × 0.5–1.5 cm, glabrous, glossy green above, paler, dull below. Flowers several per cyme, fragrant; calyx segments *ca* 8–9 mm long; corolla bright yellow, tube 2.5–3 cm long, lobes 3.5–4 cm long. Drupes black when ripe, somewhat compressed, broader than long, ± obtriangular or broadly ellipsoid with raised broad ridge around middle, *ca* 3–4.5 cm diameter; seeds *ca* 1.5 cm × 3.5 cm.

Native of tropical America; widely cultivated and possibly naturalized in the warmer parts of the coastal districts of the region. Flowers summer–autumn. All parts of plant poisonous if eaten, though most cases of poisoning have been from eating the kernels of the fruits.

**7. ERVATAMIA (A. DC.) Stapf**

Glabrous or sparsely hairy erect shrubs or trees. Leaves opposite, penninerved, petiole with basal semi-amplexicaul appendage on upper side. Inflorescences terminal or seemingly axillary cymes; calyx 5-lobed, few–many basal glands inside; corolla salverform, widened about middle, throat scales absent, lobes 5, overlapping in bud; stamens inserted in widened section of corolla, filaments short or ± absent, anthers free from stigma, subsagittate; ovaries 2, free, glabrous, many-ovuled, styles 1–2, glabrous. Follicles divaricate; seeds with fleshy orange or red outer layer, ecomose.

80 species palaeotropical; 4–5 species Australia; 1 species south-eastern Queensland.

**1. *Ervatamia angustisepala* (Benth.) Domin***Tabernaemontana orientalis* R. Br. var. *angustisepala* Benth.

Shrub or small tree up to *ca* 4 m tall, sap milky. Leaves with petioles 0.3–1.5 cm long; blades obovate or sometimes elliptic, apex acuminate, base attenuate to cuneate,

3–13.5 cm × 0.7–4 cm, glabrous, dark green above, paler beneath. Inflorescences several-flowered; calyx segments 2.5–3 mm long; corolla cream, tube *ca* 1.5 cm long, lobes spreading, *ca* 1.3–2 cm long. Follicles bright orange, ± compressed ovoid with acuminate apex, 3–4.5 cm long. **Fig. 44B.**

Mainly coastal districts in light rainforest, fringing forest along creeks or littoral closed forest. Flowers spring.

## 8. *CARISSA* L.

Erect widely branched shrubs or trees, often with opposite axillary spines. Leaves opposite, penninerved. Flowers in peduncled short terminal or axillary cymes, bracts very small; calyx deeply 5-lobed, without glands; corolla tube cylindrical, slightly swollen at insertion of stamens, upper part pubescent within, throat without scales, lobes contorted in bud, spreading; stamens included in top of tube, filaments very short, anthers free from stigma; ovary solitary, 2-locular, ovules 4 per loculus, 2-seriate, style glabrous, filiform. Fruits indehiscent succulent berries; seeds *ca* 2, ecumose.

35 species warm Africa and Asia; *ca* 4 species Australia; 1 species south-eastern Queensland.

### 1. *Carissa ovata* R. Br.

### CURRENT BUSH; BLACKBERRY

Erect or spreading, intricately branched shrub 1–2 m tall, rarely semiscandent up to 4.5 m tall, glabrous or scabrous with opposite axillary spines. Leaves with petioles 1–3 mm long; blades ovate, broadly ovate or broadly elliptic, apex acute, pungent pointed or mucronate, base cuneate to truncate, margin recurved, 0.5–5.5 cm × 0.5–4 cm, glabrous or sometimes puberulent with harsh tubercular-based hairs. Inflorescences of compact sessile or shortly pedunculate cymes; flowers fragrant; calyx 2–2.5 mm long, lobes subulate; corolla white to greenish white, tube *ca* 6–8 mm long, lobes *ca* 3 mm long. Fruits purplish black, ovoid, 1–1.5 cm long.

Two varieties occur in the region:

- |   |   |
|---|---|
| 1. Erect shrubs   | <i>C. ovata</i> var. <i>ovata</i>       |
| Sprawling shrubs with branches rooting at nodes where they touch the soil, forming thickets | <i>C. ovata</i> var. <i>stolonifera</i> |

*C. ovata* var. *ovata* (**Fig. 44D.**) is widespread throughout the region in rainforest, depauperate rainforest, or in eucalypt forest, while *C. ovata* var. *stolonifera* F. M. Bailey is found in western dry areas. Flowers may be found much of the year. Suspected of poisoning stock but not proven toxic. Commonly regarded as useful browse plants. Ripe fruits edible.

## 9. *ALSTONIA* R. Br.

Lactiferous trees or shrubs. Leaves 3–8-verticillate, or opposite, penninerved. Inflorescences of terminal and upper axillary panicles or corymbs; calyx deeply 5-lobed without basal glands; corolla tubular, slightly inflated around anthers, thickened at throat, pubescent below stamens, often also at throat, lobes 5, spreading at maturity; stamens inserted at widened part of tube, included, filaments short but distinct, anthers free from stigma; ovaries 2, ± superior, style glabrous, stigma reaching to anthers, acute or bilobed. Follicles 2, pendulous, parallel, thin, linear, 2-valved; seeds oblong or linear, long bearded, ciliate at both ends.

50 species Indomalaysia to Polynesia; 7 species Australia; 1 species south-eastern Queensland.

### 1. *Alstonia constricta* F. Muell.

### BITTER BARK

*Alstonia mollis* Benth.; *A. constricta* var. *mollis* (Benth.) F. M. Bailey; *A. constricta* var. *montmariensis* F. M. Bailey

Shrub or small tree rarely up to 10 m tall, bark with bitter principle, latex present in young shoots. Leaves with petioles 0.3–5(–7.5) cm long; blades narrowly ovate to ovate, sometimes elliptic, apex acuminate or acute, base cuneate to rounded, margin somewhat undulate, 2.5–20 cm × 0.4–8 cm, glabrous or sometimes variously pubescent to velvety villous, dark green above, paler beneath, lateral veins arcuate and

ascending. Inflorescences mainly terminal, glabrous or pubescent, pedicels up to 2 mm long; calyx *ca* 1.5–2 mm long, lobes *ca* 1 mm long, margin ciliolate; corolla cream or white, tube 2.5–3.5 mm long, densely papillose at throat inside; lobes ligulate, 7–9 mm long, base bearded inside. Fruits linear, cylindrical, 6–20(–30) cm × *ca* 1 cm.

Throughout the region, usually in depauperate rainforest, occasionally in eucalypt forest, sometimes a pest in regenerating areas. Flowers spring. Can be poisonous to stock.

### 10. ALYXIA Banks ex R. Br.

Semiscandent lactiferous shrubs. Leaves 3–4-verticillate, mostly coriaceous, midrib prominent below, penninerved. Inflorescences axillary or pseudoterminal, thyrsoid, sometimes few-flowered, bracts small; calyx deeply 5-lobed, without basal glands inside; corolla tube cylindrical, slightly inflated at insertion of stamens, reflexed hairs inside below anthers, throat scales absent, lobes overlapping to left in bud; stamens inserted in or above middle of tube, included, filaments short, anthers free from stigma; ovaries 2, ovules 4–6 seriate, style glabrous, stigma as long as anthers. Fruits apocarpous, berries, either 2–5-seeded and moniliform, or 1-seeded by abortion; seeds solitary per article, ecomose.

80 species Madagascar, Indomalaysia; 9 species Australia; 2 species south-eastern Queensland.

- |   |                         |
|---|-------------------------|
| 1. Leaves up to 6 cm × 3 cm; corolla lobes 3–4 mm long              | 1. <i>A. ruscifolia</i> |
| Leaves generally larger than 6 cm × 3 cm; corolla lobes 7–8 mm long | 2. <i>A. magnifolia</i> |

#### 1. *Alyxia ruscifolia* R. Br.

#### CHAIN FRUIT

Glabrous or scabrous shrub 1–3 m tall. Leaves with petioles 1–5 mm long; blades elliptic to obovate, or ovate, sometimes narrowly so, apex acuminate with pungent point 2–3 mm long, base cuneate, margin usually recurved, occasionally revolute, 0.9–6 cm × 0.3–3 cm, glabrous or scabrous, dark green, lateral venation oblique, prominent on upper surface, pale with obscure venation beneath. Inflorescences axillary clusters; calyx 2–2.5 mm long; corolla white to cream, 5–7 mm long, lobes 3–4 mm long. Fruits orange to scarlet, either a single berry or a longitudinal chain, each segment globose to ellipsoid, 1–1.5 cm long.

Three varieties occur in the region:

- |  |  |
|--|--|
| 1. Upper surface of leaves scabrous; plants usually with small leaves in whorls close together       | <i>A. ruscifolia</i> var. <i>ulicina</i>       |
| Upper surface of leaves smooth, shining; plants with various sizes of leaves and proximity of whorls | 2  |
| 2. Leaves very narrowly ovate with revolute margin, <i>ca</i> 6–8 times as long as broad             | <i>A. ruscifolia</i> var. <i>pugioniformis</i> |
| Leaves ovate with recurved margin, <i>ca</i> 1.5–4 times as long as broad                            | <i>A. ruscifolia</i> var. <i>ruscifolia</i>    |

*A. ruscifolia* var. *ruscifolia* (Fig. 44C.) occurs mainly in the coastal districts in rainforest and depauperate rainforest, occasionally eucalypt forest, while *A. ruscifolia* var. *pugioniformis* Cunn. has been recorded from rainforest of the Moreton district and Bunya Mts., and *A. ruscifolia* var. *ulicina* F. M. Bailey grows mainly in depauperate rainforest in dry or rocky areas. All flower mainly late winter–spring.

#### 2. *Alyxia magnifolia* F. M. Bailey

Shrub or small tree up to 4 m tall, rarely more. Leaves with petioles 2–10 mm long; blades elliptic to obovate, sometimes broadly so, apex acuminate with pungent point 2–3(–5) mm long, base cuneate, margin recurved, (5–)6–11(–14) cm × (2–)3–6 cm, glabrous, dark green, lateral venation oblique, prominent above, pale and obscure below. Inflorescences of axillary clusters of inconspicuous fragrant flowers; calyx 3–4 mm long; corolla white, tube *ca* 1 cm long, lobes 7–8 mm long. Fruits orange to scarlet, of single globose to ellipsoid berries *ca* 1–1.5 cm long, or moniliform.

Remnant rainforest or depauperate rainforest mainly north of Brisbane. Flowers late winter–spring.

This taxon is possibly only a large leaved and flowered form of *A. ruscifolia*.

### 11. NEISOSPERMA Raf.

Trees. Leaves opposite or whorled with transverse primary lateral veins. Inflorescences of dichotomous or trichotomous cymes; flowers pedicellate; calyx shortly lobed, eglandular; corolla tube slender, lobes contorted; anthers included in corolla tube; ovary of 2 carpels united by styles. Fruits drupes, generally ovate, of 2 carpels or 1 by abortion, endocarp densely echinate with branched spines or fibrous, without central hollow stuffed with soft tissue.

18 species Malesia, New Guinea, Australia, Pacific Is.; 2 species Australia; 1 species south-eastern Queensland.

#### 1. *Neisosperma poweri* (F. M. Bailey) Fosberg & Sachet

*Ochrosia poweri* F. M. Bailey; *O. newelliana* F. M. Bailey

Shrub or tree up to ca 10 m tall, rarely more, with a little milky sap. Leaves with petioles 0.3–1.2 cm long; blades obovate or sometimes elliptic, apex abruptly bluntly acuminate, base cuneate, 4–15.5 cm × 2–6.5 cm, dark green above, slightly paler beneath, venation ± parallel, straight, slightly ascending, visible but not prominent, intramarginal vein present. Inflorescences terminal dichotomous cymes; flowers several, strongly perfumed, pedicels 1.5–2.5 cm long, bracts and bracteoles minute; calyx tube ca 0.5 mm long, lobes obtuse, 1–1.5 mm long, whole glabrous; corolla white, cream or pale yellow, tube 0.8–1.2 cm long, constricted at throat, lobes 6.5–8 mm long, ± glabrous. Fruits bright red, ellipsoid or ovoid, ca 4 cm × 1.5 cm, endocarp nearly smooth, fibrous, corky or soft.

Rainforest of the lowland coastal districts. Flowers autumn.

### 12. OCHROSIA Juss.

Trees with abundant milky sap. Leaves opposite or whorled, with transverse primary lateral veins. Inflorescences of pedunculate terminal or upper axillary cymes, bracts very small; calyx eglandular; corolla tube cylindrical, slightly swollen around anthers, lobes spreading, contorted in bud, throat without scales; anthers enclosed in tube; disc absent or of minute glands; ovary of 2 distinct carpels united by style, stigma conical, ovules 4–6 per carpel, in 2 rows. Fruits drupes, usually single by abortion, somewhat compressed, endocarp very thick and long, divided longitudinally along inner face into 2 thick cylindrical usually hollow portions, true loculus usually 1-, rarely 2-seeded.

21 species Indonesia, Indian Is., Australia, New Guinea, Pacific Is.; 2 species Australia; 1 species south-eastern Queensland.

#### 1. *Ochrosia moorei* (F. Muell.) F. Muell. ex Benth.

*Lactaria moorei* F. Muell.; *Bleekeria moorei* (F. Muell.) Koidzumi

Small tree with milky sap in twigs. Leaves mainly opposite but some in whorls of 3–4; petioles 0.6–1.3 cm long; blades narrowly obovate, apex long acuminate, base cuneate to attenuate, margin slightly recurved, 6–15 cm × 1.5–2.5(–3.5) cm, glabrous, transverse veins numerous, close together, interconnecting in an intramarginal vein. Inflorescences terminal, several-flowered, flowers ultimately ± sessile; calyx lobes obtuse, keeled, ca 3 mm long; corolla tube ca 8 mm long, lobes ca 5–6 mm long. Fruits scarlet, ± ellipsoid to ovoid, compressed, ca 6 cm × 2.5 cm, endocarp smoothly sculptured in pits or wavy lines.

Rainforest of the Gold Coast hinterland, rarely collected. Flowers summer.

## 125. ASCLEPIADACEAE

Climbing twining or erect shrubs or shrublets, herbs or rarely trees. Leaves opposite or verticillate, exstipulate, entire. Inflorescences mostly cymose, bracts usually small;

flowers bisexual, actinomorphic; calyx tube short, lobes 5, imbricate or valvate; corolla tube mostly short, lobes 5, contorted or valvate, sometimes connivent at apex; corona present or absent, simple or of separate scales; stamens 5, inserted at or near base of corolla tube, filaments connate into tube mostly shorter than anthers, anthers introrse, 2-locular, basifixed, connivent at apex above stigma, sometimes produced into recurved appendages, pollen in waxy or sub-pellucid masses (pollinia) and solitary or rarely in pairs in each loculus; disc absent; ovary of 2 separate carpels, styles 2, free up to stigma, stigma 1, peltately dilated and disk-like, ovules numerous, in several rows on single adaxial placenta in each carpel. Fruits of 2 follicles, or sometimes 1 by abortion, sessile, dehiscent lengthwise on adaxial side; seeds compressed and often margined, mostly crowned with coma of long silky hairs.

130 genera with 2000 species tropical and subtropical; ca 20 genera with ca 60 species Australia; 14 genera with 27 species south-eastern Queensland.

1. Stems with leaves . . . . .		2
Stems without leaves, sometimes stems toothed . . . . .		13
2. Erect herbs or shrubs . . . . .		3
Twiners or vines . . . . .		5
3. Corolla lobes contorted in bud; stigmas rostrate . . . . .	1. <i>Tweedia</i>	
Corolla lobes valvate in bud; stigmas not rostrate . . . . .		4
4. Corona scales hood shaped with large horn-like appendage on the inside arching over stigma, yellowish to orange . . . . .	2. <i>Asclepias</i>	
Corona scales hood shaped without large appendage inside, usually 2 short points at apex, whitish . . . . .	3. <i>Gomphocarpus</i>	
5. Corolla tubes 0.8–1.2 cm long, with 5 basal swellings and basal cavities inside; plants glaucous . . . . .	4. <i>Araujia</i>	
Corolla tubes less than 0.8 cm long, without 5 distinct basal swellings and cavities; plants not glaucous . . . . .		6
6. Inflorescences of reflexed dense racemes, sometimes branched; corollas rotate; coronas of 5 membranous segments, peltately attached to back of anthers . . . . .	5. <i>Thozetia</i>	
Inflorescences of umbels cymes panicles or clusters; not the above combination of characters . . . . .		7
7. Corolla lobes valvate; leaves thick or fleshy . . . . .	6. <i>Hoya</i>	
Corolla lobes contorted in bud; leaves herbaceous . . . . .		8
8. Finger glands present at base of leaf blade . . . . .		9
Finger glands absent at base of leaf blade . . . . .		12
9. Pollen masses pendulous; coronas annular, cup shaped or tubular, often with 5 apical lobes or teeth . . . . .	7. <i>Cynanchum</i>	
Pollen masses erect; coronas of 5 segments attached to or near base of staminal column, or absent . . . . .		10
10. Corollas ± rotate; corona segments ± spreading or radiating from near base of staminal column . . . . .	8. <i>Tylophora</i>	
Corollas generally with short broad tube; corona segments adnate to staminal column, erect or absent . . . . .		11
11. Corona segments adnate to staminal column, erect . . . . .	9. <i>Marsdenia</i>	
Coronas reduced to 5 hardly visible lobes or ridges on lower part of corolla tubes, or absent . . . . .	10. <i>Gymnema</i>	
12. Pollen masses 4 per anther, erect; coronas of 5 falcate points adnate halfway up staminal column . . . . .	11. <i>Secamone</i>	
Pollen masses 2 per anther, pendulous; coronas very shortly tubular with 5 lobes longer than anthers adnate halfway up staminal column . . . . .	12. <i>Ischnostemma</i>	
13. Branches terete; corolla lobes ca 4–5 mm long . . . . .	13. <i>Sarcostemma</i>	
Branches 4-, rarely 6-angled; corolla lobes more than 2 cm long . . . . .	14. <i>Stapelia</i>	

### 1. TWEEDIA Hook. & Arn.

Twining subshrubs. Leaves opposite, membranous. Inflorescences of axillary umbels, flowers large; calyx 5-partite; corolla campanulate, 5-lobed, segments acuminate; corona at corolla throat, scales 5, fleshy, retuse or bifid, exerted, opposite sinuses; anthers terminated by a membrane, pollen masses ventricose, attached to attenuate apex, pendulous; stigma elongate acuminate, bipartite.

1 species South America; 1 species cultivated Australia, naturalized in south-eastern Queensland.

#### 1. \**Tweedia coerulea* D. Don

*Oxypetalum coeruleum* (D. Don) Decaisne; *Tweedia versicolor* Hook.

Many-stemmed pubescent herb. Leaves with petioles 0.5–1.3 cm long; blades triangular, apex obtuse, mucronate, base cordate to hastate, margin undulate, 2.7–5 cm × 1–3 cm, densely long pubescent above and below with straight hairs, few finger glands at base of midrib on upper surface. Inflorescences interpetiolar, few-flowered, pubescent; calyx deeply lobed, 5–7 mm long; corolla blue, tube *ca* 4–5 mm long, lobes 0.9–1.2 cm long; corona segments 5, arising near base of corolla, *ca* twice as long as staminal column; style rostrate. Follicles slender, *ca* 8–11 cm long, pubescent, striate.

Native of Central and South America; apparently naturalized in the Stanthorpe area of the Darling Downs district and a few localized areas of the Moreton district. Flowers summer.

### 2. ASCLEPIAS L.

Erect perennial herbs, sometimes woody-based. Leaves without finger glands. Inflorescences of terminal or axillary umbels; calyx small, deeply 5-parted, often glandular at base inside; corolla rotate, lobes 5, valvate, often reflexed at anthesis; corona scales 5, adnate to staminal column, erect with hood shaped apex, within hood an incurved ligular horn-like appendage; anthers with apical membrane, pollinia 2 per anther, pendulous; stigma depressed, 5-angled. Follicles slender, acuminate; seeds comose.

120 species America; 1 species naturalized Australia, occurring in south-eastern Queensland.

#### 1. \**Asclepias curassavica* L.

#### RED HEAD COTTON BUSH

Erect herb up to *ca* 1 m tall, finely pubescent, copious milky sap. Leaves with petioles 0.5–2 cm long; blades narrowly elliptic to narrowly oblong-elliptic, apex acute, base attenuate, margin slightly sinuate, 5.5–14 cm × 0.7–2.7 cm, paler green beneath, often with scattered hairs above and below. Inflorescences of terminal or interpetiolar umbels, peduncles 3–5.5 cm long, pedicels 1.2–2 cm long; calyx 3–4 mm long; corolla red, lobes reflexed, *ca* 8 mm long; corona yellowish to orange, *ca* 4–4.5 mm long, appendage slender, curved, projecting inwards over stigma, *ca* 2–2.5 mm long; stigma flat. Follicles narrowly ovoid, tapered, 6–8 cm long, smooth, held erect on erect or ascending pedicels. **Fig. 44F.**

Native of tropical America; common weed of disturbed sites, roadsides, run down paddocks, cultivation. Flowers late winter to late autumn. Feeding tests have shown it to be toxic to stock, but it is rarely eaten under normal conditions.

### 3. GOMPHOCARPUS R. Br.

Erect shrubs or subshrubs. Leaves without finger glands. Inflorescences interpetiolar umbels; calyx deeply 5-parted, glandular at base inside; corolla rotate, lobes 5, valvate, often reflexed at anthesis; corona scales 5, adnate to staminal column, erect, hood shaped, 2 teeth on inner margin of cucullate top; anthers with apical membrane; pollinia 2 per anther, compressed, pendulous; stigma flat, 5-angled. Follicles broad, inflated; seeds comose.

50 species tropical and southern Africa; 2–3 species naturalized Australia; 1 species south-eastern Queensland.



**Fig. 44** A–D APOCYNACEAE — A<sub>1</sub>–A<sub>2</sub> *Cerbera manghas*, A<sub>1</sub> part inflorescence showing 2 ovate bracts, 5-lobed calyx and 5-lobed corolla x1, A<sub>2</sub> fruit x1/2; B<sub>1</sub>–B<sub>3</sub> *Ervatamia angustisepala*, B<sub>1</sub> part of flowering branchlet x1, B<sub>2</sub> part of calyx with basal glands inside x12, B<sub>3</sub> fruit with divaricate follicles x1; C<sub>1</sub>–C<sub>2</sub> *Alyxia ruscifolia* var. *ruscifolia*, C<sub>1</sub> part of flowering stem x1, C<sub>2</sub> part of fruiting stem with fruit in chains x1; D *Carissa ovata* var. *ovata*, part of flowering branchlet x1; E PERIPLOCACEAE — *Gymnanthera nitida*, part of flowering stem x1; F–G ASCLEPIADACEAE — F<sub>1</sub>–F<sub>3</sub> *Asclepias curassavica*, F<sub>1</sub> part of flowering stem x1; F<sub>2</sub> flower showing hood-shaped corona scales with inner horn-like appendage x1 1/2, F<sub>3</sub> fruits x1/2; G<sub>1</sub>–G<sub>2</sub> *Gomphocarpus physocarpus*, G<sub>1</sub> flower showing corona scales with small apical point x1, G<sub>2</sub> fruiting branchlet x1/2.

1. \***Gomphocarpus physocarpus** E. Meyer sens. lat. BALLOON COTTON BUSH  
*Asclepias physocarpa* (E. Meyer) Schlechter; *A. fruticosa* auct. non L.; *Gomphocarpus brasiliensis* auct. non Fourn.

Erect shrub up to 2 m tall, stems finely pubescent, milky sap copious. Leaves with petioles 0.3–1.3 cm long, blades narrowly ovate to narrowly elliptic, apex acute to acuminate, base cuneate to attenuate, 3.5–11.7 cm × 0.5–1.6 cm, slightly paler and often sparsely pubescent beneath. Inflorescences interpetiolar, peduncles 2–3.5 cm long, pedicels 1–2.5 cm long, initially spreading, later reflexed, curved; sepals 3–4 mm long, pubescent outside; corolla white, 0.8–1.1 cm long, reflexed; corona segments whitish with short apical erect or recurved tooth on inner side. Follicles inflated, ± subglobose, ca 5–7.5 cm long, surface with soft prickle-like processes 7–10 mm long. **Fig. 44G.**

Native of Africa; naturalized through most of the region, weed of disturbed sites, degraded pasture, cultivation, roadsides etc. Flowers most of the year. Feeding tests have shown it is poisonous to stock, but it is unpalatable and hence rarely eaten. Declared noxious under the Stock Routes and Rural Lands Protection Acts 1944–1967 as *Asclepias physocarpa*.

This species has been confused with **G. fruticosus** (L.) R. Br. (*Asclepias fruticosa* L.) but the fruit of that species is quite different, being narrowly oblong-ovate, and often somewhat falcate, with a long beak. Indeed there is evidence to suggest that the taxon described above could be of hybrid origin with **G. physocarpus** as one parent, since a number of forms can be separated out on the character of the shape of the coronal teeth, at least one of which appears to have some characteristics of **G. fruticosus** (from the description) except for the shape and size of the fruit.

#### 4. ARAUJIA Brot.

Twining, hoary or hirsute herbs. Inflorescences of few-flowered cymes; calyx of 5 sepals, eglandular; corolla salverform or funnelshaped tube with 5 basal swellings and 5 cavities inside, lobes 5; corona adnate to base of corolla; anthers terminated by a membrane, pollinia pendulous; stigma ovate, apically 2-horned. Follicles ovate; seeds adhering to membrane of dissepiment, comose.

2–3 species South America; 1 species naturalized Australia, occurring in south-eastern Queensland.

1. \***Araujia hortorum** Fourn. WHITE MOTH PLANT; CRUEL PLANT  
*Araujia albens* G. Don; *A. sericofera* auct. non Brot.

Usually robust, finely pubescent vine, sap milky. Leaves with petioles 0.6–3.3 cm long; blades ± triangular, apex acuminate or sometimes obtuse, mucronate, base ± truncate or very broadly cordate, 3–10 cm × 1–6 cm, dark green above, whitish or greyish glaucous beneath, sparsely pubescent above, short curly pubescent beneath, finger glands present at base of midrib above. Flowers few–several per cyme, interpetiolar; sepals 0.7–1.1 cm long, margin undulate, pubescent; corolla white or pale pink, tube basally enlarged, 0.8–1.4 cm long, lobes undulate, spreading, 0.5–1 cm long, glabrous inside; corona with 5 incurved appendages, stigma 2-lobed. Follicles ovoid or ± basally truncate, up to 10 cm × 6.5 cm, surface finely striate, sometimes glaucous. **Fig. 45A.**

Native of Peru; naturalized through most of the region often in disturbed sites, creek banks, wasteland, a pest in some forestry plantations. Flowers summer–autumn. Has been suspected of poisoning stock, but not often eaten.

#### 5. THOZETIA F. Muell. ex Benth.

Tall twiners. Leaves herbaceous. Inflorescences of reflexed interpetiolar racemes, rachis persistent, elongated, scarred; corolla ± rotate, lobes 5, induplicate-valvate in bud; corona of 5 erect membranous segments, peltately attached to back of anthers, upper end free; anthers terminating in a membrane, pollen masses 2 per anther, erect; stigma conical.

1–2 species endemic in Australia; 1 species south-eastern Queensland.

**1. *Thozetia racemosa* F. Muell. ex Benth.**

Hirsute vine with thin watery nearly colourless sap. Leaves with petioles 2–4.5 cm long; blades oblong to oblong-ovate, apex obtuse or abruptly acuminate, base cordate, in young plants lobed, margin slightly irregular, 10–16 cm × 4–9.5 cm, dark green above, paler beneath, pubescent with ferruginous hairs beneath, finger glands present at base of midrib above. Inflorescences dense racemes, or sometimes branched, elongating and densely prominently scarred with remains of fallen pedicels, usually *ca* 6 cm long but up to 15 cm long, pedicels 5–7 mm long; calyx lobes 4–5 mm long, hirsute; corolla *ca* 10 mm long, lobes 9–9.5 mm long; corona segments obtuse, longer than staminal column, free part *ca* 1–1.5 mm long. Follicles not seen.

Light rainforest on mountain slopes, e.g. Montville area, Samford area of the Moreton district.

**6. HOYA R. Br.**

Twining or trailing plants. Leaves often thick or fleshy. Inflorescences pedunculate interpetiolar simple umbels; flowers often fleshy or waxy; corolla rotate, lobes valvate in bud, flat or with reflexed margins; corona of 5 fleshy segments attached to staminal column, horizontally spreading or expanded into variously shaped discs; anthers terminated by a membrane, pollinia 2 per anther, erect; stigma obtuse.

200 species southern China, south-eastern Asia, Indomalaysia, Australia, Pacific region; 6–7 species Australia; 1–2 species south-eastern Queensland.

**1. *Hoya australis* R. Br. ex Traill****WAX FLOWER**

Glabrous to puberulent vine. Leaves fleshy; petioles 0.7–2 cm long; blades oblong or ovate-oblong, apex abruptly acuminate, base rounded, 3.5–9 cm × 2–5.5 cm, glabrous or lower surface puberulent, usually few finger glands at base of midrib above. Inflorescences umbels of 10–20 flowers, peduncle 1.5–2.5 cm long, rarely longer, pedicels 3–3.5 cm long; sepals 2.5–3 mm long, pubescent outside; corolla white or pinkish, lobes 7–8 mm long, margin slightly reflexed, lobes ascending; corona of 5 horizontal slightly dishd ovate segments with apiculate tip at ventral end, 2 obtuse keels beneath. Follicles slender, *ca* 12–14 cm long. **Fig. 45B.**

Widespread in the region often in or near light rainforest, rocky gullies etc. Flowers mainly spring. Has been suspected of poisoning cattle.

**H. keysii** F. M. Bailey was described from specimens collected in the Mt. Perry area of the Burnett district, differing from **H. australis** in the leaves being pubescent all over, ± orbicular when young and having pure white flowers. There are specimens which would match this description but the flowers appear to be typical of **H. australis** in shape and size and there is normally a great deal of variation in shape, size and indumentum of leaves in **H. australis**. It is tentatively regarded here as a “dry country” form of **H. australis**, adapted to growing under harsh conditions, e.g. rocky outcrops etc., and it has even been reported to be shrubby. The genus is in need of revision.

**7. CYNANCHUM L.**

Perennial herbs, usually twining, rarely erect. Leaves herbaceous. Inflorescences simple or compound umbels or fascicles on solitary interpetiolar peduncles; sepals 5, often with scales inside at base; corolla rotate, lobes 5, contorted in bud; corona arising from or near base of staminal column, annular, cup shaped or tubular, truncate, toothed or lobed, sometimes with a tooth, lobe, thickening or keel near base on inner surface; anthers with a membranous appendage, pollinia 2 per anther, pendulous; stigma short obtuse, truncate or 2-lobed. Follicles sometimes winged or keeled.

About 150 species tropical and temperate; 9–10 species endemic in Australia; 1 species south-eastern Queensland.

**1. *Cynanchum bowmanii* S. T. Blake**

*Vincetoxicum ovatum* Benth.; *Cynanchum ovatum* (Benth.) Domin non (E. Meyer) Druce

Climber, young parts puberulent, otherwise glabrous. Leaves with petioles 0.5–2 cm long; blades ovate to triangular-ovate, apex acuminate, base rounded, truncate to cordate, margin slightly undulate, 1.4–7.5 cm × 0.7–4.2 cm, glabrous, paler beneath, often *ca* 2 finger glands at base of midrib above. Inflorescences of 2, rarely 3 fascicles of few–several flowers on solitary elongated interpetiolar peduncles 2–4 cm long, pedicels 7–10 mm long; sepals *ca* 1.5 mm long, few hairs on back; corolla cream, *ca* 3.5 mm long, very deeply lobed; corona shortly tubular, with 5 lobes *ca* 1 mm long, as long as staminal column, with *ca* 3 or 4 small lobes at apex of each. Follicles narrowly ovoid, attenuate, 4–7 cm long. **Fig. 45C.**

Scattered through most of the region in light rainforest near creeks or wetter eucalypt forest; not commonly collected. Flowers summer–autumn.

**8. TYLOPHORA R. Br.**

Twiners, or sometimes erect. Inflorescences umbel-like cymes, panicles or clusters along single or branched interpetiolar peduncle; sepals sometimes with basal glands inside; corolla deeply 5-lobed, lobes contorted, tube saucer shaped; corona of 5 segments adnate to or radiating from near base of staminal column, usually not exceeding filaments; anthers tipped by membrane, pollinia 2 per anther; stigma short, obtuse or shortly 2-lobed. Follicles usually narrowly fusiform; seeds with narrow marginal wing.

50 species palaeotropic and South Africa; 10–11 species endemic in Australia; 3 species south-eastern Queensland.

- |   |                          |
|---|--------------------------|
| 1. Corolla lobes 1–1.7 cm long; flowers 1–3 per inflorescence . . . . .             | 1. <i>T. grandiflora</i> |
| Corolla lobes 0.4–0.6 cm long; flowers several–numerous per inflorescence . . . . . | 2                        |
| 2. Calyx segments <i>ca</i> 1–1.25 mm long . . . . .                                | 2. <i>T. paniculata</i>  |
| Calyx segments 3–4 mm long . . . . .  | 3. <i>T. crebriflora</i> |

**1. *Tylophora grandiflora* R. Br.**

Slender pubescent twiner. Leaves with petioles 0.3–1.5 cm long; blades oblong-ovate to ± triangular, apex abruptly acuminate or obtuse, base broadly cuneate, truncate or somewhat hastate, margin slightly irregular, 1–5 cm × 0.7–2.8 cm, sparsely pubescent, few finger glands at base of midrib above. Inflorescences of 1–2, rarely 3 flowers on common peduncle, pedicels filiform, much longer than peduncles; sepals 2–2.5 mm long; corolla dark red to purple, tube *ca* 2–2.5 mm long, lobes obtuse to acute, 1–1.7 cm long, papillose within; corona segments basally united, very broad, spoon shaped; staminal column *ca* 1.5 mm long; stigma very obtusely 2-lobed. Follicles very slender, *ca* 5–8 cm long. **Fig. 45D.**

Rainforest margins or vine forest of the region. Flowers spring to autumn.

**2. *Tylophora paniculata* R. Br.**

Glabrous or sparsely pubescent twiners. Leaves with petioles 0.8–4.5 cm long; blades ovate or sometimes elliptic, apex acuminate, base cuneate, rounded, sometimes cordate, margin slightly irregular, 3.5–8.5 cm × 1.7–5 cm, dark green above, paler beneath, glabrous or sparsely pubescent, few finger glands at base of midrib above. Inflorescences of loose slender cymes of umbels often larger than leaves, peduncles filiform, longer than pedicels; sepals 1–1.25 mm long; corolla greenish yellow, tube 0.5 mm long, lobes 4–5 mm long, apex filiform; corona segments adnate at base, apical lobes somewhat spreading, shorter than staminal column; staminal column *ca* 1 mm long; stigma short, 2-lobed. Follicles very slender, fusiform, 7–8 cm long.

Rainforest or fringing forest of the coastal districts. Flowers summer–autumn.

**3. *Tylophora crebriflora* S. T. Blake***Tylophora floribunda* auct. non Miq., Benth.

Slender somewhat pubescent twiner, latex yellow. Leaves with petioles 2–3(–4.5) cm long; blades ovate, apex acuminate, base rounded, truncate or somewhat cordate, margin slightly irregular, 6–9(–12.5) cm × 2.8–6(–8) cm, ± glabrous or lower surface sparsely pubescent, few finger glands at base of midrib on upper surface. Inflorescences of a number of umbels forming cymes, often larger than leaves, peduncles longer than pedicels; sepals 3–4 mm long, pubescent; corolla deep purple or brownish purple, tube *ca* 1–1.5 mm long, lobes 4–6 mm long, ± puberulent outside; corona segments 5, radiating, prominent, tongue shaped; staminal column ± globular, 1–1.5 mm long; stigma very short, minutely 2-lobed. Follicles slender, fusiform, *ca* 12 cm long, slightly winged.

Rainforest margins or vine forest; not commonly collected. Flowers spring or autumn.

**9. MARSDENIA R. Br.**

Twiners or rarely erect. Leaves herbaceous. Inflorescences of irregular cymes or panicles or often simple umbels on interpetiolar peduncles; sepals usually with glands inside at base; corolla with short broad tube or nearly rotate, lobes 5, spreading, contorted in bud; corona of 5 segments adnate to staminal column at base, sometimes with free basal auricles or almost peltate, upper end erect and free, shorter than, or scarcely exceeding anthers; anthers terminated by membrane, pollinia 2 per anther, erect; stigma obtuse, conical or beaked.

About 20 species tropical and subtropical; 15–20 species Australia; 10 species south-eastern Queensland.

- |  |                           |
|--|---------------------------|
| 1. Leaves glabrous . . . . .   | 2                         |
| Leaves pubescent on one or both surfaces . . . . .   | 9                         |
| 2. Bark on young branches fissured, cream, corky; flowers in fascicles, usually 2–3 fascicles per peduncle . . . . .                                   | 1. <i>M. suberosa</i>     |
| Bark on young branches not cream, corky, though oldest stem sometimes brownish corky; flowers in simple umbels . . . . .                               | 3                         |
| 3. Corollas glabrous inside . . . . .  | 3                         |
| Corollas pubescent or with hair tufts inside . . . . .   | 6                         |
| 4. Corollas lobes 1–1.2 cm long . . . . .  | 2. <i>M. glandulifera</i> |
| Corolla lobes 0.2–0.7 cm long . . . . .  | 5                         |
| 5. Corolla lobes 5–6 mm long . . . . .   | 3. <i>M. longiloba</i>    |
| Corolla lobes <i>ca</i> 2 mm long . . . . .  | 4. <i>M. coronata</i>     |
| 6. Corolla lobes 3.5–5 mm long; styles rostrate, 2–3 mm longer than staminal columns . . . . .   | 5. <i>M. rostrata</i>     |
| Corolla lobes 1.5–2.5 mm long; stigmas truncate, conical or projecting 1.5–2 mm above staminal columns . . . . .                                       | 7                         |
| 7. Free point on corona scales <i>ca</i> 1 mm long, slightly longer than staminal column; stigmas projecting 1.5–2 mm above staminal columns . . . . . | 6. <i>M. fraseri</i>      |
| Free point on corona scales <i>ca</i> 0.5 mm long, shorter than staminal column; stigmas conical, as long as anthers, or truncate . . . . .            | 8                         |
| 8. Stigmas conical, as long as anthers . . . . .   | 7. <i>M. leptophylla</i>  |
| Stigmas truncate . . . . .   | 8. <i>M. viridiflora</i>  |
| 9. Inflorescences of corymbose cymes . . . . .   | 9. <i>M. flavescens</i>   |
| Inflorescences of simple umbels . . . . .  | 10                        |
| 10. Corollas glabrous inside . . . . .   | 10. <i>M. microlepis</i>  |
| Corollas pubescent with tufts of hairs inside . . . . .  | 11                        |
| 11. Stigmas conical, as long as anthers . . . . .  | 7. <i>M. leptophylla</i>  |
| Stigmas truncate . . . . .   | 8. <i>M. viridiflora</i>  |

**1. *Marsdenia suberosa* S. T. Blake**

Glabrous twiner with fissured cream corky bark, sap milky. Leaves with petioles 1.5–3.5 cm long; blades oblong to triangular-oblong, apex abruptly acuminate, base truncate to cordate, 4–11 cm × 1.5–5.5(–6.2) cm, glabrous, dark green above, paler beneath, veins looping, visible beneath when dry, 10–20 finger glands at base of midrib on upper surface. Inflorescences of 2–3-, rarely 1–several-flowered fascicles per peduncle, peduncle and rachis 1–2 cm long; sepals 2–2.5 mm long; corolla white, tube *ca* 2 mm long, pubescent inside with antrorse hairs at throat, tufts of retrorse hairs in upper third of tube opposite lobes, lobes *ca* 2 mm long; corona of 5 scales adnate to staminal column at base, 0.4 mm long. Follicles ± ovoid, *ca* 4–5 cm long. **Fig. 45J.**

Light rainforest or wet eucalypt forest of the coastal districts and eastern Darling Downs district. Flowers spring.

**2. *Marsdenia glandulifera* C. T. White**

Tall glabrous climber; bark somewhat longitudinally wrinkled. Leaves with petioles 2.5–7 cm long; blades oblong, ovate-oblong or ± elliptic, apex abruptly acuminate, base cordate, 9–20 cm × 5–10.5 cm, dark green above, paler beneath with looping venation visible when dried, several finger glands at base of midrib above. Inflorescences of simple compact umbels on solitary interpetiolar peduncle 0.5–1 cm long, elongating in fruit, pedicels 2–3 mm long; sepals *ca* 6 mm long, glabrous; corolla whitish, glabrous, tube *ca* 5 mm long, lobes 1–1.2 cm long, tapered; corona *ca* 4–4.5 mm long, adnate to staminal column for half its length, ± triangular, free apex *ca* 2 mm long, longer than anthers. Follicles ovoid, valves thick, *ca* 10–11 cm × 5 cm.

Recorded from Fraser I. in vine forest. Flowers ? spring.

**3. *Marsdenia longiloba* Benth.**

Glabrous twiner with rather watery sap. Leaves with petioles 0.7–3 cm long; blades ovate to triangular, apex acuminate, base rounded, truncate to somewhat hastate, 3.5–12.2 cm × 0.8–5.5 cm, dark green above, paler beneath, glabrous, few finger glands at base of midrib above. Inflorescences several-flowered umbels, peduncles 5–10 mm long, pedicels 7–8 mm long; sepals *ca* 2.5 mm long; corolla whitish, tube 1–1.5 mm long, prominent lobe or scale inside at throat opposite sinus, otherwise glabrous, lobes acute, 5–6 mm long; corona segments each with 2 prominent vertical auricles along adnate base, free apex apiculate, *ca* 0.75 mm long; stigma narrow conical, *ca* 1.5 mm long. Fruits not seen.

Rainforest or wet eucalypt forest of the southern Moreton district. Flowers summer.

**4. *Marsdenia coronata* Benth.**

Slender twiner, young tips puberulent. Leaves with petioles 4–8 mm long; blades narrowly ovate, apex acuminate, base rounded, margin crisped, 2–5.5 cm × 0.4–1.8 cm, occasionally larger, glabrous, dark green above, paler beneath, veins visible below when dried, few glands at base of midrib above. Inflorescences of several-flowered umbels, peduncles 5–10 mm long, pedicels 7–9 mm long, glabrous or puberulent; calyx 2–2.5 mm long, ciliate; corolla whitish, tube 1.5–2 mm long, glabrous but with thickened ring at throat, most obvious beneath sinus, lobes *ca* 2 mm long; corona segment base thickened and broad horizontally, free apex acute, 0.5 mm long, *ca* as long as staminal column; stigma thick, very short, obtuse. Fruits not seen. **Fig. 45H.**

Moreton district in few areas, e.g. Buderim, Mt. Tibrogargan, not often collected. Flowers spring, autumn.

**5. *Marsdenia rostrata* R. Br.****MILK VINE**

Often robust vine, glabrous or young parts puberulent. Leaves with petioles 1.5–4 cm long; blades ovate to oblong-ovate, sometimes broadly so, apex bluntly acuminate, base cuneate to ± truncate or subcordate, margin slightly recurved, 2.5–11.5 cm × 1.2–8 cm, dark green above, paler beneath, reticulation visible on lower surface, several glands at base of midrib above. Inflorescences several-many-flowered umbels, peduncles 1.5–3 cm long, pedicels 0.8–1.5 cm long, both generally pubescent; sepals

2–2.5 mm long; corolla cream, tube 1.5–2.5 mm long, very shortly pubescent inside up to middle and at throat, lobes 3.5–5 mm long; corona segments  $\pm$  basally attached, free apex acute, *ca* 0.5 mm long, slightly longer than staminal column; style 2–3 mm longer than staminal column. Follicles ovoid, blunt, *ca* 5–7 cm long. **Fig. 45I.**

Coastal districts of the region in rainforest or wet eucalypt forest. Flowers spring. Poisonous to stock but normally unpalatable.

*M. rostrata* var. *dunnii* Maiden & Betche, a vine very similar to *M. rostrata* var. *rostrata* in vegetative characters, has the floral characters of *Gymnema* and needs to be transferred to that genus. Accordingly for a description of this taxon see *Gymnema* sp. 1.

#### 6. *Marsdenia fraseri* Benth.

Glabrous slender twiner. Leaves with petioles 0.5–2 cm long; blades ovate or narrowly ovate, apex acuminate, base rounded, margin slightly recurved, 3.3–10.5 cm  $\times$  0.7–3.8 cm, paler beneath, veins generally obscure, few–several finger glands at base of midrib above. Inflorescences solitary compact several-flowered umbels on peduncles 0.6–1.5(–2.7) cm long, pubescent, pedicels 3–6.5 mm long; calyx 2–2.5 mm long; corolla white to cream or yellowish inside, tube 2–2.5 mm long, pubescent with reflexed hairs at throat, lobes 2–2.5 mm long; corona segments adnate at cordate base, free apex acute, *ca* 1 mm long, slightly longer than staminal column. Follicles compressed,  $\pm$  reniform, *ca* 3 cm  $\times$  2.5 cm.

Coastal districts of the region, usually in littoral areas and on offshore islands in deep sandy soils, though once collected near Beerwah in sand. Flowers spring.

#### 7. *Marsdenia leptophylla* F. Muell. ex Benth.

Slender glabrous or sparsely pubescent twiner. Leaves with petioles 0.3–1.3 cm long; blades  $\pm$  linear, apex acute or mucronate, base cuneate to rounded, 2.8–8.5 cm  $\times$  0.2–0.7 cm, dark green above, paler beneath, glabrous or sparsely pubescent, venation generally obscure, 1–2 finger glands usually at base of midrib above. Inflorescences several-flowered umbels, peduncles 0.6–1.2 cm long, pedicels 0.7–1.2 cm long; calyx lobes obtuse, 2.5–3 mm long; corolla whitish, tube 2–2.5 mm long, tufts of hairs at throat or thickened ring on upper half of tube, lobes 1.5–2 mm long; corona segments  $\pm$  peltately attached, base auriculate, free apex  $\pm$  obtuse, *ca* 0.5 mm long; stigma conical, as long as anthers. Follicles ovoid, 4.5–8 cm long. **Fig. 45F.**

Western districts of the region. Flowers summer.

#### 8. *Marsdenia viridiflora* R. Br.

Slender glabrous or sparsely pubescent twiner. Leaves with petioles 4–10 mm long; blades linear to linear-ovate, apex acute to mucronate, base cuneate to rounded, 4–9.5 cm  $\times$  0.3–1 cm, glabrous or sparsely pubescent, paler beneath, venation often visible on lower surface, often 1–few finger glands at base of midrib above. Inflorescences several-flowered umbels, peduncles 0.3–1(–2) cm long, pedicels 0.5–1.3 cm long; calyx lobes obtuse, 2.5–3.5 mm long; corolla greenish cream, tube 2–3 mm long, tufts or ring of hairs at throat, lobes 1.5–2 mm long; corona segments peltately attached, base auriculate, free apex obtuse, *ca* 0.5 mm long; stigma very short obtuse,  $\pm$  truncate. Follicles ovoid, *ca* 6–7 cm long.

Western districts of the region. Flowers spring–summer.

#### 9. *Marsdenia flavescens* Cunn.

Pubescent slender twiner. Leaves with petioles 0.3–1.5(–2.5) cm long; blades oblong to oblong-obovate, apex abruptly acuminate or sometimes obtuse, base cuneate to rounded, 2.2–7.5(–10.2) cm  $\times$  1.1–3.7 cm, upper surface  $\pm$  glabrous, dark green, venation pale, visible when dried, lower surface pubescent with spreading hairs, venation obscure or less prominent, 1–3 finger glands at base of midrib above. Inflorescences corymbose cymes with numerous flowers on puberulent peduncles up to *ca* 2.5 cm long, pedicels 3–6 mm long; sepals 1–1.25 mm long; corolla yellowish, tube *ca* 1 mm long, lobes 1–1.25 mm long, papillose within; corona segments  $\pm$

triangular, broadly attached at base and centre, free apex obtuse, *ca* 0.5 mm long, shorter than staminal column. Follicles very slender, tapered, 4.5–6.5 cm long. **Fig. 45G.**

Rainforest of McPherson Ra., Mt. Tamborine etc. Flowers summer.

### 10. *Marsdenia microlepis* Benth.

Pubescent twiner. Leaves with petioles 0.6–2(–5) cm long; blades oblong-ovate, apex acuminate, often abruptly so, base rounded, truncate or cordate, margin somewhat sinuate, 2.5–5.5(–8) cm × 1–3.5(–7) cm, pubescent or puberulent both surfaces, 1–3 finger glands at base of midrib above. Inflorescences of several-flowered umbels, peduncles *ca* 1 cm long, pedicels *ca* 8–9 mm long, all pubescent; calyx lobes ovate, 2.5–3.5 mm long, pubescent; corolla greenish, glabrous, tube 2–2.5 mm long, lobes *ca* 2 mm long; corona segments ± triangular, peltately attached, free apex obtuse, *ca* 0.5–0.7 mm long, shorter than staminal column. Follicles ovoid, tapered, 6–10.5 cm long.

Drier parts of the region in depauperate rainforest or eucalypt forest. Flowers late spring–summer.

## 10. GYMNEMA R. Br.

Erect or twining. Leaves herbaceous. Inflorescences of umbels, either solitary or 2 together on short interpetiolar peduncles or axillary and opposite; calyx often with glands inside at base; corolla with short broad tube, lobes 5, spreading, contorted in bud; corona absent or reduced to 5 scarcely prominent lobes or ridges on lower part of corolla tube; anthers terminated by a membrane, pollinia 2 per anther, erect; stigma short and obtuse or conical or rarely elongated.

25 species palaeotropical, southern Africa, Australia; 7–8 species Australia; 2 species south-eastern Queensland.

- |                             |   |   |   |   |   |   |                          |
|-----------------------------|---|---|---|---|---|---|--------------------------|
| 1. Corollas glabrous inside | : | : | : | : | : | : | 1. <i>G. micradenium</i> |
| Corollas pubescent inside   | : | : | : | : | : | : | 2. <i>G. sp. 1.</i>      |

### 1. *Gymnema micradenium* Benth.

*Gongronema micradenia* (Benth.) Benth. & J. D. Hook. ex F. Muell.

Slender pubescent twiner with latex. Leaves with petioles 0.2–1.1 cm long; blades obovate, sometimes oblong-obovate, apex abruptly acuminate, base cuneate to rounded, margin slightly recurved, somewhat undulate, 1.5–6.5 cm × 0.6–2.7 cm, ± puberulent above and below, paler beneath, few finger glands at base of midrib above. Inflorescences of few-flowered umbels or cymes on peduncles 0.5–1.1 cm long, pedicels 2–4 mm long; calyx lobes 1–1.5 mm long, pubescent; corolla whitish, tube *ca* 1.5 mm long, lobes *ca* 1–1.25 mm long, all glabrous; corona absent; stigma truncate. Follicles very slender, *ca* 5.5 cm long. **Fig. 45K.**

Light rainforest of the region. Flowers summer.

### 2. *Gymnema* sp. 1.

*Marsdenia rostrata* R. Br. var. *dunnii* Maiden & Betche

Puberulent vine, larger branchlets with corky furrowed bark. Leaves with petioles 0.6–2.5(–4) cm long; blades ovate, oblong-ovate to oblong-elliptic, apex acute to acuminate, base rounded, 2.7–9(–16) cm × 1.3–4(–10.5) cm, paler beneath, puberulent beneath, often also above, few finger glands at base of midrib above. Inflorescences several-flowered umbels, usually 2 per node, peduncles 0.3–1.2 cm long, pedicels 3–5 mm long; calyx *ca* 1.5–2 mm long, puberulent; corolla whitish, tube *ca* 2.5 mm long, shortly pubescent inside, thickened ridges longitudinally down tube alternate with lobes, ciliate on edges and thickened at throat, lobes *ca* 2.5 mm long; corona segments reduced to 5 small tubercles at base of staminal column extending in fine ridges up side of column with no obvious free apex, stigma 2–2.5 mm longer than staminal column. Follicles slender, tapered, *ca* 5–6 cm long. **Fig. 45L.**

Rainforest or drier vine forest of the region. Flowers summer.

**11. SECAMONE R. Br.**

Straggling or twining, woody-based plants. Leaves often pellucid-dotted without finger glands. Inflorescences loose axillary or interpetiolar solitary cymes; flowers very small; calyx small; corolla rotate, deeply 5-lobed, lobes contorted in bud; corona of 5 laterally compressed segments, vertically adnate to staminal column at base, with free falcate or ligulate points; pollinia 4 per anther, erect, attached in fours, 2 from each adjoining anther to small appendages of style; stigma very short and obtuse. Follicles slender; seeds comose.

100 species palaeotropical; 2 species Australia; 1 species south-eastern Queensland.

**1. *Secamone elliptica* R. Br.**

Slender vine, older stems with thick soft deeply fissured corky bark. Leaves with petioles 2.5–6 mm long; blades narrowly ovate to ovate, apex acuminate, base cuneate, margin slightly recurved or sinuate-undulate, 1.6–6.5 cm × 0.4–2.5 cm, dark green above, paler beneath, glabrous or few hairs on midrib, mostly pellucid dotted. Inflorescences several-flowered, ferruginous pubescent, interpetiolar or sometimes appearing terminal; calyx lobes obtuse, *ca* 1 mm long; corolla whitish, tube *ca* 0.5 mm long, lobes *ca* 2.5–3 mm long; corona of 5 falcate points arising from near base of staminal column. Follicles narrowly ovoid, very divergent, *ca* 5–7 cm × 0.8–1.2 cm, each valve striate, narrowly winged. **Fig. 45E.**

Mainly light rainforest through most of the region, sometimes littoral closed forest behind beaches. Flowers spring–summer.

**12. ISCHNOSTEMMA King & Gamble**

Twining herbs. Leaves without finger glands. Inflorescences of lax interpetiolar cymes; calyx deeply 5-lobed, segments acute, glands at base inside; corolla rotate, deeply 5-lobed, contorted in bud, widely overlapping at top to right; corona inserted on staminal tube, 5-lobed, lobes free, erect, slightly longer than stigma; anthers with apical membrane, pollinia 2 per anther, pendulous; ovaries free, stigma obtuse. Follicles slender acuminate; seeds ± round, broadly winged, comose.

1 species Malay Peninsula, Philippines, Java, New Guinea, tropical Australia, occurring in south-eastern Queensland.

**1. *Ischnostemma carnosum* (R. Br.) Merr. & Rolfe**

*Oxystelma carnosum* R. Br.; *Vincetoxicum carnosum* (R. Br.) Benth.; *Cynanchum carnosum* (R. Br.) Schlechter

Slender twiner. Leaves with petioles 0.4–0.8(–2) cm long; blades oblong to oblong-obovate, apex abruptly contracted, acuminate, base cuneate, 1.5–6(–7.5) cm × 0.5–2(–3.5) cm, somewhat fleshy, glabrous or few curly hairs on margin near base and petiole. Inflorescences few-flowered interpetiolar umbels, peduncles *ca* 1.5–2 cm long, pedicels 1–1.5 cm long; sepals 1.5–2.5 mm long, glabrous; corolla whitish, tube *ca* 2 mm long, lobes 5–6 mm long; corona very shortly tubular, arising from base of corolla with 5 long lobes adnate in middle to staminal column to about halfway up lobe, lobes *ca* 2.5 mm long, longer than staminal column. Follicles ovoid, *ca* 5–7 cm long, surface striate. **Fig. 45M.**

Coastal districts in strand or littoral areas, in wallum or behind mangroves. Flowers spring to autumn.

**13. SARCOSTEMMA R. Br.**

Stems leafless, often somewhat fleshy. Inflorescences sessile lateral umbels; calyx small; corolla ± rotate, lobes contorted in bud; corona double, outer annular or cup shaped, usually at base of staminal column, inner of 5 segments at back of anthers, fleshy or saccate at base with an erect free point; anthers with apical membrane, pollinia 2 per anther, pendulous; stigma short, obscurely notched.

10 species tropical and subtropical Old World; 1 species endemic in Australia, occurring in south-eastern Queensland.

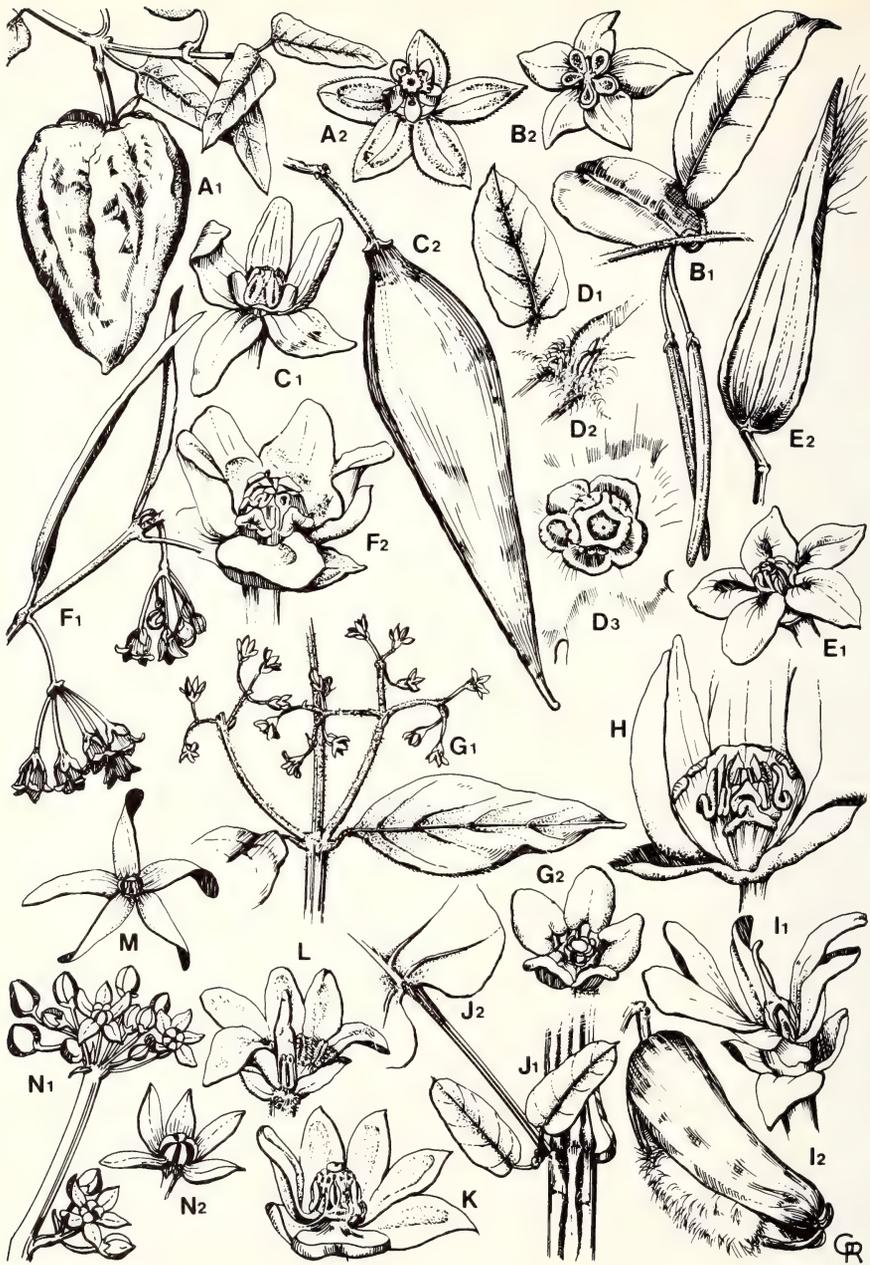


Fig. 45 ASCLEPIADACEAE — A<sub>1</sub>–A<sub>2</sub> *Araujia hortorum*, A<sub>1</sub> part of fruiting stem x1/2, A<sub>2</sub> flower x1 1/2; B<sub>1</sub>–B<sub>2</sub> *Hoya australis*, B<sub>1</sub> part of fruiting stem x1/2, B<sub>2</sub> flower x1 1/2; C<sub>1</sub>–C<sub>2</sub> *Cynanchum bowmanii*, C<sub>1</sub> flower showing corona with short basal tube x3, C<sub>2</sub> fruit x1; D<sub>1</sub>–D<sub>3</sub> *Tylophora grandiflora*, D<sub>1</sub> leaf x1, D<sub>2</sub> enlargement of junction of leaf base and petiole to show finger glands x12, D<sub>3</sub> centre of flower showing corona segments x6; E<sub>1</sub>–E<sub>2</sub> *Secamone elliptica*, E<sub>1</sub> flower x6, E<sub>2</sub> fruit x1; F<sub>1</sub>–F<sub>2</sub> *M. leptophylla*, F<sub>1</sub> part of flowering stem x1, F<sub>2</sub> flower x6; G<sub>1</sub>–G<sub>2</sub> *M. flavescens*, G<sub>1</sub> section of stem with inflorescence x1, G<sub>2</sub> flower x6; H *M. coronata*, part flower showing thickened ring on corolla and corona lobes x6; I<sub>1</sub>–I<sub>2</sub> *M. rostrata*, I<sub>1</sub> flower showing long style x3, I<sub>2</sub> fruit x1/2; J<sub>1</sub>–J<sub>2</sub> *M. suberosa*, J<sub>1</sub> section of stem showing corky bark x1, J<sub>2</sub> leaf base showing finger glands x1; K–L *Gymnema* spp. — K *G. micradenium*, flower showing glabrous corolla and no corona x6; L *G. sp. l.*, flower showing pubescent corolla with thickened ridges on tube; M *Ischnostemma carnosum*, flower x3; N<sub>1</sub>–N<sub>2</sub> *Sarcostemma australe*, N<sub>1</sub> part of flowering stem x1 1/2, N<sub>2</sub> flower x2.

**1. *Sarcostemma australe* R. Br. CAUSTIC VINE; CAUSTIC BUSH; PENCIL CAUSTIC**

Scrambling shrub or climber, glabrous, often ± glaucous, sap milky. Inflorescences clusters of flowers arising from node, pedicels 3–6 mm long, pubescent; sepals *ca* 1 mm long, sparsely pubescent; corolla creamy white, tube *ca* 0.5 mm long, lobes *ca* 4 mm long; outer part of corona cup shaped, sinuate lobed, lobes *ca* 0.5 mm long, opposite inner segments which are thickened, ridge-like, adnate to back of anthers, with erect free point *ca* 0.75 mm long; stigma obscure. Follicles slender, up to *ca* 9 cm long. **Fig. 45N.**

Dry vine forest or rocky areas of the region, sometimes in littoral areas in sandy or stony soil. Flowers summer–autumn.

**14. STAPELIA L.**

Succulent dwarf leafless perennials, branches tufted or spreading, 4-, rarely 6-angled, angles usually toothed with rudimentary leaves. Flowers several from rudimentary peduncles towards base of branches, developing successively, sometimes 2 open at same time; sepals often with scales inside at base; corolla rotate or sometimes shortly tubular, rarely with tube longer than lobes, sometimes with raised ring around corona, lobes mainly triangular, acute; corona 2-seriate arising from staminal column, outer corona 5-lobed, lobes free, spreading, entire or variously toothed, usually channelled down face, inner corona 5-lobed, lobes simple, 2-fid or 2-lobed; anthers without terminal appendage, pollinia 2 per anther. Follicles fusiform.

75 species Africa; few species cultivated Australia; 1 species possibly naturalized south-eastern Queensland.

**1. \**Stapelia variegata* L. CARRION FLOWER**

Succulent perennial with teeth 1.5–4.5 mm long opposite each other on angles of stem. Flowers solitary arising from near nodes on peduncles 3–3.5 cm long; calyx lobes *ca* 4–5 mm long; corolla rotate, variegated, greenish yellow with dark purple-brown spots; 3–3.5 cm long, lobes *ca* 2.5 cm long; ring raised, papillose, *ca* 2 cm across; outer coronal lobes *ca* 4 mm long, 3-toothed at apex, inner *ca* 2.5–3 mm long, 2-fid; staminal column short.

Native of Africa; garden escape, possibly naturalized in the Darling Downs district or localized occurrences near habitation. Flowers autumn.

***Rhyncharrhena linearis* (Decaisne) K. L.** Wilson has been recorded once from the Darling Downs district in cleared mixed open forest. It can be distinguished by its linear herbaceous usually revolute leaves without finger glands, axillary umbels and small dull purplish or brownish flowers. It is usually found in western Queensland through to central Australia.

**126. PERIPLOCACEAE**

Climbing, twining or erect shrubs or shrublets, rarely trees or shrubs. Leaves opposite, exstipulate, entire. Inflorescences cymose, bracts usually very small, flowers bisexual, actinomorphic; calyx tube very short, lobes 5, imbricate or valvate; corolla tube mostly short, lobes 5, contorted or rarely valvate; corona absent or present; stamens 5, inserted at or near base of corolla, filaments free at apex or from base, anthers 2-locular, introrse, basifixed, connivent at apex above stigma, sometimes produced into dilated subrecurved-spreading appendages, pollen granular, often cohering into masses in each loculus, but easily separated; disc absent; ovary of 2 separate carpels, styles 2, free up to stigma, stigma 1, peltately dilated and disc-like, ovules numerous per carpel, several-rowed on single adaxial placenta. Fruits of 2 follicles, or sometimes 1 by abortion, sessile, dehiscing lengthwise on adaxial side; seeds compressed and often margined, mostly crowned with coma of long silky hairs.

45–50 genera with 200 species tropical and warm temperate, especially tropical Africa; 2 genera with 1 native and 1 naturalized species Australia, both occurring in south-eastern Queensland.

- |   |                        |
|---|------------------------|
| 1. Inflorescences interpetiolar or ± axillary | 1. <i>Gymnanthera</i>  |
| Inflorescences terminal                       | 2. <i>Cryptostegia</i> |

## 1. GYMNANTHERA R. Br.

Twining with milky sap. Leaves herbaceous. Inflorescences lax cymes in interpetiolar or  $\pm$  axillary peduncles; corolla tube cylindrical, lobes contorted; corona of 5 scales, inserted in corolla throat behind filaments; filaments free, inserted in corolla throat, pollen masses 4 per anther, attached in fours (2 from each adjoining anther) to filiform appendages of style.

1 species endemic in Australia, occurring in south-eastern Queensland.

1. *Gymnanthera nitida* R. Br.

Glabrous twiner. Leaves with petioles 0.8–3 cm long; blades ovate to ovate-oblong, apex mostly very shortly abruptly acuminate, occasionally more tapered or obtuse, base cuneate to rounded, margin entire or slightly sinuate, 5–12.5 cm  $\times$  2–6.5 cm, glabrous, paler beneath, reticulate venation prominent when dried. Inflorescences bracteate, peduncles divided very close to stem into 2 branches 5–10 mm long, pedicels 0.5–1.2 cm long; calyx 1.5–2 mm long, lobes broadly ovate, irregular ring of glands inside and small scales alternating with segments at base; corolla greenish white, tube 0.8–1.2 cm long, lobes 6–8 mm long; corona whitish; anthers with acuminate appendages. Follicles slender, acute, up to 20 cm long; seeds *ca* 6–7 mm long, comose. **Fig. 44E.**

Coastal districts, usually along creek banks in fringing rainforest, not commonly collected. Flowers spring to autumn.

## 2. CRYPTOSTEGIA R. Br.

Twining glabrous shrubs. Inflorescences terminal, peduncles 3-fid; flowers large; corolla infundibuliform, lobes contorted; stamens inserted in tube, filaments free, anthers included, coherent; stigma pentagonal, with 5 glandular processes placed at angles of stigma in which pollen is deposited.

2 species Madagascar; 1 species naturalized Australia, occurring in south-eastern Queensland.

1. \**Cryptostegia grandiflora* (Roxb.) R. Br.

## RUBBER VINE

*Nerium grandiflorum* Roxb.

Robust woody vine with milky sap. Leaves with petioles 0.5–1.5 cm long; blades ovate to oblong-ovate, often broadly so, apex obtuse or abruptly bluntly acuminate, base cuneate, usually broadly so, margin entire or slightly undulate, 3–9.5 cm  $\times$  2–6 cm, paler beneath, reticulate venation prominent when dried. Inflorescences large, terminal, finely pubescent, peduncles *ca* 1.5 cm long, usually 3-branched, bracts caducous, pedicels 5–7 mm long; calyx 1.2–1.5 cm long, lobes ovate; corolla purplish pink, fading whitish, glabrous, tube *ca* 3–3.5 cm long, with 5 filiform 2-fid scales attached to tube above stamens, lobes obtuse, 2.5–3 cm long; filaments short, anthers incurved over stigma. Follicles usually 2, widely divergent, broad basally, 12–15 cm  $\times$  2–4.5 cm, surface winged and wrinkled; seeds *ca* 8 mm long, comose.

Native of Madagascar; naturalized often along creeks in rich soil, a pest in some areas. Flowers summer. Toxic to stock but usually unpalatable. Declared noxious under the Stock Routes and Rural Lands Protection Acts 1944–1967.

## 127. RUBIACEAE

Trees, shrubs or sometimes herbs. Leaves opposite or verticillate; stipules interpetiolar or intrapetiolar, free or connate, sometimes leaf-like; blades simple, entire or rarely toothed. Flowers mostly bisexual, rarely slightly zygomorphic, solitary to capitate; calyx adnate to ovary; corolla epigynous,  $\pm$  tubular, lobes 4–10, rarely 3, contorted, imbricate or valvate; stamens as many as corolla lobes and alternate with them, inserted in tube or at mouth, anthers mostly free, 2-locular, opening lengthwise; ovary inferior, 2- or more-locular, with axile apical or basal placentation, rarely 1-locular

with parietal placentas, style often slender, variously lobed, ovules 1–many. Fruits capsules, berries or drupes; seeds rarely winged, mostly with endosperm.

500 genera with 6000 species, mostly tropical, but temperate and Arctic as well; ca 25 genera with ca 170 species Australia; 23 genera with 54 species south-eastern Queensland.

1. Herbs, or if shrubby then with an inflorescence of heads of flowers united into compound dry heads ( <b>Opercularia</b> ) . . . . .		2
Shrubs or trees or climbers . . . . .		13
2. Ovules numerous per loculus . . . . .		3
Ovules solitary per loculus . . . . .		5
3. Flowers 5-merous; corolla lobes 2–3-toothed . . . . .	1. <i>Dentella</i>	
Flowers 4-merous; corolla lobes entire . . . . .		4
4. Corollas rotate, withering, persistent . . . . .	2. <i>Synaptantha</i>	
Corollas with short or long tubes, valvate, deciduous . . . . .	3. <i>Hedyotis</i>	
5. Flowers united by calyx tube into simple or compound heads . . . . .		6
Flowers not united by calyx tube into simple or compound heads . . . . .		7
6. Inflorescences of umbels of simple heads . . . . .	4. <i>Pomax</i>	
Inflorescences of simple heads united into a compound head . . . . .	5. <i>Opercularia</i>	
7. Inflorescences of dense many-flowered sessile axillary clusters, or if terminal then subtended by large foliaceous bracts . . . . .		8
Inflorescences of terminal or sometimes lateral or axillary cymes of few-flowered clusters, or panicles of spikes . . . . .		10
8. Fruits separating into 3 or 4, 1-seeded mericarps crowned by eventually deciduous 4–6 radiating calyx lobes . . . . .	6. <i>Richardia</i>	
Fruits of only 2, 1-seeded united carpels, crowned by erect calyx lobes . . . . .		9
9. Fruits circumscissing when mature . . . . .	7. <i>Mitracarpus</i>	
Fruits septically or loculicidally dehiscent when mature, or rarely indehiscent . . . . .	8. <i>Spermacoce</i>	
10. Calyces with usually 4 rarely –6 minute, persistent teeth; inflorescences apparently of panicles of spikes; leaves 2 per node . . . . .		11
Calyces completely united to ovaries, teeth or lobes absent; inflorescences of small cymes or few-flowered clusters, leaves 2 in 1 species otherwise in whorls of 4–8 per node . . . . .		12
11. Plants bisexual; flowers in terminal cymes or corymbs, branches often lengthened into 1-sided spikes; stamens 4; ovary 2-locular; fruits dry . . . . .	9. <i>Knoxia</i>	
Plants dioecious; flowers in terminal and subterminal axillary compound dichasia; stamens 5; ovary 1-locular; fruits fleshy . . . . .	10. <i>Durringtonia</i>	
12. Corolla tubes funnel shaped; fruits 2-lobed, indehiscent . . . . .	11. <i>Asperula</i>	
Corollas rotate; fruits of 2 dry 1-seeded mericarps, falling separately at maturity . . . . .	12. <i>Galium</i>	
13. Flowers connate by calyx tubes, fruits united into fleshy syncarp . . . . .	13. <i>Morinda</i>	
Flowers and fruits free . . . . .		14
14. Ovaries and fruits divided by longitudinal oblique or transverse septa into 4–12, 1-ovuled loculi, pyrenes numerous . . . . .	14. <i>Timonius</i>	
Ovaries and fruits 2–4-locular with 2–4-pyrenes . . . . .		15
15. Ovaries with 2 or more ovules per loculus . . . . .		16
Ovaries with 1 ovule per loculus . . . . .		18
16. Ovules several per loculus . . . . .	15. <i>Randia</i>	
Ovules 2, rarely up to 4, per loculus . . . . .		17
17. Corolla lobes 4, imbricate; drupes with 2-locular pyrenes . . . . .	16. <i>Diplospora</i>	
Corolla lobes 5, rarely 4, valvate; drupes with 4 distinct 1-seeded pyrenes . . . . .	17. <i>Coelospermum</i>	

18. Inflorescences terminal . . . . .	19
Inflorescences axillary . . . . .	22
19. Flowers unisexual, in umbels . . . . .	18. <i>Hodgkinsonia</i>
Flowers bisexual, in cymes or panicles . . . . .	20
20. Corolla lobes 5, rarely 4, valvate . . . . .	19. <i>Psychotria</i>
Corolla lobes 4, rarely 5, imbricate . . . . .	21
21. Floral bracts at base of inflorescence connate into a sheath . . . . .	20. <i>Pavetta</i>
Floral bracts at base of inflorescence free . . . . .	21. <i>Ixora</i>
22. Flowers in umbels . . . . .	18. <i>Hodgkinsonia</i>
Flowers in clusters or cymes . . . . .	23
23. Corolla lobes valvate in bud . . . . .	22. <i>Canthium</i>
Corolla lobes contorted in bud . . . . .	23. <i>Coffea</i>

### 1. DENTELLA J. R. & G. Forster

Prostrate or mat forming herbs. Leaves opposite; stipules interpetiolar, entire or ciliate. Flowers solitary, usually axillary; calyx tubular, 5-lobed, persistent in fruit; corolla tube widened across apex, lobes 5, usually each 2–3-toothed, induplicate valvate in bud; stamens 5, attached about middle of tube, ovary 2-locular, ovules several per loculus, attached to placenta arising from near base, style 2-lobed. Capsules  $\pm$  globose, crowned by calyx tube, 2-locular, tardily dehiscent; seeds  $\pm$  angular.

10 species Indomalaysia, Australia; *ca* 7 species Australia; 1 species south-eastern Queensland.

#### 1. *Dentella repens* (L.) J. R. & G. Forster

*Oldenlandia repens* L.

Prostrate, spreading, mat forming herb, stems rooting at nodes. Leaves with petioles up to 2 mm long; blades elliptic, or sometimes obovate or ovate-elliptic, apex  $\pm$  acute, base cuneate to attenuate, 3–10 mm  $\times$  0.5–3.5 mm, glabrous to puberulent. Flowers solitary, axillary; calyx tube *ca* 2.5 mm long from base of ovary, pubescent with blunt hollow hyaline unicellular hairs on ovary, lobes *ca* 1 mm long; corolla white, tube *ca* 3.5–4.5 mm long, lobes 2–3 mm long. Fruits spherical to globose capsules *ca* 2.5–3 mm diameter, crowned for some time by persistent calyx. **Fig. 46A.**

Moist areas such as near streams or fresh water swamps of mainly the coastal districts, but also the Eidsvold area. Flowers late winter to autumn.

### 2. SYNAPTANTHA J. D. Hook.

Small herbs. Leaves opposite; stipules small, connate with petioles, 2-toothed, hyaline. Flowers small, axillary, solitary or paired; calyx tubular, lobes 4, persistent; corolla rotate, 4-partite, only briefly basally connate, withering, persistent; stamens 4, inserted between corolla segments, anthers dorsifixed, oblong; ovary half superior, 2-locular, ovules numerous per loculus, style slender, 2-branched. Capsules usually more than half superior, 2-locular, 2-valved, few-seeded.

1–2 species endemic in Australia; 1 species south-eastern Queensland.

#### 1. *Synaptantha tillaeacea* (F. Muell.) J. D. Hook.

*Hedyotis tillaeacea* F. Muell.; *Oldenlandia tillaeacea* (F. Muell.) F. Muell.

Small prostrate succulent herb often with scabrous stems. Leaves  $\pm$  sessile or with petioles up to 1 mm long; blades linear-oblong, linear-elliptic, or very narrowly obovate, apex obtuse or subacute, margin often recurved, 0.5–1.7 cm  $\times$  0.1–0.25 cm, glabrous or scabrous. Flowers clustered, 1–few axillary on peduncles up to 6 mm long

in fruit; calyx lobes 0.75–1.5 mm long, acute or subobtusate; corolla whitish, 1–2 mm long, lobes  $\pm$  triangular, abruptly acuminate; stamens persistent. Capsules *ca* 1–2 mm broad, somewhat laterally compressed, opening loculicidally by 2 valves. **Fig. 46B.**

Western Darling Downs district. Flowers spring to autumn.

### 3. HEDYOTIS L.

Herbs subshrubs or rarely climbers. Leaves opposite; stipules interpetiolar, united into short sheath or with petioles, or  $\pm$  free. Inflorescences of terminal panicles or sometimes axillary; calyx lobes 4, rarely 5; corolla tube short or long, 4-, rarely 5-lobed, valvate in bud; stamens inserted in tube, anthers usually exerted; ovary 2-, rarely 3–4-locular, ovules several per loculus, placentas  $\pm$  basal. Capsules globular to ovoid, often compressed, loculicidally or septicidally 2-valved, rarely indehiscent.

150–450 species chiefly Asian; *ca* 14 species Australia; 3 species south-eastern Queensland.

- |  |                             |   |
|--|-----------------------------|---|
| 1. Inflorescences dichasially branched terminal panicles . . . . . | 1. <i>H. trachymenoides</i> |   |
| Inflorescences axillary . . . . .                                  |                             | 2 |
| 2. Inflorescences 2–8-flowered corymbs . . . . .                   | 2. <i>H. corymbosa</i>      |   |
| Flowers 1–2 per axil, each on separate peduncles . . . . .         | 3. <i>H. galioides</i>      |   |

#### 1. *Hedyotis trachymenoides* F. Muell.

Slender erect branched herb up to *ca* 40 cm tall, stems scabrous or young branchlets glabrous, ribbed. Leaves linear, occasionally linear-elliptic, apex acute, margin incurved, 0.4–3.7 cm  $\times$  0.05–0.2 cm, glabrous to scabrous. Inflorescences terminal, often dichasially branched panicles; calyx lobes 0.5–1 mm long; corolla white, sometimes tinged violet, tube (2–)3–5 mm long, pubescent inside at throat, lobes (1–)1.5–3.5 mm long, generally *ca* half as long as tube. Capsules somewhat compressed,  $\pm$  hemispherical or depressed globose, 2–2.5 mm  $\times$  3–3.5 mm, opening apically, persistent calyx lobes *ca* 0.5 mm from apex. **Fig. 46C.**

Western districts of the region often in sandy soil. Flowers late spring to autumn.

#### 2. *Hedyotis corymbosa* (L.) Lam.

*Oldenlandia corymbosa* L.

Small erect or prostrate annual, stems up to 30 cm long, glabrous or sometimes minutely scabrous. Leaves  $\pm$  sessile or with ill-defined petioles up to 2 mm long; blades elliptic or narrowly elliptic, sometimes ovate, apex acute, base cuneate to attenuate, margin often revolute, 0.8–3 cm  $\times$  0.2–0.6 cm,  $\pm$  glabrous. Inflorescences axillary 2–8-flowered corymbs, sometimes with 2 flowers on peduncle below corymb; calyx lobes 0.5–1 mm long; corolla white, *ca* 1 mm long, lobes slightly shorter than tube. Capsules slightly compressed, usually parallel sided or narrower at apex, 1.5–2 mm  $\times$  2–2.5 mm, dehiscing apically, persistent calyx lobes almost at apex.

Northern districts of the region, sometimes a weed in lawns. Flowers mainly summer.

#### 3. *Hedyotis galioides* F. Muell.

Small prostrate or ascending annual; stems up to 45 cm long, glabrous or rarely minutely scabrous. Leaves  $\pm$  sessile, linear to very narrowly elliptic, apex attenuate, base attenuate, margin revolute, 0.4–2.2 cm  $\times$  0.05–0.3 cm, glabrous. Flowers solitary or rarely 2 per axil, each on peduncle 0.3–2 cm long; calyx lobes 1–1.5 mm long; corolla white, 1.5–2.5 mm long, lobes shorter than tube. Capsules slightly compressed, ovoid, apex narrowed, 2–2.5 mm  $\times$  2–2.5 mm, dehiscing apically, persistent calyx lobes almost at apex. **Fig. 46D.**

Most districts of the region, not commonly collected. Flowers mainly summer.

#### 4. POMAX Solander ex DC.

Subshrubs. Leaves opposite; stipules interpetiolar. Flowers bisexual, connate by their calyx tubes into simple heads, several of these pedicellate into a terminal umbel; calyx lobes *ca* 3 per flower; corolla tube short, lobes 3–5, spurred; stamens 5 or fewer, inserted at base of corolla tube, filaments long, anthers exserted; ovary 1-locular, ovule 1, erect, style filiform, deeply bifid. Fruits 2-valved capsules, outer valves of all capsules united in persistent cup crowned by outer calyx lobes, inner valves united into deciduous operculum.

1 species endemic in Australia, occurring in south-eastern Queensland.

##### 1. *Pomax umbellata* (Gaertn.) Solander ex A. Rich.

*Opercularia umbellata* Gaertn.

Woody herb or subshrub, prostrate or up to 40 cm tall; bark decorticating at least when dried, stems pubescent, sometimes minutely so. Leaves with petioles 1–9 mm long; blades ovate to obovate, or narrowly so, apex acute, base cuneate to attenuate, margin sometimes undulate, 0.4–3 cm × 0.2–1.3 cm, pubescent, sometimes only on veins beneath. Inflorescences with peduncles 0.5–1.2 cm long; flowers usually 2–4 together; united calyx cup *ca* 1.5–2 mm long, expanding in fruit up to 4 mm long; corolla dull red, *ca* 2–3 mm long, lobes *ca* 0.5 mm long; anthers exserted, *ca* 2 mm long. Fruits obconical, empty calyx retained on plant for some time. **Fig. 46E.**

Throughout the region in sandy or stony soils under eucalypt forest or in sandy wallum areas. Flowers mainly spring and autumn.

#### 5. OPERCULARIA Gaertn.

Herbs undershrubs or rarely twiners. Leaves opposite; stipules usually connate with petioles into short sheath with 1 or 2 points per side. Inflorescences consisting of flowers connate by calyx tubes in globular compound, rarely simple and solitary head, usually in forks of stem or terminal, sometimes appearing axillary, peduncle erect or recurved; flowers unisexual or bisexual; calyx lobes 3–5; corolla tube short, lobes 3–5, valvate; stamens inserted at base of corolla tube, filaments long, anthers exserted; ovary 1-locular with 1 ovule, rarely 2-locular, style filiform, mostly 2-branched. Fruits 2-valved capsules, but capsules of each compound head distributed into partial heads of 3–6, outer valves of each partial head united into a persistent cup, inner valves united into a deciduous operculum.

15 species endemic in Australia; 3 species south-eastern Queensland.

- |   |                       |
|---|-----------------------|
| 1. Seeds with 2 longitudinal smooth ridges as well as a rough central one on inner surface; calyx lobes 3–4 mm long . . . . .       | 1. <i>O. aspera</i>   |
| Seeds without 2 longitudinal smooth ridges, only a rough central one on pitted inner surface; calyx lobes up to 1 mm long . . . . . | 2                     |
| 2. Leaves very narrow, glabrous or scabrous . . . . .   | 2. <i>O. diphylla</i> |
| Leaves usually broad, sparsely to densely hirsute . . . . .   | 3. <i>O. hispida</i>  |

##### 1. *Opercularia aspera* Gaertn.

Weak shrub up to 3 m tall; stems ribbed, glabrous or scabrous. Leaves with foetid smell when crushed; petioles 0.1–1.5 cm long; blades narrowly ovate to linear-ovate, apex attenuate, base cuneate to attenuate, margin usually serrulate or with hooked hairs, 2–11.5 cm × 0.2–2 cm, scabrous above, glabrous or scabrous on nerves beneath. Inflorescences compound heads on short recurved peduncles 5–10 mm long; calyx lobes linear, 3–4 mm long; corolla 3–4 mm long. Fruits scabrous; seeds compressed obovoid, *ca* 2 mm long, outer surface transversely wrinkled, inner surface wrinkled except for 2 smooth longitudinal ridges, one on each side of raised central longitudinal wrinkled edge. **Fig. 46F.**

Mountains of the southern Moreton district, e.g. Mt. Glorious, Mt. Barney, as understory in wet eucalypt forest or light rainforest. Flowers spring.

F. M. Bailey in "Qd. Fl." 3:776 (1900) mentions that 2 varieties as well as the type variety occur in Queensland. The form described here is probably referable to *O. aspersa* var. *ligustrifolia* (Juss.) Benth. (*O. ligustrifolia* Juss.), but the original descriptions of all the varieties are very short and vague. The main distinguishing feature given for separating the varieties is leaf size but within the species there is a gradation in leaf size, with the smallest and largest leaves even on the one plant. It is impossible therefore to assess how *O. aspera* var. *hyssopifolia* Benth. differs from *O. aspera* var. *ligustrifolia* or *O. aspera* var. *aspera*. With this confusing situation it seems better not to recognize varieties within this variable species.

*O. varia* J. D. Hook. was reported by F. M. Bailey "Qd. Fl." 3:776 (1900) to occur in Queensland but as there are no authentic specimens in the Queensland Herbarium, it is not included here. It appears to be native to southern Australia and Tasmania.

## 2. *Opercularia diphylla* Gaertn.

Small weak or procumbent herb; stems minutely scabrous. Leaves  $\pm$  sessile or with ill-defined petioles up to 4 mm long; blades linear-elliptic or linear-ovate, or sometimes lowermost narrowly obovate, apex attenuate, rarely acute or obtuse, base attenuate, 0.5–4.5 cm  $\times$  0.05–0.3(–0.5) cm, usually minutely scabrous above,  $\pm$  glabrous beneath. Inflorescences compound heads on eventually recurved peduncles 2–9 mm long; calyx lobes *ca* 0.5–0.75 mm long; corolla *ca* 2 mm long. Fruits minutely scabrous; seeds  $\pm$  compressed obovoid, *ca* 2 mm long, outer surface transversely wrinkled, inner surface pitted except for narrow middle part. **Fig. 46G.**

Coastal districts in lowland areas, often in eucalypt forest. Flowers spring to autumn.

## 3. *Opercularia hispida* Sprengel

Prostrate to erect herb, usually with a number of stems arising from central taproot; stems sparsely to densely hirsute. Leaves with petioles 1–8 mm long; blades ovate, or sometimes elliptic, rarely narrowly so, apex acute or subacute, mucronate, base cuneate to broadly so, margin entire or sometimes undulate, 0.7–3.5 cm  $\times$  (0.15–)0.3–1.7 cm, hirsute or sparsely so. Inflorescences compound heads on recurved peduncles 0.2–1(–1.5) cm long; calyx lobes 0.5–1 mm long, corolla *ca* 2–3 mm long. Fruits minutely hirsute; seeds  $\pm$  compressed obovoid, *ca* 1.5–2 mm long, outer surface transversely wrinkled, inner surface pitted except for narrow usually raised middle section.

Moreton and Darling Downs districts, possibly most of the region, often in rocky areas or under eucalypt forest. Flowers spring to autumn.

## 6. RICHARDIA L.

Annual or perennial herbs, usually with taproot, usually decumbent or sprawling. Leaves opposite; stipules fused with leaf bases, encircling stem, bearing setae. Inflorescences of pedunculate terminal heads of usually numerous flowers subtended by 2 or 4 leaf-like involucre bracts; calyx tube short, lobes 4–8, eventually deciduous from top of mature mericarp, broad, radiating; corolla 3–6-lobed; stamens 4 or 6, rarely 3, inserted near top of corolla tube, normally exerted; ovary usually 3–4-carpellate, ovule 1 per loculus. Fruits dehiscent into usually 3 or 4 dry, 1-seeded mericarps; seeds brown, ovoid or ellipsoid.

15 species tropical and subtropical Central and South America; 3 species Australia, all occurring in south-eastern Queensland.

- |  |                           |   |
|--|---------------------------|---|
| 1. Calyx lobes 4, rarely 5; mericarps 4, smooth . . . . .                                      | 1. <i>R. stellaris</i>    | 2 |
| Calyx lobes 6; mericarps 3, papillose . . . . .  |                           |   |
| 2. Mericarps with long acute papillae, adaxial face broad with definite middle ridge . . . . . | 2. <i>R. brasiliensis</i> |   |
| Mericarps with short papillae, adaxial face reduced to narrow groove . . . . .                 | 3. <i>R. scabra</i>       |   |

**1. *Richardia stellaris* (Cham. & Schlecht.) Steudel***Richardsonia stellaris* Cham. & Schlecht.

Perennial herb with long taproot. Leaves sessile, narrowly ovate to ovate, apex acuminate,  $\pm$  acute, base cuneate to rounded, margin revolute, 0.7–1.5 cm  $\times$  0.2–0.5 cm, usually glabrous above, hispid below. Inflorescences few-flowered; calyx 4- or sometimes 5-lobed, lobes spreading, triangular, ciliate; corolla white, tube 2–4 mm long, lobes *ca* 1–1.5 mm long, cleistogamous flowers smaller, remaining bud-like, *ca* 1.5 mm long. Mericarps usually 4, crowned by persistent calyx, abaxial surface glabrous, smooth, adaxial surface rough with ridge in middle. **Fig. 46H.**

Recorded from coastal districts and also Darling Downs district often as a weed near habitation, in lawns etc. Flowers spring to autumn.

**2. *Richardia brasiliensis* Gomes**

WHITE EYE; MEXICAN CLOVER

*Richardsonia scabra* auct. non (L.) St.-Hil., F. M. Bailey

Prostrate hispid usually annual herb with long taproot. Leaves with petioles 0.4–1.2 cm long; blades elliptic or obovate, sometimes ovate, apex acute, base cuneate, margin entire, 0.8–5 cm  $\times$  0.3–2.8 cm,  $\pm$  hispid particularly on margin. Involucral bracts 2 or 4; flowers 20 or more; calyx 6-lobed, lobes spreading, margin shortly ciliate; corolla white, 6-, rarely 4-lobed, tube 3–8 mm long, lobes 1–3 mm long. Mericarps 3, crowned by persistent calyx, 2.5–3 mm long, abaxial surface papillose, adaxial surface broad, glabrous, concave with definite raised median keel. **Fig. 46J.**

Throughout the region, often a weed of disturbed sites, gardens etc. Flowers mainly spring to autumn.

**3. *Richardia scabra* L.***Richardsonia scabra* (L.) St.-Hil.

Decumbent or sprawling annual hirsute herb. Leaves with petioles up to 4 mm long; blades elliptic to obovate, apex acute, base cuneate to attenuate, margin entire, 1–2.5 cm  $\times$  0.4–1(–1.3) cm, sparsely hispid. Inflorescences with leaf-like bracts, flowers 20 or more; calyx 6-lobed, lobes narrow, margin long ciliate; corolla white, tubes *ca* 2–5 mm long, lobes 6, 0.5–3 mm long. Mericarps 3, crowned by persistent calyx, abaxial surface shortly papillose, adaxial surface closed into narrow groove by intrusion of abaxial side, convex, glabrous. **Fig. 46I.**

Recorded from the Darling Downs district, uncommon. Flowers winter.

**7. MITRACARPUS Zucc. ex J. A. & J. H. Schultes**

Erect or prostrate annual or perennial herbs. Leaves opposite; stipules connate with petioles to form setiferous sheath. Flowers very small, crowded into dense terminal or upper axillary heads, usually subtended by 4 leaf-like bracts; calyx of 4–5 narrow persistent teeth; corolla salverform or funnelform, 4-lobed; stamens 4, inserted in corolla throat; ovary 2-locular, ovules solitary, attached peltately to middle of septum, style 2-branched. Capsules 2-lobed, membranous, circumscissile at or below middle, upper part separating with calyx and exposing seeds, septum persistent with basal part; seeds oblong or globose.

40 species tropical South America, West Indies, tropical and southern Africa; 1 species naturalized Australia, occurring in south-eastern Queensland.

**1. *Mitracarpus hirtus* (L.) DC.***Spermacoce hirta* L.

Erect or ascending annual hispid herb up to 60 cm tall. Leaves  $\pm$  sessile or with petioles up to 2 mm long; blades ovate to elliptic, apex acute, base cuneate, margin often recurved, 1.2–5 cm  $\times$  0.5–2 cm, hispid, veins impressed on upper surface. Flowers in axillary clusters right around stem, subtended by 2 leaves and connate interpetiolar ciliate stipules, pedicels *ca* 1 mm long; calyx 3–4-lobed, 1 pair smaller than other, 1 sometimes very reduced or absent, ciliate subulate, longest *ca* 2.5 mm

long; corolla white, tube 1.5–2 mm long; lobes *ca* 0.5 mm long. Fruits 2-locular circumscissile capsules *ca* 1.5–2 mm long; seeds 1 per loculus,  $\pm$  rectangular, folded. **Fig. 46K.**

Recorded from the Moreton district, usually weed of disturbed sites. Flowers mainly autumn.

## 8. SPERMACOCE L.

Annual or perennial herbs or small shrubs; stems often 4-angled. Leaves opposite; stipules often united with petioles into a usually fimbriate sheath. Flowers mostly small, bisexual, sessile, mostly in axillary usually many-flowered clusters, sometimes terminal, subtended by usually 2 leaf-like bracts; calyx tubular, lobes 2–4, often  $\pm$  persistent; corolla tube funnelform or salverform, tube sometimes slender, lobes 4, rarely 3, valvate in bud; stamens 4; ovary 2-locular, ovules 1 per loculus, style filiform, stigma simple or 2-lobed. Fruits mostly 2-valved capsules dehiscent septically (Section *Borreria*), or sometimes 2 cocci, 1 dehiscent, the other remaining  $\pm$  indehiscent (Section *Spermacoce*) or rarely in overseas species capsule splitting from base upwards, valves and calyx limb falling off like a lid leaving a persistent septum (Section *Arbulocarpus*); seeds oblong-ellipsoid or ovoid, usually brown with reticulate testa, ventrally grooved.

About 250 species warm tropical; *ca* 20 species Australia; 2 species south-eastern Queensland.

- |  |                          |
|--|--------------------------|
| 1. Inflorescences terminal, rarely in uppermost axils as well; corollas 2.5–3.5 mm long with lobes 1.5–2.5 mm long; setae on stipular sheath less than 3 mm long | 1. <i>S. multicaulis</i> |
| Inflorescences numerous per stem, terminal and most upper axils; corollas 2–2.5 mm long with lobes 0.75–1 mm long; setae on stipular sheath 3–6.5 mm long        | 2. <i>S. brachystema</i> |

### 1. *Spermacoce multicaulis* Benth.

*Borreria multicaulis* (Benth.) Specht

Erect or spreading many-stemmed herb *ca* 10–30 cm tall; rootstock woody, stems glabrous or scabrous. Leaves  $\pm$  sessile with short stipular sheath *ca* 1–1.5 mm long, cilia up to 2 mm, rarely 3 mm long; blades narrowly elliptic to elliptic, apex acute, base attenuate, margin recurved to revolute, 0.5–2.5 cm  $\times$  0.1–0.6 cm, rarely glabrous to scabrous. Flowers in small dense terminal heads subtended by 2 leaf-like bracts, rarely in the uppermost axil as well; calyx lobes triangular, 1–2 mm long, often scabrous; corolla white, 2.5–3.5 mm long, lobes *ca* 1.5–2.5 mm long, tube  $\pm$  pubescent to almost glabrous within; stamens inserted at mouth of tube alternate with lobes,  $\pm$  exserted, but not longer than lobes. Fruits capsules, 2–2.5 mm long, dehiscent septically almost to base. **Fig. 46L.**

Recorded from coastal districts in stony soils under eucalypt forest, but to be expected in the western districts as well. Flowers periodically throughout the year.

### 2. *Spermacoce brachystema* R. Br. ex Benth.

*Borreria brachystema* (R. Br. ex Benth.) Valetton

Erect or spreading rigid herb up to *ca* 60 cm tall; stems scabrous to hirsute. Leaves  $\pm$  sessile, sometimes clustered, with stipular sheath *ca* 1.5–2 mm long, cilia 3–6.5 mm long; blades elliptic to ovate, often narrowly so, apex acute to apiculate, base cuneate to attenuate, margin recurved to revolute, (0.7–)2–4.5 cm  $\times$  (0.1–)0.2–0.7 cm, scabrous to hirsute. Flowers numerous in dense clusters, both terminal and axillary, sometimes on almost every node on stem, subtended by bracts and leaves; calyx lobes subulate, 1.5–2.5(–3) mm long, often ciliate or hirsute; corolla blue or white, 2–2.5 mm long, lobes 0.75–1 mm long, pubescent inside at throat, glabrous or very finely papillose outside; stamens inserted towards base of tube, anthers included within tube. Fruits capsules, obovoid, *ca* 2 mm long, hirsute on upper half to almost glabrous, septically dehiscent almost to base. **Fig. 46M.**

Throughout most of the region except the Darling Downs district, usually in dry rocky soil on hillsides under eucalypt forest. Flowers mostly late spring to autumn.



Fig. 46 RUBIACEAE — A *Dentella repens*, part of stem showing fruit with hyaline hairs and persistent calyx x6; B<sub>1</sub>–B<sub>2</sub> *Synaptantha tillaeacea*, B<sub>1</sub> section of stem with flowers x6, B<sub>2</sub> section of stem with fruit x6; C–D *Hedyotis* spp. — C<sub>1</sub>–C<sub>2</sub> *H. trachymenoides*, C<sub>1</sub> part of flowering stem x1, C<sub>2</sub> fruit x6; D<sub>1</sub>–D<sub>2</sub> *H. galioides*, D<sub>1</sub> part of flowering stem x1, D<sub>2</sub> fruit x6; E<sub>1</sub>–E<sub>2</sub> *Pomax umbellata*, E<sub>1</sub> flowering stem x1, E<sub>2</sub> fruiting stem x1; F–G *Opercularia* spp. — F<sub>1</sub>–F<sub>2</sub> *O. aspera*, F<sub>1</sub> aggregate fruit x2, F<sub>2</sub> seed showing ridges x6; G *O. diphylla*, seed x6; H–J *Richardia* spp. — H<sub>1</sub>–H<sub>2</sub> *R. stellaris*, H<sub>1</sub> part of fertile stem x1, H<sub>2</sub> fruit x6; I *R. scabra*, seed showing narrow groove on inner face x6; J<sub>1</sub>–J<sub>3</sub> *R. brasiliensis*, J<sub>1</sub> part of fertile stem x1, J<sub>2</sub> flower x3, J<sub>3</sub> seed showing broad inner face x6; K<sub>1</sub>–K<sub>2</sub> *Mitracarpus hirtus*, K<sub>1</sub> capsule showing circumcissile apex, K<sub>2</sub> seed x6; L–M *Spermacoce* spp. — L *S. multicaulis*, cluster of fruits at apex of stem x6; M *S. brachystema*, section of stem showing setae and fruits x1; N *Knoxia sumatrensis*, part of flowering stem x1.

**9. KNOXIA L.**

Herbs or undershrubs. Leaves opposite; stipules divided into lobes or subulately fimbriate, connate with base of petioles into short sheath. Flowers in terminal cymes or corymbs, branches often lengthened into 1-sided spikes, bisexual; calyx tubular, usually with 4 minute persistent teeth; corolla tube slender, lobes 4, valvate in bud; stamens 4; ovary 2-locular with 1 pendulous ovule per loculus, style shortly 2-lobed. Fruits small and dry, of 2 carpels either separating from base upwards or falling together, leaving persistent filiform axis.

15 species Indomalaysia; 2 species Australia; 1 species south-eastern Queensland.

**1. *Knoxia sumatrensis* (Retz.) DC.**

*Spermacoce sumatrensis* Retz.; *Knoxia corymbosa* auct. non Willd.

Usually erect herbaceous perennial, usually 45–90 cm tall. Leaves with petioles 0.3–1 cm long; blades narrowly elliptic to elliptic or narrowly ovate to ovate, apex acute or sometimes attenuate, base cuneate to attenuate, margin ciliolate, 2.5–9 cm × 0.8–3.5 cm, shortly pubescent above and below, sometimes puberulent. Inflorescences terminal, dense, up to 4 cm long; pedicels *ca* 0.5 mm long; calyx 1–1.5 mm long; corolla whitish or bluish, *ca* 1.5–2 mm long; anthers exerted slightly. Fruits ellipsoid, *ca* 1.5–2 mm long, crowned by calyx lobes, usually falling entire from filiform persistent axis. **Fig. 46N.**

Mainly coastal districts but one recorded from Mt. Perry area. Flowers usually summer–autumn.

**10. DURRINGTONIA R. Henderson & Guymer**

Dioecious rhizomatous herbaceous perennials, needle shaped cellular crystals (raphides) copious; aerial stems arising singly or in pairs from axils at apical nodes of underground branched or unbranched rhizome, dying back after flowering. Leaves decussate, each fused at base with base of opposing leaf to form rim around stem; interpetiolar stipules placed singly on margin of rim opposite each other, stipules and leaves deciduous. Inflorescences effuse, of terminal and subterminal axillary compound dichasia; flowers subtended by 2 minute bracts; male flowers with calyx tube short, surmounting vestigial ovary, lobes 4–6, corolla valvate, 5-lobed, stamens 5, inserted at base of corolla, anthers 2-locular, introrse, attached at base of shorter connective, pollen granular, tricolporate, ovary and style vestigial; female flowers with calyx tube short, lobes 4–6, persistent on fruit, corolla lobes 4–6, valvate, staminodes absent, ovary wholly inferior, unilocular, ovule 1, basal, erect, vestiges of a second locule without an ovule present, stigma solitary, ± sessile. Fruits fleshy; seeds enclosed in thick, woody endocarp.

1 species endemic in Australia, occurring in south-eastern Queensland.

**1. *Durrintonia paludosa* R. Henderson & Guymer**

Glabrous herbaceous perennial; aerial stems green, up to 1 m long, decussately branched particularly from middle and upper nodes, slender and weak but held upright by surrounding vegetation, or decumbent, quadrangular, internodes up to 4 cm long. Stipules subulate, minute; basal leaves ovate to narrowly elliptic, apex attenuate, 0.8–1.2 cm × 0.2–0.25 cm, soon linear-subulate, up to 1.5 cm × 0.2 cm, but usually much shorter and narrower. Inflorescences with ultimate cymes reduced to single sessile pendulous flower; males with calyx tube 0.1–0.2 mm long, lobes triangular, 0.3–0.5 mm long, corolla cream to pale red-brown, funnelliform, tube 0.1–0.2 mm long, lobes oblong, obtuse, 2–2.5 mm long, minutely papillose on outer upper edge, filaments up to 3.75 mm long, anthers 2.5–2.8 mm long; females with calyx tube 0.1 mm long, lobes 0.2–0.4 mm long, corolla hyaline, tube 0.6–1 mm long, lobes oblong, obtuse, *ca* 1 mm long, ovary ovoid, *ca* 0.5–1.5 mm long, stigma somewhat fusiform, 0.3–0.8(–1.2) cm × *ca* 0.05 cm, papillose throughout. Fruits

orange-yellow, ellipsoid though slightly laterally flattened, up to *ca* 5.5 mm × 4.5 mm × 4.3 mm; seeds obovate, up to 3 mm × 1.3 mm.

Moreton I. and Stradbroke I. within swamps in areas with permanent subsurface fresh water, associated with *Empodisma minus* (J. D. Hook.) L. A. S. Johnson & O. D. Evans in a closed sedgeland community. Flowers late spring–early summer.

## 11. ASPERULA L.

Herbs with slender quadrangular stems. Leaves opposite, but with stipules often leaf-like, appearing as whorls of 4–8. Flowers small, solitary or in axillary or terminal cymes or clusters, occasionally ± unisexual; calyx connate to ovary, lobes absent; corolla tube funnellform, shorter in female flowers than in males, 4-lobed, valvate in bud; anthers exserted; ovary 2-locular with 1 ovule per loculus, style 2-lobed, sometimes very deeply so. Fruits small, dry, 2-lobed, indehiscent.

More than 200 species mainly Europe, Asia, especially Mediterranean; 16 species Australia; 6 species south-eastern Queensland.

- |  |                           |   |
|--|---------------------------|---|
| 1. Leaves 2 per node . . . . .   | 1. <i>A. geminifolia</i>  | 2 |
| Leaves more than 2 per node, whorled . . . . .   |                           |   |
| 2. Leaves 4 per whorl, alternately 2 long, 2 shorter . . . . .                                 | 2. <i>A. ambleia</i>      | 3 |
| Leaves 6 per whorl, all ± equal . . . . .  |                           |   |
| 3. Leaves mostly erect; plants with woody stems and rootstock . . . . .                        |                           | 4 |
| Leaves mostly spreading; plants herbaceous, without woody rootstock . . . . .                  |                           | 5 |
| 4. Leaves subulate to linear-subulate, very acute, minutely tomentose, midrib robust . . . . . | 3. <i>A. subulifolia</i>  |   |
| Leaves linear, subacute or subobtuse, pubescent, midrib slender . . . . .                      | 4. <i>A. cunninghamii</i> |   |
| 5. Leaves generally elongate, flaccid, strap shaped, 0.5–2.7 cm × <i>ca</i> 0.15 cm . . . . .  | 5. <i>A. charophyton</i>  |   |
| Leaves small, rigid, linear, 0.1–1.1 cm × 0.03–0.1 cm . . . . .                                | 6. <i>A. conferta</i>     |   |

### 1. *Asperula geminifolia* F. Muell.

Perennial herb with slender sprawling glabrous or scabrous stems. Leaves 2 per node, opposite, spreading or reflexed, sessile, linear-elliptic or linear-ovate, apex acute or subobtuse, 0.5–4 cm × 0.05–0.4 cm, ± glabrous. Inflorescences terminal, capitate, solitary or 2–3 together, each with *ca* 6 flowers; corolla white, males with tube *ca* 2.5 mm long, females with tube *ca* 1 mm long, lobes of both 0.5–1 mm long. Fruits *ca* 1.5 mm diameter.

Moreton and Darling Downs districts, often in rocky areas or eucalypt forest. Flowers late winter–spring, mainly spring.

### 2. *Asperula ambleia* Airy Shaw & Turrill

*Asperula conferta* var. *elongata* auct. non Benth., F. M. Bailey

Perennial herb with woody rootstock; stems erect or ascending, usually minutely pubescent. Leaves 2 per node, erect or ascending, alternating with usually 2, very rarely 4 smaller leaf-like stipules, sessile, very shortly united at base, linear to linear-oblong, apex ± obtuse, margin recurved, 1.5–7(–10) mm × 0.3 mm, sparsely tomentose or glabrous. Inflorescences terminal, capitate, few-flowered; corolla white, males with tube *ca* 1–1.5 mm long, females with tube *ca* 1 mm long, lobes of both 1–1.5 mm long. Fruits *ca* 2 mm diameter. **Fig. 47C.**

Stanthorpe area of the Darling Downs district. Flowers spring.

### 3. *Asperula subulifolia* Airy Shaw & Turrill

*Asperula scoparia* auct. non J. D. Hook., Benth.

Perennial herb with woody taproot; stems extremely finely and densely tomentose. Leaves in whorls of 6, all ± equal, sessile, ± erect or ascending, narrowly subulate to linear-subulate, flexuose towards apex, apex very acute, margin revolute, 2–8 mm

long; midrib very broad. Inflorescences terminal; corolla white, males 1.5–3 mm long, females *ca* 1.5 mm long.

Recorded once from the Texas area of the Darling Downs district. Flowers probably spring.

**4. *Asperula cunninghamii* Airy Shaw & Turrill**

*Asperula scoparia* auct. non J. D. Hook., Benth.

Perennial erect herb with woody taproot; stems usually minutely pubescent. Leaves in whorls of 6, all ± equal, sessile, ± erect, rarely ascending, linear, apex ± obtuse, margin recurved, ciliate, 1.5–8 mm × 0.5–1 mm, often pubescent beneath. Inflorescences terminal, subcapitate, few-flowered; corolla white, males with tube and lobes each *ca* 1 mm long, females with tube and lobes each *ca* 0.75 mm long. Capsules *ca* 2 mm diameter.

Darling Downs district. Flowers late winter–spring.

**5. *Asperula charophyton* Airy Shaw & Turrill**

*Asperula conferta* var. *elongata* auct. non Benth., F. M. Bailey

Perennial spreading herb; stems flexuose to suberect, glabrous or minutely scabrous. Leaves in whorls of 6, all ± equal, sessile, linear to linear-obovate, apex ± obtuse, margin recurved, 0.4–3 cm × 0.07–0.15 cm, ± glabrous. Inflorescences of terminal few-flowered cymes; corolla white, males with tube and lobes each *ca* 1 mm long, females with tube *ca* 0.5 mm long, lobes 0.75–1 mm long. Capsules *ca* 3 mm diameter, sometimes only 1 lobe developing. **Fig. 47B.**

Moreton and Darling Downs districts usually near creeks. Flowers spring.

**6. *Asperula conferta* J. D. Hook.**

**COMMON WOODRUFF**

Perennial herb with erect or ascending stems from prostrate rhizome, glabrous or minutely scabrous. Leaves in whorls of 6, all ± equal, sessile, linear, acute or ± obtuse, mucronate, margin often recurved, 0.1–1.1 cm × up to 0.1 cm, glabrous above, sometimes scabrous below. Inflorescences terminal and/or upper axillary few-flowered cymes, sometimes 2 together; corolla white, males with tube 1–1.5 mm long, females with tube up to 2 mm long, lobes of both 1–1.5 mm long. Capsules *ca* 1.5–2 mm diameter, often only 1 mericarp developing.

Two varieties occur in the region:

- 1. Leaves with acute or shortly mucronate apex . . . . . *A. conferta* var. *conferta*
- Leaves with translucent hyaline long acuminate apex . . . . . *A. conferta* var. *scoparioides*

*A. conferta* var. *conferta* (**Fig. 47A.**) is widespread throughout the region, while *A. conferta* var. *scoparioides* Airy Shaw & Turrill has been reported once from the Texas area of the Darling Downs district. Flowers mainly spring–summer, sometimes also autumn.

**12. GALIUM L.**

Annual or perennial herbs or sometimes shrubby, stems square. Leaves opposite, but apparently in whorls of 4–8 due to leaf-like stipular appendages. Inflorescences of simple or compound dichasia on lateral or sometimes terminal branches; flowers small, unisexual or bisexual, pedicellate; calyx completely connate to ovary; corolla rotate, usually 4-lobed; stamens 4, inserted in corolla throat alternately with lobes, anthers versatile; ovary 2-locular, ovule solitary per loculus, stigma bifid. Fruits of 2 dry 1-seeded, ± hemispherical mericarps, sometimes berries, or 1-seeded by abortion, glabrous, tuberculate or variously pubescent, the two carpels falling separately at maturity, not dehiscent.

About 400 species cosmopolitan; *ca* 11 species Australia; 7 species south-eastern Queensland.

- 1. Leaves in whorls of 6–8 . . . . . 2
- Leaves in whorls of 4 . . . . . 3

- |  |                             |
|--|-----------------------------|
| 2. Stems glabrous except for recurved hooked hairs along angles; upper leaf surfaces glabrous; fruits verrucose, on recurved peduncles   | 1. <i>G. tricornutum</i>    |
| Stems pubescent at nodes as well as with recurved hairs; upper leaf surfaces pubescent; fruits pubescent with hooked hairs, on spreading peduncles   | 2. <i>G. aparine</i>        |
| 3. Flowers in condensed lateral cymes 3-5(-10) mm long; leaves sessile, linear to narrowly subulate  | 3. <i>G. gaudichaudii</i>   |
| Flowers in pedunculate or open cymes; leaves petiolate, ovate, elliptic or obovate   | 4                           |
| 4. Leaves ovate to broadly ovate, bases abruptly rounded into petioles <i>ca</i> 0.5 mm long; flowers in small pedunculate cymes $\pm$ shorter than leaves   | 5                           |
| Leaves usually elliptic to obovate, bases cuneate or tapered into petioles <i>ca</i> 0.5-1 mm long; flowers usually in lax pedunculate cymes, or with short peduncles and long pedicels, or appearing solitary | 6                           |
| 5. Leaves ovate, 3-7(-10) mm $\times$ 1.5-3(-4) mm; fruits 1.5-3 mm diameter, papillose  | 4. <i>G. ciliare</i>        |
| Leaves ovate to broadly ovate 2.5-5(-7) mm $\times$ (1.5-)2-3(-3.5) mm; fruits <i>ca</i> 1.5 mm long, tuberculate to rugose, with numerous recurved hairs  | 5. <i>G. terrae-reginae</i> |
| 6. Stems and internodes usually glabrous; flowers generally appearing solitary, or in cymes with peduncle shorter than pedicels; fruits $\pm$ hemispherical  | 6. <i>G. propinquum</i>     |
| Stems and internodes mostly pubescent; flowers generally in cymes or panicles with peduncle longer than pedicels; fruits $\pm$ reniform  | 7. <i>G. migrans</i>        |

**1. \*Galium tricornutum** Dandy

**THREEHORN BEDSTRAW**

*Galium tricorne* Stokes

Scrambling stout herb up to 80 or 100 cm tall, stems quadrangular with retrorse small prickles on angles, otherwise glabrous. Leaves in whorls of 6-8, rarely few upper whorls of only 4, sessile, linear-obovate to narrowly obovate, apex obtuse but long aristate, point *ca* 1 mm long, base attenuate, margin with small retrorse prickles, 1-4 cm  $\times$  0.1-0.4(-0.8) cm,  $\pm$  glabrous except sometimes midrib. Inflorescences apparently axillary, usually 3-5-flowered, peduncles 0.8-1.5 cm long, pedicels 1-8 mm long, distinctly curved inwards and downwards after flowering; corolla whitish, up to 1 mm long, lobes united into basal tube less than 0.1 mm long. Fruits 2-lobed, or 1-lobed by abortion, 3-5 mm diameter, surface verrucose. **Fig. 47F.**

Native of Europe; recorded from the Brisbane area. Flowers spring.

**2. \*Galium aparine** L.

**CLEAVERS**

Scrambling stout herb usually up to 1 m tall, stems quadrangular, with small retrorse prickles on angles, pubescent with simple hyaline hairs at or above nodes. Leaves in whorls of 6-9, sessile, narrowly obovate to obovate, apex obtuse but with hyaline point up to 1 mm long, base attenuate, margin with small retrorse prickles, 1-6 cm  $\times$  0.2-0.8 cm, upper surface and midrib below puberulent with small prickly hairs. Inflorescences apparently axillary, 1-7-flowered, peduncles up to 2.5 cm long, pedicels 0.4-1.5 cm long, mostly straight, spreading; corolla whitish, up to 1 mm long, tube *ca* 0.2 mm long. Fruits 2-lobed, up to 2 mm diameter, covered with hooked hairs. **Fig. 47D.**

Native of Europe; recorded from Darling Downs district. Flowers spring.

**3. Galium gaudichaudii** DC.

*Galium vagans* J. D. Hook.; *G. axiflorum* F. Muell. ex Miq.; *G. umbrosum* G. Forster ex J. D. Hook. var. *gaudichaudii* (DC.) Maiden & Betche; *G. gaudichaudii* var. *typicum* Domin; *G. umbrosum* auct. Aust. non G. Forster ex J. D. Hook.

Slender branched herb; stems  $\pm$  quadrangular, puberulent when young. Leaves in

whorls of 4, all  $\pm$  equal or 2 alternately shorter; petioles up to 0.5 mm long; blades narrowly ovate to ovate, apex acute, base cuneate, margin recurved, 2–8 mm  $\times$  0.5–1.5 mm,  $\pm$  glabrous except on midrib above, often puberulent below. Inflorescences of condensed lateral 1–5, rarely –7-flowered cymes 3–5(–10) mm long, peduncles up to 2.5 mm long, pedicels 0.1–1(–2) mm long; corolla whitish, up to 1.5 mm long, lobes scarcely basally united. Fruits 2-lobed, *ca* 2 mm diameter, smooth to rugulose. **Fig. 47E.**

Darling Downs district in granite areas usually in relatively dry sites in forest, woodland or heath. Flowers spring.

#### 4. *Galium ciliare* J. D. Hook.

*Galium gaudichaudii* DC. var. *glabrescens* Benth.; *G. umbrosum* G. Forster ex J. D. Hook. var. *gaudichaudii-glabrescens* Maiden & Betche; *G. umbrosum* auct. non G. Forster ex J. D. Hook.

Slender prostrate herb; stems quadrangular, often ciliate on angles. Leaves in whorls of 4; petioles *ca* 0.5 mm long; blades ovate, apex acuminate, base cuneate to rounded, margin often recurved, 3–7 mm  $\times$  1.5–3.5 mm, glabrous. Inflorescences small axillary cymes of 2–3, rarely –9 flowers, peduncles 1–3(–10) mm long, pedicels 1–3(–5) mm long, spreading; corolla yellowish to white, up to *ca* 0.75 mm long, lobes scarcely basally united. Fruits 2-lobed, *ca* 1 mm diameter, smooth to papillose.

Bunya Mts. area, near mountain summit. Flowers late spring.

#### 5. *Galium terrae-reginae* Ehrendorfer & McGillivray

*Galium australe* auct. non DC., F. M. Bailey

Straggling herb, stems quadrangular, 15–45 cm long, branching throughout, hispid. Leaves in whorls of 4; petioles up to *ca* 0.5 mm long; blades broadly ovate, ovate or elliptic, apex acute, base rounded, margin strongly recurved when dry, 2.5–5(–7) mm  $\times$  1.5–3(–3.5) mm, pubescent. Inflorescences small 1–3-flowered cymes, peduncles 1–5(–7) mm long, pedicels 1–3(–5) mm long; corolla ? yellowish, up to *ca* 0.75 mm long, rotate. Fruits *ca* 1.5 mm long, tuberculate to rugose and covered with numerous slightly to strongly recurved hairs.

Darling Downs district from Chinchilla to Warwick, rarely collected. Flowers ? spring.

#### 6. *Galium propinquum* Cunn.

*Galium umbrosum* G. Forster ex J. D. Hook. nom. illeg.; *G. gaudichaudii* DC. var. *muriculatum* auct. non Benth.; Benth.; *G. umbrosum* var. *muriculatum* auct. non (Benth.) Ewart & Rees, Ewart & Rees

Slender herb; stems quadrangular, glabrous. Leaves in whorls of 4, subequal; petioles up to 1 mm long; blades oblong-elliptic, elliptic or obovate, apex acute, mucronate, base cuneate, margin slightly recurved, 0.2–1(–1.5) cm  $\times$  0.1–0.45(–0.6) cm, rarely larger, usually very sparsely pubescent. Inflorescences of 1–5-, rarely 7-, commonly 3-flowered cymes on peduncles usually up to 3 mm long, very rarely up to 6 mm long, or often flowers solitary, pedicels 1–4.5(–7) mm long; corolla whitish, up to 0.5 mm long, scarcely basally tubular. Fruits with each mericarp  $\pm$  hemispherical, flat or with shallow central depression outside, *ca* 1–1.5 mm diameter but often 1 loculus aborting, at least initially puberulent with minute hooked hairs.

Shady areas in rainforest e.g. Mt. Tamborine, Blackall Ra. Flowers summer–autumn.

#### 7. *Galium migrans* Ehrendorfer & McGillivray

*Galium erythrorrhizum* F. Muell. ex Miq. nom. illeg.; *G. gaudichaudii* DC. var. *muriculatum* Benth.; *G. umbrosum* G. Forster ex J. D. Hook. var. *muriculatum* (Benth.) Ewart & Rees; *G. umbrosum* var. *gaudichaudii-muriculatum* Maiden & Betche; *G. australe* auct. non DC., Benth. et. al.; *G. umbrosum* auct. Aust. non J. D. Hook.; *G. gaudichaudii* auct. non DC., Wakefield

Prostrate or decumbent slender herb; stems quadrangular, almost always ciliate along angles, pubescent at nodes. Leaves in whorls of 4, subequal; petioles up to 1.5 mm long; blades oblong-elliptic to obovate, apex abruptly acuminate, base cuneate or narrow, margin slightly recurved, 0.3–1(–1.8) cm  $\times$  0.1–0.5 cm, puberulent to

pubescent, rarely  $\pm$  glabrous. Inflorescences of 3–7-, rarely –25-flowered cymes on peduncles 0.5–1.5(–3.5) cm long, or sometimes flowers solitary, peduncles up to 1.2 cm long, pedicels 2–3.5(–8) mm long; corolla whitish, up to 0.75 mm long, scarcely basally tubular. Fruits with each mericarp reniform at maturity, *ca* 1–1.25 mm diameter, usually puberulent with hooked hairs.

Moist or shady areas usually near rainforest of Moreton and eastern Darling Downs districts. Flowers spring to autumn.

### 13. MORINDA L.

Trees or shrubs or sometimes woody climbers. Leaves opposite; stipules interpetiolar, united, membranous. Inflorescences of peduncled irregularly globose or ovoid heads; flowers usually bisexual; calyx tubes connate, usually truncate or 1–2-lobed; corolla tube cylindrical, lobes 5, rarely 4 or 3, valvate in bud; stamens inserted  $\pm$  in throat; ovary 2-locular or incompletely 4-locular, 1 ovule per loculus attached near base, style exerted, usually 2-lobed. Fruits 1-pyrenous, 1-seeded drupes, all fruits in head united to form a fleshy syncarp.

80 species tropical; 6 species Australia; 3 species south-eastern Queensland.

- |   |                          |
|---|--------------------------|
| 1. Heads of 1–3 flowers united on axillary peduncles 0.2–0.5 cm long                                    | 1. <i>M. acutifolia</i>  |
| Heads of 4 or more, usually several flowers united on terminal, rarely axillary peduncles 0.5–3 cm long | 2                        |
| 2. Heads in terminal pairs, or rarely axillary  | 2. <i>M. jasminoides</i> |
| Heads 3–7 on terminal peduncles   | 3. <i>M. umbellata</i>   |

#### 1. *Morinda acutifolia* (F. Muell. ex Benth.) F. Muell.

*Coprosma acutifolia* F. Muell. ex Benth.

Climber,  $\pm$  glabrous. Leaves with petioles 2–7 mm long; blades coriaceous, ovate or sometimes oblong-ovate, apex acuminate, base cuneate to rounded, 3.5–7 cm  $\times$  1.3–3.6 cm, glabrous, usually with small domatia in vein axils beneath, looping venation prominent when dry. Flowers 1–3 together on axillary peduncles 2–5 mm long; calyces  $\pm$  united, *ca* 1 mm long, irregularly toothed; corolla cream, fragrant, *ca* 2.5–3 mm long, tube shorter than lobes, lobes 5 or 4. Fruits orange-red, irregularly shaped when 2–3 pyrenes developed, or globular, *ca* 4 mm diameter when one developed. **Fig. 47H.**

Coastal districts in fringing or depauperate lowland rainforest. Flowers spring.

#### 2. *Morinda jasminoides* Cunn. ex Hook.

Shrub, usually scandent, or climber,  $\pm$  glabrous. Leaves with petioles 0.2–1.2 cm long; blades elliptic to ovate, apex acuminate, base cuneate to rounded, 2–7.5(–9) cm  $\times$  0.7–3(–4) cm, glabrous, large domatia or pits usually in vein axils beneath. Flowers in 4–20-flowered heads on usually terminal paired peduncles 0.7–3 cm long, occasionally axillary; calyces completely fused, limb truncate or minutely dentate, 0.1–0.2 mm long; corolla white to pale purplish outside, often yellowish with age, tube cylindrical, 3–6 mm  $\times$  *ca* 0.5 mm when dry, lobes 3–4, 2.5–4 mm long,  $\pm$  obtuse; stamens exerted, up to as long as lobes. Fruits succulent, orange, irregularly shaped, up to 2 cm diameter, with remains of calyx limbs scattered over surface. **Fig. 47G.**

Mainly coastal districts in rainforest but also depauperate rainforest areas near Kingaroy and Coalstoun Lakes. Flowers spring–summer.

A very robust form of this species has been collected from Lamington National Park, Beechmont, and Cunningham's Gap in rainforest. It has 15–30 flowers per head, corolla with tube 4–6 mm  $\times$  *ca* 0.75–1 mm when dry, usually 4 lobes about 4 mm long, a few hairs around insertion of stamens, and stamens apparently as long as corolla lobes.

**3. *Morinda umbellata* L.**

Vine, ± glabrous. Leaves with petioles 0.5–1.5 cm long; blades ovate to elliptic, sometimes narrowly so, apex bluntly acuminate, base cuneate to rounded, 3–9 cm × 1.2–4 cm, glabrous except for small hairy domatia in vein axils, ± shiny both surfaces. Flowers in *ca* 5–7-flowered heads, 3–7 together on separate terminal peduncles 0.5–2 cm long; calyces fused, limb ± truncate, *ca* 1 mm long; corolla white to cream, tube *ca* 2 mm long, lobes 4, 2–2.5 mm long, pubescent at base inside; stamens exerted, not as long as lobes. Fruits orange, succulent, up to *ca* 1.5 cm diameter, with remains of calyx limbs scattered over surface.

Recorded from Fraser I., possibly also on mainland. Flowers spring–summer.

**14. TIMONIUS DC.**

Trees or shrubs. Leaves opposite; stipules interpetiolar, membranous, caducous. Inflorescences axillary peduncled 1–many-flowered cymes; flowers unisexual, males 3 or more together, females usually solitary; calyx tubular, truncate or 4-dentate, persistent; corolla tube cylindrical, lobes 4–12, thick, fleshy, imbricate to subvalvate in bud; anthers slightly exerted in males, linear and sterile and enclosed in females; ovary abortive in males, 4–12-locular in females, divided by longitudinal transverse or oblique septa into 1-ovuled loculi, style filiform, exerted in females with linear stigmatic branches as many as corolla lobes. Fruits drupes with numerous pyrenes.

About 155 species Indian Ocean region, Malaysia, Australia, Pacific region; 2 species Australia; 1 species south-eastern Queensland.

**1. *Timonius timon* (Sprengel) Merr.**

*Erithalis timon* Sprengel; *Timonius rumphii* DC.; *T. sericeus* (Desf.) K. Schum.

Shrub or tree up to *ca* 10 m tall, young shoots sometimes silky hairy. Leaves with petioles (0.5–)1–2 cm long; blades narrowly elliptic to elliptic, sometimes narrowly ovate to oblong, apex acuminate or bluntly so, base cuneate, margin (5.5–)6–15 cm × 1.5–6 cm, glabrous or with silky hairs usually scattered on veins and lower surface, hairy domatia in vein axils beneath. Flowers scented, solitary or in few-flowered cymes on peduncles *ca* 1.5–2 cm long; calyx tube cylindrical, 4–6 mm long in males, enlarged globular and 6–8 mm long in females, irregularly dentate or lobed, lobes up to 3 mm long, all silky pubescent; corolla white, tube 6–8 mm long, lobes 4–10, *ca* 4–5 mm long, silky pubescent. Fruits globular, *ca* 1.3 cm diameter, crowned by persistent calyx tube. **Fig. 47I.**

Coastal districts and offshore sand islands, often near beaches but not restricted to them, and always in sheltered areas, e.g. in eucalypt forest or littoral forests. Flowers spring.

**15. RANDIA L.**

Trees or climbing or erect shrubs, with or without thorns. Leaves opposite, often crowded at apex of short branchlets, rarely whorled; stipules interpetiolar; blades with domatia on undersides. Flowers in axillary cymes or clusters, or solitary at apex of short branchlets, bisexual; calyx tube truncate, dentate or lobed; corolla tube short or long, lobes 5, contorted in bud; stamens 5, anthers ± sessile, inserted in throat; ovary 2-locular, ovules several–many per loculus, style cylindrical, stigma entire or 2-lobed. Fruits 2-locular berries, indehiscent, succulent; seeds usually several, embedded in placenta or free.

200–300 species, tropical; 9 species Australia; 4 species south-eastern Queensland.

- |   |                              |
|---|------------------------------|
| 1. Flowers in dense panicles . . . . .  | 1. <i>R. cochinchinensis</i> |
| Flowers 1–3 together in axils . . . . .   | 2                            |
| 2. Branchlets often with axillary thorns; calyces <i>ca</i> 4 mm long . . . . . | 2. <i>R. moorei</i>          |
| Branchlets never with axillary thorns; calyces 5–8 mm long . . . . .            | 3                            |
| 3. Calyces hirsute; leaves with petioles 0.2–0.5 cm long . . . . .              | 3. <i>R. chartacea</i>       |
| Calyces glabrous; leaves with petioles 0.5–2 cm long . . . . .                  | 4. <i>R. benthamiana</i>     |

**1. *Randia cochinchinensis* (Lour.) Merr.**

*Aidia cochinchinensis* Lour.; *R. densiflora* (DC.) Benth.; *R. racemosa* (Cav.) F. Vill.

Shrub or small tree up to ca 10 m tall, ± glabrous. Leaves with petioles 0.5–1.3 cm long; blades elliptic or sometimes ovate or obovate, apex acuminate, sometimes bluntly so, base cuneate to rounded, margin slightly undulate, 6–14(–16) cm × 2.5–6(–7.5) cm. Flowers in axillary dense panicles up to ca 3.5 cm long; calyx glabrous, ca 3 mm long, apex dentate; corolla cream, tube ca 4.5 mm long, lobes obtuse, 6–7 mm long, pubescent at throat. Fruits reddish or orange-red, succulent, ellipsoid or sometimes obovoid, usually 7–8 mm long, sometimes up to 1.5 cm long, crowned by persistent calyx tube. **Fig. 47K.**

Recorded from Bundaberg area in depauperate rainforest. Flowers summer–autumn.

**2. *Randia moorei* F. Muell. ex Benth.**

Shrub ca 2.5 m tall, glabrous, with small axillary thorns. Leaves with petioles 1–5 mm long; blades ovate, rarely obovate, apex acute or bluntly acuminate, base rounded, 1.5–4.5 cm × 0.9–2.3 cm, glabrous, discolourous, paler beneath, often with small domatia in vein axils. Flowers upper axillary or sometimes apparently terminal, usually 2 together, on separate peduncles 2(–10) mm long; calyx ca 4 mm long, dentate, glabrous; corolla tube 6–8 mm long, lobes 5, 4–5 mm long, ± glabrous. Fruits not seen.

Moreton district south of Brisbane, in rainforest, rarely collected. Flowers spring.

This taxon is thought to belong to the genus *Xeromphis* by some botanists.

**3. *Randia chartacea* (F. Muell.) F. Muell.**

*Gardenia chartacea* F. Muell.; *G. chartacea* var. *latifolia* F. Muell. ex Benth.

Tall shrub or small tree ca 3 m tall, usually ± pubescent. Young leaves sometimes whorled; petioles 2–5 mm long; blades narrowly elliptic, elliptic, oblong-ovate, or rarely ovate, linear in juveniles, apex acute or obtuse, base cuneate, 3–12(–25 in juveniles) cm × (0.3 in juveniles)–0.7–5 cm, glabrous, or puberulent below on young leaves, lateral venation ascending, ± parallel, prominent when dry beneath. Flowers usually axillary, solitary or 2 together on very short peduncle subtended by bract, pedicels ca 1–3(–8) mm long; calyx 6–8 mm long, dentate to lobed, ± hirsute; corolla white, tube 8–9 mm long, lobes usually 5, 1–1.2 cm long, ± glabrous. Fruits red, succulent, ± cylindrical, up to 3 cm × 2 cm, crowned by persistent calyx limb 5–7 mm long, eventually ± glabrous. **Fig. 47J.**

Coastal districts in rainforest or depauperate rainforest. Flowers late winter to summer.

**4. *Randia benthamiana* F. Muell.**

Shrub or tree up to ca 8 m tall, youngest shoots pubescent. Leaves with petioles 0.5–2 cm long; blades oblong-obovate, apex acuminate or bluntly so, base cuneate, 5–15 cm × 2–6 cm, ± glabrous, lateral veins looping, often domatia in vein axils. Flowers axillary or terminal in up to 6-flowered clusters, peduncles ca 1–2 mm long, pedicels 1–1.5 cm long; calyx ca 5–8 mm long, dentate, glabrous; corolla white, tube 6–8 mm long, lobes acute, 1–1.5 cm long, glabrous. Fruits yellowish, succulent, globose, ca 1.5–2 cm diameter, crowned by scar of calyx limb, pedicels elongated, up to 2.5 cm long.

Rainforests of the coastal districts, mainly on McPherson Ra. Flowers late winter–spring.

**16. DIPLOSPORA DC.**

Trees or shrubs. Leaves with interpetiolar carinate stipules. Inflorescences of axillary clusters or dense cymes, or pairs of clusters with a terminal one also; calyx tube short, 4-dentate, corolla tube short, lobes 4, spreading, imbricate in bud; stamens 4, inserted in throat, anthers exerted; ovary 2-locular, 2 or more ovules per loculus, style with 2 stigmatic lobes. Fruits drupes with 2-locular pyrenes; seeds 1–5.

25 species China, Indomalaysia, Australia; 3 species Australia; 2 species south-eastern Queensland.

- |  |                        |
|--|------------------------|
| 1. Leaves 1.5–5.5 cm long; inflorescences of 1–few-flowered terminal pedunculate clusters; fruits globular   | 1. <i>D. ixoroides</i> |
| Leaves 4.5–10 cm long; inflorescences of few–several-flowered clusters in terminal pedunculate corymb, often 3 together; fruits ovoid to ellipsoid | 2. <i>D. cameronii</i> |

### 1. *Diplospora ixoroides* F. Muell.

Shrub or small tree *ca* 4 m tall. Leaves with petioles 2–6 mm long; blades elliptic or oblong-ovate, apex acute or obtuse, base cuneate, 1.5–5.5 cm × 0.5–2.6 cm, glabrous, dark shiny above, paler beneath. Inflorescences terminal 1–few-flowered clusters, peduncles 2–7 mm long, pedicels 1–3 mm long; calyx *ca* 1 mm long; corolla whitish, tube 1.5–2 mm long, lobes 3–4 mm long, puberulent inside on lower half of lobes and tube. Fruits black, globular, 7–10 mm diameter, crowned by persistent calyx teeth. **Fig. 47M.**

Burnett district in depauperate rainforest or brigalow closed forest. Flowers spring.

### 2. *Diplospora cameronii* C. T. White

Small tree. Leaves with petioles 0.5–1.2 cm long; blades ovate to elliptic, apex acute, obtuse, or bluntly acuminate, base cuneate to rounded, 4.5–10 cm × 1.2–4.5 cm, glabrous. Inflorescences of few–several-flowered ± sessile clusters in terminal corymbs, 1–3 together, peduncles 5–10 mm long, calyx *ca* 1.5 mm long, 4-dentate; corolla whitish, tube 2–2.5 mm long, lobes 3–3.5 mm long, pubescent inside on lower half. Fruits black, ovoid to ellipsoid, 7–8 mm long, crowned by persistent calyx teeth.

Moreton and eastern Darling Downs districts, in depauperate rainforest. Flowers spring.

## 17. COELOSPERMUM Blume

Shrubs with climbing or straggling branches. Leaves opposite; stipules interpetiolar, ± connate, acuminate. Flowers in umbels clusters or cymes, terminal and solitary or forming panicles, bisexual; calyx tube short, truncate or obscurely dentate; corolla tube usually cylindrical, lobes 5, rarely 4, valvate in bud; stamens in throat, anthers linear, exserted; ovary 2-locular, 2 ovules per loculus, style filiform, 2-lobed. Fruits drupes with 4 distinct 1-seeded pyrenes.

15 species south-eastern Asia, Malaysia, Australia, New Caledonia; *ca* 3 species Australia; 2 species south-eastern Queensland.

- |  |                          |
|--|--------------------------|
| 1. Flowers in panicles; leaves with only primary venation prominent            | 1. <i>C. paniculatum</i> |
| Flowers in umbels; leaves thick, primary veins and even reticulation prominent | 2. <i>C. reticulatum</i> |

### 1. *Coelospermum paniculatum* F. Muell.

Glabrous woody climber. Leaves with petioles 0.5–2(–2.5) cm long; blades oblong-elliptic, oblong-obovate, or occasionally oblong-ovate, apex bluntly acuminate, obtuse or acute, base cuneate, 4–14.5 cm × 1.5–6 cm, glabrous, only primary lateral veins visible. Flowers in terminal cymose panicles; calyx ± truncate, 2–3.5 mm long; corolla cream, tube *ca* 3–4 mm long, lobes *ca* 4–5.5 mm long, suture lines continuing down side of tube, often split again at base, pubescent in throat and tube. Fruits blackish, ± globose, *ca* 1–1.3 cm diameter.

Coastal districts in rainforest or depauperate closed forest, sometimes near beaches. Flowers spring–summer.

### 2. *Coelospermum reticulatum* (F. Muell.) Benth.

### MEDICINE BUSH

*Pogonolobus reticulatus* F. Muell.

Shrub up to *ca* 2.5 m tall, sometimes scrambling, glabrous. Leaves with petioles 0.3–1.1 cm long; blades oblong to oblong-obovoid, apex obtuse, truncate or abruptly acute, base cuneate, margin sometimes irregular, almost crenate, 2.5–9 cm × 1.2–6 cm, glabrous, yellow-green, reticulation prominent when dry, sometimes with domatia. Flowers in umbels or clusters, either terminal, sometimes sessile, or axillary by reduction of flowering branches to leafless peduncles, pedicels 0.5–1.5 cm long; calyx

± truncate, 2.5–3.5 mm long; corolla white, pubescent inside, tube 5–6 mm long, split along suture lines at base, lobes 7–9 mm long. Fruits blackish, succulent when ripe, globular, *ca* 8 mm diameter.

Northern districts of the region in eucalypt forest. Flowers spring. Seeds said to be edible.

### 18. HODGKINSONIA F. Muell.

Trees. Leaves opposite; stipules interpetiolar, caducous. Inflorescences umbellate, pedunculate; flowers unisexual; calyx minute, 4-dentate, corolla tube ovoid, lobes 4; staminal filaments inserted near base of corolla tube, anthers included; ovary 2–4-locular, ovule 1 per loculus, pendulous, style with as many stigmatic lobes as ovary loculi. Fruits drupes with 2–4-locular hardened endocarp.

2 species endemic in Australia; 1 species south-eastern Queensland.

#### 1. *Hodgkinsonia ovatiflora* F. Muell.

Tree up to 13 m tall, ± glabrous with age. Leaves with petioles (2–)4–10 mm long; blades elliptic or sometimes obovate-elliptic, apex acute or bluntly acuminate, base cuneate, margin entire, 2.5–8 cm × 1–4 cm, glabrous above, usually scattered hairs along midrib, hairy domatia in vein axils. Inflorescences axillary on peduncles 0.4–3 cm long, 1–3 umbels per inflorescence, males with 10–20 flowers per umbel, females with few flowers per umbel; calyx tube in males *ca* 0.5 mm long, in females 1.5–2 mm long, lobes of both 0.5 mm long; corolla yellowish, males with urceolate tube *ca* 4 mm long, lobes 0.5 mm long, females with ± globular tube *ca* 2–2.5 mm long, lobes 0.5 mm long. Fruits black, obovoid, 6–10 mm long.

Coastal districts often in remnant rainforest or gullies or in wet eucalypt forest with rainforest understorey, also recorded from Great Dividing Ra., e.g. near Killarney. Flowers late spring to autumn.

### 19. PSYCHOTRIA L.

Trees, shrubs or climbers or rarely small herbs. Leaves opposite; stipules interpetiolar, usually entire. Flowers in usually terminal cymose inflorescences, bisexual; calyx lobes 5, rarely 4 or 6; corolla tube short, lobes 5, rarely 4 or 6, valvate in bud; stamens inserted at various levels in corolla tube, anthers included or exerted; ovary 2-locular, ovule 1 per loculus, basal, erect, style with 2 stigmatic lobes. Fruits drupes with usually 2 pyrenes, smooth or with longitudinal furrows.

700 species warm parts of the world; *ca* 11 species Australia; 3 species south-eastern Queensland.

- |  |                           |   |
|--|---------------------------|---|
| 1. Leaves pubescent with long white or ferruginous hairs, not glandular punctate . . . . . | 1. <i>P. loniceroides</i> |   |
| Leaves glabrous or rarely with short curly hairs, often glandular punctate . . . . .       |                           | 2 |
| 2. Corollas pubescent outside; leaves not glandular punctate . . . . .                     | 2. <i>P. daphnoides</i>   |   |
| Corollas glabrous outside, leaves glandular punctate . . . . .                             | 3. <i>P. simmondsiana</i> |   |

#### 1. *Psychotria loniceroides* Sieber ex DC.

*Psychotria loniceroides* var. *angustifolia* Benth.

Shrub or small tree *ca* 4 m tall, young stems and leaves pubescent with long white or often rusty coloured hairs. Leaves with petioles 0.5–1.2 cm long; blades usually obovate, sometimes elliptic or ovate, apex obtuse or acute, base cuneate to attenuate, margin slightly sinuate or irregular, 2.7–12.5 cm × 1.1–5 cm, pubescent or eventually sometimes ± glabrous above, lateral veins visible, rather close together on undersurface. Inflorescences terminal, though sometimes appearing lateral through elongation of branch; flowers in heads at ends of cymose or umbellate branches; calyx *ca* 1.5–2 mm long, dentate, pubescent; corolla white, tube 1–2.5 mm long, lobes 3–3.5 mm long, pubescent outside; style exerted, 2-lobed. Fruits whitish to pale

yellow, fleshy, ellipsoid, *ca* 6–8 mm diameter, pyrenes longitudinally ribbed and furrowed. **Fig. 47L.**

Coastal districts in rainforest particularly along creeks or littoral closed forest. Flowers spring–summer. Fruits edible.

## 2. *Psychotria daphnoides* Cunn. ex Hook.

*Psychotria daphnoides* var. *angustifolia* Benth.

Shrub usually 2–3 m tall, sometimes more, ± glabrous except for inflorescences or young parts minutely pubescent. Leaves with petioles 0.2–1.3 cm long; blades obovate, apex obtuse or abruptly bluntly acuminate, base cuneate, attenuate, 1–9.5 cm × 0.4–3.6 cm, glabrous or sometimes minutely pubescent. Flowers in terminal cymose finely pubescent panicles, often 3 flowers together with central 1 sessile, other 2 pedicellate; calyx 1–1.5 mm long, minutely pubescent; corolla white to cream, tube *ca* 2–3 mm long, lobes 1.5–2.5 mm long, pubescent within, style exserted. Fruits fleshy, ellipsoid, *ca* 5–7 mm diameter, pyrenes longitudinally ribbed and furrowed.

Two varieties occur in the region:

- |  |   |
|--|---|
| 1. Leaves ± glabrous . . . . .   | <i>P. daphnoides</i> var. <i>daphnoides</i> |
| Leaves ± shortly pubescent with curly hairs particularly on<br>underside . . . . . | <i>P. daphnoides</i> var. <i>pubescens</i>  |

**P. daphnoides** var. **daphnoides** occurs throughout the region in rainforest or depauperate rainforest while **P. daphnoides** var. **pubescens** F. M. Bailey occurs in depauperate rainforest often in mountainous areas. Both flower spring–summer.

## 3. *Psychotria simmondsiana* F. M. Bailey

Erect or spreading shrub or small tree up to *ca* 4 m tall, branchlets glabrous or hirsute. Leaves with petioles 3–10 mm long; blades narrowly elliptic to elliptic, sometimes ovate or obovate, apex acuminate to attenuate, base cuneate to attenuate, 1.7–7(–8) cm × 0.3–2.5(–3.2) cm, glandular punctate, especially prominent below when dried. Flowers usually 3 together, ± sessile on terminal or sometimes upper axillary peduncles up to 2 cm long; calyx 1–1.5 mm long; corolla white, tube 2.5–3 mm long; lobes 3–4 mm long; style slightly exserted. Fruits white, fleshy, globular, *ca* 6 mm diameter, pyrenes ribbed and furrowed.

Three varieties occur in the region:

- |   |  |   |
|---|--|---|
| 1. Stems hispid . . . . .   | <i>P. simmondsiana</i> var.<br><i>simmondsiana</i> | 2 |
| Stems ± glabrous except for few hairs on upper nodes . . . . .                                    |  |   |
| 2. Leaves elliptic to obovate, usually more than 3 cm long, always<br>glabrous . . . . .          | <i>P. simmondsiana</i> var.<br><i>glabrescens</i>  |   |
| Leaves narrowly elliptic or ovate, usually less than 4 cm long,<br>sometimes with hairs . . . . . | <i>P. simmondsiana</i> var. <i>exigua</i>          |   |

**P. simmondsiana** var. **simmondsiana** occurs in low and high altitude rainforest of the Moreton district, while **P. simmondsiana** var. **glabrescens** F. M. Bailey occurs in low altitude rainforest of both coastal districts and **P. simmondsiana** var. **exigua** F. M. Bailey is found in the McPherson Ra., e.g. Springbrook, Lamington National Park. All flowers summer–autumn. Fruits edible.

## 20. PAVETTA L.

Shrubs or small trees. Leaves opposite; stipules interpetiolar, basally connate into short sheath, acuminate, aristate. Inflorescences terminal corymbs or panicles subtended by connate bracts; flowers bisexual, protandrous; calyx tube 4-dentate or 4-lobed; corolla tube cylindrical, lobes 4, contorted in bud; stamens 4, filaments short; ovary 2-locular, ovule 1 per loculus, embedded in placenta, style filiform, exserted, apex thick, 2-dentate or undivided. Fruits drupes, globose or slightly 2-lobed; seeds 2.

400 species palaeotropical; 5 species Australia; 1 species south-eastern Queensland.

**1. *Pavetta australiensis* Bremek.***Pavetta indica* auct. Aust. non L.

Shrub or small tree *ca* 7 m tall,  $\pm$  glabrous. Leaves with petioles 0.5–2 cm long; blades narrowly elliptic, elliptic or obovate, apex acuminate to obtuse, base attenuate to cuneate, 4–15 cm  $\times$  1.2–6 cm, glabrous. Inflorescences terminal, sessile above uppermost leaves, subtended by connate stipules; calyx 1.5–2 mm long; corolla white, tube 1–1.5 cm long, lobes 0.5–0.8 cm long, sometimes whole corolla smaller, style twice as long as tube. Fruits black, globose, 6–8 mm diameter, crowned by persistent calyx teeth. **Fig. 47N.**

Mainly in the coastal districts in rainforest but also recorded near Mt. Perry and Coalstoun Lakes in depauperate rainforest. Flowers spring.

**21. IXORA L.**

Shrubs or small trees. Leaves opposite, sometimes in whorls of 3; stipules interpetiolar, acuminate, connate at base into broad sheath. Inflorescences terminal corymbs or panicles, floral bracts at base of inflorescence free; flowers often 3 together, bisexual, protandrous; calyx tube small, 4-, rarely 5-dentate or -lobed; corolla tubular, lobes 4, rarely 5, contorted in bud; anthers usually exerted; ovary 2-, rarely 3-locular, ovule 1 per loculus, style up to as long as corolla lobes, stigmas 2. Fruits drupes with usually 2, 1-seeded thin walled pyrenes.

400 species tropical; 6 species Australia; 1 species south-eastern Queensland.

**1. *Ixora beckleri* Benth.**

Shrub or small tree *ca* 6 m tall,  $\pm$  glabrous. Leaves with connate stipules with subulate points up to 5 mm long; petioles 0.4–1.2 cm long; blades obovate or sometimes elliptic, apex obtuse or abruptly acuminate; base cuneate, 4–16.5 cm  $\times$  2–5.5 cm, glabrous. Inflorescences sessile, shorter than leaves; calyx *ca* 1.5–2 mm long, 4-dentate; corolla whitish, tubes 3–4 mm long, lobes 4, 2.5–3 mm long. Fruits black, obovoid, *ca* 8–10 mm long, crowned by persistent calyx teeth.

Coastal districts in lowland rainforest or dry closed forest, also recorded from Mt. Perry area. Flowers summer.

**22. CANTHIUM Lam.**

Trees or shrubs with or without thorns. Leaves opposite; stipules interpetiolar; nerve axils barbate on undersurface of leaf. Flowers in axillary cymes or clusters, rarely solitary, pedicellate, bisexual or unisexual; calyx tube 4–6-dentate; corolla tube glabrous outside, usually with ring of hairs inside at throat, lobes 4–6, valvate in bud, spreading or reflexed; stamens inserted in tube, anthers exerted; ovary 2-locular, ovule 1 per loculus, pendulous, style filiform, stigma thick, broad. Fruits drupes, pyrenes 1 or 2, 1-seeded.

200 species palaeotropical; *ca* 10–12 species Australia; 7 species south-eastern Queensland.

- |   |                            |   |
|---|----------------------------|---|
| 1. Flowers in clusters . . . . .  | 1. <i>C. coprosmoides</i>  | 2 |
| Flowers in cymes or panicles . . . . .  |                            |   |
| 2. Flowers 2–3 per cyme; leaves 0.3–1.3 cm long on very divaricately branched often spinescent twigs . . . . .                    | 2. <i>C. vaciniifolium</i> |   |
| Flowers more than 3 in cymose panicles; leaves longer than 1.5 cm, not on spinescent divaricate branches . . . . .                |                            | 3 |
| 3. Leaves dull or without yellowish margin when dried; corolla tube 2–3 mm long and lobes 3.5–4.5 mm long . . . . .               |                            | 4 |
| Leaves shiny above, <i>C. buxifolium</i> with yellowish margin when dried; corolla not the above combination of lengths . . . . . |                            | 5 |
| 4. Leaves with prominent lateral venation especially when dry . . . . .   | 3. <i>C. attenuatum</i>    |   |
| Leaves with obscure lateral venation even when dry . . . . .  | 4. <i>C. oleifolium</i>    |   |

5. Leaves usually less than 4 cm long, lateral venation obscure, if visible at all, smallest with yellowish margin when dried; corolla tubes *ca* 1 mm long and lobes 2.5–3 mm long . . . . . 5. *C. buxifolium*
- Leaves usually more than 4 cm long, lateral veins visible at least above, none with yellow margin; corollas not the above combination of lengths . . . . . 6
6. Leaves up to 8 cm long; calyces glabrous, corolla tubes 1–2 mm long, lobes 3–4 mm long . . . . . 6. *C. odoratum*
- Leaves generally more than 8 cm long; calyces minutely pubescent; corolla tubes 2–3 mm long, lobes 2–2.5 mm long . . . . . 7. *C. sp. 1.*

### 1. *Canthium coprosmoides* F. Muell.

Shrub or small tree up to 10 m tall, glabrous. Leaves with petioles 2–10 mm long; blades oblong-obovate or oblong-elliptic, apex obtuse or sometimes bluntly acuminate, base cuneate to rounded, margin recurved, 2–8(–12.5) cm × 1–4(–6) cm, glabrous, dull deep green above, paler beneath, lateral venation dark, visible beneath. Flowers in axillary clusters, pedicels 1.5–4 mm long; calyx 1.5–2 mm long, 5-dentate; corolla white, tube 5–9 mm long, lobes *ca* 4 mm long, ciliate along margin, pubescent in orifice of tube; anthers sessile at orifice of tube; stigma large, peltate. Fruits red, ± laterally compressed, obovoid, *ca* 1 cm diameter, pedicel elongated up to 8 mm long. **Fig. 47Q.**

Mainly coastal districts in depauperate rainforest or near creeks or in littoral closed forests. Flowers mainly summer–autumn.

### 2. *Canthium vaciniifolium* F. Muell.

Shrub or small tree up to *ca* 7 m tall, glabrous, with numerous divaricate branches, smaller ones often spinescent. Leaves with petioles 0.5–1.5 mm long; blades thick, oblong to obovate, occasionally elliptic or orbicular, apex obtuse to retuse, base cuneate to rounded, margin recurved, 0.3–1.3 cm × 0.15–1 cm, glabrous, venation other than midrib obscure. Flowers 2–3 on peduncles up to 6 mm long, pedicels 1–3.5 mm long; calyx *ca* 1 mm long, 4-lobed, glabrous; corolla white, tube 2.5–4 mm long, lobes usually 4, 3–3.5 mm long; stamens slightly exerted; stigma ovoid, 2-lobed. Fruits black, globose to slightly compressed, *ca* 5 mm diameter. **Fig. 47P.**

Throughout the region in depauperate rainforest. Flowers sporadically, late spring to autumn.

### 3. *Canthium attenuatum* R. Br. ex Benth.

Glabrous shrub. Leaves with petioles 0.7–2.5 cm long; blades obovate, elliptic to linear-elliptic, apex obtuse to bluntly acuminate, base attenuate, 4.5–12 cm × (1–)2–3.5 cm, glabrous, dull, venation prominent at an acute angle to midvein. Inflorescences several–many-flowered dense cymes smaller than leaves; calyx 1.5–2 mm long, 4–5-dentate, glabrous; corolla white, tube 2–3 mm long, lobes 4–5, 3–4.5 mm long, sometimes puberulent at throat; stamens and stigma exerted. Fruits compressed globose or compressed didynamous, *ca* 6 mm diameter.

Darling Downs and Burnett districts. Flowers spring–summer.

The taxon as described here is doubtfully distinct from *C. oleifolium*, as on larger dried leaves of *C. oleifolium* the venation is visible and ± intermediate between the two. There is a slight difference in leaf shape and size but no clear distinction in floral characters to support the vegetative ones, though the inflorescences in *C. attenuatum* seem larger and more open than in *C. oleifolium*.

### 4. *Canthium oleifolium* Hook.

#### MYRTLE TREE

Tall shrub or small tree up to *ca* 6 m tall, sometimes stiffly branched. Leaves with petioles (0.2–)0.4–1(–2) cm long; blades narrowly obovate or oblong-obovate, apex obtuse, base cuneate to attenuate, (1.2–)2–5.5(–8) cm × 0.5–2(–2.5) cm, usually glabrous, dull, venation obscure or sometimes just visible on vegetative shoots. Inflorescences of few–many-flowered dense cymes smaller than leaves; calyx 1.5–2 mm long, 4–5-dentate, glabrous; corolla white, tube 2–3 mm long, lobes 4–5,



Fig. 47 RUBIACEAE — A–C *Asperula* spp. — A *A. conferta* var. *conferta*, flowering stem x1; B *A. charophyton*, leaves and fruit x1; C *A. ambleia*, flowering stem x1; D–F *Galium* spp. — D<sub>1</sub>–D<sub>2</sub> *G. aparine*, D<sub>1</sub> fruiting stem x1, D<sub>2</sub> fruit x6; E *G. gaudichaudii*, fruiting stem x1; F<sub>1</sub>–F<sub>2</sub> *G. tricordatum*, F<sub>1</sub> fruiting stem x1, F<sub>2</sub> fruit x6; G–H *Morinda* spp. — G<sub>1</sub>–G<sub>2</sub> *M. jasminoides*, G<sub>1</sub> flowering stem x1, G<sub>2</sub> fruiting stem x1; H *M. acutifolia*, fruit x1; I<sub>1</sub>–I<sub>2</sub> *Timonius timon*, I<sub>1</sub> flowers x2, I<sub>2</sub> L.S. of fruit showing numerous 1-ovuled loculi x1<sup>1</sup>/<sub>2</sub>; J–K *Randia* spp. — J *R. chartacea*, fruit x2/3; K<sub>1</sub>–K<sub>2</sub> *R. cochinchinensis*, infructescence x1, K<sub>2</sub> L.S. of fruit x3; L *Psychotria loniceroides*, flowering stem x1; M *Diplospora ixoroides*, flowering stem x1; N *Pavetta australiensis*, stem node showing connate floral bracts x1; O–Q *Canthium* spp. — O *C. buxifolium*, flowering stem x2/3; P *C. vacinifolium*, part of flowering stem x2/3; Q<sub>1</sub>–Q<sub>2</sub> *C. coprosmoides*, Q<sub>1</sub> inflorescence x1, Q<sub>2</sub> fruiting stem x1.

3.5–4.5 mm long, puberulent sometimes at throat; stamens and stigma exserted. Fruits compressed globose, *ca* 6 mm diameter.

Darling Downs and Burnett districts usually on poor soils or stony ridges. Flowers late spring–summer.

See note under *Canthium attenuatum*.

#### 5. *Canthium buxifolium* Benth.

Shrub to small tree up to *ca* 8 m tall, glabrous, intricately branched. Leaves with petioles 1–5 mm long; blades thick, ovate to elliptic, or sometimes  $\pm$  orbicular or obovate, rarely narrowly so, apex obtuse, base cuneate to rounded, margin thickened, yellowish when dry, 1.5–5.5 cm  $\times$  0.6–2.8 cm, glabrous, dark, shiny above, paler beneath, venation other than midrib obscure. Inflorescences of few–several-flowered axillary pedunculate cymose panicles slightly shorter than leaves; calyx *ca* 1.5 mm long, 4-dentate, glabrous; corolla white, tube *ca* 1 mm long, lobes usually 4, 2.5–3 mm long, glabrous; stamens slightly exserted; stigma ovoid. Fruits black, often slightly compressed, globose to ovoid, *ca* 6–8 mm diameter. **Fig. 47O.**

Throughout most of the region in depauperate rainforest. Flowers summer.

#### 6. *Canthium odoratum* (G. Forster) Seem.

*Plectronia odorata* G. Forster; *Canthium lucidum* Hook. & Arn.

Shrub or small tree up to *ca* 8 m tall, glabrous. Leaves with petioles 2–8 mm long; blades elliptic or sometimes obovate, apex obtuse or abruptly bluntly acuminate, base cuneate,  $\pm$  decurrent on petiole, 3–8.2 cm  $\times$  1–3.5 cm, shiny dark green above, paler beneath, lateral venation visible above, obscure beneath. Inflorescences many-flowered cymose panicles shorter than leaves; calyx 1–1.5 mm long, puberulent at throat; anthers exserted; style long exserted, quadrangular. Fruits black, compressed, obovoid, *ca* 7–8 mm diameter.

Throughout the region in depauperate rainforest, more common in coastal districts. Flowers late spring–summer.

#### 7. *Canthium* sp. 1.

*Canthium didymum* auct. non P. Gaertn., F. M. Bailey

Tree up to 12 m tall, glabrous. Leaves with petioles 1–1.5 cm long; blades narrowly ovate to ovate, apex acuminate, base cuneate to rounded, margin entire, (7–)8.5–12 cm  $\times$  3–4.5 cm, shiny green above, paler beneath, venation visible both sides when dried, sometimes domatia in vein axils. Inflorescences much-branched many-flowered panicles up to 4 cm long, pedicels much shorter than peduncles; calyx *ca* 1 mm long, hardly dentate, minutely pubescent; corolla white, tube 2–3 mm long, lobes 4, 2–2.5 mm long, puberulent in throat; stamens and style exserted. Fruits compressed, globose to ovoid, *ca* 8 mm diameter.

Coastal districts in lowland light or fringing rainforest. Flowers late summer–autumn.

Specimens with leaves with petioles 0.7–1.5 cm long and ovate blades with bluntly acuminate apices, rounded to truncate bases and 9–13(–16) cm  $\times$  4.5–7(–10) cm probably represent a vegetative or juvenile form of this taxon since they have been collected in similar localities to it, but not fertile.

The leaves of this species resemble the overseas *C. didymum* quite closely, but the inflorescence of *C. didymum* is quite different, with the pedicels more than 3 times as long as the peduncle and usually more than 1 cm long.

### 23. COFFEA L.

Shrubs or small trees, branchlets terete, but very compressed when young. Leaves opposite, sometimes in threes; stipules mostly interpetiolar, broad. Inflorescences axillary or sometimes terminal shortly peduncled cymes; flowers bisexual; calyx tube glabrous, shortly persistent,  $\pm$  truncate with 5–8 minute sometimes glandular teeth or

lobes; corolla tube cylindrical, lobes 4–8, contorted in bud; stamens 4–8, anthers  $\pm$  sessile in throat or tube, often recurved or twisted after anthesis; ovary 2-locular, rarely more, ovule 1 per loculus, style filiform, 2-branched. Fruits drupes with thin or thick pericarps, pyrenes usually 2, plano-convex, usually grooved on flat side.

40 species palaeotropical, especially Africa; 1–2 species cultivated and possibly naturalized Australia; 1 species south-eastern Queensland.

### 1. \**Coffea arabica* L.

### ARABIAN COFFEE

Shrub, 2–3(–5) m tall, branches in opposite  $\pm$  horizontal pairs, or drooping slightly. Leaves with petioles 0.6–1.5 cm long; blades elliptic or elliptic-obovate, apex acuminate, sometimes bluntly so, base cuneate, 5–18.5(–25) cm  $\times$  3–7.5(–10) cm, glabrous. Inflorescences few together in axils, usually 3-flowered cymes, *ca* 1–1.5 cm long, bracts enclosing base; calyx *ca* 2 mm long, dentate, glabrous; corolla white, tube 0.8–1 cm long, lobes usually 5, 0.8–1.2 cm long; stamens exserted. Fruits red when ripe, ellipsoid, *ca* 1.3–1.5 cm long.

Native of tropical Africa; naturalized in a few areas of the Moreton district, e.g. near Nambour, Currumbin Ck. Flowers spring–summer. When ground, seeds used in preparation of the beverage coffee.

## 128. CONVULVULACEAE

Herbs or shrubs, sometimes parasitic, usually twining, prostrate or creeping, occasionally erect. Leaves usually absent in parasitic species, otherwise alternate; stipules absent, pseudostipules (leaves of reduced axillary shoots resembling stipules) rarely present. Inflorescences mostly cymose, 1–many-flowered, bracts usually present; flowers usually bisexual, usually actinomorphic, rarely slightly zygomorphic, usually 5-merous, rarely 4-merous; sepals usually free; corolla sympetalous; stamens alternating with corolla lobes; ovary superior, mostly 1–2-locular or sometimes 4-locular, rarely 3-locular, ovules 1–2 per loculus, styles 1 or 2, stigmas 1–4 per style. Fruits capsules dehiscing by valves or circumscissile or irregularly dehiscing, rarely berries or nut-like.

About 55 genera with *ca* 1800 species in tropical, subtropical and temperate parts of the world; 19 genera with *ca* 110 species Australia; 9 genera with *ca* 34 species south-eastern Queensland.

1. Plants leafless, often yellowish, twining parasites . . . . .	1. <i>Cuscuta</i>
Plants leafy, not parasitic . . . . .	2
2. Style 1, undivided . . . . .	3
Styles 2, free or connate at base . . . . .	7
3. Styles with 4–8 linear stigmatic lobes . . . . .	2. <i>Polymeria</i>
Styles with capitate or 2-lobed stigma . . . . .	4
4. Pollen spiny; style 1, stigma capitate . . . . .	3. <i>Ipomoea</i>
Pollen smooth; style 1, stigma 2-lobed . . . . .	5
5. Bracts large, conspicuous, enclosing calyx . . . . .	4. <i>Calystegia</i>
Bracts not enclosing calyx . . . . .	6
6. Hairs on leaves stellate . . . . .	5. <i>Jacquemontia</i>
Hairs on leaves not stellate . . . . .	6. <i>Convolvulus</i>
7. Styles 2, each deeply bifid . . . . .	7. <i>Evolvulus</i>
Styles 2, each with capitate stigma . . . . .	8
8. Plants creeping, rooting at nodes . . . . .	8. <i>Dichondra</i>
Plants erect or diffuse, not rooting at nodes . . . . .	9. <i>Cressa</i>

1. CUSCUTA L.

Herbaceous annual parasites with twining yellowish or reddish stems with haustoria. Leaves reduced to minute scales. Flowers small, mostly in cymose clusters, 5-, rarely 4- or 3-merous; calyx ± deeply lobed or of free sepals; corolla tube with scales inside; ovary 2-locular, styles 2 or 1, stigmas globose or elongated. Fruits ovoid or globose, dry or fleshy.

About 165 species cosmopolitan but mainly Americas; ca 8 species, 4 naturalized, Australia; 4 species south-eastern Queensland.

Seeds of species of **Cuscuta** germinate in the soil in the usual way. If the young plant contacts a host plant all contact with the soil is lost and the **Cuscuta** becomes completely dependent on the host plant. If contact is not made with a host plant the seedling soon perishes.

Species of **Cuscuta** are all called DODDERS.

- |  |                         |   |
|--|-------------------------|---|
| 1. Stigmas linear . . . . .  | 1. <i>C. epithymum</i>  | 2 |
| Stigmas globular . . . . .   |                         |   |
| 2. Calyx lobes much shorter than corolla tube . . . . .  | 2. <i>C. suaveolens</i> | 3 |
| Calyx lobes about equal to corolla tube . . . . .  |                         |   |
| 3. Corolla lobes obtuse, corolla scales shorter than corolla tube, deeply bifid with few fimbriae . . . . .        | 3. <i>C. australis</i>  |   |
| Corolla lobes acute, tips often inflexed, corolla scales slightly longer than tube, abundantly fimbriate . . . . . | 4. <i>C. campestris</i> |   |

1. \***Cuscuta epithymum** (L.) L.

LESSER DODDER

*Cuscuta europaea* L. var. *epithymum* L.

Flowers sessile and numerous in dense compact clusters, 5-merous; calyx about as long as corolla tube, lobes acute; corolla ca 2–3 mm long, lobes acute, spreading, scales shorter than tube, fringed about upper part; styles 2, stigmas linear. Capsules globose, circumscissile, ca 2–3 mm diameter.

Native of Europe. The Queensland Herbarium has only one specimen from the region, collected in the Darling Downs district in 1876. This is a common species in southern states.

2. \***Cuscuta suaveolens** Ser.

Flowers in racemose clusters, 5-merous, ca 3 mm long; calyx shorter than corolla tube, lobes ± acute, not overlapping; corolla lobes upright with acute inflexed tips, scales shorter than tube, fringed with short fimbriae; styles 2, stigmas globose. Capsules globose, circumscissile, ca 2–3 mm diameter.

Native of southern South America. The Queensland Herbarium has a single specimen from the region, from the Darling Downs district.

3. **Cuscuta australis** R. Br.

AUSTRALIAN DODDER

Flowers in compact clusters, 5-merous, ca 2 mm long; calyx about equalling corolla tube, lobes obtuse, not overlapping; corolla lobes obtuse, mostly upright but sometimes spreading, scales shorter than tube, deeply bifid, fimbriae few; styles 2, stigmas globose. Capsules depressed globose or obpyriform, ca 3–4 mm diameter, with interstylar opening, not circumscissile. **Fig. 49B.**

The Queensland Herbarium has a single specimen from the region, from the Moreton district.

4. **Cuscuta campestris** Yunckers

*Cuscuta australis* auct. non R. Br., F. M. Bailey

Flowers in compact clusters, 5-merous, ca 2–2.5 mm long; calyx about equalling corolla tube, obtuse, overlapping when young; corolla lobes acute with inflexed tips, spreading, scales slightly longer than corolla tube, abundantly fimbriate; styles 2, stigmas globose. Capsules depressed globose, ca 3–4 mm diameter, with interstylar opening, not circumscissile. **Fig. 49A.**

Common and widespread in the region. Flowers spring.

## 2. POLYMERIA R. Br.

Erect prostrate or trailing herbs, rarely twining. Leaves usually entire. Inflorescences axillary, cymose, 1–3-flowered, bracts small; corolla broadly campanulate, entire or angular; ovary 2-locular, 1 ovule per loculus, style filiform with 4–8 or very rarely 2 linear stigmatic lobes. Fruits capsules; seeds 1 or 2.

8–10 species, Timor, Australia and New Caledonia; 6 species Australia; 4 species south-eastern Queensland.

- |  |                         |
|--|-------------------------|
| 1. Stems creeping or trailing . . . . .  | 2                       |
| Stems erect . . . . .  | 3                       |
| 2. Flowers less than 1 cm long; sepals nearly equal . . . . .                              | 1. <i>P. pusilla</i>    |
| Flowers 1–1.5 cm long; outer sepals longer and broader than inner ones . . . . .           | 2. <i>P. calycina</i>   |
| 3. Leaves glabrous above, margin fringed with silky hairs; flowers 2–2.5 cm long . . . . . | 3. <i>P. marginata</i>  |
| Leaves glabrous or silky hairy, margin not fringed; flowers 1.5–2 cm long . . . . .        | 4. <i>P. longifolia</i> |

### 1. *Polymeria pusilla* R. Br.

Annual; stems creeping or trailing, rooting at nodes. Leaves with petioles 0.2–0.5 cm long; blades broadly ovate to ovate to oblong, apex obtuse or retuse, base cordate or almost truncate, margin entire, 0.4–3.5 cm × 0.2–3 cm, glabrous. Peduncles 1-flowered, 0.5–4 cm long, bracts *ca* 1.5 mm long; sepals nearly equal, 3–4 mm long; corolla pink, 6–8 mm long.

Moreton and Darling Downs districts, on heavy soils. Flowers summer–autumn.

### 2. *Polymeria calycina* R. Br.

Annual; stems prostrate or creeping, glabrous or with few hairs. Leaves with petioles 0.3–3 cm long; blades of lower leaves or of young plants ovate or oblong, apex obtuse or emarginate, base cordate, margin entire, 1–3 cm × 0.8–1.8 cm; upper blades triangular to narrowly ovate to linear-oblong to linear, apex obtuse, mucronulate, base cordate to hastate or occasionally ± cuneate, margin entire, 1–12 cm × 0.1–0.9 cm. Peduncles 1-flowered, 1.5–4 cm long, bracts 1.5–2 mm long; outer sepals broadly ovate, apex acute-acuminate, base rounded to cordate, 5–8 mm long, inner ones narrowly ovate, apex acuminate, shorter than outer ones; corolla pink or mauve, 1–1.5 cm long. **Fig. 49C.**

Widespread in the region. Flowers spring to autumn.

### 3. *Polymeria marginata* Benth.

Erect, up to *ca* 25 cm tall, stems hirsute, arising from creeping rhizome. Leaves with petioles 2–10 mm long; leaf blades linear or linear-ovate, or rarely oblong, apex obtuse to acute, mucronate, base ± cordate, margin entire, 2–11 cm × 0.5–1.5 cm, glabrous above, with few hairs on veins below, margin fringed with silky hairs. Peduncles 1-flowered, 2–8 cm long, bracts 2–8 mm long; sepals unequal, outer ones broadly ovate, apex acute, 0.8–1.2 cm long, inner ones narrower and shorter; corolla pink or pinkish purple, 2–2.5 cm long.

Known from the western Darling Downs district. Flowers spring to autumn, but mostly autumn.

### 4. *Polymeria longifolia* Lindl.

### POLYMERIA; PEAK DOWNS CURSE

Erect, up to *ca* 25 cm tall, with perennial rootstock, pubescent or villous with silky hairs. Leaves with petioles 0–3 mm long; leaf blades linear or linear-ovate, apex acute, mucronate, base ± hastate, margin entire, 2–7 cm × 0.2–1 cm, glabrous to silky pubescent. Peduncles 1-flowered, 1.5–6 cm long, bracts *ca* 3–10 mm long; sepals nearly equal, 5–9 mm long; corolla pink, 1.5–2 cm long.

Widespread in the Burnett and Darling Downs districts. Flowers found most of the year.

## 3. IPOMOEA L.

Herbs or shrubs, usually twining or prostrate. Petioles sometimes with pseudostipules (small leaves of axillary shoot) at base. Inflorescences mostly axillary, cymose, 1-many-flowered; sepals 5; corolla actinomorphic, rarely slightly zygomorphic, tubular, limb shallowly or rarely deeply 5-lobed; stamens 5, mostly inserted near base of corolla tube, pollen globular, spinulose; ovary usually 2-, rarely 4-locular; style 1, simple, stigma capitate. Fruits capsules.

About 500 species widely distributed in tropical and subtropical regions of the world; ca 36 species Australia; 18 species south-eastern Queensland.

1. Corolla tubes 7–8 cm long . . . . .	1. <i>I. alba</i>	2
Corolla tubes less than 7 cm long . . . . .		
2. Inflorescences involucrate, with large outer bracts 1–3 cm long with long ± spreading hairs	2. <i>I. pes-tigridis</i>	
Inflorescences not involucrate, bracts mostly less than 1 cm long, if 1 cm or more long then without long spreading hairs . . . . .		3
3. Ovaries hairy . . . . .		4
Ovaries glabrous . . . . .		6
4. Peduncles absent or much less than 1 cm long . . . . .	3. <i>I. eriocarpa</i>	
Peduncles 1 cm or more long . . . . .		5
5. Corollas 1.5–2 cm long . . . . .	4. <i>I. triloba</i>	
Corollas 3–4.5 cm long . . . . .	5. <i>I. batatas</i>	
6. Stamens and style exerted from corolla . . . . .		7
Stamens and style included in corolla tube . . . . .		8
7. Leaves pinnately divided to midrib into 10–18 pairs of linear to filiform segments . . . . .	6. <i>I. quamoclit</i>	
Leaves entire or 3-lobed . . . . .	7. <i>I. hederifolia</i>	
8. Corollas less than 1.5 cm long . . . . .		9
Corollas 2 cm or more long . . . . .		12
9. Sepals 3.5–4.5 mm long; flowers yellow . . . . .	8. <i>I. brownii</i>	
Sepals 6–10 mm long; flowers not yellow . . . . .		10
10. Leaf blades narrowly elliptic, elliptic-oblong or obovate, margin entire to coarsely dentate, or blades lyrate with large ovate or elliptic terminal segment and small triangular-hastate basal ones . . . . .	9. <i>I. polymorpha</i>	
Leaf blades narrowly ovate to broadly ovate, margin entire . . . . .		11
11. Leaf bases conspicuously cordate . . . . .	10. <i>I. plebeia</i>	
Leaf bases cuneate to truncate to shallowly cordate . . . . .	11. <i>I. lonchophylla</i>	
12. Outer sepals 1 cm or more long, if 1 cm long then bracts 2 mm or more long . . . . .		13
Outer sepals 0.3–1 cm long, if 1 cm long then bracts less than 2 mm long . . . . .		15
13. Outer sepals acute, not long attenuate nor abruptly narrowed to long tip . . . . .	12. <i>I. purpurea</i>	
Outer sepals long attenuate or abruptly narrowed to long tip . . . . .		14
14. Outer sepals long and gradually linear-acuminate . . . . .	13. <i>I. indica</i>	
Outer sepals abruptly narrowed to long tips . . . . .	14. <i>I. hederacea</i>	
15. Corollas 2–2.5 cm long, yellow to white . . . . .	15. <i>I. obscura</i>	
Corollas 3–6 cm long, white to purple, never yellow . . . . .		16
16. Leaves digitate with 5 segments split almost to base . . . . .	16. <i>I. cairica</i>	
Leaves not digitately divided into 5 segments . . . . .		17

17. Species not from sea shore, producing subterranean tubers . . . . . 5. *I. batatas*  
 Species from sandy beaches near the sea shore, not producing  
 subterranean tubers . . . . . 18
18. Leaves herbaceous, apex acute to obtuse or retuse; stems prostrate  
 or twining; capsules *ca* 9 mm diameter . . . . . 17. *I. littoralis*  
 Leaves subcoriaceous, apex emarginate or truncate; stems  
 prostrate; capsules 1.2–1.7 cm diameter . . . . . 18. *I. pes-caprae* subsp.  
*brasiliensis*

### 1. \**Ipomoea alba* L.

### MOON FLOWER

*Ipomoea bona-nox* L.

Glabrous annual or perennial twiner. Leaves with petioles 5–20 cm long; blades ovate to orbicular in outline, rarely oblong to ovate-oblong, apex acuminate, base cordate, margin entire or 3-lobed often on same plant, 6–20 cm × 5–16 cm. Inflorescences axillary, 1–several-flowered, peduncles 1–24 cm long, pedicels 0.7–1.5 cm long, bracts small, caducous; flowers fragrant; sepals unequal, 2 or 3 outer ones shorter, 0.8–1.5 cm long with an awn 4–9 mm long, inner ones longer with a shorter mucro 2–3 mm long; corolla opening after sunset, white with greenish bands, tube 7–12 cm long, limb 6 cm or more across; stamens and style exerted; ovary glabrous. Capsules ovoid, 2–3 cm long.

Native of tropical America; probably introduced as an ornamental plant, naturalized in eastern parts of the region. Flowers spring–summer.

### 2. \**Ipomoea pes-tigridis* L.

Annual; stems twining or sometimes prostrate, with long ± spreading hairs. Leaves with petioles 1.5–10 cm long; blades orbicular or transversely elliptic in outline, palmately divided nearly to base into 3–7 segments, or 3–5-lobed, or almost entire, apex of leaf and/or segments acuminate, base cordate, 2.5–9 cm × 2–12 cm, ± densely hairy with appressed or spreading hairs. Inflorescences axillary, involucrate, few-flowered, peduncles 1–18 cm long, outer bracts oblong or linear-oblong, 1–3 cm long, inner ones smaller, all with long ± spreading hairs; sepals 0.7–1.2 cm long, long hairy; corolla white, funnellform, up to *ca* 4 cm long; stamens and style included; ovary glabrous. Capsules ovoid, *ca* 8 mm long.

Native of tropical Africa and Asia; reported once from the Darling Downs district.

### 3. *Ipomoea eriocarpa* R. Br.

Twining or prostrate annual with retrorse or spreading hairs. Leaves with petioles 0.5–8 cm long; blades mostly linear-ovate to ovate to oblong, apex long attenuate to acuminate with an obtuse to acute mucronate point, base cordate, margin entire, 1.5–6.5(–8) cm × 0.6–3.4(–4) cm sparsely pilose on both surfaces or more densely hairy below. Inflorescences axillary, sessile or with short peduncles, 1–3-flowered, pedicels 0–3 mm long, bracts up to 8 mm long; sepals ovate, apex long acuminate, *ca* 7–8 mm long; corolla pink or purple, tubular to funnellform, 6–9 mm long; stamens and style included; ovary hairy. Capsules broadly ovoid to globular, *ca* 5–7 mm diameter, hairy.

Occasional in the region. Flowers mainly autumn.

### 4. \**Ipomoea triloba* L.

Perennial, twining or sometimes prostrate, glabrous. Leaves with petioles 0.5–3.5 cm long; blades broadly ovate to orbicular in outline, apex acute to acuminate, base cordate, margin entire or 3-lobed, mostly 2–8 cm × 2–8 cm. Inflorescences axillary, 1–several-flowered, peduncles 1–10 cm long, pedicels 2–8 mm long, bracts minute; sepals 7–8 mm long; corolla pink, funnellform, *ca* 1.5–2 cm long; stamens and style included; ovary hairy. Capsules subglobular, 5–6 mm long.

Native of tropical America; known from the Wide Bay district. Flowers spring to autumn.

**5. \**Ipomoea batatas* (L.) Lam.**

SWEET POTATO

*Convolvulus batatas* L.

Perennial with subterranean tubers; stems prostrate or ascending, occasionally twining, rooting at nodes, glabrous or hairy, green or tinged with purple. Leaves with petioles 4–20 cm long; blades broadly ovate or orbicular in outline, apex acuminate, base cordate to truncate, margin entire, angular or ± deeply palmately 3–5-, rarely 7-lobed, lobes from broadly ovate to linear-oblong, whole blade 4–14 cm × 4–11 cm. Inflorescences axillary, 1–several-flowered, peduncles 3–18 cm long, pedicels 0.3–1.2 cm long, bracts 2–3 mm long, caducous; outer sepals 7–8 mm long, inner ones 0.9–1.2 cm long, all acute at apex, distinctly mucronulate; corolla pale violet, 3–4.5 cm long; stamens and style included; ovary hairy or sometimes glabrous. Capsules ovoid.

Native of America; widely cultivated for its edible tubers, often found persisting around old gardens etc. Flowers spring–summer.

**6. \**Ipomoea quamoclit* L.**

STAR OF BETHLEHEM

Annual, twiner rarely prostrate, glabrous. Leaves with petioles 0.5–3.5 cm long, often with pseudostipules at base; blades ovate or oblong in outline, divided to midrib into usually 10–18 pairs of linear to filiform segments, whole blade 1.5–10 cm × 1–6 cm. Inflorescences axillary, 1–few-flowered, peduncles 1.5–12 cm long, pedicels 0.9–2 cm long, bracts minute; sepals mucronulate, outer ones 4–4.5 mm long, inner ones 5–6 mm long; corolla red, salverform, tube 1.5–3 cm long, limb up to *ca* 2 cm diameter; stamens and style exerted; ovary glabrous. Capsules ovoid, 6–8 mm long. **Fig. 48B.**

Probably of eastern Indian origin but now circumtropical; probably introduced as an ornamental, naturalized mainly coastal parts of the region but occasionally elsewhere. Flowers mainly spring to autumn.

**7. \**Ipomoea hederifolia* L.***Ipomoea angulata* Lam.; *I. coccinea* auct. non L.

Annual twiner, glabrous or sparsely pilose. Leaves with petioles 2–17 cm long; blades ovate to broadly ovate to orbicular in outline, apex acuminate and mucronate, base cordate, margin entire, angular, coarsely dentate or obscurely to deeply 3-lobed, middle lobe narrowed towards base, 3–15 cm × 3–15 cm, mostly glabrous. Inflorescences axillary or terminal, few–several-flowered, peduncles 3–22 cm long, pedicels 5–7 mm long in flower, 0.8–1.2 cm long in fruit, pedicel of central flower up to *ca* 1.5 cm long, bracts *ca* 1.5–2 cm long; sepals 2–3 mm long with awn 3–4 mm long; corolla scarlet, salverform, tube 2–4 cm long, limb up to *ca* 2.5 cm diameter; stamens and style exerted; ovary glabrous. Capsules globular, *ca* 5–7 mm diameter; seeds glabrous.

Native of tropical America; probably introduced as an ornamental, naturalized in eastern parts of the region. Flowers mostly autumn–early winter.

**8. *Ipomoea brownii* Roemer & Schultes***Ipomoea luteola* R. Br.

Twiner, glabrous or sparsely hairy; stems up to *ca* 60 cm long. Leaves with petioles up to *ca* 1.5 cm long; blades ovate, acuminate with obtuse tip, mucronulate, base cordate, margin entire, 1.5–3 cm × 1.2–2 cm. Flowers axillary, 1–2 together, peduncles 0.3–2 cm long, bracts *ca* 1–2 mm long; sepals 3.5–4.5 mm long, sparsely to moderately hairy; corolla yellow, campanulate, *ca* 5 mm long; stamens and style included; ovary glabrous. Capsules ± globular, 6–8 mm diameter.

Known from the Burnett district. Flowers probably summer.

**9. *Ipomoea polymorpha* Roemer & Schultes***Ipomoea heterophylla* R. Br.

Annual, ± prostrate; stems up to 60 cm long; young parts densely softly hairy. Leaves with petioles up to *ca* 3 cm long; blades narrowly elliptic, elliptic-oblong or obovate, mostly narrowed at both ends, margin entire to coarsely dentate or blades lyrate with large ovate or elliptic terminal segment and small triangular-hastate ones at base,

1.5–7.5 cm × 0.5–3 cm, glabrous or sparsely hairy. Flowers axillary, solitary, peduncles up to 4 mm long or absent, bracts *ca* 8–10 mm long; sepals 8–10 mm long, long hairy; corolla pink-purple, funnellform, *ca* 1.3 cm long; stamens and style included; ovary glabrous. Capsules globular, *ca* 4–6 mm diameter.

Known from the Burnett district. Flowers summer–autumn.

**10. *Ipomoea plebeia* R. Br.**

BELLVINE

Annual, twining or prostrate, with appressed or spreading hairs. Leaves with petioles 1–6 cm long; blades ovate, apex attenuate to short acuminate with acute or obtusish mucronate point, base cordate, margin entire, 2.5–8 cm × 1.2–6 cm, sparsely pilose on both surfaces. Inflorescences axillary, 1–3-flowered, peduncles 0–7 mm long, pedicels 0.5–1.5 cm long, bracts *ca* 2.5 mm long; sepals 6–8 mm long; corolla white, tubular to funnellform, *ca* 0.9–1.3 cm long; stamens and style included; ovary glabrous. Capsules broadly ovoid to globular, *ca* 5–7 mm long.

Moderately common in the region, except in the Darling Downs district. Flowers mostly summer–autumn.

**11. *Ipomoea lonchophylla* J. M. Black**

Prostrate perennial; stems from central taproot, ± scabrous with short hairs or glabrous. Leaves with petioles 3–6 cm long; blades narrowly ovate to broadly ovate, apex obtuse to acute, base broadly cuneate to truncate or shallowly cordate, margin entire, 3.5–7 cm × 1–7 cm, glabrous or sparsely hairy. Inflorescences axillary, 1–several-flowered, peduncles 0.5–3 cm long, pedicels 4–8 mm long, bracts 2–3 mm long; sepals narrowly ovate to ovate, apex long acuminate, *ca* 8–10 mm long, corolla white, *ca* 1.2 cm long; stamens and style included; ovary glabrous. Capsules depressed globular, *ca* 8 mm diameter; seeds glabrous (in south-eastern Queensland) or hairy.

Known from the Darling Downs district on heavy soils. Flowers summer–autumn.

**12. \**Ipomoea purpurea* (L.) Roth**

COMMON MORNING GLORY

*Convolvulus purpureus* L.

Annual; stems twining, with short hairs intermixed with long retrorse ones. Leaves with petioles 2–15 cm long; blades broadly ovate or orbicular in outline, apex shortly acuminate, base cordate, margin entire or 3-lobed, 3–15 cm × 2.5–12 cm, both surfaces with short appressed bristly hairs. Inflorescences axillary, 1–few-flowered, peduncles 3–18 cm long, pedicels 0.8–2 cm long in flower, up to *ca* 3 cm long in fruit, bracts up to *ca* 7 mm long; sepals *ca* 1–1.5 cm long in flower, lengthening up to *ca* 2 cm long in fruit; corolla purple or bluish purple to red to pink or white, funnellform, 3–6 cm long; stamens and style included; ovary glabrous. Capsules globular, *ca* 7–9 mm diameter.

Native of America; probably introduced as an ornamental, now naturalized, widespread except in the Wide Bay district, found mainly in disturbed and neglected areas. Flowers mainly summer–autumn.

**13. *Ipomoea indica* (Burm.) Merrill**

BLUE MORNING GLORY

*Convolvulus indicus* Burm.; *Ipomoea learii* Paxton; *I. congesta* R. Br.; *I. acuminata* (Vahl) Roemer & J. A. Schultes

Perennial; stems twining or occasionally prostrate, ± densely retrorsely pilose. Leaves with petioles 2–18 cm long; blades broadly ovate to orbicular in outline, apex short or long acuminate, base cordate, margin entire or shallowly or deeply 3-lobed, 5–17 cm × 3.5–16 cm, upper surface with dense soft short appressed hairs, lower surface often silky tomentose. Inflorescences axillary, several-flowered, peduncles 4–20 cm long, pedicels 2–8 mm long, bracts linear, occasionally broader, 1–1.5 cm long; outer sepals narrowly ovate to ovate, inner ones narrower at base, all acuminate, 1.4–2.2 cm long, with soft appressed hairs or nearly glabrous; corolla funnellform, limb bright blue or bluish purple becoming reddish, tube pink to whitish, whole corolla 5–8 cm long; stamens and style included; ovary glabrous. Capsules globular, papery, *ca* 1 cm diameter. **Fig. 48A.**

Not common, known from eastern parts of the region, sometimes cultivated for ornamental purposes. Flowers spring to autumn.



Fig. 48 CONVULVULACEAE — A-D *Ipomoea* spp. — A<sub>1</sub>-A<sub>2</sub> *I. indica*, A<sub>1</sub> portion of flowering stem x1, A<sub>2</sub> pistil x1; B<sub>1</sub>-B<sub>2</sub> *I. quamoclit*, B<sub>1</sub> portion of flowering stem x1, B<sub>2</sub> fruit x1; C *I. obscura*, portion of flowering stem x1; D *I. cairica*, portion of flowering stem x1.

**14. \*Ipomoea hederacea** (L.) Jacq.*Convolvulus hederaceus* L.

Herbaceous annual twiner,  $\pm$  hirsute. Leaves with petioles 1–6 cm long; blades ovate in outline, apex acuminate, base cordate, margin entire or 3-lobed, lobes acuminate, 3–14 cm  $\times$  2–12 cm, sparsely to densely pilose. Inflorescences axillary, 1–few-flowered, peduncles 0.3–2 cm long on specimens seen, pedicels 0.2–0.7 cm long, bracts up to *ca* 1 cm long; sepals ovate, abruptly narrowed to long tips, strongly curved or spreading, whole calyx *ca* 2 cm long, with conspicuously long spreading hairs; corolla blue or mauve, 3–4 cm long; stamens and style included; ovary glabrous. Capsules globular, *ca* 1 cm diameter.

Native of North America; apparently introduced as an ornamental, naturalized in eastern parts of the region, occasional. Flowers summer–autumn.

**15. \*Ipomoea obscura** (L.) Ker-Gawl.*Convolvulus obscurus* L.

Perennial; stems twining, glabrous to densely hairy. Leaves with petioles 1.5–9 cm long; blades ovate to orbicular, apex attenuate or acuminate with tips acute to obtuse and mucronate, base cordate, margin entire, 2–10 cm  $\times$  2–9 cm, glabrous or sparsely hairy or fimbriate along margin. Inflorescences axillary, 1–few-flowered, peduncles 0.6–1.4 cm long, pedicels 0.5–2 cm long, bracts 1–2 mm long; sepals 3–4 mm long; corolla white or yellow with dark purple centre, 2–2.5 cm long; stamens and style included; ovary glabrous. Capsules broadly ovoid, 7–9 mm long. **Fig. 48C.**

Native of tropical Africa and tropical Asia; cultivated as an ornamental, apparently naturalized in the Moreton district. Flowers found most of the year.

**16. \*Ipomoea cairica** (L.) Sweet

COAST MORNING GLORY; MILE A MINUTE

*Convolvulus cairicus* L.; *Ipomoea palmata* Forssk.

Rampant perennial twiner, glabrous. Leaves with petioles 2–6 cm long; blades ovate to orbicular in outline, palmately cut almost to base into 5 narrowly ovate to ovate or elliptic basally and apically acuminate entire segments, basal pair of segments usually again lobed or parted, whole blade 3–10 cm  $\times$  3–10 cm. Inflorescences axillary, 1–few-flowered, peduncles 0.5–7 cm long, pedicels 1.2–2 cm long, bracts minute; sepals subequal, 4–6.5 mm long, mucronulate; corolla funnellform, purple, pinkish purple or occasionally white, 4–6 cm long; stamens and style included; ovary glabrous. Capsules subglobose, 1–1.2 cm diameter. **Fig. 48D.**

Probably native of tropical Africa and Asia but now cosmopolitan; probably introduced into Australia, widespread and common in south-eastern Queensland where it is often considered a weed. Cultivated in western areas as an ornamental creeper. Flowers most of the year.

**17. Ipomoea littoralis** Blume

Glabrous perennial; stems twining or prostrate and rooting at nodes, herbaceous or becoming woody with age. Leaves with petioles 0.5–9 cm long; blades broadly ovate to oblong in outline, occasionally orbicular to reniform, apex acute to obtuse or retuse, base cordate, margin entire in Australian specimens seen but described as entire or slightly undulate to angular or  $\pm$  deeply 3-lobed, 1–10 cm  $\times$  1–7.5 cm, glabrous or nearly so. Inflorescences axillary, 1–few-flowered, peduncles 0.5–1 cm long, larger in descriptions of overseas specimens, pedicels 1–3 cm long, bracts minute, caducous; outer sepals 0.6–1 cm long, inner ones 0.8–1.2 cm long, all mucronate; corolla funnellform, pink or mauve or purplish, 3–4.5 cm long; stamens and style included; ovary glabrous. Capsules depressed globose, *ca* 9 mm diameter.

Littoral species known from northern parts of the region. Flowers spring to autumn.

**18. Ipomoea pes-caprae** (L.) Sweet subsp. **brasiliensis** (L.) van Ooststr.*Convolvulus pes-caprae* L.; *Convolvulus brasiliensis* L.

Perennial, glabrous; stems long trailing, rooting at nodes, containing milky juice. Leaves with petioles up to *ca* 17 cm long; blades ovate, obovate, elliptic, orbicular, transverse-elliptic to reniform or quadrangular to oblong, apex emarginate or

sometimes truncate, mucronate, base truncate, rounded, shortly attenuate to subcuneate or slightly cordate at base, 3–10 cm × 3–10.5 cm, glabrous, 2 halves of blades often folded upwards along midrib. Inflorescences axillary, 1–several-flowered, peduncles 1–16 cm long, pedicels 1–4 cm long in flower, 2–5 cm long in fruit, bracts *ca* 3 mm long, caducous; outer sepals 5–8 mm long, inner ones 0.7–1.1 cm long; corolla pink to purple, funnellform, 3–5.5 cm long; stamens and style included; ovary glabrous. Capsules globular to depressed globular, 1.2–1.7 cm diameter.

On and immediately behind sandy sea shores, common. Flowers found most of the year.

***Stictocardia tiliifolia*** (Desr.) H. Hallier, a species with purplish blue flowers 6.5 cm or more across and fruits enclosed in enlarged sepals 4–5 cm long is sometimes cultivated as *Ipomoea* “Proserpine Blue”. It is native of northern Queensland and has been reported from Burleigh Heads in the Moreton district but is not naturalized in the region.

#### 4. CALYSTEGIA R. Br.

Prostrate or twining perennial herbs. Leaves petiolate. Flowers axillary, pedunculate, solitary or rarely in few-flowered cymes, bracts 2, conspicuous, embracing calyx, persistent; sepals 5, ± equal; corolla actinomorphic, shallowly lobed or ± entire; stamens 5, included; ovary 1-locular or imperfectly 2-locular, 4-ovuled; style 1, included, stigmas 2. Capsules 4-valved; seeds 4.

About 25 species warm regions of the world; 4 species Australia; 2 species south-eastern Queensland.

- |   |       |                         |
|---|-------|-------------------------|
| 1. Leaves ovate to triangular, base hastate, apex acuminate | . . . | 1. <i>C. marginata</i>  |
| Leaves reniform or rounded, base cordate, apex obtuse       | . . . | 2. <i>C. soldanella</i> |

##### 1. *Calystegia marginata* R. Br.

Glabrous twiner. Leaves with petioles 1.5–3 cm long; blades narrowly ovate to triangular, apex acuminate, base hastate, margin entire or occasionally with few teeth on basal lobes, 3–7 cm × 1.5–4.5 cm. Peduncles mostly shorter than petioles, bracts broadly ovate, 0.6–1.2 cm long, ± equal to or longer than calyx; sepals *ca* 6 mm long; corolla white, *ca* 2 cm long.

Not common in south-eastern Queensland, known from the south-eastern part of the region and from the northern Burnett district. Flowers mostly spring–summer.

##### 2. *Calystegia soldanella* (L.) R. Br.

*Convolvulus soldanella* L.

Prostrate trailing or shortly twining from creeping rootstock, glabrous. Leaves with petioles 1–4 cm long; blades reniform or rounded, apex obtuse, base cordate, margin entire or shortly angular lobed, 1.5–5 cm broad. Peduncles *ca* 1.5–7 cm long, mostly as long as or longer than petioles of subtending leaf, bracts broadly ovate, up to 1.2 cm long, shorter than calyx; sepals 0.8–1.6 cm long; corolla *ca* 3–5 cm long. **Fig. 49D.**

Not common, known from near the sea. Flowers about spring–summer.

F. M. Bailey in “Qd. Fl.” 4:1069 (1901) records *C. sepium* (L.) R. Br. from the “Southern coast”; however as the Queensland Herbarium has no specimens of it from Queensland the species is not included in this treatment.

#### 5. JACQUEMONTIA Choisy

Herbaceous or woody twiners, usually stellate hairy. Leaves mostly petiolate. Flowers usually in axillary umbelliform or capitate cymes, bracts small or foliaceous but not enclosing calyx; sepals 5, often with outer ones larger; corolla actinomorphic, shallowly lobed or toothed; stamens 5, included; ovary 2-locular, 2 ovules per loculus, style 1, stigmas 2, included. Capsules 2-locular, 4- or 8-valved; seeds 4 or fewer.

About 120 species tropical and subtropical parts of the world; 2 species Australia; 1 species south-eastern Queensland.

**1. *Jacquemontia paniculata* (N. L. Burm.) H. Hallier**

*Ipomoea paniculata* N. L. Burm.; *Convolvulus parviflorus* auct. non Desr., Vahl  
Herbaceous twiner, young parts mostly hairy, at length  $\pm$  glabrous. Leaves with petioles 0.5–4.5 cm long; blades narrowly ovate to ovate, or ovate-oblong, apex mostly acuminate, occasionally acute, mucronulate, base cordate, rounded or truncate, margin entire, 2–9 cm  $\times$  0.8–4.5 cm, sparsely to densely hairy when young, at length  $\pm$  glabrous. Flowers few–many in umbelliform cymes, peduncles up to *ca* 8 cm long, pedicels 3–6 mm long in flower, longer in fruit, bracts 1–2 mm long; sepals unequal, 3 outer ones 5–7 mm long, 2 inner ones 3–4.5 mm long; corolla pink or blue, funnellform. Capsules globose, 3–4 mm diameter.

Known from the north-eastern Burnett district, rare. Flowers spring to autumn.

**6. CONVULVULUS L.**

Annual or perennial, prostrate, erect or twining herbs or erect shrubs. Flowers axillary, solitary or in pedunculate corymbose or umbel-like cymes; sepals 5,  $\pm$  equal; corolla actinomorphic, shallowly lobed or entire; stamens 5, included; ovary 2-locular, 2 ovules per loculus, style 1, stigmas 2, included. Capsules 2-locular, usually 4-valved; seeds 4 or fewer.

About 250 species temperate and subtropical regions of the world; 3 species Australia; 2 species south-eastern Queensland.

- |   |                         |
|---|-------------------------|
| 1. Sepals acute, mostly pubescent; corollas 1–2 cm diameter when expanded | 1. <i>C. erubescens</i> |
| Sepals obtuse, glabrous; corollas 1.5–2.5 cm diameter when expanded       | 2. <i>C. arvensis</i>   |

**1. *Convolvulus erubescens* Sims****AUSTRALIAN BINDWEED**

Perennial, prostrate, trailing or rarely climbing, with thick rootstock. Leaves with petioles 0.5–3 cm long; blades very variable, from narrowly ovate to linear, apex obtuse to acute, base sagittate-cordate, lobes entire or lobed, margin from slightly crenate to deeply incised, sometimes blades ovate with obtuse apex, cordate base and  $\pm$  entire margin, or sometimes blades  $\pm$  linear with minute or long basal lobes, mostly 1–6 cm long, glabrous or pubescent. Peduncles 1-flowered, occasionally 2-flowered, up to *ca* 3.5 cm long, bracts 1–1.5 mm long; sepals acute, 4–6 mm long, mostly pubescent; corolla pink or white, 1–2 cm diameter when expanded. **Fig. 49E.**

Widespread in the region; an occasional pest in cultivation. Flowers found most of the year.

**2. \**Convolvulus arvensis* L.****EUROPEAN BINDWEED**

Perennial twiner with creeping rootstock. Leaves with petioles 0.5–2.5 cm long; blades ovate-oblong or ovate, apex obtuse and mucronate, base hastate or sagittate, margin entire, 1.5–6 cm  $\times$  1–3 cm. Peduncles 1–many-flowered, 1–5 cm long, pedicels 4–10 mm long, bracts *ca* 3 mm long; sepals obtuse, 3–5 mm long, glabrous; corolla pink or white, 1.5–2.5 cm diameter when expanded.

Native of Europe; naturalized and widespread in the region, and is a serious weed of cultivation, particularly in the Darling Downs district. Flowers found most of the year.

**7. EVOLVULUS L.**

Annual or perennial herbs, undershrubs or shrubs. Leaves entire. Flowers axillary, solitary or in cymes, cymes pedunculate, flowers sessile or pedicellate, sometimes aggregated in terminal spikes or heads; sepals 5; corolla actinomorphic, limb subentire to distinctly 5-lobed; stamens 5, included or exerted; ovary 2-locular, rarely 1-locular, styles 2, united at base or free, each style deeply bifid. Capsules 1–2-locular, mostly 4-valved.

About 98 species all in the Americas, 2 species also widespread in tropical and subtropical parts of the world; 1 species Australia, occurring in south-eastern Queensland.

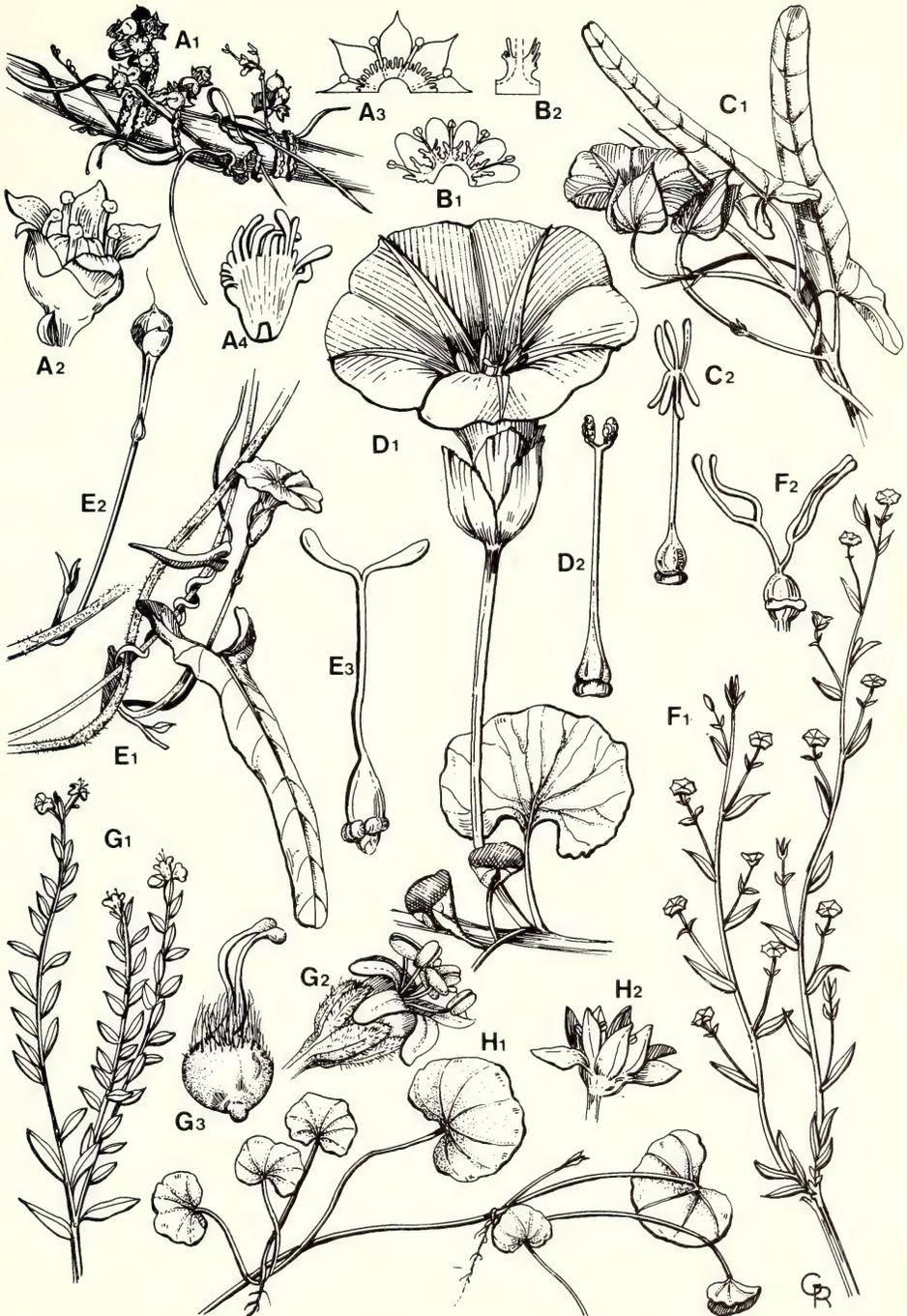


Fig. 49 CONVULVULACEAE — A-B *Cuscuta* spp. — A<sub>1</sub>-A<sub>4</sub> *C. campestris*, A<sub>1</sub> habit x1, A<sub>2</sub> flower x6, A<sub>3</sub> corolla opened out x2, A<sub>4</sub> scale x12; B<sub>1</sub>-B<sub>2</sub> *C. australis*, B<sub>1</sub> corolla opened out x3, B<sub>2</sub> scales x6; C<sub>1</sub>-C<sub>2</sub> *Polymeria calycina*, C<sub>1</sub> portion of flowering stem x1/2, C<sub>2</sub> pistil showing style with linear stigmatic lobes x6; D<sub>1</sub>-D<sub>2</sub> *Calystegia soldanella*, D<sub>1</sub> portion of flowering stem x1, D<sub>2</sub> pistil x2; E<sub>1</sub>-E<sub>3</sub> *Convolvulus erubescens*, E<sub>1</sub> portion of flowering stem x1, E<sub>2</sub> fruit x1, E<sub>3</sub> pistil x6; F<sub>1</sub>-F<sub>2</sub> *Evolvulus alsinoides* var. *decumbens*, F<sub>1</sub> portion of flowering plant x1/2, F<sub>2</sub> pistil x6; G<sub>1</sub>-G<sub>3</sub> *Cressa cretica*, G<sub>1</sub> portion of flowering plant x2/3, G<sub>2</sub> flower x3, G<sub>3</sub> pistil x6; H<sub>1</sub>-H<sub>2</sub> *Dichondra repens*, H<sub>1</sub> habit x2/3, H<sub>2</sub> flower x3.

**1. *Evolvulus alsinoides* (L.) L. var. *decumbens* (R. Br.) van Ooststr. TROPICAL SPEEDWELL**

*Evolvulus decumbens* R. Br.

Stems at first erect, afterwards with ascending branches, up to 45 cm tall, appressed and patently pilose. Leaves with petioles up to *ca* 1.5 mm long; blades narrowly ovate to linear, apex acute or acuminate, base rounded to acute, 0.5–2.5 cm × 0.15–0.5 cm, basal leaves sometimes broader and more obtuse. Peduncles filiform, longer than leaves, mostly 1–2-flowered, pedicels mostly longer than calyx, bracts linear-subulate, 1.5–2 mm long; sepals 2.5–3 mm long; corolla white or pale blue, rotate, 7–8 mm diameter when expanded. **Fig. 49F.**

Widespread and common in the region. Flowers spring to autumn.

**8. DICHONDRA J. R. & G. Forster**

Small creeping perennial herbs. Leaves entire. Flowers small, solitary, axillary, bracts minute; sepals 5; corolla actinomorphic, campanulate, deeply 5-lobed; stamens shorter than corolla; ovary deeply 2-lobed, each lobe with 2 ovules, styles 2, inserted between ovary lobes. Capsules 2-lobed, lobes erect, 1-, rarely 2-seeded.

About 5 species mainly Americas, 1 species widespread in tropical and subtropical regions of the world; 2 species Australia; 1 species south-eastern Queensland.

**1. *Dichondra repens* J. R. & G. Forster KIDNEY WEED**

Slender, creeping, rooting at nodes, usually shortly softly hairy. Leaves with petioles 0.8–5 cm long; blades reniform to orbicular, apex rounded or emarginate, base broadly cordate, margin entire, 0.4–2.5 cm diameter, appressed hairy especially below. Peduncles shorter than petioles; sepals *ca* 2 mm long; corolla yellow or white, slightly shorter than calyx. **Fig. 49H.**

Widespread in the region, capable of forming a complete ground cover and sometimes considered a weed. Flowers spring–summer.

**9. CRESSA L.**

Perennials. Leaves entire. Flowers small in terminal leafy spikes or heads; sepals 5; corolla tubular-campanulate, lobes 5; ovary 2-locular with 2 ovules per loculus, styles 2, each with capitate stigma. Capsules 2–4-valved, 1-seeded by abortion.

5 species warm tropical and subtropical parts of the world; 1 species Australia, occurring in south-eastern Queensland.

**1. *Cressa cretica* L.**

*Cressa australis* R. Br.

Erect or diffuse, much-branched, rarely exceeding 15 cm tall, hoary silky pubescent or villous all over. Leaves sessile or lower ones shortly petiolate; blades narrowly ovate, apex acute, base cuneate, margin entire, 0.2–1.4 cm × 0.1–0.4 cm. Flowers sessile in terminal leafy spikes or heads or reduced to single flower; sepals *ca* 4 mm long; corolla white, *ca* 6 mm long, lobes 5, spreading, about as long as tube. **Fig. 49G.**

Rare in the region, recorded only from the northern Wide Bay district but possibly found elsewhere in the region.

**129. BORAGINACEAE**

Herbs, rarely shrubs or trees. Leaves alternate or rarely opposite, often also with radical leaves, exstipulate, simple. Inflorescences boragoid, mostly ultimately forming spikes or racemes, these often collected into cymes; flowers actinomorphic, rarely zygomorphic; calyx lobes imbricate, rarely valvate, usually 5; corolla tubular, usually 5-lobed; stamens same number as corolla lobes and alternate with them, inserted in

tube; ovary superior, 2- or 4-locular, 4- or 2-lobed, style usually  $\pm$  gynobasic. Fruits usually of 4 nutlets, rarely succulent.

100 genera with 2000 species, tropical and temperate parts of the world; *ca* 12 genera with 53 species Australia; 8 genera with 15 species south-eastern Queensland.

1. Trees or woody shrubs . . . . .	1. <i>Argusia</i>	2
Herbs or undershrubs . . . . .		
2. Flowers zygomorphic . . . . .	2. <i>Echium</i>	3
Flowers actinomorphic . . . . .		
3. Anther appendages forming long spirally twisted conspicuous beak, exerted from corolla tube . . . . .	3. <i>Trichodesma</i>	4
Anthers without spirally twisted appendages, not exerted from corolla tube . . . . .		
4. Nutlets armed with barbed prickles . . . . .	4. <i>Cynoglossum</i>	5
Nutlets not so armed . . . . .		
5. Ovaries slightly 2-4-lobed, styles short, subterminal . . . . .	5. <i>Heliotropium</i>	6
Ovaries deeply 4-lobed, styles inserted between lobes . . . . .		
6. Flowers yellow or orange . . . . .	6. <i>Amsinkia</i>	7
Flowers white or blue . . . . .		
7. Nutlets attached by broad basal areole to almost flat receptacle; corolla with 5 longitudinal lines of hairs inside, running from base of lobes to stamens . . . . .	7. <i>Buglossoides</i>	
Nutlets attached by oblique areole to conical receptacle; corolla without line of hairs inside . . . . .	8. <i>Plagiobotrys</i>	

## 1. ARGUSIA Boehmer

Trees, shrubs or herbs. Inflorescences ebracteate, dichotomously branched, bearing flowers in unilateral cymes; calyx deeply divided into 5 lobes; corolla tube cylindrical or campanulate, 5-lobed, lobes spreading. Fruits dry when mature, dividing into 2, 2-seeded fruitlets, 2 fertile cavities of each fruitlet separated by deep groove or sterile cavity.

3 species Europe, Asia, West Indies, Pacific Is. and Australia; 1 species Australia, occurring in south-eastern Queensland.

### 1. *Argusia argentea* (L.f.) Heine

*Tournefortia argentea* L.; *Messerschmidia argentea* (L.) I. M. Johnston

Shrub or tree up to *ca* 10 m tall. Leaves with petioles up to *ca* 5 cm long; blades obovate to oblong to ovate, apex obtuse, base attenuate, margin entire, 4-20 cm  $\times$  2-8 cm, both surfaces with dense appressed silky hairs. Inflorescences terminal, up to 18 cm across, peduncles 3-15 cm long; calyx 1.5-2 mm long; corolla white, tube usually 1.5-2 mm long, lobes 1.5-2 mm long. Fruits globose, 5-8 mm diameter, eventually dividing into 2 halves.

Usually confined to vicinity of beaches, known from the Wide Bay district. Flowers found most of the year.

## 2. ECHIUM L.

Erect annual, biennial or perennial herbs. Radical and lower stem leaves petiolate, cauline leaves sessile. Flowers in cymes arranged in panicles; calyx deeply 5-lobed; corolla funnelliform with 5 unequal lobes, limb oblique; stamens 5, unequal, 2 or more exerted from corolla tube; style exerted. Nutlets ovoid-triangular, erect, rugose, with flat base.

About 40 species from Africa, Europe and western Asia; 3 species naturalized Australia; 1 species south-eastern Queensland.

1. \**Echium plantagineum* L.

PATERSON'S CURSE; SALVATION JANE

*Echium lycopsis* L.

Erect annual or biennial, mostly 20–60 cm tall, but up to *ca* 2 m tall, with soft white hairs. Basal leaves with petioles up to *ca* 6 cm long, blades broadly ovate, apex acute, base narrowed, margin entire, 5–20 cm × 1.5–10 cm; cauline leaves oblong to narrowly ovate, apex acute, base narrowed or cordate in upper parts, margin entire, smaller than basal leaves. Calyx 0.7–1 cm long in flower, up to 1.5 cm long in fruit; corolla blue becoming pink to purple, occasionally white; 2 stamens long exserted, 2 intermediate enclosed, 1 short enclosed; style hairy. Nutlets *ca* 2 mm long. **Fig. 50A.**

Native of the Mediterranean region; probably introduced as a garden plant, widespread and moderately common in the region, often in pastures and wheatfields. Flowers spring–early summer. Reported poisonous to sheep when eaten over a long period. It is a declared noxious weed under the Stock Routes and Rural Lands Protection Acts 1944–1967.

## 3. TRICHODESMA R. Br.

Coarse herbs or small shrubs. Flowers in terminal 1-sided simple or rarely forked racemes, usually bracteate, occasionally flowers solitary; calyx deeply divided into 5 lobes; corolla almost rotate, tube short, lobes 5; stamens inserted in throat, filaments very short, anthers erect, linear, coherent into cone, connective much produced above anther locules, hairy, usually twisted; style filiform, stigma minute. Nutlets 4, attached by whole inner surface to thick persistent axis.

35 species from tropical and subtropical areas of Africa, Asia and Australia; 1 species Australia, occurring in south-eastern Queensland.

1. *Trichodesma zeylanica* (N. L. Burm.) R. Br.

CAMEL BUSH

*Borago zeylanica* N. L. Burm.

Coarse usually erect annual up to *ca* 1 m tall, with sparse to dense appressed hairs mixed with stiffer, ± spreading often tubercle-based hairs. Lower leaves opposite, upper ones alternate; blades linear-ovate to ovate, apex obtuse, base narrowed, margin entire, 3–11 cm × 0.2–3 cm, extreme upper ones smaller. Cymes bracteate, becoming loose by lengthening of pedicels after flowering; calyx segments *ca* 1.2 cm long in flower, *ca* 2 cm long in fruit; corolla pale blue, 1–2.5 cm across. Nutlets smooth, often mottled on outer face, tuberculate on inner face. **Fig. 50B.**

Widespread but not common in region. Flowers found most of year. The plant has been suspected of poisoning animals but there is no definite evidence.

## 4. CYNOGLOSSUM L.

Biennial perennial or rarely annual herbs. Inflorescences with or without bracts; calyx deeply divided into 5 segments; corolla with short broad tube, throat closed with scales opposite lobes, limb spreading, 5-lobed; anthers enclosed in tube; style with small capitate stigma. Nutlets 4.

50–60 species from temperate and subtropical regions of the world; 3 species, all endemic in Australia, all occurring in south-eastern Queensland.

- |  |                         |   |
|--|-------------------------|---|
| 1. Leaves ovate, upper side with short scabrous hairs with large tubercular bases, lower side glabrous except for midrib and occasionally margins and veins; weak straggling plant | 1. <i>C. latifolium</i> |   |
| Leaves narrowly ovate to elliptic, hispid above and below; erect plants  |                         | 2 |
| 2. Nutlets ovoid, densely and equally prickly over outer convex face, quite wingless   | 2. <i>C. suaveolens</i> |   |
| Nutlets much flattened, prickly in centre of outer face which has an upcurved prickly wing   | 3. <i>C. australe</i>   |   |

**1. *Cynoglossum latifolium* R. Br.**

Weak straggling perennial, sometimes reaching *ca* 1 m tall; stems scabrous with scattered tubercles, sometimes lengthening into short hairs or prickles. Leaves with petioles up to *ca* 3.5 cm long in lower leaves,  $\pm$  absent in upper leaves; blades ovate, apex acute, base rounded to  $\pm$  cordate, margin  $\pm$  entire, lower leaves 5–8 cm  $\times$  3.5–4.5 cm, becoming smaller upwards, upper side with short scabrous hairs with large tubercular-based hairs, lower side glabrous except for midrib and occasionally margin and veins. Pedicels *ca* 0.8 cm long in flower, 1–2.5 cm long in fruit, not recurved in fruit; calyx segments *ca* 1–1.5 mm long in flower, 2 mm long in fruit; corolla white, *ca* 2–2.5 mm long. Nutlets obovate, glochidiate all over.

Moist situations, often near rainforest. Flowers mostly autumn.

**2. *Cynoglossum suaveolens* R. Br.****SWEET HOUND'S TOOTH**

Erect perennial, mostly less than 45 cm tall, but up to 90 cm tall, whole plant coarsely hirsute. Radical and lower cauline leaves with petioles up to 8 cm long, reducing upwards, upper leaves  $\pm$  sessile; blades narrowly ovate or elliptic, apex acute, base attenuate, margin entire, lower blades 5–14 cm  $\times$  1–3 cm, reducing upwards. Inflorescences  $\pm$  branched, flowers scented, pedicels up to *ca* 2 cm long in fruit, recurved in fruit; calyx *ca* 1.5 mm long in flower, *ca* 3 mm long in fruit; corolla white or cream, rarely with bluish tinge, 2.5–3 mm long. Nutlets ovoid, densely and equally prickly over outer convex face, not winged. **Fig. 50D.**

Widespread in the region in a variety of habitats. Flowers found most of the year but mostly autumn and spring.

**3. *Cynoglossum australe* R. Br.****AUSTRALIAN FORGET ME NOT**

Erect stout perennial up to *ca* 1 m tall, hispid or coarsely hirsute. Radical and lower cauline leaves with petioles up to *ca* 8 cm long, reducing upwards, upper leaves  $\pm$  sessile; leaf blades narrowly ovate or rarely few oblong, apex acute, base narrowed, margin entire, lower blades 4–10 cm  $\times$  0.8–2 cm, reducing upwards. Inflorescences  $\pm$  forked, flowers only slightly scented, pedicels up to *ca* 7 mm long in fruit, recurved in fruit; calyx *ca* 1.5 mm long in flower, *ca* 2 mm long in fruit; corolla light blue, occasionally white or pinkish, *ca* 3 mm long. Nutlets quite flattened, prickly on centre of outer face which has an upcurved prickly wing. **Fig. 50C.**

Widespread, mainly in non-coastal areas. Flowers mostly spring–summer.

**5. HELIOTROPIUM L.**

Annual or perennial herbs, sometimes woody at base. Inflorescences with or without bracts; calyx deeply divided into 5 segments; corolla with cylindrical tube, lobes 5, spreading; stamens inserted in tube, anthers sometimes cohering by their tips, included or tips slightly protruding; style included. Nutlets 2 or 4.

About 250 species from tropical and subtropical regions of the world; *ca* 30 species, 25 endemic, Australia; 4 species south-eastern Queensland.

- |  |                           |
|--|---------------------------|
| 1. Petioles up to <i>ca</i> 4 mm long, sometimes $\pm$ absent . . . . .        | 2                         |
| Petioles longer than 5 mm . . . . .  | 3                         |
| 2. Leaf margins undulate; fruits of 2, 2-locular succulent fruitlets . . . . . | 1. <i>H. amplexicaule</i> |
| Leaf margins flat recurved or revolute; fruits of 4 nutlets . . . . .          | 2. <i>H. pauciflorum</i>  |
| 3. Leaf margins entire; fruits of 4 nutlets . . . . .                          | 3. <i>H. europaeum</i>    |
| Leaf margins $\pm$ serrate; fruits of 2, 2-seeded, 2-pointed pyrenes . . . . . | 4. <i>H. indicum</i>      |

**1. \**Heliotropium amplexicaule* Vahl****BLUE HELIOTROPE**

*Heliotropium anchusifolium* Poiret

Diffuse perennial up to *ca* 30 cm tall, arising from rhizome; stems with long spreading or recurved hairs and often shorter glandular ones. Leaves  $\pm$  sessile, narrowly oblong-ovate, apex acute, base narrowed, often somewhat stem clasping, margin undulate, 2–8 cm  $\times$  0.3–1.2 cm, both surfaces with long hairs and short tubercle-based

hairs. Inflorescences bracteate; calyx *ca* 3 mm long; corolla tube yellow, lobes blue, *ca* 6 mm long, hairy outside and in throat; stigma  $\pm$  sessile. Fruits subglobose, exocarp succulent, becoming rugulose, separating into 2, 2-locular fruitlets. **Fig. 50F.**

Native of South America; probably introduced as a garden plant, naturalized and moderately common in pasture, cultivation and road shoulders. It can be a serious pest, particularly on deep red loamy soils. Flowers found most of the year. Suspected of poisoning sheep.

## 2. *Heliotropium pauciflorum* R. Br.

Erect much-branched annual up to *ca* 25 cm tall, very hispid. Leaves with petioles 1–4 mm long; blades linear-ovate, apex acute, base narrowed, margin flat, recurved or revolute, 0.5–3.5 cm  $\times$  0.15–0.35 cm. Flowers forming terminal leafy spikes or racemes; calyx *ca* 3 mm long; corolla white, *ca* 4–5 mm long, tube bearded inside at throat, anthers cohering by their minutely hairy tips. Nutlets 4, scabrous with short hairs.

Rare in south-eastern Queensland, known from the Wide Bay district.

## 3. \**Heliotropium europaeum* L.

## A HELIOTROPE

Pubescent annual-stemmed herb up to *ca* 30 cm tall. Leaves with petioles up to *ca* 4 cm long; blades ovate or  $\pm$  oblong, apex obtuse-acute, base cuneate, margin entire, 1–5 cm  $\times$  0.6–2.5 cm, rough with short appressed tubercular-based hairs. Inflorescences without bracts; calyx 2–3 mm long; corolla white, tube as long as calyx, pubescent outside, glabrous within, stigmatic cone much longer than minute style. Nutlets 4, tuberculate-rugose, glabrous to pubescent on back.

Native of the Mediterranean region; rare in south-eastern Queensland and perhaps not truly naturalized. Poisonous to sheep if eaten over a long period.

## 4. \**Heliotropium indicum* L.

Annual up to *ca* 45 cm tall; stems hirsute. Leaves with petioles 1–11 cm long, sometimes  $\pm$  winged at apex; blades ovate, apex acute, base truncate or subcordate, margin  $\pm$  serrate, 2–15 cm  $\times$  1–9 cm, smooth or wrinkled, woolly hairy to almost glabrous. Calyx *ca* 2 mm long; corolla white to blue with yellow throat, *ca* 3–4 mm long; hairy outside, glabrous within. Fruits deeply bifid, margins of lobes meeting each other below middle of fruit, fruit halves 2-locular and with 2 points.

Native of South America; naturalized in south-eastern Queensland in the Wide Bay district.

## 6. AMSINKIA Lehm.

Annual bristly herbs, often with basal rosette of leaves. Inflorescences usually bractless; calyx 5-parted or with 1-several lobes  $\pm$  united; corolla tubular or salverform, tube cylindrical, glabrous, lobes spreading; stamens inserted in throat or tube, included, filaments short; ovary 4-lobed, style filiform, stigma capitate, 2-lobed. Nutlets 4, erect.

About 50 species western North and South America; 3 species naturalized Australia, all occurring in south-eastern Queensland.

- |  |                          |   |
|--|--------------------------|---|
| 1. Corolla throats constricted and closed by intruding hairy saccate processes; stamens inserted low in corolla tube | 1. <i>A. lycopsoides</i> | 2 |
| Corolla throats open or glabrous; stamens inserted in throat   |                          |   |
| 2. Corollas orange to orange-yellow, conspicuously exerted beyond calyx; stems strigose only, often almost glabrous  | 2. <i>A. intermedia</i>  |   |
| Corollas pale yellow, usually scarcely exerted from calyx; stems hispid as well as strigose                          | 3. <i>A. calycina</i>    |   |

## 1. \**Amsinkia lycopsoides* Lehm.

## YELLOW BURRWEED

Erect or ascending, up to *ca* 1 m tall; stems hispid with stiff hairs and with fine hairs. Leaves  $\pm$  sessile or shortly petiolate below; blades linear-ovate to narrowly ovate, apex acute to acuminate, base somewhat stem clasping, 6–15 cm  $\times$  0.4–2 cm, bristly-hirsute. Calyx 5–6 mm long in flower, up to *ca* 10 mm long in fruit; corolla

light yellow, 5–9 mm long, tube longer than calyx, throat constricted by saccate hairy outgrowths; stamens inserted in tube well below throat. Nutlets 2.4–3 mm long.

Native of western North America; reported naturalized in the Darling Downs district. Flowers late winter–spring. Reported to be poisonous to horses, pigs and cattle.

**2. \**Amsinkia intermedia* Fischer & C. A. Meyer**

**YELLOW BURRWEED;  
IRONWEED**

Erect or ascending, up to *ca* 1 m tall; stems strigose, often almost glabrous. Leaves sessile or shortly petiolate below; blades linear to linear-ovate, apex acute, base often somewhat stem clasping, 5–15 cm × 0.4–2 cm, bristly-hirsute. Calyx *ca* 5 mm long; corolla orange to orange-yellow, 0.7–1.5 cm long, conspicuously exerted from calyx, throat open and glabrous. Nutlets 3–3.5 mm long.

Native of western North America; reported naturalized in the Moreton district and possibly to be found elsewhere in the region. Flowers late winter–spring. Reported to be poisonous to horses, pigs and cattle.

**3. \**Amsinkia calycina* (Moris) Chater**

**YELLOW BURRWEED**

*Lithospermum calycinum* Moris; *Amsinkia hispida* (Riuz & Pavon) I. M. Johnston nom. illeg.; *A. angustifolia* Lehm.

Erect or ascending up to *ca* 1 m tall; stems hispid with stiff hairs and strigose. Leaves ± sessile, occasionally shortly petiolate, linear to narrowly ovate, apex acute, base somewhat stem clasping, 5–15 cm × 0.4–2 cm, bristly hirsute. Calyx 3–4 mm long; corolla pale yellow, 4–4.5 mm long, scarcely exerted from calyx, throat open and glabrous. Nuts 2–2.5 mm long.

Native of Chile; reported naturalized in the Darling Downs district. Flowers late winter–spring. Reported to be poisonous to horses, pigs and cattle.

**7. BUGLOSSOIDES Moench**

Annual or perennial herbs or dwarf shrubs. Inflorescences at length appearing spicate; calyx 5-partite or 5-lobed; corolla funnellform or salverform with 5 longitudinal bands of hairs and glands inside; stamens inserted at or below middle of corolla tube, filaments shorter than anthers, anthers apiculate; style simple, usually much shorter than calyx, stigmas 2, rounded. Nutlets 1–4, erect to divergent.

About 15 species from temperate Eurasia; 1 species naturalized Australia, occurring in south-eastern Queensland.

**1. \**Buglossoides arvensis* (L.) I. M. Johnston**

**CORN GROMWELL; WHITE  
IRONWEED; SHEEPWEED**

*Lithospermum arvense* L.

Annual up to *ca* 90 cm tall; stems few to many, appressed bristly-hairy. Petioles of lower leaves up to *ca* 3 cm long, upper leaves ± sessile; blades of lower leaves oblong-spathulate or obovate, apex obtuse, base attenuate, margin entire, 3–6 cm × 0.8–1.5 cm; upper leaves oblong to linear, apex obtuse to acute, base narrowed, margin entire, up to 4 cm × 0.5 cm, all leaves bristly hairy. Calyx *ca* 4–5 mm long in flower, *ca* 8–9 mm long in fruit, deeply lobed, lobes narrow; corolla white, purplish or blue, 5–9 mm long; stamens inserted below middle of corolla tube. Nutlets *ca* 3–3.5 mm long. **Fig. 50E.**

Native of Europe; occasional weed of the region, mainly in the Darling Downs district, often as a weed of cereal crops. Flowers late winter to early summer. It can be poisonous to pigs, cattle and horses if eaten over a long period.

8. **PLAGIOBOTHRYIS** Fischer & C.A. Meyer

Annual or perennial herbs. Lower stem leaves often opposite but often obscured by rosulate basal arrangement. Flowers with or without bracts; calyx segments 5–8, cut almost to base; corolla scarcely exceeding calyx, tube cylindrical, lobes 5, short; stamens inserted in tube; ovary deeply 4-lobed, style inserted between lobes. Nutlets 4.

About 60 species mainly Americas; 4 species, 3 endemic, Australia; 1 species south-eastern Queensland.



Fig. 50 A–F BORAGINACEAE — A *Echium plantagineum*, portion of inflorescence x1; B *Trichodesma zeylanica*, flowering stem x1; C–D *Cynoglossum* spp., fruits x6 — C *C. australe*; D *C. suaveolens*; E *Buglossoides arvensis*, portion of fertile stem x1; F *Heliotropium amplexicaule*, portion of fertile stem x1; G EHRETIACEAE — G *Cordia dichotoma*, fruiting stem x1.

1. *Plagiobothrys elacanthus* (F. Muell.) I. M. JohnstonHAIRY FORGET ME  
NOT*Heliotropium elacanthum* F. Muell.; *Eritrichum australasicum* auct. non A. DC., Benth.

Tufted diffuse or ascending annual up to *ca* 15 cm tall, usually appressed villous or hispid-villous. Leaves sessile; blades linear or linear-ovate, apex obtuse, base somewhat narrowed, margin entire, 1–2.5 cm × 0.1–0.2 cm. Calyx segments 5, *ca* 2 mm long in flower, up to *ca* 3 mm long in fruit; corolla white, *ca* 2 mm long. Nutlets pearl-grey, erect, ovoid-trigonous, apex acute, rugose-reticulate.

An endemic species, rare in the region, known from the Darling Downs district.

## 130. EHRETIACEAE

Trees shrubs or climbers. Leaves alternate, rarely subopposite, exstipulate. Flowers in cymes, cylindrical spikes or heads or rarely axillary or leaf-opposed, mostly bisexual; calyx tubular or campanulate, dentate or variously divided, mostly enlarged in fruit and enclosing it; corolla tubular, lobes 5, rarely 4 or 6; stamens as many as and alternate with corolla lobes, anthers 2-locular; ovary superior, style terminal on ovary. Fruits drupes hard and dry, or berries.

13 genera with *ca* 400 species, tropics and subtropics worldwide; 4 genera and *ca* 15 species Australia; 2 genera with 3 species south-eastern Queensland.

- |   |                   |
|---|-------------------|
| 1. Styles 4-branched; calyces shallowly lobed . . . . . | 1. <i>Cordia</i>  |
| Styles 2-branched; calyces deeply lobed . . . . .       | 2. <i>Ehretia</i> |

1. *CORDIA* L.

Trees shrubs or climbers. Leaves entire or repand-serrate. Flowers in axillary cymes, sometimes contracted into heads, bracts small or none; calyx 5-toothed or irregularly toothed or lobed, enlarged under fruit; corolla tube cylindrical or funnelform, lobes 4–7; stamens inserted on tube, anthers included or exserted; style 4-branched. Fruits drupes, 4-seeded or few by abortion.

250 species warm regions of the world; *ca* 4 species Australia; 1 species south-eastern Queensland.

1. *Cordia dichotoma* G. Forster sens. lat.

Tree up to *ca* 20 m tall. Leaves with petioles 1–5 cm long; blades broadly ovate to oblong, apex acute, obtusely-acuminate or rounded, base rounded or subcordate, margin mostly entire, sometimes coarsely repand-serrate, 3.5–21 cm × 2.5–10.5 cm, glabrous or sparsely hairy, often with tufts of hairs in vein axils below. Calyx 5–7 mm long in flower, appressed hairy inside in upper half; corolla white or yellowish, tube 3.5–6 mm long, lobes 4–6 mm long; stamens inserted near throat, exserted. Fruits pink, ellipsoid, 1.5–2 cm long. **Fig. 50G.**

Eastern parts of the region, often in or near rainforest or along creek banks. Flowers late winter–spring. Sometimes cultivated as a street tree.

2. *EHRETIA* P. Browne

Trees or shrubs. Leaves entire or toothed. Flowers in panicles or cymes, either terminal or in upper axils, rarely all axillary, bracts small; calyx deeply 5-lobed; corolla tube campanulate or elongate, lobes 5, spreading or recurved; stamens inserted in corolla tube, exserted; style 2-branched. Fruits drupes, endocarp forming 2, 2-seeded or 4, 1-seeded pyrenes.

About 50 species from Africa, southern Asia to Australia with a few species America; 4 species Australia; 2 species south-eastern Queensland.

- |                                   |                            |
|-----------------------------------|----------------------------|
| 1. Leaf margins serrate . . . . . | 1. <i>E. acuminata</i>     |
| Leaf margins entire . . . . .     | 2. <i>E. membranifolia</i> |

**1. *Ehretia acuminata* R. Br.**

KODA

Tree up to *ca* 30 cm tall, stem diameter up to *ca* 80 cm. Leaves with petioles 1–3 cm long; blades ovate to elliptic to obovate, apex acuminate, sometimes obtusely so, base rounded to crenate, margin serrate, 6–15 cm × 2–6 cm, discolourous, glabrous. Flowers scented, sessile in terminal and upper axillary panicles; calyx cup shaped, *ca* 1–1.5 mm long, ciliate; corolla white, tube exceedingly short, lobes *ca* 2–3 mm long; anthers exserted; ovary 4-locular. Fruits yellow, globular, 4–6 mm diameter, endocarp splitting vertically into 2 parts, each part containing 2 locules, each loculus 1-seeded.

Rainforest of eastern parts of the region, moderately common. Flowers spring. The timber is suitable for furniture, joinery and flooring.

**2. *Ehretia membranifolia* R. Br.**

Shrub or small tree up to *ca* 5 m tall. Leaves with petioles 0.8–1.8 cm long; blades oblong or oblong-ovate, apex obtuse to acute, base cuneate, margin entire, 3–9 cm × 0.6–2.6(–3) cm, glabrous. Flowers in shortly pedunculate dichotomous cymes, pedicels 1.5–2 mm long; calyx *ca* 1 mm long, deeply lobed, lobes ciliate; corolla yellow-green, tube *ca* 2 mm long, lobes *ca* 1.5 mm long; anthers exserted; ovary 2-locular with 2 ovules per loculus. Fruits red turning black, *ca* 3–4 mm diameter.

Widespread in drier parts of the region, often in depauperate rainforest. Flowers spring–early summer.

**131. VERBENACEAE**

Trees shrubs or herbs, often with quadrangular stems. Leaves opposite or verticillate or rarely alternate, exstipulate, simple or compound. Flowers bisexual, usually ± zygomorphic; calyx 4–5-lobed or -toothed; corolla 4–5-lobed; stamens 4, rarely 2 or 5, inserted on corolla tube; ovary superior, style terminal. Fruits drupes or berries.

About 75 genera with *ca* 3000 species, almost all tropical or subtropical; *ca* 14 genera with *ca* 50 species Australia; 12 genera with 23 species south-eastern Queensland.

1. Flowers solitary or in groups of 2 or 3 in axils, herbs Flowers in heads racemes spikes or cymes, sometimes collected into terminal panicles, or if flowers few, on axillary peduncles	1. <i>Oncinocalyx</i>	2
2. Flowers in heads of many flowers Flowers not in heads or flowers few on axillary peduncles	2. <i>Lantana</i>	3
3. Flowers in spikes, spikes sometimes several together; fruits dry at maturity Flowers in cymes or racemes, often arranged in panicles, or 2–3 flowers on axillary peduncles; fruits fleshy at maturity		4 6
4. Perfect stamens 2; flowers in furrows in rachis of spike Perfect stamens 4; flowers not in furrows in rachis	3. <i>Stachytarpheta</i>	5
5. Flowers white; leaves serrate above middle Flowers blue purple or pink, or if white then leaves pinnatifid	4. <i>Phyla</i> 5. <i>Verbena</i>	
6. Flowers in racemes collected into terminal often leafy panicles Flowers in cymes, often collected into terminal panicles or 2–3 flowers on axillary peduncles	6. <i>Duranta</i>	7
7. Corollas ± actinomorphic Corollas ± bilabiate	7. <i>Clerodendrum</i>	8
8. Woody climbers of rainforest Erect shrubs or trees or prostrate shrubs, not woody climbers	8. <i>Glossocarya</i>	9
9. Flowers collected into terminal panicles Flowers in axillary or terminal cymes		10 11
10. Corollas up to 1.2 cm long; fruits up to <i>ca</i> 1 cm diameter Corollas 1.4 cm long or longer; fruits <i>ca</i> 2.5 cm diameter	9. <i>Vitex</i> 10. <i>Gmelina</i>	
11. Shrubs with stellate hairs Trees with simple hairs	11. <i>Callicarpa</i> 12. <i>Premna</i>	

1. **ONCINOCALYX** F. Muell.

Herbaceous perennials. Leaves opposite, simple. Flowers axillary, solitary or in groups of 2–3; calyx obconical, veins 10, teeth 5, equal, narrow, hooked at end, not enlarging in fruit; corolla bilabiate, scarcely longer than calyx, lower lip 3-lobed; stamens 4, didynamous, included in corolla, anthers subunilocular at apex by confluence of locules; ovary shortly 4-lobed, 4-locular, ovules 1 per loculus, style tapered, deeply bifid. Fruits enclosed in calyx, dry, separating into 4 pyrenes.

Monotypic genus endemic in Australia, occurring in south-eastern Queensland.

1. ***Oncinocalyx betchei*** F. Muell.

## ONCINO BURR

Perennial up to *ca* 1 m tall, branches 4-angled,  $\pm$  pubescent. Leaves  $\pm$  sessile, linear, apex acute, margins recurved, 1–4 cm  $\times$  0.1–2 cm, pubescent. Calyx tube 2–3 mm long, pubescent, lobes 2–3 mm long; corolla white, 5–7 mm long. Fruits scarcely longer than calyx tube, pubescent.

Restricted to a small area around Goondiwindi in the southern Darling Downs district and adjacent areas of N.S.W. The calyx with the enclosed fruit can become attached to the fleece of sheep and the species is sometimes considered a nuisance, especially in N.S.W.

2. **LANTANA** L.

Herbs or shrubs, erect, decumbent or scandent. Leaves mostly opposite, simple. Flowers in pedunculate axillary heads, rarely spikes, each one  $\pm$  sessile within small bract; calyx small thin truncate and entire or sinuate toothed; corolla  $\pm$  regular, tube slender, lobes 4–5; stamens 4, included in corolla tube, ovary 2-locular, ovules 1 per loculus. Fruits  $\pm$  succulent drupes, 2-locular or dividing into 2, 1-locular pyrenes.

150 species tropical America and tropical and southern Africa; 2 species naturalized Australia, both occurring in south-eastern Queensland.

- |   |                            |
|---|----------------------------|
| 1. Shrubs up to <i>ca</i> 2 m tall; leaves 2.5 cm long or longer; flowers white yellow orange red or pink, not purplish | 1. <i>L. camara</i>        |
| Prostrate or decumbent shrubs, rooting at nodes; leaves less than 2.5 cm long; flowers purplish                         | 2. <i>L. montevidensis</i> |

1. \****Lantana camara*** L.

## LANTANA

Shrub up to *ca* 2 m tall, often forming dense thickets; branches long, weak, often armed with short recurved prickles,  $\pm$  hairy, young parts often glandular. Leaves with petioles 0.5–2 cm long; blades ovate, apex acute or shortly acuminate, base rounded, acutely narrowed or sometimes cordate, margin crenate-serrate, 2.5–12 cm  $\times$  1.5–7 cm, reticulate-rugose, scabrous above, more softly pubescent below. Flowers in heads 2–3 cm wide, peduncles 2–8 cm long, bracts narrow, 4–7 mm long; corolla white yellow orange red or pink, 1–1.4 cm long. Drupes black, 6–8 mm long.

Native of tropical South America; probably introduced as a garden plant, naturalized and a pest in eastern parts of the region. Flowers most of the year. Some forms are grown as garden plants. Some forms are poisonous to stock.

2. \****Lantana montevidensis*** (Sprengel) Briq.

## CREEPING LANTANA

*Lippia montevidensis* Sprengel; *Lantana sellowiana* Link & Otto

Prostrate or decumbent shrub, often forming dense mats; branches rooting at nodes, strigose. Leaves with petioles *ca* 2–4 mm long; blades ovate, apex acute or subacute, base abruptly narrowed or truncate, cuneate into petiole, margin crenate-serrate, 0.8–2.2 cm  $\times$  0.5–1.6 cm,  $\pm$  scabrous above, more softly hairy below. Flowers in heads 1–2 cm across, peduncles 2–8 cm long, bracts broadly ovate, 4–7 mm long; corolla purplish, 0.8–1.2 cm long. Drupes purplish black, *ca* 6–8 mm long. **Fig. 51A.**

Native of South America; probably introduced as a garden plant, naturalized and a pest in eastern and northern parts of the region. Flowers most of the year. One form is grown in gardens as ground cover. It is suspected of being poisonous to stock.

3. STACHYTARPHETA Vahl

Annual or perennial herbs or low shrubs. Leaves opposite or alternate, simple, often rugose. Inflorescences terminal spikes; flowers sessile in furrows in rachis of spike, each solitary in axil of a bract; calyx long tubular, 5-lobed; corolla tube cylindrical, limb spreading, 5-lobed; stamens 2, included in corolla, staminodes 2; ovary 2-locular, 1 ovule per loculus. Fruits dry, included in calyx, splitting at maturity into 2, 1-seeded cocci.

About 100 species tropical America and Asia; 4 species naturalized Australia; 3 species south-eastern Queensland.

- |  |                          |
|--|--------------------------|
| 1. Stems and undersides of leaves densely pubescent; flowers reddish to pink   | 1. <i>S. mutabilis</i>   |
| Stems and undersides of leaves glabrous or only sparsely hairy; flowers blue to purple   | 2                        |
| 2. Rachises stout, up to ca 5 mm diameter, conspicuously wider than furrows; stems and leaves glabrous or leaves with few hairs on veins beneath | 2. <i>S. jamaicensis</i> |
| Rachises slender, up to ca 2.5 mm diameter, ± as wide as furrows; young stems and leaves usually sparsely hairy                                  | 3. <i>S. cayennensis</i> |

1. \**Stachytarpheta mutabilis* (Jacq.) Vahl PINK SNAKEWEED

*Verbena mutabilis* Jacq.

Robust perennial up to ca 2 m tall. Leaves opposite; blades ovate, ovate-oblong or subcordate-ovate, apex acute, base abruptly rounded and decurrent on petiole, margin serrate, 5–12 cm × 3–8 cm, upper surface villous, lower surface tomentose. Spikes stout, up to ca 40 cm long, rachis up to ca 7 mm diameter, tomentose; corolla reddish to pink, tube up to ca 2 cm long, limb 1–1.2 cm diameter.

Native of South America; naturalized in north-eastern Wide Bay district, not common. Flowers spring to autumn. Occasionally cultivated as a garden plant.

2. \**Stachytarpheta jamaicensis* (L.) Vahl JAMAICA SNAKEWEED; LIGHT BLUE SNAKEWEED

*Verbena jamaicensis* L.; *Stachytarpheta dichotoma* auct. non Vahl

Perennial up to ca 1.2 m tall, glabrous or almost so except at nodes. Leaves opposite or sometimes alternate; blades oblong to elliptic to ovate, apex obtuse to acute, base cuneate, decurrent on petiole, margin serrate, 2–8 cm × 1–5 cm, glabrous or with few hairs on veins below. Spikes stout, up to 40 cm long, rachis up to ca 5 mm diameter, wider than furrows; corolla blue or violet to purple, tube 8–10 mm long, limb ca 8 mm diameter. Fig. 51G.

Native of South America; naturalized but not common in eastern parts of the region. Flowers mostly spring to autumn.

3. \**Stachytarpheta cayennensis* (Rich.) Vahl

*Verbena cayennensis* Rich.

Perennial up to ca 1 m or more tall; stems from sparsely hairy to ± villous. Leaves decussate; blades ovate to elliptic, apex obtuse to ± acute, base narrowed or rounded, margin serrate, 1.5–7 cm × 1–2.5 cm, usually sparsely hairy, occasionally more densely hairy. Spikes slender, up to ca 30 cm long, up to ca 2.5 mm diameter; corolla pale blue to purple, ca 4 mm long, limb ca 5 mm diameter.

Native of South America; naturalized but not common in eastern parts of region. Flowers mostly spring to autumn.

4. PHYLA Lour.

Perennial, mostly procumbent or creeping herbs. Leaves decussate, simple. Inflorescences axillary ± cylindrical spikes, densely many-flowered, usually greatly elongated in fruit, solitary or 2 or 3 together; flowers small, sessile, solitary in axil of a bract; calyx membranous, 2- or 4-fid or 4-toothed; corolla irregular, somewhat

bilabiate, 4-lobed; stamens 4 didynamous, included in or slightly exerted from corolla; ovary 2-locular, ovules 1 per loculus, stigma stout. Fruits dry, included in calyx, dividing into 2 pyrenes at maturity.

10 species from tropical and subtropical America, with 1 species worldwide in warm areas; 1 species probably introduced and become naturalized in Australia, occurring in south-eastern Queensland.

1. \***Phyla nodiflora** (L.) Greene      PHYLA; CARPET WEED; FOG FRUIT; NO  
MOW GRASS

*Verbena nodiflora* L.; *Lippia nodiflora* (L.) Michaux

Creeping herbs rooting at nodes with shortly ascending flowering branches, whole plant with appressed medifixed hairs. Leaves spatulate to obovate, occasionally elliptic or cuneate, apex obtuse or subacute, base attenuate, margin serrate above middle, entire at base, occasionally completely entire, 0.5–5 cm × 0.15–1.5 cm. Spikes solitary, globose at first, cylindrical and elongating with age, up to 2.5 cm long when mature, peduncles 1–10 cm long; flowers white, *ca* 2 mm long.

Two varieties occur in the region:

- |  |  |
|--|--|
| 1. Plants of sandy soil near the sea; bracts membranous but not ciliate along margin; leaves mostly 1.5 cm long or longer . . . . .                | <i>P. nodiflora</i> var. <i>longifolia</i> |
| Plants not of sandy soil near the sea; bracts with hairs which form a ciliate margin, often not membranous; leaves less than 1.5 cm long . . . . . | <i>P. nodiflora</i> var. <i>nodiflora</i>  |

The species is widely distributed throughout tropical and subtropical parts of the world; probably introduced into Australia. *P. nodiflora* var. *nodiflora* (Fig. 51L.) is widespread and common in the region in areas away from the sea coast. *P. nodiflora* var. *longifolia* Moldenke (Fig. 51K.) is common in the region on sandy soils near the sea. Both varieties flower most of the year.

## 5. VERBENA L.

Herbs, sometimes slightly woody based. Leaves mostly decussate, rarely whorled, mostly dentate, lobed, incised or pinnatifid. Inflorescences spicate, terminal, usually densely many-flowered, often flat topped and pseudo-umbellate or fasciculate-capitate, sometimes elongate with crowded or scattered flowers, rarely axillary, often elongating only after anthesis; flowers solitary in axil of a bract; calyx usually tubular, 5-angled, unequally 5-toothed; corolla tube straight or curved, limb flat, weakly bilabiate, lobes 5; stamens 4, didynamous, included in corolla tube; ovary superior, 4-locular, style shortly 2-lobed or 2-fid. Fruits schizocarps separating at maturity into 4, 1-seeded nutlets.

About 250 species, almost all tropical and subtropical America, 2–3 Europe and Mediterranean region; 8 species, 7 naturalized, Australia; 5 species south-eastern Queensland.

- |   |                          |
|---|--------------------------|
| 1. Leaves sessile, base subcordate, semi-amplexicaule . . . . .   | 2                        |
| Leaves petiolate, base attenuate . . . . .  | 3                        |
| 2. Bracts conspicuously longer than calyx; corolla tubes <i>ca</i> 3 times longer than calyx . . . . .  | 1. <i>V. rigida</i>      |
| Bracts not or scarcely longer than calyx; corolla tubes less than 2 times longer than calyx . . . . .   | 2. <i>V. bonariensis</i> |
| 3. Spikes solitary; calyces 7–9 mm long; corolla limbs 8–10 mm diameter; plants prostrate or ascending . . . . .                                | 3. <i>V. tenuisecta</i>  |
| Spikes arranged in panicles; calyces <i>ca</i> 2 mm long; corolla limbs 2–5 mm diameter; plants erect . . . . .                                 | 4                        |
| 4. Leaves ± coarsely and sharply serrate; inflorescences hispid with simple hairs, often becoming ± glabrous with age . . . . .                 | 4. <i>V. litoralis</i>   |
| Upper leaves often entire, lower ones pinnatifid or deeply divided; inflorescences often with glandular hairs as well as simple hairs . . . . . | 5. <i>V. officinalis</i> |

Corolla measurements refer to fresh material, as considerable shrinkage occurs during drying.

**1. \**Verbena rigida* Sprengel**

## VEINED VERBENA

*Verbena venosa* Gillies & Hook.

Perennial 20–40 cm tall; stems erect or ascending from creeping rhizome. Leaves sessile, rigid, oblong-ovate or narrowly obovate, apex acuminate, base subcordate and semi-amplexicaule, margin coarsely sharply serrate, often somewhat revolute, 4–12 cm × 1–4 cm, both surfaces scabrous. Spikes dense, 1–4 cm long, forming terminal panicles, with simple and glandular hairs, bracts *ca* 6 mm long; calyx *ca* 4 mm long; corolla bluish purple, tube *ca* 3 times as long as calyx, limb *ca* 5–7 mm diameter.

Native of South America; naturalized and widespread in the region. Flowers mostly summer–autumn. It has been suspected of poisoning stock.

**2. \**Verbena bonariensis* L.**

## PURPLETOP

Erect coarse rigid perennial 0.6–1.5 m tall; stems acutely 4-angled. Leaves sessile, narrowly ovate or oblong, apex acute to acuminate, base subcordate and semi-amplexicaul, margin sharply coarsely serrate in upper part, 4–13 cm × 1–4.5 cm, hirsute-scabrous. Spikes dense, 1–4 cm long, forming terminal corymbose panicles, bracts 3–4 mm long; calyx 3–4 mm long; corolla blue to violet or purple, tube scarcely twice as long as calyx, limb *ca* 2 mm diameter.

Native of South America; naturalized and widespread in the region. Flowers mostly summer–autumn. It has been suspected of poisoning stock.

**3. \**Verbena tenuisecta* Briq.**

## MAYNE'S PEST

*Glandularia tenuisecta* (Briq.) Small; *Verbena tenera* auct. Aust. non Sprengel

Stems decumbent with divergent ascending branches up to *ca* 30 cm tall, sparsely pilose, glabrous with age. Leaves triangular in outline, 1–3 cm × 1–3 cm, tripartite-pinnatifid. Spikes terminal, solitary, short and dense during anthesis, later elongating up to 4 cm or more, bracts 2–3 mm long; calyx 8–9 mm long; corolla white to violet or purple, tube 1.1–1.4 cm long, limb *ca* 1 cm diameter. **Fig. 51F.**

Native of South America; naturalized and widespread in the region, considered a pest in the western Darling Downs district. Flowers found most of the year. It has been suspected of poisoning stock.

**4. \**Verbena litoralis* Kunth**

Erect perennial up to *ca* 1 m tall, hispid with simple hairs, becoming ± glabrous with age. Leaves narrowly ovate to oblong, apex obtuse to acute, base tapering to short petiole, margin coarsely sharply serrate in upper part, entire in lower  $\frac{1}{4}$ – $\frac{1}{3}$ , 1.5–9 cm × 0.5–2 cm. Spikes dense at first, but soon elongating to 4 cm long or longer, forming panicles, bracts ± equal in length to calyx; calyx 2–2.5 mm long; corolla blue to purple, tube 2.5–3 mm long, limb 2.5–3 mm wide. **Fig. 51E.**

Native of Central and South America; naturalized in the Moreton district, possibly also to be found in the Wide Bay district. Flowers summer–autumn.

**5. \**Verbena officinalis* L.**

## COMMON VERBENA

Erect perennial up to *ca* 80 cm tall; stems quadrangular. Lower leaves deeply incised or 1–2-pinnatifid, 2–7 cm × 0.5–3 cm, upper leaves entire or subentire, smaller. Spikes dense at first, soon elongating, up to *ca* 30 cm long, forming panicle, bracts *ca* 2 mm long; calyx *ca* 3 mm long; corolla pale pink to lilac, tube 3–3.5 mm long, limb *ca* 3–3.5 mm diameter.

Native of southern Europe; naturalized and widespread in the region. Flowers mostly summer–autumn. It has been suspected of poisoning stock.

**6. DURANTA L.**

Shrubs, branches often with axillary spines. Leaves opposite or verticillate, simple. Flowers in terminal and axillary racemes forming terminal panicle; each flower in axil of a bract with 2 bracteoles on pedicels; calyx 5-toothed; corolla tubular, 5-lobed, somewhat zygomorphic; stamens 4, included in corolla tube, didynamous, staminodes 1; ovary 8-locular, ovules 1 per loculus, style short, stigma oblique, irregularly lobed.

Fruits drupes, tightly enclosed by enlarged calyx, endocarp separating into 4, 2-locular pyrenes.

36 species tropical America; 1 species cultivated and naturalized Australia, occurring in south-eastern Queensland.

1. \**Duranta repens* L.

DURANTA

*Duranta plumeri* Jacq.

Shrub or small tree, branches often spiny, often drooping. Leaves with petioles 0.5–1 cm long; blades ovate-elliptic, ovate-obovate, apex obtuse to acute, base attenuate, margin entire or coarsely serrate above middle, 2–8 cm × 1.2–3.5 cm. Inflorescences up to *ca* 20 cm long; calyx *ca* 3–4 mm long; corolla blue, tube 0.6–1 cm long, lobes 4–5 mm long. Drupes globose, 0.5–1 cm diameter, enclosed by orange fruiting calyx. **Fig. 51J.**

Native of Central America to Brazil; widely cultivated as a hedge plant, naturalized in the Moreton and Wide Bay districts. Flowers summer–autumn. It has been suspected of poisoning stock and children.

The cultivated white flowered form is referable to *Duranta repens* var. *alba* (Masters) L. H. Bailey.

7. CLERODENDRUM L.

Trees or shrubs or rarely herbs or woody climbers. Leaves opposite or in whorls, simple. Flowers in loose heads or cymes, usually forming terminal corymbose or thyrsoid panicles, rarely axillary; calyx 5-toothed or 5-lobed, enlarged and spreading under fruit; corolla tube slender, lobes 5, nearly equal, spreading; stamens 4, exserted; ovary 4-locular, 1 ovule per loculus, style filiform with 2 short acute stigmatic lobes. Fruits ± succulent, or almost dry drupes, endocarp separating into 4, 1-locular pyrenes or rarely 2, 2-locular pyrenes.

About 400 species from tropical and subtropical parts of the world; 9 species, 7 endemic, Australia; 4 species south-eastern Queensland.

- |   |                           |
|---|---------------------------|
| 1. Calyces minutely toothed . . . . .   | 1. <i>C. inerme</i>       |
| Calyces distinctly 5-lobed . . . . .  | 2                         |
| 2. Corollas 4 cm long or longer . . . . .   | 2. <i>C. cunninghamii</i> |
| Corollas less than 3.5 cm long . . . . .  | 3                         |
| 3. Calyces ± conspicuously tomentose, corolla tubes usually less than 2.5 cm long; leaves usually velvety tomentose . . . . . | 3. <i>C. tomentosum</i>   |
| Calyces glabrous or with minute hairs; corolla tubes 2.5–3 cm long; leaves glabrous or tomentose only when young . . . . .    | 4. <i>C. floribundum</i>  |

1. *Clerodendrum inerme* (L.) Gaertn.

*Volkameria inermis* L.

Shrub, erect or straggling, up to 6 m tall, glabrous or young shoots with few hairs. Leaves with petioles 0.5–2 cm long; blades ovate or elliptic, apex obtuse to shortly acuminate, base rounded to ± cuneate, margin entire, 1.5–14 cm × 0.8–8 cm. Inflorescences axillary or appearing terminal, usually 3 flowers on peduncle but often cyme of 7 or more flowers, peduncle up to *ca* 4 cm long, bracts minute, pedicels 3–6 mm long; calyx 5–7 mm long, minutely 5-toothed; corolla white, tube 1.5–3.5 cm long, lobes 5–8 mm long; stamens exserted up to *ca* 2.5 cm beyond throat. Drupes black, obovoid, 1.2–1.5 cm long.

Known from a few near coastal areas of the Moreton district, probably also in coastal areas of the Wide Bay district. Flowers mostly summer–autumn.

2. *Clerodendrum cunninghamii* Benth.

Erect shrub up to *ca* 5 m tall, glabrous or undersides of leaves and inflorescences ± tomentose. Leaves with petioles 2–5 cm long; blades ovate, apex acutely acuminate, base cuneate or rounded or subcordate, margin entire, 7–25 cm × 3–15 cm. Flowers numerous in broad terminal corymbs, pedicels 0.5–1.5 cm long; calyx 1–1.3 cm long

in flower, up to *ca* 2.2 cm long in fruit; corolla white, tube 4–6 cm long, lobes 0.7–1 cm long; stamens exerted up to *ca* 2.5 cm. Drupes black,  $\pm$  globose, 1–1.3 cm diameter.

Known from the northern Wide Bay district. Flowers found most of the year but mainly summer–autumn.

### 3. *Clerodendrum tomentosum* R. Br.

### LOLLY BUSH

Shrub or tree 1–10 m tall, foliage and inflorescences usually velvety-tomentose, older leaves rarely glabrous. Leaves with petioles 0.8–5 cm long; blades ovate to elliptic, apex acute or shortly acuminate, base cuneate or rarely rounded, margin entire, 4–14 cm  $\times$  2–4.5 cm. Flowers in compact terminal corymbs, rarely with few peduncles bearing small cymes in upper axils; calyx 5–6 mm long in flower, up to *ca* 1.2 cm long in fruit, tomentose at least in flower, lobes acute to obtuse; corolla white, tube 2–2.5 cm long, lobes 4–7 mm long, usually tomentose; stamens exerted up to *ca* 2.5 cm. Drupes black, globular to ellipsoid, 0.8–1 cm long.

Widespread in the region. Flowers mostly spring–summer.

### 4. *Clerodendrum floribundum* R. Br.

### LOLLY BUSH

Shrub or tree up to *ca* 6 m tall, usually quite glabrous, sometimes young parts tomentose. Leaves with petioles 2–7 cm long; blades very variable, usually ovate or elliptic but varying from broadly ovate to narrowly ovate to elliptic, apex obtuse, acute or acuminate, base acute, rounded or cordate, 4–18 cm  $\times$  2–10 cm but mostly 4–12 cm  $\times$  2–8 cm. Flowers in cymes, sometimes few-flowered in upper axils, sometimes forming broad terminal corymbose panicles; flowers apparently glabrous but often sprinkled with minute hairs; calyx 5–6 mm long in flower, *ca* 0.8–1.2 cm long in fruit; corolla white, tube 2.5–3 cm long, lobes 5–7 mm long; stamens exerted up to *ca* 2.5 cm.

Widespread in the region. Flowers mostly spring–summer.

## 8. GLOSSOCARYA Wall. ex Griff.

Scandent shrubs or woody climbers. Leaves opposite, simple. Flowers in cymes arranged in dense broad corymbose panicles; calyx 5-toothed, not enlarging in fruit; corolla  $\pm$  bilabiate, tube slender, 5-lobed, 2 upper lobes slightly connate, 3 anterior lobes subequal; stamens 4, didynamous, inserted in throat, long exerted; ovary 4-locular, ovules 1 per loculus, style elongate, 2-fid at apex. Fruits 4-locular, separating into pyrenes.

9 species Indomalaysia and Australia; 2 species, 1 endemic, Australia; 1 species south-eastern Queensland.

### 1. *Glossocarya hemiderma* (F. Muell. ex Benth.) Benth. & J. D. Hook.

*Clerodendrum hemiderma* F. Muell. ex Benth.

Tall woody climber, young parts and inflorescences  $\pm$  pubescent, leaves becoming glabrous with age. Leaves with petioles 3–8 mm long; blades broadly ovate, occasionally ovate, apex obtuse or shortly obtusely acuminate, rarely acuminate, base rounded or occasionally cordate, margin entire, 2–9 cm  $\times$  1.5–5 cm. Calyx 3–5 mm long; corolla white, *ca* 6–9 mm long, lobes silky pubescent outside. Fruits oblongoid, 6–8 mm long.

Known from depauperate rainforest of the northern Wide Bay and Burnett districts. Flowers most of the year.

## 9. VITEX L.

Trees or erect rarely creeping shrubs. Leaves opposite, digitately 1–7-foliolate or all or most of them simple. Flowers in cymes, these either axillary or combined into terminal or axillary panicles or racemes; calyx shortly 5-dentate; corolla pubescent

outside, limb bilabiate, upper lip shortly bifid, lower lip 3-fid; stamens 4, inserted near middle of corolla tube, exerted, didynamous; ovary imperfectly 2-locular, style filiform, bifid at tip. Drupes sessile on often enlarged calyx.

About 250 species from tropical and temperate areas of the world; *ca* 4 species Australia; 2 species south-eastern Queensland.

- |  |                        |
|--|------------------------|
| 1. Leaves white hairy beneath; leaflets 1–5 . . . . .          | 1. <i>V. trifolia</i>  |
| Leaves glabrous or nearly so when mature, green on both sides; |                        |
| leaflets 3, rarely 5 . . . . .                                 | 2. <i>V. acuminata</i> |

### 1. *Vitex trifolia* L.

Shrub or small tree, sometimes decumbent. Leaves very variable, simple or 1–5-foliolate, nearly white below, upper side often  $\pm$  glabrous. Flowers in cymes forming terminal panicles, either simple and spike-like or branched, corolla blue or pale blue. Drupes black.

Two varieties occur in the region:

- |  |   |
|--|---|
| 1. Calyces 2–3.5 mm long; corollas 0.8–1.2 cm long; leaves |   |
| 1–3-foliolate, leaflets obtuse or acute . . . . .          | (a) <i>V. trifolia</i> var. <i>trifolia</i> |
| Calyces 1.5–2 mm long; corollas 0.6–0.8 cm long; leaves    |   |
| 3–5-foliolate, leaflets long acuminate . . . . .           | (b) <i>V. trifolia</i> var. <i>bicolor</i>  |

#### (a) *Vitex trifolia* var. *trifolia*

Shrub 1–4 m tall. Leaflets 1–3, those of 2–3-foliolate leaves either all sessile or largest leaflet on petiolule less than 5 mm long; leaflet blades ovate to elliptic to oblong to obovate, apex obtuse or acute, those of 2–3-foliolate leaves 1.5–9.5 cm  $\times$  1.2–3.8 cm, those of 1-foliolate leaves 2–6.5 cm  $\times$  1.2–3.5 cm, white hairy below,  $\pm$  glabrous above. Panicles up to *ca* 15 cm long, mostly less than 2.5 cm broad in flower; calyx 2–3.5 mm long in flower, up to *ca* 5 mm long in fruit; corolla 0.8–1.2 cm long. Drupes dry, 4–6 mm diameter. **Fig. 51H.**

Probably native in the northern Wide Bay district, widely cultivated in the region, and possibly naturalized in south-eastern parts of the region. Naturally occurring plants found on sandy soil near the sea but the species grows in cultivation on a wide variety of soil types. Flowers found most of the year.

#### (b) *Vitex trifolia* var. *bicolor* (Willd.) Moldenke

*Vitex bicolor* Willd.; *V. negundo* L. var. *bicolor* H. J. Lam; *V. petiolaris* Domin

Shrub or small tree up to *ca* 6 m tall. Leaves 3–5-foliolate, central one on petiolule 0.5–2 cm long, 2 adjacent ones with petiolules less than 0.4 cm long in 3-foliolate leaves or with petiolules up to 1.5 cm long in 5-foliolate leaves, outermost leaflets in 5-foliolate leaves  $\pm$  sessile; leaflet blades ovate or narrowly ovate, apex acuminate, rarely acute, 1.5–10 cm  $\times$  1–3.5 cm, white-hairy below,  $\pm$  glabrous above. Panicles much-branched, up to *ca* 15 cm long, up to *ca* 8 cm broad; calyx 1.5–2 mm long; corolla 6–8 mm long. Drupes dry, 4–6 mm diameter. **Fig. 51I.**

Coastal sand dunes and sometimes behind mangrove communities of Moreton and Wide Bay districts, moderately common. Flowers found most of the year.

A third variety, *V. trifolia* var. *simplicifolia* Cham. (*V. ovata* Thunb.) may also occur in coastal northern Wide Bay district. This variety is prostrate, roots at the nodes, has erect flowering branches 15–50 cm tall and ovate leaves with an obtuse tip. It occurs on foredunes in northern Queensland.

### 2. *Vitex acuminata* R. Br.

Shrub or tree up to *ca* 25 m tall in northern Queensland but mostly less than 15 m tall in southern Queensland, young shoots and inflorescences pubescent but mature leaves glabrous or nearly so. Leaflets 3, rarely 5, petiolules 0.2–1.5 cm long; leaflet blades ovate-oblong, elliptic or narrowly ovate, apex acuminate, base cuneate, margin entire, toothed in juveniles, 2.5–15 cm  $\times$  1–5 cm, laterals usually shorter than terminal one, gland dotted below. Flowers in loose thyrsoid panicles up to *ca* 10 cm long; calyx 1.5–2.5 mm long; corolla 6–8 mm long. Drupes red, *ca* 10 mm diameter.

Rainforest of the Wide Bay and Burnett districts. Flowers irregularly.



Fig. 51 VERBENACEAE — A *Lantana montevidensis*, portion of flowering stem  $\times 1$ ; B *Premna lignum-vitae*, portion of inflorescence  $\times 1$ ; C *Gmelina leichhardtii*, flower  $\times 1$ ; D<sub>1</sub>–D<sub>2</sub> *Callicarpa pedunculata*, D<sub>1</sub> portion of flowering stem  $\times 1$ , D<sub>2</sub> fruits  $\times 1$ ; E–F *Verbena* spp. — E<sub>1</sub>–E<sub>2</sub> *V. litoralis*, E<sub>1</sub> leaves  $\times 1$ , E<sub>2</sub> inflorescence  $\times 1$ ; F *V. tenuisecta*, portion of flowering stem  $\times 1$ ; G *Stachytarpheta jamaicensis*, portion of flowering stem  $\times 1/2$ ; H *Vitex trifolia* var. *trifolia*, leaf  $\times 1/2$ ; I *Vitex trifolia* var. *bicolor*, leaf  $\times 1/2$ ; J<sub>1</sub>–J<sub>2</sub> *Duranta repens*, J<sub>1</sub> portion of flowering stem  $\times 1$ , J<sub>2</sub> fruit  $\times 1$ ; K *Phyla nodiflora* var. *longifolia*, portion of flowering stem  $\times 1$ ; L *Phyla nodiflora* var. *nodiflora*, portion of stem  $\times 1$ .

## 10. GMELINA L.

Trees or tall shrubs. Leaves opposite, simple. Flowers in cymes arranged in irregular terminal panicles, sometimes almost reduced to simple racemes; calyx 4–5-toothed or -lobed; corolla tube much dilated upwards or almost campanulate, lobes 4 or 5, 2 upper sometimes united in an upper lip; stamens 4, didynamous, included in corolla; ovary 4-locular, ovules 1 per loculus, style filiform, unequally 2-lobed. Fruits succulent drupes, endocarp hard, usually 4-locular.

35 species from tropical Africa, eastern Asia through Indomalaysia to Australia; 4 species, 1 naturalized, Australia; 1 species south-eastern Queensland.

### 1. *Gmelina leichhardtii* (F. Muell.) Benth.

WHITE BEECH; GREY TEAK

*Vitex leichhardtii* F. Muell.

Tree up to *ca* 40 m tall with stem diameter of 1.2 m; young branches inflorescences petioles and undersides of leaves light brown tomentose. Leaves with petioles 2–4 cm long; blades ovate, apex acute, occasionally somewhat acuminate, rarely rounded, base rounded, acute or cuneate, margin entire, 7–18 cm × 4–8 cm, glabrous above. Calyx turbinate-campanulate, 3.5–5 mm long at flowering, enlarged and spreading under fruit; corolla white with purple markings, ± bilabiate, tube twice as long as calyx, lobes *ca* 7 mm long. Fruits blue, *ca* 2.5 cm diameter. **Fig. 51C.**

Rainforest of the Moreton and Wide Bay districts, not common. Flowers summer. An excellent timber tree.

## 11. CALLICARPA L.

Shrubs, usually with stellate hairs, rarely glabrous and often with numerous resinous glandular dots especially on underside of leaves. Leaves opposite, simple. Flowers small, in axillary cymes with small bracts; calyx truncate or 4-, rarely 5-toothed; corolla tube short, lobes 4, rarely 5, spreading, nearly equal; stamens 4, rarely 5, shortly exserted; ovary 4-locular, ovules 1 per loculus, styles filiform, dilated and truncate or very shortly 2-lobed. Fruits drupes.

140 species tropical and subtropical regions of the world; 7 species Australia; 1 species south-eastern Queensland.

### 1. *Callicarpa pedunculata* R. Br.

Shrub up to *ca* 2 m tall, hairs brownish, stellate, often ± woolly on branches. Leaves with petioles 0.5–1.5 cm long; blades ovate or narrowly ovate, apex acuminate, base rounded or scarcely contracted, margin serrate, 6–13 cm × 2.5–6 cm, scattered hairs above, more densely hairy below. Cymes loose, peduncles usually exceeding petioles, whole inflorescence including peduncle up to *ca* 3 cm long and wide; calyx *ca* 1.5 mm long, minutely 4–5-toothed; corolla purplish, *ca* 3 mm long, glabrous. Drupes purple, globose, succulent, *ca* 3 mm diameter. **Fig. 51D.**

Rainforest of the Moreton and Wide Bay districts. Flowers summer.

Munir in *Journal Adelaide Bot. Gard.* 6(1): 25 (1982) reports *Callicarpa macrophylla* Vahl from the Bremer River. It seems likely that this is based on a specimen which is from a cultivated plant. As this species is not definitely recorded naturalized from the region it is not included here. *C. macrophylla* differs from *C. pedunculata* in having white fruit and leaves with greyish white tomentum rather than brownish tomentum.

## 12. PREMNA L.

Trees, erect shrubs or woody climbers. Leaves opposite, simple. Flowers in terminal or axillary corymbs or cymes; calyx truncate or shortly toothed; corolla bilabiate, tube short, throat villous, upper lip entire or shortly emarginate, lower lip 3-lobed; stamens 4, ± didynamous, included in or exserted from corolla; ovary at first 2-locular, later

4-locular, style bifid. Fruits drupes, pyrenes 1, usually 4-locular, occasionally locules fewer.

About 200 species, tropical and subtropical Africa, Asia and Australia; 10 species, 9 endemic, Australia; 1 species south-eastern Queensland.

**1. *Premna lignum-vitae* (Cunn. ex Schauer) Pieper**

LIGNUM-VITAE

*Vitex lignum-vitae* Cunn. ex Schauer

Tree up to *ca* 40 m tall with stem diameter 1 m, young branches petioles and inflorescence with rusty coloured hairs, young branchlets often 4-angled. Leaves with petioles 0.5–2.5 cm long; blades elliptic to narrowly ovate, occasionally narrowly obovate, apex acute to acuminate, occasionally rounded, base rounded or sometimes cuneate, 3–15 cm × 1–4.5 cm, shining above, dull beneath, often with domatia in vein axils below or on both surfaces. Cymes axillary, usually shorter than leaves; calyx 2–3 mm long; corolla 0.8–1 cm long, tomentose outside. Fruits red, globose, 1–1.8 cm diameter. **Fig. 51B.**

Rainforest of eastern parts of the region as far west as the Bunya Mts., moderately common. Flowers found throughout the year.

## 132. AVICENNIACEAE

Shrubs or trees of maritime regions (mangroves) with pneumatophores. Leaves decussate, exstipulate. Inflorescences axillary or terminal, cymose, spicate or subcapitate, axillary inflorescences mostly paired; flowers sessile; calyx of 5 nearly separate sepals; corolla actinomorphic, campanulate-rotate, 4-lobed; stamens 4, inserted in throat of corolla tube; ovary with free central placenta, ovules 4. Fruits capsules, dehiscent by 2 valves, 1-seeded by abortion.

1 genus with 15 species, of maritime areas of tropical and subtropical regions of the world; 2 species Australia; 1 species south-eastern Queensland.

### 1. AVICENNIA L.

Characters as for the family.

2 species Australia; 1 species south-eastern Queensland.

**1. *Avicennia marina* (Forssk.) Vierh. var. *australasica* (Walp.) Moldenke** GREY  
MANGROVE  
*Avicennia tomentosa* L. var. *australasica* Walp.; *A. marina* var. *resinifera* (G. Forster) Bakh.

Tree up to *ca* 20 m tall, mostly less than 12 m tall in south-eastern Queensland, branches inflorescences and underside of leaves greyish white or silvery. Leaf blades narrowly ovate to elliptic or obovate, apex acute or sometimes obtuse or acuminate, base cuneate, margin entire, 3.5–12 cm × 1–4 cm, upper surface usually glabrous. Flowers in small dense cymes on angular peduncles in upper axils or in terminal panicles; calyx *ca* 2.5 mm long; corolla tube shorter than sepals. Fruits compressed capsules, *ca* 3 cm diameter; seed solitary, germinating before fruit drops.

Saltwater swamps and estuaries, common in south-eastern Queensland. Flowers found most of the year.

## 133. CHLOANTHACEAE (DICRASTYLIDACEAE nom. illeg.)

Shrubs or shrublets, often clothed in much-branched hairs or rarely scales. Leaves opposite or verticillate, rarely scattered, sessile or subsessile. Inflorescences terminal or axillary, spicate, capitate or paniculate, occasionally flowers solitary; calyx 4–8-lobed; corolla sympetalous, actinomorphic or zygomorphic, truncate to 4–8-lobed; stamens as many as corolla lobes or one fewer, inserted on corolla tube.

10 genera with 99 species all endemic in Australia; 4 genera with 6 species south-eastern Queensland.

- |   |                           |   |
|---|---------------------------|---|
| 1. Fruits fleshy at maturity; leaves distant, often reduced to scales . . . . . | 1. <i>Spartothamnella</i> | 2 |
| Fruits dry at maturity; leaves never reduced to scales . . . . .                |                           |   |
| 2. Flowers actinomorphic; stamens 5-6 . . . . .                                 | 2. <i>Newcastelia</i>     | 3 |
| Flowers zygomorphic; stamens 4 . . . . .  |                           |   |
| 3. Leaves decurrent on stem . . . . .   | 3. <i>Chloanthes</i>      |   |
| Leaves not decurrent . . . . .  | 4. <i>Pityrodia</i>       |   |

### 1. SPARTOTHAMNELLA Briq.

Shrubs or undershrubs with few small distant leaves, all opposite. Flowers very small, solitary in axils, or 2-3 on short common axillary peduncles, bracts caducous, bracteoles small; calyx 5-lobed; corolla tube short and broad, limb spreading, 5-lobed, middle lower lobe rather larger than others; stamens 4, exserted, anther loculi minutely appendiculate at lower end; ovary 2-4-locular, 2 ovules per loculus. Fruits small globular succulent drupes, separating into 4, 1-seeded pyrenes.

3 species endemic in Australia; 1 species south-eastern Queensland.

#### 1. *Spartothamnella juncea* (Cunn. ex Walp.) Briq.

*Spartothamnus junceus* Cunn. ex Walp.

Shrub or undershrub up to *ca* 1.5 m tall; branches divaricate, rigid, acutely 4-angled, appearing almost leafless, smaller branchlets often 2 or 3 together at nodes. Leaves small and distant, often reduced to small scales, when more developed especially on young shoots narrowly ovate, apex acute, margin entire or with few coarse teeth, up to *ca* 10 cm long. Flowers solitary in axils; calyx *ca* 2 mm long; corolla scarcely longer than calyx. Fruits orange-red, 2-4 mm diameter, smooth. **Fig. 52D.**

Widespread in the region, often in depauperate rainforest. Flowers found most of the year.

### 2. NEWCASTELIA F. Muell.

Small erect perennial shrubs, densely covered with woolly or cottony tomentum of branched hairs: Leaves decussate or in whorls of 3, exstipulate, sessile, simple, entire. Inflorescences dense elongated spikes or  $\pm$  subglobose heads terminal on branches; flowers 1 or 3 in axil of a bract; calyx 5-6-lobed; corolla  $\pm$  campanulate, 5-6-lobed; stamens 5-6, epipetalous; ovary 2-locular, ovules 1 per loculus. Fruits dry, indehiscent, 1-2-seeded.

12 species all endemic in Australia; 2 species south-eastern Queensland.

- |   |                         |
|---|-------------------------|
| 1. Stems leaves and peduncles velvety with white hairs; spikes not interrupted; corolla tubes villous all over within . . . . .                                       | 1. <i>N. velutina</i>   |
| Stems and leaves not velvety, densely greyish tomentose, peduncle and often bracts darker tomentose; corolla tubes with dense villous band within near base . . . . . | 2. <i>N. interrupta</i> |

#### 1. *Newcastelia velutina* Munir

Erect. Leaves decussate, broadly ovate, apex acute, margin recurved, up to 4 cm  $\times$  1.2 cm, densely silky white tomentose, reticulation concealed by tomentum. Spikes elongated, 6-17 cm long, densely woolly tomentose; flowers sessile, 3 in axil of each bract, *ca* 4 mm long; calyx densely cottony woolly outside; corolla glabrous outside; stamens 5, included in corolla tube.

Only 1 specimen known, from near Durong in the Burnett district.

#### 2. *Newcastelia interrupta* Munir

*Newcastelia cladotricha* auct. non F. Muell., F. M. Bailey

Shrub up to *ca* 90 cm tall. Leaves decussate or sometimes in whorls of 3 on main stem, sessile, narrowly oblong-ovate, apex  $\pm$  acute, margin recurved, (1-)2-3(-3.5) cm  $\times$  (0.3-)0.4-0.5(-0.6) cm, densely covered with short greyish tomentum. Spikes short

when young, later elongated, regularly interrupted, up to *ca* 18 cm long, peduncle greyish or dark tomentose; flowers sessile, mostly 3 in axil of bract, 4–4.5 mm long; calyx densely cottony woolly outside; corolla purple-violet; stamens 5, included in corolla tube. Fruits  $\pm$  obovoid, 1–1.5 mm across. **Fig. 52E.**

Endemic in the Maranoa and Darling Downs districts of Queensland; in the Darling Downs district mainly along the Moonie Highway between St. George and Dalby. Flowers spring–summer.

### 3. CHLOANTHES R. Br.

Erect perennial shrubs or undershrubs; stems woolly tomentose. Leaves decussate or in whorls of 3, decurrent on stem, exstipulate, sessile, simple. Flowers solitary, axillary, bisexual, bracteate, bracteoles 2; calyx deeply 5-lobed; corolla bilabiate; stamens 4, epipetalous,  $\pm$  didynamous; ovary 4-locular, ovules 1 per loculus, style filiform, 2-lobed in upper half. Fruits dry 4-locular drupes, separating into 2, 2-locular nutlets.

4 species all endemic in Australia; 2 species south-eastern Queensland.

- |   |                         |
|---|-------------------------|
| 1. Stamens and styles included in corolla tube; corollas pale mauve                     | 1. <i>C. parviflora</i> |
| Stamens and styles exerted from corolla tube; corollas greenish yellow or greenish blue | 2. <i>C. stoechadis</i> |



**Fig. 52** CHLOANTHACEAE — A–B *Chloanthes* spp. — A *C. parviflora*, portion of flowering stem  $\times 1/2$ ; B *C. stoechadis*, portion of flowering stem  $\times 2/3$ ; C *Pityrodia salviifolia*, portion of flowering stem  $\times 1/2$ ; D *Spartothamnella juncea*, portion of flowering stem  $\times 1$ ; E *Newcastelia interrupta*, portion of flowering stem  $\times 2/3$ .

**1. *Chloanthes parviflora* Walp.**

Shrub 30–70(–90) cm tall. Leaves linear, margin revolute, 1–4 cm × 0.2–0.4 cm, rugose-bullate and tuberculate or muricate above, woolly underneath. Pedicels 1–2(–3) mm long, bracts leaf-like, 1–2.3 cm long, bracteoles 5–10 mm long; calyx 0.8–1.3 cm long, glandular and pubescent outside and on inside of lobes, lobes 7–10 mm long; corolla pale mauve with purple spots in throat and tube, 1.5–2.5 cm long, glandular and pubescent outside; stamens included in corolla tube. Fruits 3–5 mm long. **Fig. 52A.**

Widespread in the region on a variety of soil types. Flowers mostly spring and autumn.

**2. *Chloanthes stoechadis* R. Br.**

*Chloanthes stoechadis* var. *parviflora* Benth.

Shrub 30–60(–90) cm tall. Leaves linear or linear-ovate, margin revolute, (0.5–)1–4(–5) cm × (0.1–)0.2–0.3(–0.5) cm, rugose-bullate and with thick hairs, white woolly below. Flowers ± sessile or pedicels 1–3(–4) mm long, bracts leaf-like, 0.8–1.7 cm long, bracteoles 3–6 mm long; calyx (0.7–)0.9–1.3 cm long; corolla greenish yellow or greenish blue, (1.8–)2–3.5(–4.5) cm long, sparsely glandular and pubescent outside; stamens exserted. Fruits (3–)4–5 mm long. **Fig. 52B.**

Known from the Moreton and Wide Bay districts but probably to be found elsewhere in the region. Flowers spring.

**4. PITYRODIA R. Br.**

Erect, perennial shrubs or undershrubs. Leaves decussate or in whorls of 3 or scattered, not decurrent, exstipulate, simple. Flowers solitary or in cymes or clusters, axillary or collected in terminal leafy spikes racemes or panicles, bracteate, bracteoles 2; calyx 5-lobed, corolla bilabiate or unequally 5-lobed; stamens 4, anthers appendiculate at lower end; ovary 4-locular, ovules 1 per loculus. Fruits dry 4-locular drupes, separating into 2, 2-locular nutlets.

41 species all endemic in Australia, 1 species south-eastern Queensland.

**1. *Pityrodia salviifolia* R. Br.**

Spreading shrub up to 2.4 m tall; stems and branches densely clothed with peltate fimbriate scales. Leaves with petioles (0.4–)0.6–0.8(–1.2) cm long; blades narrowly ovate, apex acute or somewhat obtuse, base cuneate, (5–)6–10(–15) cm × (0.5–)1–2(–3.3) cm, rugose, usually with some peltate-fimbriate scales above, with rusty coloured peltate-fimbriate scales below. Flowers in axillary clusters of 5–9, pedicels almost absent or up to *ca* 2 mm long, bracts shorter than calyx, 3–4.5 mm long, bracteoles 1.5–2 mm long; calyx divided to below middle, 5–7 mm long; corolla white, scarcely exceeding calyx, 5–7 mm long, middle lobe of lower lip larger than others; stamens included or scarcely exserted. Fruits loosely enclosed within persistent calyx, 3–5 mm long. **Fig. 52C.**

Known from sandy coastal soils of the northern Wide Bay district. Flowers late winter–spring.

**134. CALLITRICHACEAE**

Herbs, terrestrial or aquatic, monoecious. Leaves opposite, close together near apex of stems, forming an apical rosette. Flowers unisexual, solitary or 2 together in leaf axils; flowers often subtended by 2 bracteoles; petals and sepals absent; male flowers of single stamen; female flowers of single ovary, 2-locular but becoming 4-locular by secondary septation, styles 2, elongated, free, papillose. Fruits 4-lobed, lobes margined or winged.

1 genus with *ca* 25 species worldwide; *ca* 10 species Australia; 4 species south-eastern Queensland.

## 1. CALLITRICHE L.

Characters as for family.

- |  |                         |   |
|--|-------------------------|---|
| 1. Fruits not broader than long, $\pm$ rounded . . . . . | 1. <i>C. stagnalis</i>  | 2 |
| Fruits broader than long . . . . .                       |                         |   |
| 2. Leaves rhomboidal . . . . .                           | 2. <i>C. muelleri</i>   | 3 |
| Leaves not rhomboidal . . . . .                          |                         |   |
| 3. Leaves linear-obovate . . . . .                       | 3. <i>C. sonderi</i>    |   |
| Leaves spatulate or obovate . . . . .                    | 4. <i>C. capricorni</i> |   |

1. *Callitriche stagnalis* Scop.

Submerged freshwater plants with stems up to 90 cm long or creeping on mud and forming low mats. Leaves with petioles up to *ca* 5 mm long; blades variable, linear-spatulate to obovate to  $\pm$  orbicular, 0.25–2.5 cm  $\times$  0.1–0.9 cm, submerged leaves usually largest, 3-, 5- or 7-nerved, upper leaves forming rosette. Flowers solitary or male and female occurring together, bracteoles 0.8–1.5 mm long; filaments 1.4–2 mm long; styles 2.5–3.5 mm long. Fruits *ca* 1.2–1.7 mm diameter, wings broad.

Not common, found in southern parts of the region.

2. *Callitriche muelleri* Sonder

Prostrate herb, usually terrestrial though occasionally in shallow fresh water. Leaves with petioles *ca* 2–3 mm long; blades rhomboid, apex apiculate, margin usually with single tooth on either side, 2.5–7.5 mm  $\times$  1.5–5 mm, 3- or 5-nerved, upper leaves scarcely forming rosette. Flowers paired, usually a male and a female together in axil, bracteoles absent; filaments *ca* 0.3 mm long; styles minute. Fruits 1.1–1.2 mm  $\times$  1.2–1.4 mm, wings conspicuous.

Known from eastern parts of the region.

3. *Callitriche sonderi* Hegelm.

Minute mat forming terrestrial, sometimes inundated. Leaves linear-obovate, *ca* 1.5 mm  $\times$  0.5 mm, 3-nerved, upper leaves not forming well defined rosette. Flowers paired, usually a male and a female together in axil, bracteoles *ca* 0.2–0.5 mm long; stamens *ca* 1 mm long; styles minute. Fruits *ca* 0.5 mm  $\times$  0.7 mm, keeled and slightly winged.

Known from eastern parts of the region.

4. *Callitriche capricorni* R. Mason

Mat forming terrestrial. Leaves with petioles *ca* 1 mm long; blades spatulate or obovate, 2–3 mm  $\times$  *ca* 1 mm, 3-nerved, not forming distinct rosette. Flowers paired, usually a male and a female together in axil, bracteoles *ca* 0.2 mm long; stamens *ca* 0.3–1.5 mm long; styles minute. Fruits *ca* 0.5 mm  $\times$  0.7–0.9 mm, base thicker than top, wings conspicuous.

Rare, known from a few scattered localities in the region.

135. LAMIACEAE  
(LABIATAE)

Herbs, rarely woody. Leaves opposite or whorled, exstipulate. Inflorescences variable; flowers often axillary or in whorl-like clusters, bisexual, zygomorphic, rarely actinomorphic; calyx persistent, of 5 variously united sepals, often 2-lipped; corolla tubular, lobes 4–5, often forming 2 lips or rarely 1 lip; stamens 4 or 2, inserted on corolla tube; ovary superior, of 2 deeply lobed carpels, ovules 4 per ovary, style arising from inner base of lobes. Fruits of 4 nuts, free or cohering in pairs.

About 180 genera and 3500 species, cosmopolitan; *ca* 37 genera with *ca* 160 species Australia; 19 genera with 52 species south-eastern Queensland.

- |  |                         |
|--|-------------------------|
| 1. Calyx with 5–10 teeth, not divided into 2 lips . . . . .  | 2                       |
| Calyx divided into 2 lips which may or may not be toothed . . . . .  | 14                      |
| 2. Leaves in whorls of 3–6 . . . . .   | 3                       |
| Leaves opposite . . . . .  | 4                       |
| 3. Stamens 2; staminodes 2; anther connectives not dilated nor<br>bearded nor crested at end . . . . .   | 1. <i>Westringia</i>    |
| Stamens 4; staminodes absent, or if stamens 2 with 2 staminodes<br>then anther connectives of 2 fertile stamens dilated and bearded<br>or crested at end . . . . . | 2. <i>Hemigenia</i>     |
| 4. Corollas ± equally 4-lobed, not or scarcely 2-lipped . . . . .  | 5                       |
| Corollas ± distinctly 2-lipped . . . . .   | 6                       |
| 5. Perfect stamens 2 . . . . .   | 3. <i>Lycopus</i>       |
| Perfect stamens 4 . . . . .  | 4. <i>Mentha</i>        |
| 6. Perfect stamens 2 . . . . .   | 7                       |
| Perfect stamens 4 . . . . .  | 8                       |
| 7. Upper 2 stamens each with 1 perfect loculus, lower pair sterile . . . . .   | 1. <i>Westringia</i>    |
| Upper 2 stamens sterile, lower pair each with 1 perfect loculus . . . . .  | 5. <i>Anisomeles</i>    |
| 8. Upper leaves sessile, ± cordate, embracing flowers, not reduced in<br>size . . . . .  | 6. <i>Lamium</i>        |
| Upper leaves usually much reduced in size, not embracing flowers . . . . .   | 9                       |
| 9. Corollas much longer than calyces . . . . .   | 10                      |
| Corollas shorter or scarcely longer than calyces . . . . .   | 11                      |
| 10. Upper lip of corollas inconspicuous, lower lip long and spreading,<br>3-lobed; anthers 1-locular . . . . .   | 7. <i>Ajuga</i>         |
| Upper lip of corollas split so that lower lip appears 5-lobed;<br>anthers 2-locular . . . . .  | 8. <i>Teucrium</i>      |
| 11. Lower lip of corollas deflexed, saccate; stamens deflexed . . . . .  | 9. <i>Hyptis</i>        |
| Lower lip of corollas not saccate; stamens ascending under upper<br>lip . . . . .  | 12                      |
| 12. Anthers contiguous in pairs . . . . .  | 10. <i>Stachys</i>      |
| Anthers not contiguous . . . . .   | 13                      |
| 13. Upper lip of corollas densely villous outside . . . . .  | 11. <i>Leucas</i>       |
| Upper lip of corollas glabrous outside . . . . .   | 12. <i>Marrubium</i>    |
| 14. Perfect stamens 2 . . . . .  | 13. <i>Salvia</i>       |
| Perfect stamens 4 . . . . .  | 15                      |
| 15. Calyces with greatly enlarged reticulate-veined lips . . . . .   | 14. <i>Moluccella</i>   |
| Calyx lips not greatly enlarged . . . . .  | 16                      |
| 16. One or both calyx lobes toothed or lobed . . . . .   | 17                      |
| Both calyx lobes entire or nearly so . . . . .   | 19                      |
| 17. Upper calyx lips 3-toothed . . . . .   | 15. <i>Prunella</i>     |
| Upper calyx lips not toothed . . . . .   | 18                      |
| 18. Lower corolla lobe boat shaped, longer than upper lobes . . . . .  | 16. <i>Plectranthus</i> |
| Lower corolla lobe ± flat, not longer than upper lobes . . . . .   | 17. <i>Basilicum</i>    |
| 19. Upper calyx lip with hollow scale-like protuberance . . . . .  | 18. <i>Scutellaria</i>  |
| Upper calyx lip with no protuberance . . . . .   | 19. <i>Prostanthera</i> |

### 1. WESTRINGIA Smith

Shrubs. Leaves in whorls of 3 or more, rarely opposite, entire. Flowers axillary or rarely in leafy clusters, each flower with pair of bracts under calyx; calyx campanulate, 5-toothed; corolla tube with dilated throat, usually hairy inside, upper lip erect,

broadly 2-lobed, lower lip spreading, 3-lobed; upper 2 stamens perfect, anthers 1-locular with short slightly prominent connective not produced below its insertion on filament, lower stamens sterile, anthers reduced to small connective with 2 linear or linear-clavate branches; style shortly bifid. Nuts reticulate-rugose, attached up to middle or higher up.

About 22 species all endemic in Australia; *ca* 9 species south-eastern Queensland.

1. Leaves opposite	1. <i>W. rupicola</i>	
Leaves in whorls of 3 or rarely 4		2
2. Calyces densely silky pubescent		3
Calyces $\pm$ glabrous or if hairy then not densely silky pubescent		5
3. Leaves 4–10 mm broad	2. <i>W. grandifolia</i>	
Leaves 1–4 mm broad		4
4. Calyces 7–8 mm long; corollas <i>ca</i> 1.2 cm long; restricted to mountains of the southern Moreton district	3. <i>W. sericea</i>	
Calyces 5–6 mm long; corollas 0.8–1 cm long; widespread in south-eastern parts of the region	4. <i>W. eremicola</i>	
5. Bracts minute, up to 1.5 mm long		6
Bracts 2 mm long or longer		7
6. Stems slender, sparsely branched, several from thickened basal rootstock; leaf margins thickened but not recurved; plants of coastal wallum areas	5. <i>W. tenuicaulis</i>	
Stems much-branched, not all arising from basal rootstock; leaf margins thickened and slightly recurved; plants of sandy or stony areas of the Darling Downs district	6. <i>W. cheelii</i>	
7. Most leaves greater than 2.5 cm long; bracts 4–6.5 mm long	7. <i>W. blakeana</i>	
Leaves up to 2.5 cm long; bracts 2–4 mm long		8
8. Bracts 3–4 mm long; leaves 1.2–2 cm $\times$ 0.5–0.8 cm; plants of granite areas in the southern Darling Downs district	8. <i>W. amabilis</i>	
Bracts 2–3 mm long; leaves 1–2.5 cm $\times$ 0.2–0.5 cm; plants of northern Wide Bay district	9. <i>W. sp. 1.</i>	

### 1. *Westringia rupicola* S. T. Blake

Pendulous shrub; stems 30–50 cm long. Leaves opposite; petioles 0.8–1.3 mm long; blades linear-ovate, apex acute, mucronate, base attenuate, 2–4.5 cm  $\times$  0.15–0.4 cm, glabrous. Peduncles *ca* 3 mm long, bracts *ca* 3.5–4 mm long; calyx 5.5–7 mm long, lobes shorter than tube; corolla bluish white, 1.3–1.4 cm long, villous.

Known from Mt. Roberts and Springbrook in the McPherson Ra. in the southern Moreton district, growing in crevices in sheer rhyolite cliffs. Flowers spring and autumn.

### 2. *Westringia grandifolia* F. Muell. ex Benth.

Shrub up to *ca* 1 m tall, young branches, calyces and underside of leaves silvery white with dense appressed hairs. Leaves in whorls of 3, whorls usually close together, petioles 1–1.5 mm long; blades oblong-elliptic, apex acuminate, base cuneate, margin recurved, 1.5–4 cm  $\times$  0.4–1 cm,  $\pm$  glabrous above. Peduncles 1.5–2.5 mm long, bracts *ca* 5 mm long; calyx 8–10 mm long, lobes as long as or slightly longer than tube; corolla pale blue or almost white, *ca* 1.5 cm long, villous.

Glasshouse Mts. in the Moreton district, in rock crevices, rare. Flowers autumn and spring.

### 3. *Westringia sericea* B. Boivin

Shrub up to *ca* 1.5 m tall, young branches, undersides of leaves and calyces silky pubescent. Leaves in whorls of 3; petioles *ca* 1.5 mm long; blades linear-ovate or linear, apex acute, usually mucronate, base cuneate, margin recurved to revolute, 1.5–3 cm  $\times$  0.15–0.4 cm, silky pubescent to glabrous above. Peduncles *ca* 1 mm long, bracts 2–2.5 mm long; calyx 7–8 mm long, lobes  $\pm$  equal to tube; corolla pale purplish blue, *ca* 1.2 cm long, villous.

Known only from Mt. Edwards and Mt. Greville in the southern Moreton district, usually in crevices in rocky slopes and outcrops. Flowers spring and autumn.

**4. *Westringia eremicola* Cunn. ex Benth.**

Shrub up to *ca* 1.5 m tall; branches  $\pm$  hoary or silky pubescent. Leaves in whorls of 3; petioles up to *ca* 1.5 mm long; blades linear or linear-ovate, apex acute, often mucronate, base cuneate, margin revolute often to midrib, 1–2.5 cm  $\times$  0.1–0.25 cm, upper surface sparsely hairy, at length  $\pm$  glabrous, undersurface silky pubescent. Peduncles 1–1.5 mm long, bracts 1–1.5 mm long; calyx 5–6 mm long, silky pubescent, lobes as long as or longer than tube; corolla light blue, *ca* 8–10 mm long, villous. **Fig. 53B.**

Widespread in south-eastern parts of the region, usually in sandy or stony areas. Flowers found mainly spring with some in autumn.

**5. *Westringia tenuicaulis* C. T. White & Francis**

Shrub up to *ca* 45 cm tall; stems slender, sparsely branched, several arising from same rootstock, young shoots with sparse appressed hairs. Leaves in whorls of 3, rarely 4; petioles *ca* 1 mm long; blades linear-elliptic, apex acute, mucronate, base narrowed, margin slightly thickened but not recurved, 0.6–1.5 cm  $\times$  0.15–0.2 cm. Peduncles less than 1 mm long, bracts *ca* 1 mm long; calyx 6–7 mm long, lobes shorter than tube; corolla white to pale purplish blue, *ca* 1 cm long, villous.

Widespread and moderately common in wallum areas of the Moreton and Wide Bay districts. Flowers spring and autumn.

**6. *Westringia cheelii* Maiden & Betche**

*Westringia parvifolia* C. T. White & Francis; *Westringia longipedunculata* B. Boivin  
Spreading shrub 0.3–1.5 m tall. Leaves in whorls of 3; petioles less than 1 mm long; blades narrowly ovate to ovate to elliptic or oblong-elliptic, apex acute, base  $\pm$  cuneate, margin thickened and slightly recurved, 2–10 mm  $\times$  1–2.5 mm, from tomentose to glabrous. Flowers axillary but clustered at ends of shoots, peduncles mostly less than 1 mm long, rarely up to 2.5 mm long, bracts up to *ca* 1.5 mm long; calyx 4–6 mm long, glabrous to pubescent, lobes *ca* 1–1.5 mm long; corolla purplish blue to white, *ca* 0.8–1.2 cm long.

Widespread in the western Darling Downs district, usually in sandy or stony soils. Flowers mostly spring.

This is a very variable species. Specimens previously named *W. parvifolia* C. T. White & Francis and *W. longipedunculata* B. Boivin represent forms of **W. cheelii** which may deserve varietal status.

**7. *Westringia blakeana* B. Boivin**

Shrub 1.5–2.5 m tall. Leaves in whorls of 3; petioles *ca* 1.5 mm long; blades linear-ovate or narrowly ovate, apex acute, base cuneate, (2–)3–5 cm  $\times$  0.2–0.5 cm, puberulous or glabrous. Flowers upper axillary, often clustered at apex of shoot, peduncles *ca* 1.5 mm long, bracts 4–6.5 mm long; calyx 7.5–9 mm long, tube 3.5–4 mm long, teeth 4–5 mm long; corolla white or bluish with orange spots in throat, *ca* 1.5 cm long, villous. **Fig. 53A.**

Widespread but not common in the mountains and ranges near the border with New South Wales, usually in crevices in rhyolitic outcrops. Flowers spring.

**8. *Westringia amabilis* B. Boivin**

Shrub up to *ca* 3 m tall. Leaves in whorls of 3; petioles 1.5–2 mm long; blades ovate or narrowly ovate, apex acute, mucronate, base cuneate, 1.2–2(–2.5) cm  $\times$  0.4–0.5 cm, those of flowering shoots smaller, puberulent. Flowers upper axillary, often clustered at apex of branches, peduncles 1–1.2 mm long, bracts 3–4 mm long; calyx 6.5–8 mm long,  $\pm$  pubescent, often  $\pm$  glaucous at base, lobes 3–4 mm long, shorter than or equal to tube; corolla white or bluish, *ca* 1.5 cm long.

Known from granite areas in the southern Darling Downs district. Flowers spring.

**9. *Westringia* sp. 1.**

Shrub up to *ca* 1 m tall, branches glabrous or  $\pm$  silky pubescent. Leaves in whorls of 3; petioles 1–1.5 mm long; blades oblong-elliptic to narrowly ovate, apex acute, mucronate, base cuneate, margin  $\pm$  recurved, 1–2.5 cm  $\times$  0.2–0.5 cm, sparsely hairy above and below. Peduncles up to *ca* 1.5 mm long; bracts 2–3 mm long; calyx *ca* 7 mm long, sparsely hairy, lobes equal to or slightly longer than tube; corolla purplish.

Known only from the northern Wide Bay district.

**2. HEMIGENIA R. Br.**

Shrubs or undershrubs. Leaves opposite or in whorls of 3. Flowers all axillary, solitary, rarely clustered, bracts 2 under calyx; calyx 2-lipped or 5-toothed; corolla throat dilated, upper lip erect, emarginate or 2-lobed, lower lip longer, spreading, 3-lobed; stamens 4, didynamous, or rarely stamens 2, staminodes 2, anthers 1-locular, connective elongated into appendage or sterile branch which in upper pair is usually shortly dilated and bearded or crested at end with short hairs, appendage in lower pair or rarely in both pairs glabrous and attenuate or bearing an imperfect loculus at end. Nuts reticulate-rugose.

About 40 species all endemic in Australia; 1 species south-eastern Queensland.

**1. *Hemigenia cuneifolia* Benth.**

Shrub up to *ca* 2.5 m tall. Leaves with petioles 2–6 mm long; blades narrowly oblong-cuneate, apex acute-mucronate, base narrowed to petiole, margin entire, 1.5–3 cm  $\times$  0.15–0.4 cm,  $\pm$  glabrous. Calyx 4–5.5 mm long, lobes shorter than tube, often with few hairs on inside of lobes; corolla blue, *ca* 8 mm long; upper stamens with connective dilated and bearded, lower stamens  $\pm$  sterile with short connective, all imperfect at upper end, lower end linear and glabrous. **Fig. 53C.**

Moderately common around Stanthorpe in the southern Darling Downs district. Flowers spring–early summer.

**3. LYCOPUS L.**

Perennial herbs, usually emitting stolons. Leaves opposite. Flowers small, usually numerous in axillary clusters; calyx equally 4–5-toothed; corolla tube short, limb  $\pm$  equally 4-lobed; 2 upper stamens reduced to small filiform staminodes, 2 lower ones perfect, anthers 2-locular; style shortly bifid. Nuts smooth with 3 angles.

14 species all from temperate areas of the northern hemisphere except for 1 species endemic in Australia and occurring in south-eastern Queensland.

**1. *Lycopus australis* R. Br.****WATER HOREHOUND**

Erect herb up to *ca* 1 m tall, whole plant glabrous or sparsely hairy. Leaves with petioles 0–5 mm long; blades narrowly ovate or narrowly elliptic, apex acuminate, base attenuate, margin with few coarse acute teeth, 5–15 cm  $\times$  0.7–3 cm. Flowers  $\pm$  sessile; bracts linear or linear-ovate, up to *ca* 5 mm long, outer ones longer than calyx; calyx *ca* 3–4 mm long, teeth 5, longer than tube; corolla white, scarcely exceeding calyx. **Fig. 53D.**

Known from the eastern Darling Downs and southern Moreton districts. Flowers summer.

**4. MENTHA L.**

Perennial, rarely annual herbs, usually copiously gland-dotted and strongly scented. Leaves opposite. Flowers in axillary clusters or in terminal spikes, floral leaves reduced to bracts; calyx 5-lobed, equal, or calyx slightly 2-lipped; corolla 4-lobed, lobes  $\pm$  equal or upper ones broad and spreading; stamens 4, equal, usually exerted. Nuts smooth.

About 25 species from northern temperate regions, southern Africa and Australia; *ca* 5–6 endemic and *ca* 4 naturalized species Australia; 2 species south-eastern Queensland.

1. Leaves oblong, not broadest near base, margin entire; peduncles 2–7 mm long  
 Leaves broadly ovate, ovate or narrowly ovate, usually broadest towards base, margin crenulate; peduncles 1–2 mm long .
1. *M. satureioides*  
 2. *M. sp. 1.*

### 1. *Mentha satureioides* R. Br.

NATIVE PENNYROYAL

Much-branched erect or diffuse herb less than 30 cm tall, ± glabrous. Leaves with petioles 0–2 mm long; blades ± oblong, apex obtuse, base narrowed to petiole, margin entire, 1–2.5 cm × 0.1–0.3 cm, copiously gland-dotted. Flowers 3–8 in axillary cymose clusters, peduncles 2–7 mm long, pedicels 2–3.5 mm long; calyx *ca* 2–3 mm long, lobes deltoid, much shorter than tube, ciliate on margin; corolla white, exceeding calyx by *ca* 1.5–2 mm.

Darling Downs and Moreton districts, moderately common. Flowers found most of the year. It has been suspected of poisoning stock but there is no definite evidence.

### 2. *Mentha sp. 1.*

Much-branched erect or diffuse herb less than 30 cm tall, mostly arising from underground rhizomes. Leaves with petioles 1–5 mm long; blades broadly ovate, ovate or narrowly ovate, apex obtuse to acute, base truncate to cuneate, margin crenulate, 0.6–1.8 cm × 0.2–1.2 cm, copiously gland dotted, often with multicellular hairs on nerves below as well as denser minute ones, sometimes ± glabrous. Flowers usually 3 in axillary cymose clusters, peduncles 1–2 mm long, pedicels 1–1.5 mm long; calyx 1.5–2.5 mm long, lobes deltoid, ciliate on margins, much shorter than calyx tube; corolla white, exceeding calyx by 1–1.5 mm. **Fig. 53E.**

Widespread and moderately common in the region. Flowers found most of the year.

Apparently related to *Mentha dimenica* Sprengel.

## 5. ANISOMELES R. Br.

Herbs, rarely shrubs, stems and branches softly pubescent or woolly. Leaves opposite. Flowers in axillary clusters or cymes, forming loose terminal spicate or paniculate inflorescences; calyx 10-nerved, almost equally 5-toothed; upper corolla lip entire, erect, lower lip 3-lobed; stamens 4, exserted, didynamous, anthers of upper pair sterile, lower pair each with 1 fertile loculus. Nuts smooth, flattened.

About 6 species from eastern Africa through south-eastern Asia to Australia; 1 species Australia, occurring in south-eastern Queensland.

### 1. *Anisomeles malabarica* (L.) R. Br. ex Sims

*Nepeta malabarica* L.; *Anisomeles salviifolia* R. Br.; *Epimeredi salviifolius* (R. Br.) Rothm.

Coarse erect herb 0.3–1.2 m tall. Leaves with petioles 0.5–2.5 cm long; blades oblong to narrowly ovate, apex acute, base cuneate, margin crenate-serrate, 3–8 cm × 1.2–3 cm, ± densely woolly below, less densely so above. Flowers up to 10 in axillary cymes, primary branches of each cyme often lengthening to *ca* 1 cm long; calyx *ca* 4 mm long when flowering, lengthening to 6–8 mm long in fruit, hirsute; corolla pink, blue or pale purple, 0.6–1.4 cm long. Nutlets ellipsoid, 2 mm long.

Widespread but not common in eastern parts of the region, usually in open eucalypt communities. Flowers autumn.

## 6. LAMIUM L.

Annual or perennial herbs. Leaves opposite, toothed or incised, ± cordate. Flowers small, in axillary and terminal clusters; calyx tubular-campanulate, usually 5-nerved, 5-toothed, teeth equal or upper longer; corolla 2-lipped, upper lip hooded, erect, usually entire, lower lip spreading, 3-lobed with middle lobe emarginate, contracted at

base, lateral lobes often with lateral appendage; stamens 4, anterior pair longer, anthers 2-locular; style bifid. Nuts smooth or tuberculate.

About 40 species, Europe, Asia and parts of Africa; 2 species naturalized Australia; 1 species south-eastern Queensland.

**1. \**Lamium amplexicaule* L.**

DEADNETTLE; HENBIT

Slender sparsely to densely pubescent ascending herb up to *ca* 40 cm tall; stems freely branched from base. Lower leaves with petioles up to *ca* 6 cm long, leaves subtending flower clusters sessile and stem clasping; blades broadly ovate to reniform or nearly orbicular, apex rounded, base truncate to cordate, margin coarsely crenate, basal leaves 1–2 cm × 1–2 cm, upper leaves 1–3 cm × 2–4 cm. Flowers 6–10 in clusters; calyx 5–7 mm long, teeth ± as long as tube; corolla pinkish purple or bluish or reddish, 1.2–1.6 cm long, upper lip pubescent with reddish hairs. Nuts smooth. **Fig. 53G.**

Native of Europe; naturalized in the Moreton, eastern Darling Downs and southern Burnett districts, often found as a weed of cultivation. Flowers spring–summer. It is poisonous to stock.

**7. AJUGA L.**

Herbs, usually diffuse or ascending or with spreading radical leaves and shortly erect stems. Flowers in clusters in axils of floral leaves, gradually smaller than radical or cauline leaves, upper flowers sometimes forming terminal leafy spikes; calyx teeth 5, equal; upper corolla lip very short, truncate or emarginate, lower lip long and spreading with middle lobe much larger than laterals; stamens 4, didynamous, exerted from upper lip; anthers reniform, 1-locular. Nuts laterally attached to near or above middle.

About 40 species mainly from warm areas of the world; 2 species, 1 naturalized, Australia; 1 species south-eastern Queensland.

**1. *Ajuga australis* R. Br.**

AUSTRALIAN BUGLE

Perennial herb, up to *ca* 30 cm tall. Leaves mainly radical; petioles 1–4 cm long; radical and lower cauline blades obovate or oblong, apex obtuse to acute, base cuneate, margin toothed or lobed, 2–12 cm × 1–5 cm, pubescent, upper cauline blades becoming shorter and narrower, passing into sessile ± entire ones above, extreme upper ones often shorter than flowers. Flowers in clusters of 6–20, very variable in size, up to *ca* 2 cm long; corolla blue. Nuts glabrous, rugose. **Fig. 53I.**

Widespread in the region. Flowers found most of the year but mainly spring–early summer.

**8. TEUCRIUM L.**

Perennial herbs with simple serrate leaves and flowers in slender spikes, or smaller annual or perennial plants with at least some leaves pinnatifid and flowers in axils of reduced upper leaves. Calyx 5-toothed, teeth equal or upper one larger; corolla with upper lip short, 4-lobed, lower lip conspicuous and spreading; stamens 4, didynamous, exerted from deep cleft between 2 upper lobes of corolla, anthers 2-locular.

About 300 species from temperate and tropical regions of the world; 9–10 species Australia; 4 species south-eastern Queensland.

- |  |                         |
|--|-------------------------|
| 1. Flowers sessile or nearly so . . . . .  | 2                       |
| Flowers on peduncles longer than calyx . . . . .   | 3                       |
| 2. Leaves ovate, 1–2 times as long as broad, with long dense spreading hairs . . . . .             | 1. <i>T. argutum</i>    |
| Leaves linear-elliptic, 6–10 times as long as broad, glabrous or with short hispid hairs . . . . . | 2. <i>T. sp. 1.</i>     |
| 3. Peduncles 1-flowered . . . . .  | 3. <i>T. racemosum</i>  |
| Peduncles 3- or more-flowered . . . . .  | 4. <i>T. corymbosum</i> |

**1. *Teucrium argutum* R. Br.**

## NATIVE GERMANDER

Perennial with erect simple or slightly branched stems, at least young stems with long spreading conspicuous hairs. Leaves with petioles 0.3–1.5 cm long; blades ovate, apex obtuse to acute, base cuneate to cordate, margin serrate or crenate to pinnatifid, 0.8–6 cm × 0.6–3 cm, mostly less than 4 cm × 2 cm in south-eastern Queensland, usually 1–2 times as long as broad, both surfaces with dense long spreading hairs. Flowers ± sessile in terminal spikes up to *ca* 10 cm long, bracts conspicuous, longer than calyx; calyx 4–6 mm long, with dense glandular hairs, hairs *ca* 0.5 mm long; corolla pink or mauve, *ca* 10 mm long, upper 4 lobes small, acute, lower lobe much larger. Nuts glabrous.

Two varieties occur in the region:

- |  |                                       |
|--|---------------------------------------|
| 1. Leaf margins serrate or crenate . . . . .     | <i>T. argutum</i> var. <i>argutum</i> |
| Leaf margins pinnatifid or pinnatisect . . . . . | <i>T. argutum</i> var. <i>incisum</i> |

*T. argutum* var. *argutum* is known from open woodlands or grassy areas of the region. *T. argutum* var. *incisum* Benth. is known from open somewhat drier areas of the Darling Downs and Burnett districts. Both varieties flower mostly summer–autumn.

**2. *Teucrium* sp. 1.**

Herb up to *ca* 25 cm tall, stems with minute recurved hairs. Leaves with petioles 1–8 mm long; blades linear-elliptic, apex acute, base mostly hastate, margin entire or with few teeth, 1–3 cm × 0.1–0.35 cm, 6–10 times as long as broad, glabrous or with short hispid hairs. Flowers ± sessile in terminal spikes up to *ca* 9 cm long, sometimes spikes on upper lateral branches forming terminal panicles of spikes, bracts shorter than calyx; calyx *ca* 3 mm long, densely glandular pubescent, hairs less than 0.25 mm long; corolla *ca* 8 mm long.

Known from around Chinchilla in the Darling Downs district.

**3. *Teucrium racemosum* R. Br.**

## GREY GERMANDER

Erect perennial up to *ca* 30 cm tall, rootstock woody, stems leaves and inflorescences with hoary or white close minute tomentum, less dense on upper surface of older leaves. Leaves with petioles 0–2 mm long; blades linear-ovate or linear-oblong, occasionally narrowly ovate or narrowly oblong or narrowly elliptic, apex ± acute, base narrowed, margin entire or undulate, 1–3.5 cm × 0.2–0.5 cm. Peduncles all 1-flowered, rigid, up to *ca* 1.5 cm long; calyx 3–6 mm long; corolla white, 1–1.3 cm long, lower lobe twice as long as others.

Known from the western Darling Downs district. Flowers found most of the year except midwinter.

**4. *Teucrium corymbosum* R. Br.**

Erect or sprawling perennial herb up to *ca* 1 m tall, stems and leaves covered with short white hairs. Leaves with petioles up to *ca* 10 mm long; blades narrowly elliptic to narrowly obovate, apex acute, base attenuate, margin irregularly serrate, 2–5.5 cm × 0.8–2 cm, often smaller on flowering branches. Peduncles 0.5–2 cm long, bearing loose cyme of 3–9 flowers; calyx 2.5–4 mm long; corolla white, 6–8 mm long.

Known from a few places in the southern Darling Downs and Moreton districts. Flowers spring to autumn.

**9. HYPTIS Jacq.**

Herbs or undershrubs, strong smelling. Leaves opposite, crenate-serrate, copiously gland dotted. Flowers small in axillary heads or cymes, often combined into panicles; calyx 10-nerved, 4-lobed, lobes subequal; corolla equalling or slightly exceeding calyx, upper lip 4-lobed, flat, lateral lobes ± close to lower lip, lower lip saccate, deflexed, with thickened basal transverse crest; stamens 4, shortly exerted, deflexed, 2 anterior ones longest, anthers 2-locular; style shortly bifid. Nuts glabrous.

About 400 species tropical and subtropical Americas and West Indies; 2 species naturalized Australia; 1 species south-eastern Queensland.



Fig. 53 LAMIACEAE — A–B *Westringia* spp. — A<sub>1</sub>–A<sub>2</sub> *W. blakeana*, A<sub>1</sub> portion of flowering stem x1, A<sub>2</sub> calyx x2; B<sub>1</sub>–B<sub>2</sub> *W. eremicola*, B<sub>1</sub> portion of flowering stem x1½, B<sub>2</sub> flower x2½; C *Hemigenia cuneifolia*, anther x25; D *Lycopis australis*, portion of flowering stem x1/3; E<sub>1</sub>–E<sub>2</sub> *Mentha* sp. 1., E<sub>1</sub> portion of flowering stem x1, E<sub>2</sub> flower x3; F *Hyptis suaveolens*, fruiting calyx x1½; G<sub>1</sub>–G<sub>2</sub> *Lamium amplexicaule*, G<sub>1</sub> portion of flowering stem x1, G<sub>2</sub> flower x1; H<sub>1</sub>–H<sub>3</sub> *Stachys arvensis*, H<sub>1</sub> portion of fertile stem x1, H<sub>2</sub> calyx x6, H<sub>3</sub> flower x6; I<sub>1</sub>–I<sub>2</sub> *Ajuga australis*, I<sub>1</sub> portion of flowering stem x1, I<sub>2</sub> flower x2.

1. \**Hyptis suaveolens* (L.) Poit.

HYPTIS

*Ballota suaveolens* L.

Annual erect herb up to *ca* 1.5 m tall, woody at base, whole plant with glandular hairs intermixed with non glandular ones. Leaves with petioles 0.5–4 cm long; blades ovate or triangular, apex acute, base cordate to rounded, margin crenate-serrate, 2–10 cm × 1.5–6 cm, those of flowering branches smaller. Peduncles 0–2.5 cm long, solitary in leaf axil but often arising in axils of much-reduced lateral shoots giving appearance of several peduncles per node; flowers 1–5 in fascicles on peduncle, pedicels 0–5 mm long; calyx in flower 4–6 mm long, lobes 2–3 mm long, calyx in fruit 0.8–1.2 cm long, lobes 2–4 mm long; corolla bluish violet, *ca* 6–7 mm long. **Fig. 53F.**

Native of the American tropics, now widespread in tropical parts of the world; naturalized but not common in coastal Wide Bay district, usually as a weed of disturbed areas. Flowers late summer to winter.

## 10. STACHYS L.

Annual biennial or perennial herbs. Leaves opposite. Flowers in clusters forming terminal racemes or spikes or sometimes panicles of spikes; calyx 5–10-nerved, 5-toothed, teeth ± equal; corolla bilabiate; stamens 4, didynamous, ascending under upper corolla lip, anthers contiguous in pairs.

About 300 species mostly north temperate zone but also South America and southern Africa; 2 species naturalized Australia; 1 species occurring in south-eastern Queensland.

1. \**Stachys arvensis* (L.) L.

STAGGER WEED

*Glechoma arvensis* L.

Decumbent or ascending annual up to *ca* 30 cm tall, stems with spreading hairs. Leaves with petioles 0.1–1.5 cm long; blades ovate or ovate-orbicular, apex obtuse, base cordate to cuneate, margin crenate, 0.8–4 cm × 0.4–3 cm, sparsely hirsute. Flowers in clusters of 2–6 forming loose leafy spikes; calyx 5–7 mm long; corolla pale purple or pinkish, scarcely longer than calyx. **Fig. 53H.**

Native of Europe and Asia; naturalized, widespread and moderately common in the region. Flowers late winter–spring. It is sometimes poisonous to stock, particularly those under stress.

## 11. LEUCAS R. Br.

Herbs or undershrubs, often annual, strong smelling. Leaves opposite, mostly crenate-dentate-serrate. Flowers in axillary clusters often crowded at tip of stems; calyx erect, straight or curved and oblique at top, 7–10-ribbed, 7–10-lobed; corolla tube ± equal to calyx tube, 2-lipped, upper lip erect, densely villous outside, lower lip large, spreading, 3-lobed; stamens 4, ascending in pairs under upper lip, anthers 2-locular; style with upper stigmatic lobe much shorter than other. Nuts smooth, glabrous.

About 100 species from tropical parts of the world; 1 native and 3 naturalized species Australia; 2 species south-eastern Queensland.

1. Calyces ± glabrous or with very short indumentum, mouth oblique, teeth 7–10, upper tooth *ca* 1.5–2.5 mm long, others minute and spinescent

1. *L. lavandulifolia*

- Calyces hirsute and woolly, mouth not or scarcely oblique, teeth 10, upper tooth *ca* 4 mm long, others *ca* 1.5–2 mm long, all ciliate

2. *L. martinicensis*1. \**Leucas lavandulifolia* Smith

LEUCAS

*Leucas linifolia* (Roth) Sprengel

Erect annual 30–80 cm tall, stems and branches pubescent. Leaves with petioles up to *ca* 1 cm long; blades linear-ovate or narrowly ovate, apex acuminate often obtusely so, base attenuate, margin subentire or remotely serrate, 3–8 cm × 0.3–1.5 cm, shortly pubescent. Flowers in axillary clusters often congested towards apex of branch, bracts linear, 3–4 mm long; calyx 6–7 mm long in flower, 8–9 mm long in fruit, throat

oblique, teeth 7–10, uppermost largest, 1.5–2.5 mm long, lower ones minute and spinescent, whole calyx glabrous or with very short indumentum; corolla white, *ca* 10 mm long, upper lip white woolly, lower lip spreading. **Fig. 55A.**

Native of southern Asia from India to New Guinea; naturalized in south-eastern Queensland around Palmwoods in the northern Moreton district, occasional. Flowers found most of the year.

## 2. \**Leucas martinicensis* R. Br.

Erect annual 40–60 cm tall, stems and branches hirsute. Leaves with petioles 0.5–1.5 cm long; blades oblong or narrowly ovate, apex acute-acuminate, base cuneate to rounded, margin serrate-crenate, 3–8.5 cm × 0.8–4.5 cm, hirsute. Flowers in globose axillary clusters, bracts linear, 0.5–1 cm long; calyx *ca* 9 mm long in flower, *ca* 10 mm long in fruit, hirsute, teeth 10, narrow, ciliate, with spinescent tips, uppermost largest, *ca* 4 mm long, others *ca* 1.5–2 mm long; corolla white, 7–8 mm long, included in calyx or barely exerted, two lips subequal.

Native of tropical America, Africa and southern Asia; naturalized in northern parts of the region. Flowers most of the year.

## 12. MARRUBIUM L.

Perennial tomentose or woolly herbs. Leaves opposite. Flowers in dense axillary clusters; calyx 5–10-nerved, 5–10-toothed, teeth short, subspinescent; corolla bilabiate, upper lip erect, 2-fid, lower lip spreading, 3-lobed; stamens 4, included in corolla tube, anther cells diverging. Nuts smooth.

About 40 species from Europe, western Asia and Mediterranean region; 1 species naturalized Australia, occurring in south-eastern Queensland.

### 1. \**Marrubium vulgare* L.

### WHITE HOREHOUND; HOREHOUND

Robust herb 20–80 cm tall, clothed with white woolly hairs. Leaves with petioles 1–2.5 cm long; blades ovate or orbicular, apex obtuse, base rounded, margin irregularly crenate, 1–4 cm × 1–3 cm, surface usually rugose. Calyx 4–5 mm long, teeth 10, subulate, recurved; corolla white, slightly longer than calyx. **Fig. 55B.**

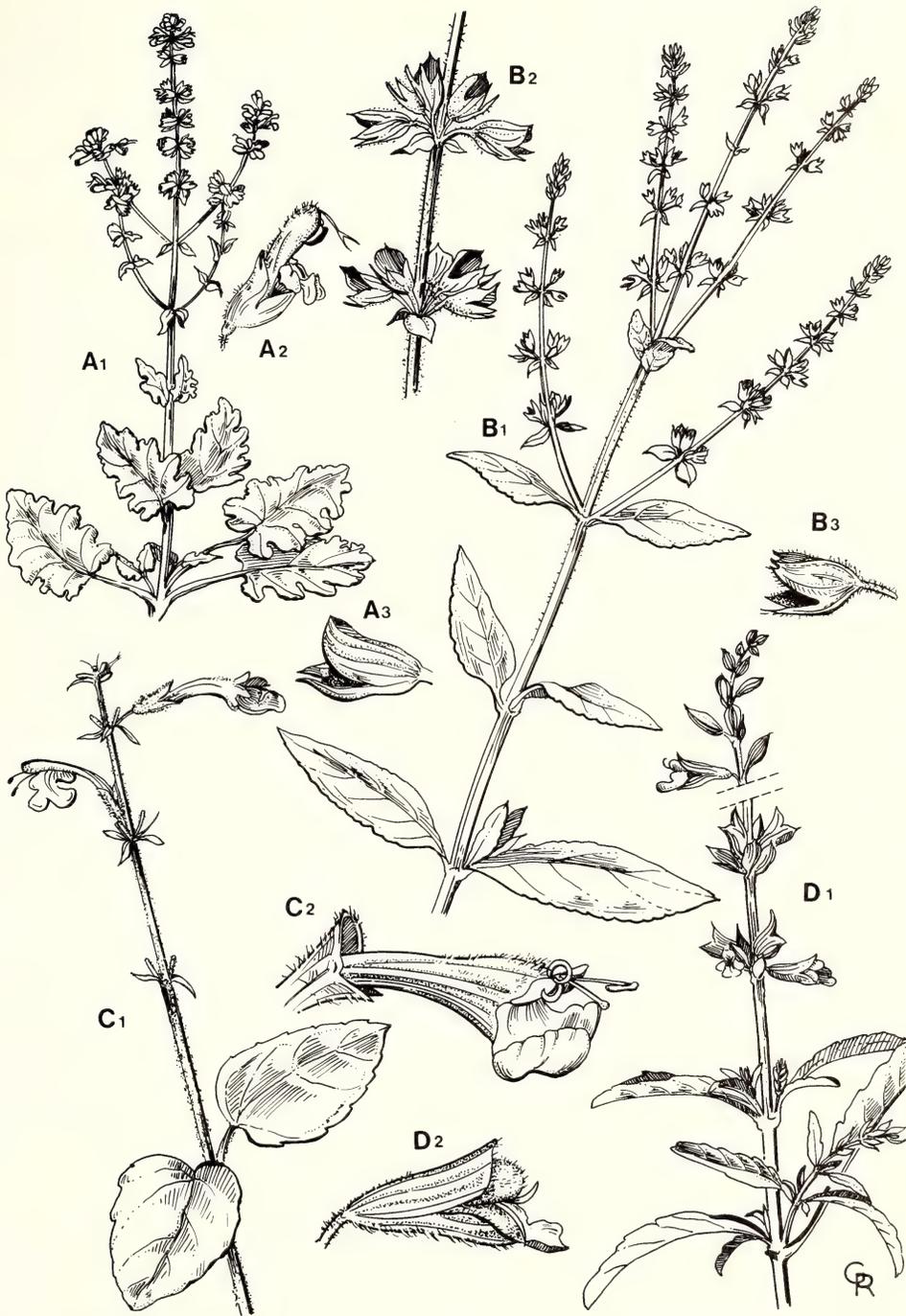
Native of Europe and western Asia; naturalized and widespread in the Moreton, eastern Darling Downs and southern Burnett districts, mainly a weed of pastures. Flowers found most of the year but mainly spring. It has been suspected of poisoning stock but there is no definite evidence.

## 13. SALVIA L.

Herbs or shrubs. Leaves opposite. Flowers in clusters arranged in terminal thyrses or racemes; calyx 2-lipped, upper lip 3-toothed or entire, lower lip deeply 2-fid or 2-toothed; corolla 2-lipped, upper lip convex, erect, 2-lobed, lower lip 3-lobed, spreading and partly reflexed; stamens 2, connective elongated, posterior loculus of each anther sterile, often expanded and flattened distally.

About 70 species from tropical and temperate parts of the world; 1 native and *ca* 6 naturalized species Australia; 5 species south-eastern Queensland.

- |   |                        |   |
|---|------------------------|---|
| 1. Corollas red, 2–2.5 cm long . . . . .                                  | 1. <i>S. coccinea</i>  | 2 |
| Corollas blue, violet, purplish or whitish, less than 1 cm long . . . . . | . . . . .              |   |
| 2. Leaf blades ± pinnatifid at least at base of plant . . . . .           | 2. <i>S. verbenaca</i> | 3 |
| Leaf blades not pinnatifid . . . . .                                      | . . . . .              |   |
| 3. Leaf blades 1.2–2.2 times as long as broad . . . . .                   | 3. <i>S. riparia</i>   | 4 |
| Leaf blades 3–7 times as long as broad . . . . .                          | . . . . .              |   |
| 4. Leaf blades mostly 3–4 times as long as broad . . . . .                | 4. <i>S. plebeia</i>   |   |
| Leaf blades mostly 4.5–7 times as long as broad. . . . .                  | 5. <i>S. reflexa</i>   |   |



**Fig. 54** LAMIACEAE — A–D *Salvia* spp. — A<sub>1</sub>–A<sub>3</sub> *S. verbenaca*, A<sub>1</sub> portion of flowering stem x1/4, A<sub>2</sub> flower x2, A<sub>3</sub> calyx x2; B<sub>1</sub>–B<sub>3</sub> *S. plebeia*, B<sub>1</sub> portion of flowering stem x1, B<sub>2</sub> detail of fruiting inflorescence x2, B<sub>3</sub> calyx x3; C<sub>1</sub>–C<sub>2</sub> *S. coccinea*, C<sub>1</sub> portion of flowering stem x1, C<sub>2</sub> flower x3; D<sub>1</sub>–D<sub>2</sub> *S. reflexa*, D<sub>1</sub> portion of flowering stem x1, D<sub>2</sub> flower x3.

1. \**Salvia coccinea* Juss. ex Murray

## RED SALVIA

Slender perennial herb up to *ca* 1 m tall, stems with short recurved hairs and often with long spreading silky hairs. Leaves with petioles 0.5–1 cm long; blades ovate or deltoid-ovate or narrowly ovate, apex acute or  $\pm$  obtuse, base truncate or cordate, margin crenate or serrate, 1.5–5 cm  $\times$  1–3.5 cm,  $\pm$  glabrous to pubescent above, more densely pubescent below. Flowers 6–10 in clusters arranged in racemes, pedicels 2–6 mm long; calyx tube 7–8 mm long in flower, 9–10 mm long in fruit, upper lip entire; corolla bright red, 2–2.5 cm long, tube much exerted. **Fig. 54C.**

Native of tropical America; probably introduced as a garden plant, naturalized in the Moreton and Wide Bay districts. Flowers found most of the year. It has been suspected of poisoning stock.

2. \**Salvia verbenaca* L.

## WILD SAGE

Erect perennial herb 10–60 cm tall. Leaves collected in basal rosette as well as along stem; petioles 3–8 cm long in lower cauline and rosette leaves, upper cauline almost sessile; blades oblong to ovate, apex acute to obtuse, base broadly cuneate, lower cauline and rosette leaves  $\pm$  pinnatifid with wide lobes, margin of lobes irregularly serrate, 3–10 cm  $\times$  1.5–4 cm, upper cauline leaves often merely toothed, smaller than rosette leaves, all leaves sparsely hairy above and below. Racemes up to *ca* 15 cm long; calyx *ca* 5 mm long in flower, 7–8 mm long in fruit; corolla blue or violet, 6–8 mm long. **Fig. 54A.**

Native of Europe; naturalized in the eastern Darling Downs district, weed of roadsides and waste places. Flowers spring–summer.

3. \**Salvia riparia* Kunth

Strong smelling  $\pm$  erect  $\pm$  perennial herb up to *ca* 1 m tall, stems and branches with long strigose and short glandular hairs. Leaves with petioles 0.1–1 cm long; blades ovate, apex acute, base cuneate or attenuate, margin serrate, 1–6.5 cm  $\times$  0.4–4 cm, 1.2–2.2 times as long as broad, both surfaces hirsute with non glandular and glandular hairs, few sessile glands also present below. Racemes up to *ca* 20 cm long, often forming terminal panicles, pedicels up to *ca* 5 mm long; calyx 3–3.5 mm long in flower, 5–7 mm long in fruit, mucro of lower lip 0.7–1 mm long; corolla blue, 5.5–6 mm long.

Native of tropical America; naturalized, reported from the eastern Wide Bay district.

This taxon has been confused with *Salvia misella* Kunth. However *S. misella* has a calyx 1.5–2 mm long in flower and 3–4 mm long in fruit. *S. misella* is known in Queensland from near Cairns but possibly may occur elsewhere in coastal Queensland.

4. *Salvia plebeia* R. Br.

## COMMON SAGE

Erect annual herb 40–60 cm tall; stems 4-angled, grooved, tomentose or glabrescent. Leaves with petioles 0.5–4 cm long; blades narrowly ovate or elliptic, apex subacute or obtuse, base attenuate or cuneate, margin crenate, 1.5–10 cm  $\times$  0.5–2.5 cm, mostly 3–4 times as long as broad, sparsely to densely hairy above and below, also with few to many sessile glands. Racemes up to *ca* 15 cm long, often forming terminal panicles; flowers 4 or more per cluster; calyx *ca* 2 mm long in flower, *ca* 2.5 mm long in fruit, teeth of lower lip acute, scarcely mucronate; corolla violet or purplish to blue, 3–3.5 mm long. **Fig. 54B.**

Widespread in the region. Flowers spring to autumn but mainly late spring–early summer.

5. \**Salvia reflexa* Hornem.

## MINTWEED

*Salvia lanceaefolia* Poiret; *Salvia lanceolata* Willd.

Annual herb up to *ca* 70 cm tall, stems puberulent to glabrous. Leaves with petioles up to *ca* 1.5 cm long; blades narrowly ovate to linear-ovate to linear-oblong, apex obtuse to acute, base attenuate, margin serrulate to entire, 1.5–5 cm  $\times$  0.3–1.2 cm, mostly 4.5–7 times as long as broad, glabrescent above, pubescent below, both surfaces with sessile glands. Racemes up to *ca* 12 cm long, often forming terminal panicles;

flowers 1–3 per cluster, pedicels 2–3 mm long; calyx *ca* 5–6 mm long in flower, 6–8 mm long in fruit; corolla blue to whitish, 7–8 mm long, exserted from calyx by *ca* 2 mm. **Fig. 54D.**

Native of southern United States of America and northern Mexico; naturalized, widespread and moderately common in the region. Flowers mainly late spring to autumn. It can be poisonous to stock. The species is a declared noxious weed under the Stock Routes and Lands Protection Acts, 1944–1967.

#### 14. MOLUCCELLA L.

Annual glabrous herbs. Leaves opposite. Flowers in axillary clusters, bracts subulate-spinose; calyx  $\pm$  2-lipped with greatly enlarged reticulate-veined lips; corolla bilabiate, upper lip hooded, lower lip 3-lobed; stamens 4, didynamous. Nuts acutely triquetrous.

4 species from the Mediterranean region to north-western India; 1 species naturalized Australia, occurring in south-eastern Queensland.

##### 1. \**Molucella laevis* L.

##### MOLUCCA BALM

Erect or ascending up to *ca* 60 cm tall. Leaves with petioles 2–4 cm long; blades broadly ovate to almost orbicular, apex obtuse, base truncate to cuneate, margin deeply crenate, 1.5–4.5 cm  $\times$  1.5–4.5 cm. Flowers in clusters of 6, bracts spinose, *ca* 10 mm long; calyx margin 5-toothed, teeth ending in spines, *ca* 2 cm diameter, enlarging to 4–5 cm after flowering; corolla whitish, *ca* 1 cm long. **Fig. 55C.**

Native of the Mediterranean region; naturalized but not common in the eastern Darling Downs district and probably in the southern Burnett district. Flowers spring.

#### 15. PRUNELLA L.

Perennial herbs. Leaves opposite. Flowers in clusters arranged in dense terminal cylindrical spikes, bracts distinctly different from leaves; calyx 2-lipped, upper lip  $\pm$  3-toothed, lower lip with 2 larger teeth; corolla tube exceeding calyx, with ring of hairs inside, upper lip distinctly hooded, lower lip denticulate; stamens 4, in pairs, enclosed in upper lip, filaments with subulate appendage below apex, anther cells divergent.

7 species from temperate Eurasia, north-western Africa and North America; 1 species naturalized Australia, occurring in south-eastern Queensland.

##### 1. \**Prunella vulgaris* L.

##### SELF HEAL

Usually decumbent and shortly creeping at base. Leaves with petioles 0.5–2 mm long; blades ovate or narrowly ovate, apex obtuse to acute, base cuneate, margin entire to irregularly crenate, 1.8–4 cm  $\times$  0.8–1.5 cm, sparsely hairy above and below. Flowers 6 in each cluster, each cluster subtended by 2 broad bracts 0.5–1.5 cm long, the whole forming dense terminal spike up to *ca* 5 cm long; calyx 8–9 mm long; corolla violet, *ca* 1.2 cm long. **Fig. 55D.**

Native of Europe; naturalized in a few places near rainforest, uncommon. Flowers spring–summer.

#### 16. PLECTRANTHUS L'Hérit.

Herbs subshrubs or shrubs, often somewhat succulent. Leaves opposite. Flowers in compact cymose clusters arranged into terminal and upper axillary racemes, cymes  $\pm$  sessile; calyx clearly 2-lipped, upper lip of single broad lobe scarcely longer than lower lip, lower lip of 4 narrow lobes; corolla tube longer than calyx, gibbous or produced into spur on upper side, upper lip 3–4-lobed, lower lip entire; stamens 4, free. Nuts smooth or slightly granular.

About 250 species from tropical Africa to Asia and Japan, Malaysia to Australia and some Pacific Is.; 14 species Australia; 5 species south-eastern Queensland.

- |   |                          |   |
|---|--------------------------|---|
| 1. Leaves narrowly ovate, mostly 2.2–4.2 times as long as broad . . . . .   | 1. <i>P. allopectus</i>  | 2 |
| Leaves ovate or broadly ovate, mostly 1–2 times as long as broad . . . . .  |                          |   |
| 2. Undersurface of leaves with few or no stalked glands, but with dense sessile glands . . . . .                    |                          | 3 |
| Undersurface of leaves with dense stalked glands and few to many sessile glands . . . . .                           |                          | 4 |
| 3. Corollas eglandular; leaves with 13–23 pairs of teeth . . . . .  | 2. <i>P. argentatus</i>  |   |
| Corollas with sessile glands at least on upper lobes; leaves with 4–12 pairs of teeth . . . . .                     | 3. <i>P. parviflorus</i> |   |
| 4. Corollas with stalked glands and few sessile glands; underside of leaves with few or no sessile glands . . . . . | 4. <i>P. suaveolens</i>  |   |
| Corollas with sessile glands but no stalked glands; underside of leaves with many sessile glands . . . . .          | 5. <i>P. graveolens</i>  |   |

### 1. *Plectranthus allopectus* S. T. Blake

Scentless shrub up to *ca* 70 cm tall, branches with dense yellowish or whitish multicelled reflexed hairs and orange sessile glands. Leaves with petioles 0.2–1(–2) cm long; blades narrowly ovate, apex obtuse or acute, base  $\pm$  cuneate, margin crenulate, 3–7.5 cm  $\times$  1–3.5 cm, (1.8–)2.2–4.2 times as long as broad, pubescent and with sessile glands above, more densely hairy and glandular below, veins much impressed above, much raised below. Racemes 1–3 together, mostly 6–25 cm long, pedicels 1–3 mm long; calyx 1.7–2.3 mm long in flower, 3.5–4 mm long in fruit; corolla mainly violet blue, 0.8–1.2 cm long,  $\pm$  pubescent above base, most lobes with sessile glands, tube decurved at angle of 120°–140°.

Known from mountains of the southern Moreton district, on cliffs and steep ledges of trachyte. Flowers from late summer to mid winter.

### 2. *Plectranthus argentatus* S. T. Blake

Spreading shrub up to *ca* 1 m tall, branches pubescent with recurved silvery multicelled hairs and dense sessile glands. Leaves with petioles 1.2–5 cm long; leaf blades ovate to broadly ovate, apex acute, base rounded to cuneate, margin crenate with 13–23 pairs of teeth, 5–11.5 cm  $\times$  3–5.5 cm, 1.4–2 times as long as wide, both sides of leaf with  $\pm$  dense sessile glands and few or no stalked glands, pubescent above, more densely so below, young leaves with silvery sheen. Racemes 12–30 cm long, pedicels 2.5–4 mm long; calyx 1.6–2.5 mm long in flower, 4–4.5 mm long in fruit; corolla bluish white, 0.9–1.1 cm long, eglandular, tube glabrous, upper lobes sparsely pubescent, tube scarcely decurved.

Known from mountains and ranges along the border with New South Wales, not common. Flowers late summer–autumn.

### 3. *Plectranthus parviflorus* Willd.

Shrub mostly 10–70 cm tall, with fleshy tuberous base up to *ca* 3 cm diameter, branches die away after flowering nearly or quite to tuber, branches with abundant short retrorse multicelled hairs and few to many longer spreading to retrorse multicelled hairs, occasionally with few gland tipped hairs and few or no sessile glands. Leaves with petioles 0.5–5 cm long; blades orbicular-ovate to ovate to oblong-ovate, apex obtuse to  $\pm$  acute, base cuneate to truncate, margin crenate to crenate-dentate with 4–12 pairs of teeth, 2–6.5 cm  $\times$  2–4 cm, mostly 1–2 times as long as broad, sparingly to densely pubescent above, occasionally with few sessile glands, lower surface less pubescent. Racemes 1–5 together, mostly 3–15 cm long, pedicels 1–6 mm long; calyx 1.4–2.6 mm long in flower, 4–5 mm long in fruit; corolla pale blue to violet-blue, 0.6–1.1 cm long,  $\pm$  pubescent, at least upper lobes with sessile glands, stalked glands absent, tube decurved at an angle of 110°–140°. **Fig. 55G.**

Widespread and moderately common in the region in a variety of habitats. Flowers found most of the year.

**4. *Plectranthus suaveolens* S. T. Blake**

Sweet smelling undershrub with decumbent or suberect branches up to 80 cm long, often rooting at lower nodes, branches densely pubescent with short white retrorse hairs and many shorter stalked glands, sessile glands very few or absent. Leaves with petioles 0.5–2 cm long; blades ovate, apex obtuse-acute, base subtruncate to cuneate, margin crenate-dentate with 5–10 pairs of teeth, mostly 3–7.5 cm × 2–6 cm, both sides rather densely villous-pubescent with whitish hairs, also with shorter stalked glands, undersides of leaf with few or no sessile usually colourless glands, veins deeply impressed above, raised beneath. Racemes 5.5–35 cm long, pedicels 1.5–7 mm long; calyx 2–2.7 mm long in flower, 4.5–5 mm long in fruit; corolla predominantly blue to violet, 0.9–1.2 cm long, sparsely pubescent, lobes with stalked glands and few sessile glands, tube decurved at an angle of 120°–130°.

Known from a few areas in the south-eastern Darling Downs district. Flowers found most of the year.

**5. *Plectranthus graveolens* R. Br.**

Loosely branched heavily scented shrub up to *ca* 1 m tall, branches sparsely to densely pilose with spreading to retrorse hairs and dense stalked glands, sometimes with few sessile glands. Leaves with petioles 1–6 cm long; blades very broadly ovate to ovate or elliptic, apex acute to obtuse, base subcordate to broadly cuneate, margin crenate-dentate with 10–19 pairs of teeth, both surfaces densely villous and with dense stalked glands, upper side with few or no sessile glands, underside of leaf with dense sessile glands. Racemes 15–25 cm long, pedicels 2–4.5 mm long; calyx 1.6–2.3 mm long in flower, 4–5 mm long in fruit; corolla predominantly violet-blue, 8–9 mm long, pubescent and with sessile glands, tube decurved at an angle of 90°–130°.

Widespread in region except for western areas, mainly in exposed rock ledges and crevices. Flowers found most of the year.

**17. BASILICUM Moench**

Erect branched annual or perennial herbs. Leaves opposite. Flowers in whorls of 6, arranged in axillary and terminal racemose inflorescences; calyx campanulate, 5-toothed, uppermost tooth often broad and forming upper lip; corolla 2-lipped, upper lip usually 3-lobed, lower lip entire, auriculate at base; stamens 4, anthers 2-locular. Nutlets ovoid, compressed, smooth.

About 6–7 species from tropics of Africa, Asia, Malesia and northern Australia; 1 species Australia, occurring in south-eastern Queensland.

**1. *Basilicum polystachyon* (L.) Moench**

*Ocimum polystachyon* L.; *Moschosma polystachyum* (L.) Benth.

Erect herb up to *ca* 40 cm tall, rarely taller. Leaves with petioles 1–4 cm long; blades ovate to oblong-ovate, apex acuminate or acute, base cuneate or attenuate, margin irregularly serrate, 1.5–5 cm × 0.6–3.5 cm, glabrous. Inflorescences 3–6 cm long in flower, extending to over 10 cm long in fruit, bracts 1–2 mm long, pedicels 1–2 mm long; calyx 1.5–2 mm long in flower, up to 3.5 mm long in fruit, pubescent, ± glandular punctate; corolla pale blue or lilac or whitish, 2–2.5 mm long. Nutlets minute. **Fig. 55E.**

Widespread in region except Darling Downs district. Flowers found most of the year but mostly spring–summer.

**18. SCUTELLARIA L.**

Herbs or rarely shrubs. Leaves opposite. Flowers solitary within each floral leaf, either opposite and axillary or in terminal racemes or spikes; calyx with 2 entire lips, upper one with hollow scale-like protuberance on back; corolla with rather long tube and small nearly closed lips; stamens 4, didynamous, ascending under upper lip, anthers ciliate, those of upper pair 2-locular, those of lower pair 1-locular. Nuts granular tuberculate.

About 300 species cosmopolitan; 3 species, 1 naturalized, Australia; 1 species south-eastern Queensland.

**1. *Scutellaria humilis* R. Br.**

Perennial with slender creeping rootstock and ascending sparsely hairy stems up to ca 30 cm tall. Leaves with petioles up to ca 3 mm long; blades ovate to ± orbicular, apex acute, base cordate to truncate, margin entire to crenate, 0.7–1 cm × 0.3–1 cm, ± glabrous to ± pubescent. Calyx 3–4.5 mm long; corolla pink or purplish, ca 6 mm long. **Fig. 55F.**

Rare in south-eastern Queensland, recorded from a few places in the Darling Downs and Moreton districts.

**19. PROSTANTHERA Labill.**

Shrubs, usually gland dotted and strong scented. Leaves opposite. Flowers solitary in axils of stem leaves or in terminal racemes with floral leaves reduced to bracts, bracteoles 2 usually close under calyx; calyx 2-lipped; corolla 2-lipped, upper lip broadly 2-lobed, lower lip 3-lobed; stamens 4, in 2 pairs, anthers 2-locular, connective prominent at back, usually cristate and produced into 1 or 2 linear appendages; style shortly bifid. Fruits nuts, reticulate-rugose.

About 50 species all endemic in Australia; 13 species south-eastern Queensland.

- 1. Flowers solitary, axillary . . . . . 2  
Flowers in terminal racemes, often collected into panicles, floral  
leaves reduced to caducous bracts . . . . . 10
- 2. Leaf margins recurved to revolute . . . . . 3  
Leaf margins flat, incurved or crisped . . . . . 4
- 3. Leaves 1–2.3 cm long, glabrous above . . . . . 1. *P. phyllicifolia*  
Leaves 0.2–1 cm long, with short coarse ± spreading hairs . . . . . 2. *P. sp. 1.*
- 4. Calyces completely glabrous . . . . . 3. *P. rigens*  
Calyces with some hairs, sometimes only along margin of lips . . . . . 5
- 5. Branches and leaves with glandular and non glandular hairs . . . . . 6  
Branches and leaves, if hairy, with non glandular hairs only,  
though sometimes glandular punctate . . . . . 7
- 6. Leaf margins with 2–3 lobes or teeth on each side . . . . . 4. *P. euphrasioides*  
Leaf margins entire . . . . . 5. *P. odoratissima*
- 7. Calyces covered with soft hairs . . . . . 6. *P. lithospermoides*  
Calyces with some parts glabrous . . . . . 8
- 8. Calyces ± glabrous but lower lip with dense appressed hairs . . . . . 7. *P. saxicola*  
Calyces glabrous except for ciliate margin of lobes . . . . . 9
- 9. Leaves 0.3–0.6 cm × 0.3–0.5 cm, petioles 1.5–3 mm long . . . . . 8. *P. sp. 2.*  
Leaves 1–5 cm × 0.1–0.3 cm, sessile . . . . . 9. *P. nivea*
- 10. Leaves ± sessile, blades 0.1–0.2 cm broad . . . . . 10. *P. sp. 3.*  
Leaves with petioles 0.3–1.1 cm long, blades 0.3–2.3 cm broad . . . . . 11
- 11. Corollas glabrous outside . . . . . 11. *P. caerulea*  
Corollas pubescent outside . . . . . 12
- 12. Leaf blades 3–10 cm long, margin serrate, apex acute-acuminate . . . . . 12. *P. lasianthos*  
Leaf blades 1–3 cm long, margin entire or with few coarse teeth,  
apex obtuse . . . . . 13. *P. ovalifolia*

**1. *Prostanthera phyllicifolia* F. Muell.**

Shrub up to ca 1.5 m tall, young stems and petioles with minute appressed hairs. Leaves with petioles 0.5–1.5 mm long; blades linear, oblong or elliptic-oblong, apex obtuse, base obtuse, margin revolute, 1–2.3 cm × 0.1–0.3 cm, glabrous above, often with few appressed hairs below. Flowers axillary, peduncles ca 2–2.5 mm long; calyx tube ca 2 mm long; upper calyx lip ca 3 mm long in flower, lengthening up to ca

4 mm long in fruit, glabrous outside, lower lip *ca* 2 mm long, ciliate on margin; corolla blue or pinkish or whitish, *ca* 8–10 mm long, pubescent outside or  $\pm$  glabrous.

Known from mountains and ranges along the border with New South Wales and from the Glasshouse Mts. in the Moreton district, also known from the Girraween National Park near Wallangarra in the Darling Downs district. Flowers spring.

The Queensland Herbarium has a single specimen collected in 1892 from Wellington Point near Brisbane of what is possibly a form of ***Prostanthera linearis*** R. Br., a species from central and southern New South Wales. This species is similar to ***P. phyllicifolia*** but the calyx is glabrous inside while ***P. phyllicifolia*** has hairs inside at the base of the upper lip.

## 2. *Prostanthera* sp. 1.

*Prostanthera parvifolia* auct. Qld. non Domin

Aromatic shrub up to *ca* 1.5 m tall, branches leaves and calyces with sparse to dense short coarse ascending or spreading hairs and sparse to dense glandular granules. Leaves with petioles up to *ca* 1 mm long; blades narrowly ovate to oblong to linear, apex obtuse, base obtuse, margin recurved to revolute, 2–10 mm  $\times$  1–3 mm. Flowers axillary, peduncles *ca* 2 mm long; calyx tube *ca* 2 mm long, upper and lower lips *ca* 2 mm long in flower, upper lengthening to 3–4 mm long in fruit; corolla bluish, *ca* 8–10 mm long, sparsely hairy and glandular punctate outside.

Western Darling Downs district, usually in stony or sandy soils. Flowers spring.

## 3. *Prostanthera rigens* Benth.

*Prostanthera leichhardtii* Benth.

Shrub up to *ca* 1.5 m tall, stems with usually few appressed hairs, leaves and calyces glabrous. Leaves with petioles 1–5 mm long; blades oblong or obovate-oblong or obovate, apex obtuse, base narrowed, margin flat, 0.5–1.5 cm  $\times$  0.15–0.5 cm, glandular punctate. Flowers axillary, peduncles 1–2.5 mm long; calyx tube 3–4 mm long, upper and lower lips *ca* 2 mm long; corolla pale blue, *ca* 1.3 cm long, sparsely hairy.

Western Darling Downs district usually in stony or sandy soils, also recorded from Eidsvold in the Burnett district. Flowers late winter–spring.

## 4. *Prostanthera euphrasioides* Benth.

Bushy aromatic shrub up to *ca* 1 m tall, stems leaves and calyces with long soft spreading hairs intermixed with glandular ones. Leaves with petioles up to *ca* 1 mm long; blades narrowly oblong, apex obtuse, base cuneate, margin with 2–3 obtuse lobes or teeth on each side, flat or incurved, 4–10 mm  $\times$  1.5–3 mm. Flowers axillary, peduncles *ca* 1.5 mm long; calyx tube *ca* 3 mm long, upper and lower lips 3–4 mm long in flower, upper lengthening in fruit to *ca* 5 mm long; corolla pinkish or bluish, *ca* 1.5 cm long, glabrous or with few hairs outside.

Known from western parts of the Darling Downs district and also from around Helidon in the western Moreton district. Flowers spring–summer.

## 5. *Prostanthera odoratissima* Benth.

Strongly scented shrub up to *ca* 1.5 m tall but often less than 40 cm tall, stems leaves and branches with glandular hairs and ascending non glandular hairs, plant usually viscid. Leaves  $\pm$  sessile; blades linear-oblong or narrowly ovate, apex obtuse, margin flat or incurved, 5–8 mm  $\times$  1–1.5 mm. Flowers axillary, peduncles up to *ca* 3 mm long; calyx tube *ca* 3 mm long, glandular punctate, upper lip *ca* 4 mm long, lower lip *ca* 3 mm long, margin ciliate, lips scarcely enlarging in fruit; corolla purple, *ca* 1–1.3 cm long, glabrous outside.

Known from far western Darling Downs district. Flowers spring.

## 6. *Prostanthera lithospermoides* F. Muell.

Shrub up to *ca* 2.5 m tall, branches leaves and calyces with soft  $\pm$  silky hairs. Leaves with petioles 0–2.5 mm long; blades linear-oblong to narrowly ovate, apex obtuse or acute, base narrowed, margin flat or incurved, 0.8–3.5 cm  $\times$  0.15–0.7 cm. Flowers axillary, often forming terminal leafy racemes or panicles of racemes, peduncles

1–1.5 mm long; calyx tube *ca* 2 mm long, silky hairy, upper and lower lips  $\pm$  equal in flower, 2–2.5 mm long, silky hairy, upper lip lengthening to 4–5 mm long in fruit, lower slightly shorter in fruit; corolla white or pinkish or bluish, 0.8–1 cm long, softly hairy outside.

Known from the western Darling Downs district in sandy soils. The Queensland Herbarium also has a specimen possibly of this species from near Gympie in the Wide Bay district. Flowers spring.

**7. *Prostanthera saxicola* R. Br. sens. lat.**

Shrub up to *ca* 1 m tall; stems ascending or erect, young shoots with sparse to dense appressed hairs, older shoots  $\pm$  glabrous or with sparse appressed hairs. Leaves shortly petiolate or sessile; blades narrowly ovate to oblong, apex obtuse, margin incurved or flat, 0.3–1(–1.5) cm  $\times$  0.1–0.3(–0.6) cm, appressed hairy at first, becoming glabrous. Flowers axillary, peduncles 1.5–2 mm long; calyx tube *ca* 2 mm long, upper lip *ca* 2 mm long, glabrous or sparsely hairy, lower lip *ca* 1.5 mm long with  $\pm$  dense appressed hairs, lips scarcely enlarging in fruit; corolla pale mauve or pale blue to purplish, *ca* 8 mm long, glabrous or  $\pm$  pubescent outside.

Known from the Stanthorpe-Wallangarra area of the southern Darling Downs district. Flowers spring.

The above description may be shown to include more than one taxon when the genus is revised.

**8. *Prostanthera* sp. 2.**

Shrub less than 1 m tall, stems with row of crisped hairs on either side. Leaves with petioles 1.5–3 mm long; blades ovate to broadly ovate to almost orbicular, apex obtuse, base broadly cuneate, margin flat or crisped, often curved upwards, 3–6 mm  $\times$  3–5 mm, glabrous except for hairs on margin and base of upper surface of young leaves. Flowers axillary, peduncles up to *ca* 2 mm long; calyx tube *ca* 3 mm long, glabrous, glandular punctate, upper and lower lips *ca* 2 mm long, glabrous except for ciliate margin; corolla blue, *ca* 8 mm long, pubescent outside.

Known from Mt. Tinbeerwah near Tewantin in the southern Wide Bay district. Flowers spring.

**9. *Prostanthera nivea* Cunn. ex Benth.**

Shrub up to *ca* 2 m tall, young shoots often densely white hairy, becoming glabrous except for corolla or with appressed hairs. Leaves sessile; blades linear or linear-elliptic, apex acute or obtuse, margin flat or incurved, 1–5 cm  $\times$  0.1–0.3 cm. Flowers axillary, peduncles *ca* 2–3 mm long; calyx tube *ca* 2 mm long, upper lip 3–6 mm long in flower, 4–7 mm long in fruit,  $\pm$  glabrous, lower lip *ca* 2 mm long in flower, up to *ca* 3 mm long in fruit, margin ciliate, otherwise with few hairs or glabrous; corolla white or bluish, 1–1.5 cm long, pubescent or villous outside.

Known from the Stanthorpe-Wallangarra area of the Darling Downs district and from around Boonah and Crows Nest in the Moreton district. Flowers spring.

**10. *Prostanthera* sp. 3.**

Shrub, stems leaves and calyces with short sparse to dense  $\pm$  spreading hairs, glandular punctate. Leaves  $\pm$  sessile; blades linear, apex  $\pm$  obtuse, margin recurved to midrib, 0.8–1.2 cm  $\times$  0.1–0.2 cm. Flowers in terminal racemes often forming terminal panicle of racemes, pedicels *ca* 2 mm long; calyx tube *ca* 2 mm long, upper and lower lips 2–2.5 mm long; corolla bluish, *ca* 8 mm long, sparsely hairy outside, glandular punctate.

Known from around Dunmore Station in the central western Darling Downs district. Flowers spring.

**11. *Prostanthera caerulea* R. Br.**

Shrub up to *ca* 3 m tall, branches and petioles with sparse to dense crisped hairs. Leaves with petioles 0.7–1.1 cm long; blades narrowly ovate, apex acute-acuminate, base cuneate-attenuate, margin entire or with few teeth, 2.5–8.5 cm  $\times$  0.8–2.3 cm, usually conspicuously glandular punctate. Flowers in terminal racemes, floral leaves reduced to caducous concave acuminate bracts 3–4 mm long, ciliate on margin, pedicels 1–2 mm long; calyx tube *ca* 3 mm long, upper and lower lips 2.5–3.5 mm



Fig. 55 LAMIACEAE — A<sub>1</sub>–A<sub>3</sub> *Leucas lavandulifolia*, A<sub>1</sub> portion of fertile stem x1, A<sub>2</sub> flower x1½, A<sub>3</sub> calyx x3; B<sub>1</sub>–B<sub>3</sub> *Marrubium vulgare*, B<sub>1</sub> portion of fertile stem x1, B<sub>2</sub> flower x2½, B<sub>3</sub> calyx x2½; C *Moluccella laevis*, portion of fertile stem x½; D<sub>1</sub>–D<sub>3</sub> *Prunella vulgaris*, D<sub>1</sub> portion of fertile stem x¼, D<sub>2</sub> flower x3, D<sub>3</sub> calyx x3; E<sub>1</sub>–E<sub>3</sub> *Basilicum polystachyon*, E<sub>1</sub> portion of fertile stem x2/3, E<sub>2</sub> flower x6, E<sub>3</sub> calyx x6; F<sub>1</sub>–F<sub>2</sub> *Scutellaria humilis*, F<sub>1</sub> portion of flowering plant x1, F<sub>2</sub> flower x3; G<sub>1</sub>–G<sub>2</sub> *Plectranthus parviflorus*, G<sub>1</sub> portion of flowering stem x1, G<sub>2</sub> flower x3.

long in flower, lengthening to 4–5 mm long in fruit, glandular punctate, ciliate on margin; corolla white or bluish, *ca* 0.8–1 cm long, glabrous outside.

Known from in or near the Girraween National Park near Wallangarra in the southern Darling Downs district. Flowers spring.

**12. *Prostanthera lasianthos* Labill.**

Shrub up to *ca* 3 m tall, glabrous except for flowers or with few hairs usually on stem at base of petioles. Leaves with petioles 4–10 mm long; blades narrowly ovate or narrowly elliptic, apex acute-acuminate, base cuneate, margin serrate, 3–10 cm × 1–2 cm, usually conspicuously glandular punctate. Flowers in racemes usually collected into terminal panicles, floral leaves reduced to caducous concave acuminate bracts *ca* 3 mm long or absent, pedicels 1–2 mm long; calyx tube *ca* 3 mm long, upper and lower lips *ca* 3–4 mm long, sparsely appressed hairy, glandular punctate; corolla white, mauve or bluish, 0.9–1.3 cm long, pubescent outside.

Known from the Girraween National Park near Wallangarra in the southern Darling Downs district. Flowers spring–early summer.

**13. *Prostanthera ovalifolia* R. Br. sens. lat.**

*Prostanthera lanceolata* Domin; *Prostanthera incisa* auct. Qld. non R. Br.

Shrub up to *ca* 3 m tall, occasionally taller, younger parts with minute hairs. Leaves with petioles 3–10 mm long; blades ovate to elliptic to oblong, apex obtuse, base cuneate, margin flat, entire or with few coarse teeth, 1–3 cm × 0.3–1.2 cm, green above, paler below, conspicuously gland dotted. Flowers in short terminal racemes, pedicels 1.5–4.5 mm long; calyx tube 2–2.5 mm long, glabrous or sparsely hairy, usually glandular punctate, upper and lower lips *ca* 2 mm long, upper sometimes lengthening to *ca* 3 mm long in fruit; corolla purplish or bluish, *ca* 8 mm long, pubescent outside.

Known from the mountains and ranges near the border with New South Wales, usually at altitudes above 600 m, also known from a few mountains in the Wide Bay district. Flowers spring.

**136. SOLANACEAE**

Herbs shrubs or rarely trees. Leaves alternate, exstipulate, simple. Flowers bisexual, mostly actinomorphic; calyx 4–6-lobed, persistent; corolla usually 5-lobed, lobes folded, contorted or valvate; stamens inserted on corolla tube, same number as and alternate with corolla lobes, anthers 2-locular, loculi parallel, opening lengthwise or by apical pores; ovary superior, 2-locular, loculi sometimes again divided by false septum, ovules very numerous, axile, style terminal. Fruits capsules or berries; seeds with copious endosperm and curved or annular embryo.

90 genera with *ca* 2000 or more species tropical and temperate but mainly Central and South America; 23 genera with *ca* 200 species Australia; 15 genera with 76–77 species south-eastern Queensland.

1. Stamens 4 . . . . .	2
Stamens 5 . . . . .	4
2. Inflorescences of large terminal panicles; fruits berries . . . . .	1. <i>Duboisia</i>
Inflorescences of 1–3 flowers; fruits capsules . . . . .	3
3. Indumentum of stellate hairs; corolla tubes up to 7 mm long; fruits opening by 2, 2-fid valves . . . . .	2. <i>Cyphanthera</i>
Indumentum of simple hairs; corolla tubes 1.5–2 cm long; fruits opening by 2 valves . . . . .	3. <i>Browallia</i>
4. Fruits capsules . . . . .	5
Fruits berries . . . . .	7
5. Capsules more than 2 cm long, spiny or tuberculate, only base of calyx persisting in fruit . . . . .	4. <i>Datura</i>
Capsules less than 1.5 cm long, ± smooth, whole calyx persisting in fruit . . . . .	6

- |   |                        |    |
|---|------------------------|----|
| 6. Flowers solitary, axillary; calyx lobes free $\pm$ to base; capsules opening apically into 2 entire or shortly 2-fid valves . . . . .  | 5. <i>Petunia</i>      |    |
| Flowers in loose elongated panicles, rarely racemes; capsules opening apically into 2, 2-fid valves . . . . .   | 6. <i>Nicotiana</i>    |    |
| 7. Connective at back of anthers large and conspicuous, broad and thick . . . . .   | 7. <i>Cyphomandra</i>  | 8  |
| Connective at back of anthers small and inconspicuous . . . . .   |                        |    |
| 8. Anthers with sterile conical terminal appendages; leaves pinnatisect to pinnate . . . . .  | 8. <i>Lycopersicon</i> |    |
| Anthers without sterile terminal appendages; leaves entire to pinnatisect . . . . .   |                        | 9  |
| 9. Calyces enlarged in fruit, enclosing berries . . . . .   |                        | 10 |
| Calyces not or scarcely enlarged in fruit, always shorter than berries . . . . .  |                        | 12 |
| 10. Fruiting calyx lobes much longer than tube, auriculate at base; flowers blue . . . . .  | 9. <i>Nicandra</i>     |    |
| Fruiting calyx lobes usually shorter than tube, not auriculate at base; flowers purple, yellowish, white or rarely bluish . . . . .   |                        | 11 |
| 11. Flowers in extra-axillary cymes, variously coloured, usually purplish, rarely yellow; fruiting calyces $\pm$ globular, never ribbed, never much larger than fruit . . . . . | 10. <i>Solanum</i>     |    |
| Flowers solitary in leaf and stem axils, yellow, sometimes with bluish and brownish blotches; fruiting calyces not globular, often ribbed, much larger than fruit . . . . .     | 11. <i>Physalis</i>    |    |
| 12. Corollas stellate, lobes $\pm$ equal to tube . . . . .  |                        | 13 |
| Corollas tubular, funnelform or urceolate, lobes much shorter than tube . . . . .   |                        | 14 |
| 13. Flowers mainly in cymes racemes or umbels, lateral, extra-axillary or internodal; anthers opening by terminal pores or short slits . . . . .                                | 10. <i>Solanum</i>     |    |
| Flowers mainly solitary or 2 together; anthers opening by longitudinal slits . . . . .  | 12. <i>Capsicum</i>    |    |
| 14. Spinescent shrubs with $\pm$ fleshy leaves in axillary clusters . . . . .   | 13. <i>Lycium</i>      |    |
| Non spinescent shrubs or climbers, leaves not fleshy; flowers solitary, axillary or in leafy sometimes congested panicles or racemes . . . . .                                  |                        | 15 |
| 15. Corollas urceolate; flowers solitary in axils; scrambling climbers . . . . .  | 14. <i>Salpichroa</i>  |    |
| Corollas tubular; flowers in panicles or racemes; erect shrubs or small trees . . . . .   | 15. <i>Cestrum</i>     |    |

### 1. DUBOISIA R. Br.

Small trees. Leaves alternate, entire. Inflorescences of terminal panicles; calyx 5-toothed; corolla ovate-campanulate, lobes 5, broad, induplicate in bud; stamens 4, didynamous, included in corolla tube, upper ones longest, fifth uppermost stamen reduced to minute rudiment, anthers reniform, turned outwards at least when fully mature, locules confluent at apex; ovary 2-locular, stigma slightly dilated, 2-lobed. Fruits indehiscent berries; seeds few, curved with crustaceous tubercular-rugose testa.

3 species Australia, New Caledonia; 3 species Australia; 2 species south-eastern Queensland.

- |   |                           |
|---|---------------------------|
| 1. Corolla lobes acuminate, narrow, 4–7 mm long; stamens exserted . . . . . | 1. <i>D. leichhardtii</i> |
| Corolla lobes obtuse, 1.5–2.5 mm long; stamens included . . . . .           | 2. <i>D. myoporoides</i>  |

#### 1. *Duboisia leichhardtii* F. Muell.

CORKWOOD

Shrub or small tree up to *ca* 7.5 m tall; bark corky. Leaves with petioles 0.3–1 cm long; blades elliptic, apex acute or blunt, base cuneate to attenuate, margin entire, 3.3–8.5 cm  $\times$  0.5–2 cm, thick, only midrib prominent. Inflorescences paniculate; flowers on pedicels 0.5–1.4(–1.8) cm long; calyx 1–1.5 mm long, teeth *ca* 0.5 mm long;

corolla tube 3.5–6 mm long, lobes narrow, attenuate, 4–7 mm long,  $\pm$  longer than tube. Berries black,  $\pm$  globular, *ca* 5 mm diameter.

Depauperate rainforest, brigalow forest or open forest or woodland of the western districts and the western Moreton district. Flowers mainly winter. Leaves harvested commercially and exported for extraction of alkaloids, mainly scopolamine.

## 2. *Duboisia myoporoides* R. Br.

## CORKWOOD

Shrub or tree up to 9 m tall; bark corky. Leaves with petioles 0.3–1.5 cm long; blades elliptic to obovate, apex obtuse to bluntly pointed, base cuneate, margin entire, 2.5–13 cm  $\times$  0.3–3.5 cm, thick, only midrib prominent. Inflorescences paniculate; flowers on pedicels 4–6(–9) mm long; calyx 1–1.5 mm long, teeth *ca* 0.4 mm long; corolla white or pale mauve, tube 4–5 mm long, lobes 1.5–2.5 mm long. Berries black,  $\pm$  globular, *ca* 5 mm diameter. **Fig. 56A.**

Rainforest margins and clearings, depauperate rainforest, fringing forest or littoral closed forests. Flowers late winter–early spring. Leaves harvested commercially and exported for extraction of alkaloids, mainly scopolamine.

## 2. CYPHANTHERA Miers

Shrubs, glabrous, glandular pubescent or hoary with stellate tomentum. Leaves entire or rarely toothed, rather thick. Inflorescences of irregular often leafy terminal racemes or panicles, peduncles 1–3-flowered, bracts small or absent; calyx small, 5-lobed; corolla tube campanulate, shortly contracted at base, lobes 5, spreading, induplicate in bud; stamens 4, didynamous, included in tube, anthers 1–2-locular; style included in tube, stigma shortly 2-lobed. Fruits oblong-ovoid or globular capsules opening in 2 bifid valves; seeds mostly few with reticulate crustaceous testa.

9 species endemic in Australia; 1 species south-eastern Queensland.

## 1. *Cyphanthera albicans* (Cunn.) Miers

## GREY RAY FLOWER

*Anthocercis albicans* Cunn.

Shrub up to 1.5 m tall, indumentum dense, of simple and dendritic hairs. Leaves with petioles 0.5–1 mm long; blades narrowly oblong or obovate, apex obtuse, base cuneate or tapered, margin recurved, 0.5–2.5 cm  $\times$  0.2–0.6 cm, hairs simple above, dendritic below. Flowers 1-few together on peduncles 1–4 mm long in upper axils; calyx 3.5–4 mm long, dendritic pubescent outside, lobes 1.5–2 mm long; corolla white, streaked with purple lines, 0.7–1.3 cm long, lobes slightly longer than tube, 4–7 mm long. Capsules globular, 3–4 mm diameter; seeds few. **Fig. 60B.**

Recorded from granite hills in Girraween National Park, near Wallangarra. Flowers spring. Suspected of being poisonous to stock but not proven toxic.

## 3. BROWALLIA L.

Erect branched herbs up to 1 m tall, hairs simple and glandular. Leaves petiolate, simple, sometimes in pairs. Flowers solitary, axillary; calyx tubular, lobed, lobes sometimes leaf-like, exceeding fruit; corolla salverform, zygomorphic, tube swollen apically, but mouth of tube contracted; stamens usually 4, sometimes 5 or a staminode present, didynamous; ovary 2-locular, ovules numerous, style simple, stigma expanded. Fruits 2-valved capsules; seeds numerous, minute.

6 species tropical America, West Indies; 1 species cultivated Australia, possibly naturalized south-eastern Queensland.

## 1. \**Browallia americana* L.

Erect herb up to 1 m tall, pubescent with simple hairs. Leaves with petioles 2–10 mm long; blades ovate, apex acute or acuminate, base broadly cuneate to rounded, margin entire, 0.7–7 cm  $\times$  0.5–5 cm, upper leaves smallest. Flowers on short erect peduncles in upper axils; calyx angular, 1–1.2 cm long, lobes 4–5, 2–4 mm long; corolla white or purple-blue, tube 1.5–2 cm long, swollen on one side in region of anthers, limb salverform, 1–1.5 cm diameter, shallowly lobed; filaments 4, upper pair very short,

broad, attached to rim of tube, curved so that filament  $\pm$  blocks mouth of corolla tube. Capsules erect, enclosed within calyx.

Native of tropical America, cultivated as an ornamental; naturalized near habitation in Moreton district. Flowers spring.

#### 4. DATURA L.

Stout annual or short-lived perennial herbs, at least young parts with simple or glandular hairs. Leaves alternate, exstipulate, petiolate. Flowers solitary in forks of branches, shortly pedunculate; calyx tubular, shortly 5-, rarely 3–6-lobed, circumscissile near thickened base after anthesis, pubescent outside, base accrescent, developing into reflexed frill subtending mature fruit; corolla usually single, funnel or trumpet-shaped,  $\pm$  glabrous, limb white or coloured, plicate and twisted in bud, 5-, rarely 9-lobed, lobes short with distinct points (acumens), sometimes limb appearing 10-, rarely 12-lobed due to interacuminal lobules; stamens 5, rarely –8, filaments adnate to corolla for  $\frac{1}{3}$ – $\frac{1}{2}$  their length, glabrous except for pilose adnate part, anthers basifixed, dehiscing longitudinally; ovary superior, 2-locular, often falsely 4-locular in lower half, covered with several–many small spines, becoming enlarged and rigid on fruit, with basal annular nectary, style filiform, glabrous, stigma with 2, rarely 3 stigmatic surfaces. Fruits ovoid to globose 2–4-locular capsules, basally frilled, covered with slender to stout spines, dehiscence septifragal, generally by 4 valves from apex; seeds numerous, compressed, with finely pitted or sculptured surface.

10 species tropical and warm temperate parts of the world; 5 naturalized and possibly 1 native species Australia; 4 species south-eastern Queensland.

All species of *Datura* are considered poisonous if eaten.

- |  |                         |   |
|--|-------------------------|---|
| 1. Plants tomentose with glandular hairs . . . . .   | 1. <i>D. innoxia</i>    | 2 |
| Plants glabrous or pubescent with simple hairs only . . . . .  |                         |   |
| 2. Leaves entire to singly lobed; flowers 14–20 cm long; capsules deflexed with numerous short blunt tubercles . . . . . | 2. <i>D. metel</i>      |   |
| Leaves doubly lobed; flowers less than 10 cm long; capsules erect with sharp spines . . . . .                            |                         | 3 |
| 3. Flowers 6–8.5 cm long; capsules with more than 100 spines, all less than half as long as capsule body . . . . .       | 3. <i>D. stramonium</i> |   |
| Flowers 6 cm or less long; capsules with 40–60 spines, some more than half as long as capsule body . . . . .             | 4. <i>D. ferox</i>      |   |

##### 1. \**Datura innoxia* Miller

##### DOWNY THORNAPPLE

Erect robust annual up to 1.5 m tall, often with perennial rootstock, glandular pubescent. Leaves with petioles (2–)5–10(–16) cm long; blades ovate, apex acute or bluntly acuminate, base broadly cuneate in young leaves to oblique, margin entire in young leaves to repand or slightly lobed, 5–15 cm  $\times$  2.2–12 cm. Flowers with peduncles 0.9–1.3 cm long; calyx 5.5–9 cm long, not angular, lobes 3–6, 1.3–2 cm long, sometimes incompletely separated; corolla white with green veins, 12–19 cm long, glabrous except for sparsely pubescent limb margin, lobes 5, rarely 6, terminated by acumens 0.5–1 cm long, interacuminal lobules prominent, as long as acumens, twisted so limb appears 10-lobed; stamens 5–6, adnate to corolla for *ca* 7–8 cm from base, included; style 10–14 cm long, stigma well below anthers. Capsules deflexed, ovoid-globose, 3.5–5 cm  $\times$  3–5 cm, breaking irregularly when ripe, spines numerous, all  $\pm$  equal, up to 1 cm long, persistent calyx base 1–2 cm long, conical, undulate; seeds 4.5–5 mm long.

Native of Central and South America; naturalized weed of waste places, roadsides, creek banks throughout the region. Flowers mainly summer–autumn.

##### 2. \**Datura metel* L.

##### HAIRY THORNAPPLE

*Datura fastuosa* auct. non L., F. M. Bailey

Erect bushy annual up to 1 m tall, young parts pubescent with simple hairs, glabrous with age. Leaves with petioles 3–10 cm long; blades ovate to broadly ovate, apex

acute, base broadly cuneate to oblique, margin repand, sinuate or coarsely serrate, with 2 or 3 lobes each side, 8–17 cm × 4–17 cm. Flowers with peduncles 1–1.5 cm long; calyx 4–7 cm long, not angular, lobes 5, rarely 9, 0.8–1.3 cm long; corolla deep purple outside, pale lavender to white inside, generally double or triple, inner larger, 14–20 cm long, glabrous, lobes 5, rarely 9, terminated by acumens 1–2.5 cm long, separated by sinuses; stamens as many as corolla lobes, adnate to corolla for *ca* 8 cm from base, included; style 10–14 cm long, stigma 2–4 cm below anthers. Capsules deflexed, ovoid to globose, 3–4 cm diameter, breaking irregularly at summit when ripe, tubercles conical, 100–200, ± equal in length, 2–5 mm long, persistent calyx base 2–3 mm long, discoid, thick and coriaceous, peduncle 1.5–3 cm long; seeds 4–5 mm long. **Fig. 56D.**

Native of Asia and Africa, cultivated in home gardens; naturalized near habitation. Flowers summer–autumn. Declared noxious throughout the State under the Stock Routes and Rural Lands Protection Acts, 1944–1967.

**3. \**Datura stramonium* L.** COMMON THORNAPPLE; STRAMONIUM;  
FALSE CASTOR OIL

*Datura tatula* L.; *D. stramonium* var. *tatula* (L.) Torrey

Erect robust annual up to 1.2 m tall, young parts pubescent with simple hairs, glabrous with age. Leaves with petioles 2–7(–11) cm long; blades ovate to broadly ovate, apex acute to acuminate, base cuneate to oblique, margin coarsely doubly lobed, major lobes acute, 7–17 cm × 4–11 cm, rarely larger. Flowers with peduncles 0.6–1 cm long; calyx 3–4.5 cm long, angular, lobes 5, 6–8 mm long; corolla white or pale lavender, 6–8.5 cm long, lobes 5, terminated by acumens *ca* 1 cm long, separated by sinuses; stamens 5, adnate to corolla for *ca* 3.5 cm from base, included; style 4.5–5.5 cm long, stigma at same level as or above anthers. Capsules erect, narrowly ovoid to ovoid, 2–4 cm × 1.5–3.5 cm, breaking regularly into 4 entire valves when ripe, spines 100–200, conical, sharp, unequal, 0.6–1.6 cm long, less than half as long as capsule body, peduncle 0.7–2 cm long; seeds 2.5–4.5 mm long. **Fig. 56B.**

Originally probably native of America but now cosmopolitan; widespread and common weed of roadsides, wastelands, cultivation, etc. Flowers mainly summer. Toxic — usually associated with consumption of grain contaminated with seeds of this species, occasionally causes deaths in poultry and pigs. Declared noxious throughout the state under the Stock Routes and Rural Lands Protection Acts, 1944–1967.

**4. \**Datura ferox* L.** FIERCE THORNAPPLE; LONGSPINE THORNAPPLE;  
LONGSPURRED THORNAPPLE; FALSE CASTOR OIL

Stout annual up to 1 m tall, young parts pubescent with simple hairs, glabrous with age. Leaves with petioles 2.5–8(–12) cm long; blades ovate to broadly ovate, apex acute, base cuneate to oblique, margin usually coarsely doubly lobed, lobes obtuse to acute, 4–14 cm × 3–12.5(–16) cm. Flowers with peduncles 0.7–1.4 cm long; calyx 2.5–3.5 cm long, angular, lobes 5, 4–7 mm long; corolla white, 4.5–6 cm long, often slightly plicate, lobes 5, terminated by acumens 1–2 mm long, separated by very short sinuses; stamens 5, adnate to corolla for *ca* 1.5 cm from base, included in tube; style *ca* 3 cm long, stigma below anthers. Capsules erect, ellipsoid to broadly ellipsoid, rarely subglobose, 2–4 cm × 2–3 cm, breaking regularly into 4 entire valves when ripe, spines 40–60, stout, conical, longest 1.5–3.5 cm long, longest ones near summit at least half as long as capsule body, peduncle 0.7–1.4 cm long; seeds 4–4.5 mm long. **Fig. 56C.**

Native of warm regions of China, now cosmopolitan; widespread weed of wasteland, cultivation, roadsides, creek banks. Flowers mainly late spring–summer. Regarded as toxic. Declared noxious throughout the state under the Stock Routes and Rural Lands Protection Acts, 1944–1967.

**5. PETUNIA** Juss.

Herbs often with sprawling stems, viscid-pubescent with glandular hairs. Leaves alternate or upper ones in pairs, sessile or petiolate in young plants, entire. Flowers solitary, axillary; calyx campanulate, deeply lobed; corolla funnelliform or salverform, actinomorphic or slightly zygomorphic, shallowly or bluntly 5-lobed; stamens 5,

inserted in tube, 4 didynamous, 5th shorter, anthers dehiscing by slits; ovary 2-locular, inserted on lobed hypogynous disc, ovules numerous, style slender, stigma dilated-capitate. Fruits septicial capsules; seeds numerous, globular, angled or prismatic.

40 species South and warm North America; several species and hybrids cultivated, 3 naturalized Australia; 1 species south-eastern Queensland.

**1. \**Petunia axillaris* (Lam.) Britton, Sterns & Poggenburg**

A PETUNIA

*Nicotiana axillaris* Lam.; *N. obtusisepala* Domin

Erect or decumbent annual or short-lived perennial, viscid-pubescent with glandular hairs. Lower leaves alternate, upper sometimes opposite; petioles winged, 0.5–2 cm long; blades ovate to elliptic, apex acute, base cuneate, 3–7 cm × 1.5–4 cm, upper leaves reduced, ± sessile. Flowers on peduncles, 2–4 cm long; calyx 1.5–2 cm long, lobes 5; corolla mostly white with dark veins in throat, sweetly scented, tube 3–4 cm long, limb 4–6 cm diameter; stamens inserted about middle of tube. Capsules ovoid, glabrous, ca 1 cm long, on erect pedicels up to 6 cm long. **Fig. 56E.**

Native of South America, cultivated as ornamental; naturalized sporadically in disturbed sites near habitation or creek banks in the coastal districts. Flowers may be found any time throughout the year.

The GARDEN PETUNIA, **P. × *hybrida***, which is derived from the above may persist near habitation, but can be distinguished in its typical form by the stamens being inserted below the middle of the tube, and the corolla often being coloured.

**6. NICOTIANA L.**

Usually erect coarse annual or short lived perennial herbs, rarely shrubs or trees, indumentum various. Leaves alternate, often rosulate, exstipulate, entire. Inflorescences usually loose elongate panicles, rarely racemes or short dense panicles; flowers subtended by bracts, pedicellate; calyx 5-lobed, persistent; corolla tube cylindrical, limb ± spreading, 5-lobed, induplicate or folded in bud; stamens 5, included in corolla tube, variously attached to tube, often filaments unequal in length, with 4 upper at throat often didynamous, anthers 2-locular, dehiscing longitudinally; ovary 2-locular, ovules numerous, stigma 2-lobed. Fruits 2-locular capsules opening by 2 bifid valves parallel to dissepiment which remains attached to axis; seeds numerous, minute, testa with reticulate ornamentation.

66 species North and South America, Australia, Polynesia; 21 native and 2 naturalized species Australia; 4–5 species south-eastern Queensland.

- |   |                           |   |
|---|---------------------------|---|
| 1. Trees; leaves glaucous; flowers yellow or greenish yellow . . . . .  | 1. <i>N. glauca</i>       | 2 |
| Herbs or shrubs; leaves green; flowers white or cream . . . . .   |                           |   |
| 2. Corolla tubes 3.4–9.3 cm long; all hairs glandular . . . . .   | 2. <i>N. megalosiphon</i> | 3 |
| Corolla tubes 1–3.5 cm long; hairs glandular and eglandular . . . . .   |                           |   |
| 3. Filaments of all stamens attached low in corolla tube;<br>indumentum on leaves and lower stems of sparse eglandular<br>hairs, glandular hairs on inflorescence . . . . . | 3. <i>N. debneyi</i>      |   |
| Filaments of 4 stamens attached at corolla throat, 5th attached<br>lower in tube; indumentum of all parts both glandular and<br>eglandular . . . . .                        | 4. <i>N. velutina</i>     |   |

**1. \**Nicotiana glauca* Graham**

TREE TOBACCO

Erect often spindly shrub or small tree up to 6 m tall, ± glabrous, glaucous. Leaves with petioles 1–12 cm long; blades ovate or narrowly ovate, or sometimes oblong-ovate just below flowers, apex acute or obtuse, base cuneate to ± truncate, often oblique, margin entire or slightly sinuate, 2–25 cm × (0.4–)1–17 cm. Inflorescences short dense terminal panicles; calyx 0.7–1.4 cm long, lobes 2–4 mm long, margin sparsely pubescent; corolla greenish yellow to yellow, tube 2–4 cm long, limb 0.8–1.3 cm diameter; all stamens attached low in corolla tube, filaments long.

Capsules ellipsoid or ovoid, 0.7–1.3 cm long, contained in calyx; seeds brown,  $\pm$  quadrangular. **Fig. 56F.**

Native of Argentina; naturalized around habitation in the region. Flowers spring to autumn. Toxic to stock, but rarely eaten.

## 2. *Nicotiana megalosiphon* Huerck & Muell. Arg.

Erect herb up to *ca* 1 m tall, glandular pubescent to puberulent. Leaves radical and/or cauline, sometimes cauline few or absent; petioles 1–8 cm long, often winged; blades ovate, sometimes oblong-ovate, obovate or elliptic, apex acute to obtuse, base cuneate, decurrent on petiole; margin entire to sinuate, 2.5–20 cm  $\times$  0.7–9 cm, uppermost cauline smallest, glandular pubescent, succulent. Inflorescences elongated few-branched panicles; calyx 1–1.8 cm long, lobes 7–9 mm long, pubescent outside; corolla white to cream, tube 3.4–9.3 cm long, limb 1.3–3.5 cm diameter; 4 stamens subsessile in throat, 5th with long filament attached in tube. Capsules ovoid-ellipsoid, 1–1.2(–1.6) cm long, contained in calyx; seeds light brown, reniform.

Darling Downs and Burnett districts, on heavy or alluvial soils. Flowers spring to autumn. Suspected of being poisonous to stock but not proven toxic.

## 3. *Nicotiana debneyi* Domin

Erect herb up to 1 m tall, stems and often leaves puberulent with eglandular hairs. Leaves radical and cauline, at least lowermost stem clasping or auriculate, narrowed into winged petiole-like structure before broadening into blade proper; petiole where present winged, up to 9(–14) cm long; blades obovate to elliptic, occasionally ovate, or some cauline leaves strap shaped, apex acute to obtuse, base obtuse or cuneate and continuous with petiole, or auriculate in lower leaves, margin entire to sinuate, 3–30 cm  $\times$  0.8–13.5 cm. Inflorescences loose terminal panicles, glandular pubescent; calyx 0.4–1 cm long, lobes 3–6 mm long; corolla whitish, tube (1–)1.4(–2.3) cm long, limb 0.6–1.3 cm diameter; all stamens attached low in corolla tube, filaments long. Capsules ellipsoid or narrowly ovoid, *ca* 0.6–1.1 cm long, contained in calyx; seeds light brown,  $\pm$  quadrangular.

Generally on the edges of rainforest or on more fertile soils of the region. Flowers spring to autumn. Possibly poisonous.

## 4. *Nicotiana velutina* Wheeler

*Nicotiana suaveolens* Lehm. var. *debneyi* F. M. Bailey

Erect herb or shrub up to 1.2 m tall, pubescent with simple and glandular hairs. Leaves radical and cauline, somewhat succulent; subsessile or on petioles 0.4–9(–15) cm long, often winged; blades ovate to elliptic, cauline often narrowly so, apex acute to obtuse, base cuneate to attenuate, often decurrent on petiole, margin entire or sinuate, 2–28 cm  $\times$  0.5–12 cm, uppermost smallest, pubescent or rarely puberulent. Inflorescences elongated few-branched terminal panicles; calyx 0.7–1.5 cm long, lobes 3–7 cm long, pubescent outside; corolla white to cream, tube 1–3.5 cm long, limb 0.7–3 cm diameter; 4 stamens subsessile on throat, 5th inserted lower, with long filament. Capsules narrowly ovoid or ellipsoid, 0.7–1.1 cm long,  $\pm$  as long as calyx; seeds brown, reniform. **Fig. 56G.**

Recorded from Brisbane around wool storage sheds and a wool scour; normally in western Queensland. Flowers spring to autumn. Suspected of being poisonous to stock but not proven toxic.

**N. tabacum** L., TOBACCO, may be met with as a stray from cultivation in the Moreton district. It can be distinguished from the other species by its size, 1–3 m tall, its sessile leaves up to 43 cm  $\times$  23 cm, cream, pink or reddish flowers *ca* 4–5 cm long, and capsules 1.5–2 cm long.



**Fig. 56** SOLANACEAE — **A** *Duboisia myoporoides*, part of flowering branchlet  $\times 1$ ; **B–D** *Datura* spp. — **B** *D. stramonium*, leaves and fruit  $\times 1/2$ ; **C** *D. ferox*, fruit  $\times 1/2$ ; **D** *D. metel*, fruit  $\times 1/2$ ; **E** *Petunia axillaris*, part of flowering branchlet  $\times 1/2$ ; **F–G** *Nicotiana* spp. — **F<sub>1</sub>–F<sub>2</sub>** *N. glauca*, **F<sub>1</sub>** leaf and flowers  $\times 1$ , **F<sub>2</sub>** flower opened out to show long staminal filaments  $\times 1$ ; **G** *N. velutina*, flower opened out to show 4 short staminal filaments, long one removed,  $\times 1$ ; **H<sub>1</sub>–H<sub>3</sub>** *Cyphomandra betacea*, **H<sub>1</sub>** flower  $\times 1$ , **H<sub>2</sub>** dorsal view of anther with apical pores  $\times 4$ , **H<sub>3</sub>** dorsal view of anther showing broad connective  $\times 4$ ; **I<sub>1</sub>–I<sub>2</sub>** *Lycopersicon lycopersicum*, **I<sub>1</sub>** part of flowering branchlet  $\times 1$ , **I<sub>2</sub>** centre of flower showing anthers with sterile terminal appendages  $\times 3$ .

## 7. CYPHOMANDRA Mart. ex Sendtner

Trees shrubs or vines, unarmed, pubescent. Leaves petiolate, simple or compound, variable. Inflorescences of simple or branched racemose cymes often arising from stem forks; flowers mostly 5-partite; corolla mostly deeply lobed; filaments free or connate extending into an elaborate connective at back of anther, anthers opening by pores or longitudinal slits; ovary with numerous ovules. Fruits succulent berries; seeds flattened.

30 species Central and South America, West Indies; 1 species cultivated Australia, naturalized in south-eastern Queensland.

### 1. \**Cyphomandra betacea* (Cav.) Sendtner TREE TOMATO; TAMARILLO *Solanum betaceum* Cav.

Small, branched tree *ca* 2 m tall, pubescent with minute simple hairs mixed with short glandular hairs, malodorous, clammy. Leaves with petioles 2–15 cm long; blades ovate to broadly ovate, apex acute to shortly acuminate, base cordate, lobes often overlapping, 7–35 cm × 4–30 cm, juvenile and lower leaves largest. Inflorescences of pendulous cymes from stem forks or leaf axils, pedicels 1–2 cm long; calyx *ca* 5 mm long, glandular pubescent, lobes small; corolla pink, scented, somewhat fleshy, deeply stellate, *ca* 2 cm diameter, lobes 9–10 mm long. Berries dull dark red, ovoid, 5–7 cm long. **Fig. 56H.**

Native of South America, naturalized in a few areas in fertile soils, or on rainforest margins, in the region. Fruits edible.

## 8. LYCOPERSICON Miller

Perennial sprawling herbs, sometimes subwoody towards base, pubescent with simple or glandular hairs, unarmed, aromatic. Leaves pinnately lobed or divided, smaller leaflets often present between major leaflets, leaflet blades sessile or petiolulate, entire or lobed. Inflorescences lateral several-flowered racemose cymes or subpanicles, pedicels articulate in upper half; calyx deeply divided, lobes narrowly ovate; corolla 5-partite, stellate; filaments short, anthers erect, cohering in tube around style, dehiscing introrsely by longitudinal slits, each anther with sterile conical terminal appendage; ovary 2-locular, with enlarged placenta. Fruits berries; seeds compressed, pilose.

7 species Pacific region, South America, Galapagos Is.; 1 species cultivated and naturalized Australia, occurring in south-eastern Queensland.

### 1. \**Lycopersicon lycopersicum* (L.) Karst. TOMATO *Solanum lycopersicum* L.; *Lycopersicon esculentum* Miller

Sprawling short lived herb up to 1.5 m tall, often densely pubescent with simple and glandular hairs. Leaves with petioles 2–5 cm long; blades up to *ca* 30 cm × 20 cm, pinnatisect into 7–9 major petiolulate lobes with entire or lobed margins, sometimes again divided on larger leaves, or pinnate, often with smaller sessile or petiolulate leaflets occurring along leaf midrib between major leaflets, leaflet apices acute to acuminate, bases oblique. Inflorescences lateral, of few-many-flowered racemose cymes, sometimes forked, pedicels articulate in upper half; calyx deeply lobed, lobes narrow, *ca* 1 cm long; corolla yellow, stellate, 2–2.5 cm diameter, often 6–9-lobed in cultivars, narrowly triangular, often reflexed. Berries red, succulent, globular or depressed globular, 1–2 cm diameter in naturalized forms, 5–10 cm diameter in cultivated forms. **Fig. 56I.**

Native of South America; naturalized in more fertile soils of the region, e.g. creek banks, near habitation. Flowers sporadically through much of the year. Ripe fruits edible.

9. NICANDRA Adans.

Erect annuals. Flowers solitary, pseudo-axillary or rarely interfoliar; calyx of 5 distinct broadly cordate segments or sepals, becoming much enlarged and inflated in fruit; corolla campanulate with 5 broad short lobes; anthers short, opening longitudinally; ovary 3–5-locular. Fruits berries enclosed in enlarged calyx.

1 species South America, cultivated and naturalized Australia, occurring in south-eastern Queensland.

1. \**Nicandra physalodes* (L.) Gaertn.

APPLE OF PERU

*Atropa physalodes* L.

Annual herb up to 2 m tall. Leaves with petioles 0.5–9 cm long; blades narrowly to broadly ovate, apex acute to acuminate, rarely obtuse, base cuneate to attenuate, margin usually widely irregularly and shallowly dentate or sinuate-dentate, 3–20 cm × 1–20 cm, glabrous or sparsely pubescent on upper surface. Flowers on peduncles 0.5–2.5 cm long, decurved, longer in fruit; calyx 5-lobed, usually glabrous, lobes ovate with sagittate base, adpressed along margins to form longitudinal wings, 0.7–2.2 cm long; corolla pale blue to mauve on limb and upper tube, whitish on lower tube, 1.2–3 cm long. Fruits pale yellow, almost dry, globular, (0.5–)1–2.2 cm diameter, enclosed in accrescent chartaceous reticulate calyx. **Fig. 60A.**

Native of South America; cultivated as an ornamental and naturalized mainly on disturbed ground in areas of relatively high rainfall. Flowers mainly summer–autumn. Suspected of being poisonous to stock but not proven toxic.

10. SOLANUM L.

Annual or perennial herbs, shrubs or small trees, sometimes trailing or climbing, unarmed or with prickles, usually pubescent. Leaves usually alternate, petiolate, simple, lobed or compound. Inflorescences terminal but usually becoming apparently lateral by growth of axillary bud, often extra-axillary, of variously developed cymes, rarely reduced to solitary flower; flowers usually bisexual; calyx campanulate, rotate or cupular, 5-, rarely 4- or up to 10-lobed or 10-toothed, sometimes enlarged to enclose fruit; corolla deeply stellate, rotate, or campanulate, 5-, rarely 4- or up to 10-lobed, lobes plicate in bud, sometimes slightly zygomorphic; stamens 5, rarely 4, inserted on throat, alternating with lobes, usually exerted, filaments usually much shorter than anthers, anthers often connivent, forming cone around style, or free and divergent, sometimes unequal in size; ovary superior, 2-, rarely 3–4-locular, ovules numerous, style simple, stigma capitate or bifid. Fruits mostly succulent berries; seeds orbicular or subreniform, compressed; sometimes stone cell concretions present also.

About 1 700 species tropical and temperate; 94 native and 31 naturalized species Australia; 45 species south-eastern Queensland.

- 1. Plants with neither prickles nor stellate hairs . . . . . 2
- Plants with either prickles or stellate hairs . . . . . 13
- 2. Climbers or vines . . . . . 3
- Erect sprawling or prostrate plants . . . . . 4
- 3. Leaves always pinnate or pinnatisect; flowers mauve blue, 2–3 cm diameter; fruits bright red, ca 10 mm diameter . . . . . 1. *S. seaforthianum*
- Leaves only pinnatisect when juvenile, entire when mature; flowers white or pale purple, ca 2 cm diameter; fruits dark blue to shiny black, ca 7–9 mm diameter . . . . . 2. *S. jasminoides*
- 4. Leaves often pinnatisect; corollas violet, 3–5 cm diameter; fruits 2–3.5 cm long . . . . . 5
- Leaves entire or shallowly lobed; corollas usually white, up to 2 cm diameter; fruits up to 1.5 cm long . . . . . 6

5. Blades of simple leaves up to 10 times longer than broad; calyces 5–6 mm long, lobes 2–3 mm long; fruits orange-red to scarlet, 2 cm × 1–1.5 cm . . . . . 3. *S. aviculare*  
 Blades of simple leaves more than 10 times as long as broad; calyces 3–4 mm long, lobes *ca* 2 mm long; fruits greenish ivory, 2–3.5 cm × 2–3 cm . . . . . 4. *S. vescum*
6. Plants conspicuously pubescent to tomentose or villous, hairs spreading or antorsely curved . . . . . 7  
 Plants ± glabrous or sparsely pilose, hairs usually strongly antorsely curved . . . . . 8
7. Corolla lobes triangular or broadly triangular, equal to or shorter than tube; fruits olive-green or light brownish when ripe, calyx enlarged, membranous, embracing *ca* lower half of fruit . . . . . 5. *S. sarrachoides*  
 Corolla lobes narrowly oblong to narrowly ovate, longer than tube; fruits purplish black to black, opaque, calyx appressed to fruit . . . . . 6. *S. chenopodioides*
8. Leaves pinnatisect to bipinnatisect; flowers 1–3 on leafy lateral shoots . . . . . 7. *S. triflorum*  
 Leaves entire, sinuate lobed or shallowly pinnatifid; flowers in leafless extra-axillary inflorescences . . . . . 9
9. Inflorescences of short cymes of 5–10, rarely –30 flowers or 1-few flowers; mature fruits orange-yellow or orange-red, 1–1.5 cm diameter . . . . . 10  
 Inflorescences usually 2–8-flowered umbels or racemes; mature fruits black to purplish black, or green to purplish green, up to *ca* 1 cm diameter . . . . . 11
10. Woody shrubs 2–5 m tall; leaf blades with hair tufts in vein axils on undersurface and scattered along midrib; fruiting pedicels 1.8–3 cm long . . . . . 8. *S. callium*  
 Shrubs 1–2 m tall, sparsely pubescent on young growth but without hair tufts in vein axils; fruiting pedicels 0.8–1.5 cm long . . . . . 9. *S. pseudocapsicum*
11. Inflorescences racemose with internodes usually conspicuous; anthers 2–2.5 mm long, rarely 1.8 mm long . . . . . 10. *S. nigrum*  
 Inflorescences umbelliform; anthers up to 1.8 mm long, rarely up to 2 mm long . . . . . 12
12. Plants usually prostrate or decumbent, herbaceous; fruiting peduncles from horizontally spreading to strongly deflexed from base, mature fruits green . . . . . 11. *S. opacum*  
 Plants erect, ascending or sprawling, often becoming shrubby; fruiting peduncles ascending or erect, mature fruits shining black . . . . . 12. *S. americanum*
13. Prickles absent . . . . . 14  
 Prickles present . . . . . 23
14. Leaf blades glabrous or only sparsely stellate pubescent on upper surface . . . . . 15  
 Leaf blades moderately to densely stellate pubescent on upper surface . . . . . 17
15. Flowers usually solitary, extra-axillary on peduncles 2–5 mm long; fruits reddish, globose, *ca* 1.2–1.5 cm diameter . . . . . 13. *S. capsicastrum*  
 Flowers in cymes of 1–9 flowers on peduncles 0.3–1.5 cm long, pedicels 0.5–1.5 cm long; fruits yellowish or greenish, 1.5–2.5 cm diameter . . . . . 16
16. Calyces 3–5 mm long, lobes 1–2 mm long, acute; fruits pale yellow, *ca* 1.5 cm diameter, readily shed with pedicel when ripe . . . . . 14. *S. tetrahecum*  
 Calyces 4–8 mm long, lobes 2–4 mm long, abruptly acuminate into linear point 2–4 mm long; fruits yellowish or greenish, 1.5–2.5 cm diameter . . . . . 15. *S. sp. 1.*

17. Inflorescences of erect compound usually many-flowered cymes or corymbs borne above leaves, at first apparently terminal, later lateral . . . . . 18  
 Inflorescences usually extra-axillary, sessile or pedunculate clusters or cymes of 1–6 flowers . . . . . 19
18. Axillary stipule-like auricular leaves present on most stems; flowers mauve; fruiting pedicels 3–5 mm long . . . . . 16. *S. mauritianum*  
 Axillary stipule-like leaves absent; flowers white; fruiting pedicels 7–10 mm long . . . . . 17. *S. erianthum*
19. Calyces 3–6 mm long; fruits light yellow-brown or pale yellow, 1–1.5 cm diameter . . . . . 20  
 Calyces 0.7–1.5 cm long; fruits bright red, succulent, 0.6–1 cm diameter . . . . . 21
20. Herbaceous perennials up to *ca* 30 cm tall; corollas purple, stellate-rotate, 1.5–2.5 cm diameter; fruits light yellow-brown, 1–1.5 cm diameter, pedicels remaining on plant . . . . . 18. *S. esuriale*  
 Erect subshrubs up to 60 cm tall; corollas blue-purple, stellate, lobes often reflexed, 2–4 cm diameter; fruits pale yellow berries *ca* 1.5 cm diameter, readily shed with pedicel when ripe . . . . . 14. *S. tetrahecum*
21. Leaves densely felty pubescent with medium length stellate hairs; calyx lobes linear-oblong, obtuse, up to 3.5 mm long, enlarging to cover fruits . . . . . 19. *S. nemophilum*  
 Leaves densely villous with long stellate hairs; calyx lobes often unequal, narrowly oblong-ovate and acute, 0.5–1.2 cm long, or  $\pm$  triangular to narrowly ovate, acute, 0.4–0.7 cm long, almost covering fruits when ripe . . . . . 22
22. Leaf blades without glandular hairs on upper surface, margin entire to sinuate or juveniles shallowly obtusely lobed; calyx lobes narrowly oblong-ovate, unequal, acute; fruits 6–7 mm diameter . . . . . 20. *S. densevestitum*  
 Leaf blades with glandular hairs on upper surface, margins shallowly but acutely lobed; calyx lobes triangular to narrowly ovate, acute; fruits 8–10 mm diameter . . . . . 21. *S. sp. 2.*
23. Stellate hairs absent from leaf blades . . . . . 24  
 Stellate hairs present on leaf blades . . . . . 27
24. Prickles absent from calyx . . . . . 22. *S. sp. 3.*  
 Prickles present, usually numerous on calyx . . . . . 25
25. Whole plants glandular pubescent; inflorescences of cymes with up to 12 flowers, peduncles 1.5–5 cm long; calyces 0.8–1.2 cm long; corollas up to 5 cm diameter; fruits bright shiny red, succulent, globular, 1.5–2 cm diameter . . . . . 23. *S. sisymbriifolium*  
 Leaves with simple hairs above, minutely glandular pubescent below, or with minute glandular hairs only on young growth, otherwise glabrous; inflorescences of 1–6 flowers, peduncles 0.3–1 cm long; calyces 4–8 mm long; corollas 2–3 cm diameter; fruits bright orange-scarlet, *ca* 2–3.5 cm diameter or greenish yellow, 1.2–1.8 cm diameter . . . . . 26
26. Leaves with simple hairs on upper surface; fruits bright orange-scarlet, dry, *ca* 2–3.5 cm diameter . . . . . 24. *S. capsicoides*  
 Leaves with minute glandular hairs on young growth only, otherwise glabrous; fruits greenish yellow, not dry, 1.2–1.8 cm diameter . . . . . 25. *S. papaverifolium*
27. Inflorescences with 50–100 flowers in lateral branched corymbs or extra-axillary branched scorpioid cymes; corollas white . . . . . 28  
 Inflorescences with usually less than 12 flowers, or if up to 20 then corollas blue or yellow . . . . . 29
28. Spreading or scrambling shrub up to 3 m tall; inflorescences compact, branched, 50–100-flowered corymbs; corollas up to 2.5 cm diameter . . . . . 26. *S. torvum*

- Erect shrub or small tree up to *ca* 4 m tall; inflorescences branched, *ca* 50-flowered dense scorpioid cymes; corollas 3–4 cm diameter . . . . . 27. *S. hispidum*
29. Plants with prickles on calyx . . . . . 30  
Plants without prickles on calyx though they may be elsewhere on plant . . . . . 40
30. Plants with moderate to dense stellate indumentum on upper leaf surface . . . . . 31  
Plants glabrous or with sparse stellate indumentum on upper leaf surface, usually along veins . . . . . 34
31. Leaves discolourous, stellate hairs short with short central vertical ray and 10–14  $\pm$  horizontal radiating rays very shortly united at their base, indumentum appearing somewhat scaly; prickles fine, usually reddish . . . . . 28. *S. elaeagnifolium*  
Leaves not markedly discolourous, stellate hairs with short to medium length rays but not as above, indumentum appearing felty; prickles fine or coarse, brownish, yellowish or dark . . . . . 32
32. Indumentum of long stellate hairs with long central ray, appearance shaggy; flowers up to 5 cm diameter; fruits 2.5–3 cm diameter . . . . . 29. *S. sp. 4.*  
Indumentum of very short stellate hairs, appearance felty or woolly; flowers 1.5–3 cm diameter; fruits 1–2 cm diameter . . . . . 33
33. Calyces 5–6 mm long, lobes 3–4 mm long; corollas 1.5–2 cm diameter; fruiting pedicels 1–1.5 cm long . . . . . 30. *S. dianthophorum*  
Calyces 6–10 mm long, lobes 5–8 mm long; corollas 2–3 cm diameter; fruiting pedicels (1–)1.5–2 cm long . . . . . 31. *S. ellipticum*
34. Corollas yellow; fruits drying blackish, globular, *ca* 1 cm diameter, enclosed in very prickly calyx . . . . . 32. *S. rostratum*  
Corollas not yellow; fruits not enclosed in calyx . . . . . 35
35. Fruits reddish, finally black, succulent, 0.8–1.2 cm diameter; inflorescences simple or 2–3 times dichotomously branched; flowers few to numerous . . . . . 33. *S. semiarmatum*  
Fruits greenish tinged with cream or purple, or eventually brownish, firm or dry when ripe, 1–3.5 cm diameter; inflorescences cymes or racemes of 1–7 flowers . . . . . 36
36. Fruits pale yellow, 1–1.5 cm diameter; erect or sprawling herbs up to 25 cm tall . . . . . 34. *S. lacunarium*  
Fruits green tinged with cream or purple or eventually brownish, 1.5–3.5 cm diameter; erect sprawling or prostrate herbs or shrubs 0.45–4 m tall . . . . . 37
37. Fruits green mottled cream eventually brownish, or dark brown; calyces densely prickly; corollas 1.5–2 cm diameter . . . . . 38  
Fruits greenish or tinged with purple; calyces usually with only few prickles; corollas 1–1.5 cm or 3–4 cm diameter . . . . . 39
38. Leaves densely pale stellate pubescent on lower surface; fruits 1.5–2 cm diameter . . . . . 35. *S. cinereum*  
Leaves moderately to sparsely stellate pubescent on lower surface; fruits 2–3.5 cm diameter . . . . . 36. *S. hermannii*
39. Corollas 1–1.5 cm diameter; fruits globular to ovoid, 1.5–2 cm  $\times$  1.5 cm . . . . . 37. *S. prinophyllum*  
Corollas 3–4 cm diameter; fruits globose, *ca* 2.5 cm diameter . . . . . 38. *S. sp. 5.*
40. Leaves moderately to densely stellate pubescent on upper surface . . . . . 41  
Leaves sparsely stellate pubescent or glabrous on upper surface . . . . . 46
41. Leaves with stellate hairs with short central vertical ray and 10–14  $\pm$  horizontal radiating rays very shortly united at their base, indumentum appearing somewhat scaly . . . . . 28. *S. elaeagnifolium*  
Leaves with long- or short-rayed stellate hairs, but not as above, indumentum appearing velvety or shaggy . . . . . 42

42. Leaves with long stellate hairs with long central ray, indumentum appearing shaggy; fruits 2.5–3 cm diameter . . . . . 29. *S. sp. 4.*  
 Leaves with medium length stellate hairs, indumentum appearing velvety; fruits 1–2 cm diameter . . . . . 43
43. Calyx lobes 0.7–1.2 cm long contracted into linear apices 4–7 mm long; fruits green with dark purple mottling on upper half . . . . . 38. *S. sp. 5.*  
 Calyx lobes triangular and 1–2 mm long, or 2–4 mm long with acuminate points 2–4 mm long; fruits yellow or greenish, without purple mottling . . . . . 44
44. Calyx lobes 2–4 mm long, abruptly acuminate into linear points 2–4 mm long; calyx lobes enlarged in fruit, up to 1.8 cm long . . . . . 15. *S. sp. 1.*  
 Calyx lobes 1–2 mm long, ± triangular or points up to ca 1.5 mm long; calyx covering base of fruit only, not much enlarged . . . . . 45
45. Leaf margins with ca 7 broadly triangular acute or rounded lobes cut halfway to midrib; calyx 6–7 mm long . . . . . 39. *S. dimidiatum*  
 Leaf margins entire or slightly undulate, not lobed, calyx 3–5.5 mm long . . . . . 14. *S. tetrahecum*
46. Leaves glabrous or sparsely stellate pubescent on lower surface . . . . . 47  
 Leaves moderately to densely stellate pubescent on lower surface . . . . . 49
47. Flowers 2.5–3.5 cm diameter; fruits 1–2 cm diameter . . . . . 40. *S. inaequilaterum*  
 Flowers 1–2 cm diameter; fruits 0.5–1 cm diameter . . . . . 48
48. Leaves ovate to elliptic in outline, pinnatifid to pinnatisect with up to 5 lobes on either side; inflorescences of racemose cymes with few–numerous flowers, peduncles ca 1 cm long, pedicels 5.5–7 cm long . . . . . 22. *S. sp. 3.*  
 Leaves mostly linear or linear-hastate, occasionally slightly undulate when juvenile; inflorescences short, 3–6-flowered, peduncles ca 3 mm long, pedicels 1–1.7 cm long . . . . . 41. *S. ferocissimum*
49. Leaf blades oblong to very narrowly ovate, 0.3–1(–1.5) cm wide; corollas 1–1.5 cm diameter . . . . . 42. *S. parvifolium*  
 Leaf blades elliptic, narrowly ovate or ovate, 0.3–5 cm wide; corollas 2–3 cm diameter . . . . . 50
50. Inflorescences extra-axillary umbel-like cymes, peduncles up to 2 cm long, pedicels 1–1.5 cm long; fruiting pedicels 1.5–3 cm long, erect or spreading . . . . . 43. *S. stelligerum*  
 Inflorescences extra-axillary cymes, peduncles 0–1 cm long, pedicels ca 1 cm long; fruiting pedicels deflexed, 1.5–2.5 cm long . . . . . 51
51. Leaf blades elliptic to oblong, 2.5–12.5 cm × 1–5 cm; corollas deeply stellate, ca 2 cm diameter . . . . . 44. *S. corifolium*  
 Leaf blades narrowly ovate to very narrowly ovate, 2.5–13.5 cm × 0.3–3.5(–4.2) cm; corollas broadly stellate, 2.5–3 cm diameter . . . . . 45. *S. elegans*

### 1. \**Solanum seaforthianum* Andr.

### BRAZILIAN NIGHTSHADE

Sprawling slender perennial shrubby climber, unarmed, ± glabrous. Leaves with petioles 0.5–6 cm long; blades ovate in outline, up to 13 cm × 11 cm, partly or completely divided to midrib into 3–9 lobes, lobes narrowly obovate, up to 4 cm × 1.5 cm, broadly attached or shortly petiolulate, rarely blades simple. Inflorescences showy panicles of few–50 flowers, at first apparently terminal, soon lateral, pedicels ca 1 cm long; calyx 1–2 mm long, lobes obtuse, very short; corolla mauve-blue, stellate, 2–3 cm diameter, lobes acute. Fruiting pedicels 1–1.5 cm long, fruits bright shiny red, succulent, globular, ca 1 cm diameter. **Fig. 57A.**

Native of Brazil; cultivated as an ornamental climber, naturalized throughout the region often near habitation or on rainforest margins or on fertile soils. Flowers mainly spring and autumn. Fruits and leaves toxic if eaten.

**2. \**Solanum jasminoides* Paxton****POTATO CREEPER***Solanum dietrichiae* Domin

Many-stemmed vigorous perennial climber,  $\pm$  glabrous, unarmed. Juvenile leaves pinnatisect with 3–5 narrowly ovate lobes; mature leaves with petioles 1–3 cm long; blades ovate to narrowly ovate, apex acute, base rounded to truncate, margin  $\pm$  entire, 2.75–5.5 cm  $\times$  1.5–3 cm. Inflorescences of leaf-opposed dichotomous panicles of ca 20 flowers, at first apparently terminal, later lateral, peduncles up to 3.5 cm long, pedicels slender, 1–1.5 cm long; calyx 2–3 mm long, lobes acuminate, 1–1.5 mm long; corolla white or pale blue, stellate, ca 2 cm diameter, lobes acute. Fruiting pedicels ca 1.5 cm long, distinctly swollen apically up to 3–4 mm diameter, fruits dark blue to shiny black, succulent, globular to slightly ovoid, 7–9 mm diameter.

Native of South America; cultivated as an ornamental, occasionally naturalized near Brisbane. Flowers summer–autumn.

**3. *Solanum aviculare* G. Forster****KANGAROO APPLE***Solanum aviculare* var. *typicum* Domin; *S. brisbanense* (Herasim.) Herasim.; *S. aviculare* var. *brisbanense* Herasim.; *S. glaberrimum* Dunal ex Poir.

Erect perennial soft wooded shrub up to 4 m tall, straggly with age,  $\pm$  glabrous, unarmed. Leaves with petioles 1–3.5 cm long; blades entire or lobed; lobed blades 15–40 cm  $\times$  10–25 cm with 3–11 lobes, lobes narrowly ovate or long triangular, apex attenuate to acuminate, 1–13 cm  $\times$  1–2.5 cm; entire blades narrowly ovate-elliptic, apex mostly acute to acuminate, base cuneate, oblique, 7.5–25 cm  $\times$  1–4 cm, less than 10 times as long as wide. Inflorescences of initially coiled 2-sided cymes of few–10 flowers from stem forks or leaf axils, often forked basally with a pedicellate flower in fork, pedicels 1.5–2 cm long; calyx 5–6 mm long, lobes bluntly triangular, 2–3 mm long; corolla bluish violet with deeper violet star, rarely pale lilac, rotate-stellate, 3–4(–5) cm diameter. Fruiting pedicels 2–3.5 cm long, fruits orange-red to scarlet, succulent, obovoid to ellipsoid, 2 cm  $\times$  1–1.5 cm.

Rainforest margins, depauperate rainforest, or better quality brigalow forest of the region. Flowers sporadically throughout the year. Cultivated in U.S.S.R., eastern Europe and New Zealand as a source of solasodine for the production of cortisone and other steroid drugs. Suspected of being poisonous to stock.

**4. *Solanum vescum* F. Muell.***Solanum aviculare* G. Forster var. *vescum* (F. Muell.) Domin; *S. vescum* var. *kibalczezcii* Herasim.; *S. vescum* var. *davidii* Herasim.

Erect or spreading  $\pm$  perennial soft wooded shrub 1–2 m tall,  $\pm$  glabrous, unarmed. Leaves entire to lobed; lobed blades up to 50 cm  $\times$  20 cm, deeply pinnatisect into 4–6 lobes, lobes oblong to linear, apex rounded to acute, (2–)5–10 cm  $\times$  (0.3–)0.8–1.2 cm; entire leaves sessile or petiolate, blades linear-ovate, apex acute, base cuneate, decurrent on petiole, 5–30 cm  $\times$  0.5–1.3 cm. Inflorescences initially coiled 2-sided cymes arising from leaf or stem axils, peduncles 0–5 cm long, pedicels 2–3 cm long; calyx 3–4 mm long, fleshy, lobes ca 2 mm long; corolla violet, rotate-stellate, ca 4 cm diameter. Floral rachis enlarged in fruit up to 2 cm long, fruiting pedicels 3–5 cm long, deflexed, fruits greenish ivory, becoming succulent and aromatic, globular to ovoid, 3–3.5 cm  $\times$  2–3 cm.

Coastal districts usually as weed of recently cleared pasture but also recorded from southern Darling Downs district. Flowers winter–spring. Suspected of being poisonous.

**5. \**Solanum sarrachoides* Sendtner***Solanum nitidibaccatum* Bitter

Sprawling annual herb up to 50 cm tall, unarmed, pubescent with glandular hairs. Leaves with petioles 0.5–2.5 cm long; blades ovate, apex acute, base cuneate or broadly so, margin entire or shallowly lobed, 2.5–7 cm  $\times$  1.2–3.5 cm. Inflorescences short racemes of 2–6 flowers, peduncles ca 1 cm long, pedicels 5–7 mm long; calyx 1.5–2.5 mm long, lobes broad, acute, ca 2 mm long; corolla white, stellate-pentagonal, ca 1.2 cm diameter. Fruiting peduncles 1.5–2.5 cm long, calyx enlarged, ca 5 mm long, appressed to and covering about half fruit, fruits shining translucent green to

brownish green, succulent, globular, *ca* 5–6 mm diameter, readily shed with pedicel; sclerotic granules 0.5–0.8 mm diameter. **Fig. 57B.**

Native of North America; naturalized weed of southern districts. Flowers sporadically winter to summer.

The correct name of this taxon is uncertain.

**6. \**Solanum chenopodioides* Lam.**

WHITETIP NIGHTSHADE

*Solanum sublobatum* Willd. ex Roemer & Schultes; *S. gracile* Dunal; *S. gracilius* Herter

Sprawling soft wooded, short lived herbaceous perennial up to 1 m tall, shortly pubescent, unarmed. Leaves with petioles 0.4–1.8 cm long; blades ovate, apex acute to bluntly acuminate, base cuneate, attenuate or sometimes rounded and decurrent on stem, margin entire to undulate or shallowly lobed towards base, 1.2–6 cm × 0.2–2.5 cm, rarely longer. Inflorescences umbels of 5–10 flowers, peduncles 1.2–2 cm long, pedicels 5–8 mm long; calyx 2 mm long, lobes *ca* 1 mm long; corolla white, stellate, 1.5–2 cm diameter, often reflexed. Fruiting peduncles enlarged, 1.5–3 cm long, usually distinctly and sharply deflexed from base, fruits black, opaque, globular, *ca* 5 mm diameter, without sclerotic granules.

Native of Argentina; naturalized but rarely collected, in moister or more fertile areas of the southern districts. Flowers spring–summer. Contains alkaloids.

**7. \**Solanum triflorum* Nutt.**

THREE FLOWERED NIGHTSHADE; CUTLEAF NIGHTSHADE

Sprawling annual herb; stems up to 1 m long, sometimes rooting at nodes, unarmed, puberulent with simple hairs. Leaves with petioles 0.5–1.5 cm long; blades ovate to elliptic in outline, apex acute, base cuneate, margin acutely lobed up to  $\frac{3}{4}$  way to midrib, lobes often pinnatifid, 1.5–4 cm × 1.3–2.5 cm. Inflorescences 3-flowered subumbellate extra-axillary cymes, peduncles 1–3 cm long, pedicels *ca* 3–4 mm long; calyx 3–3.5 mm long, lobes acute, *ca* 2 mm long; corolla white, stellate, 5–6 mm diameter, lobe apices pubescent. Fruiting pedicels *ca* 8 mm long, recurved, calyx well developed but not enclosing fruit, reflexed at maturity, fruits marbled whitish green, succulent, globular, 1–1.2 cm diameter; sclerotic granules *ca* 1 mm diameter.

Native of North America; naturalized in the Stanthorpe-Wallangarra area of the Darling Downs district, weed in crops. Flowers summer.

**8. *Solanum callium* C. T. White ex R. Henderson**

Woody shrub 2–5 m tall, open and straggly with age, unarmed, ± glabrous. Leaves with petioles 0.8–4 cm long; blades elliptic to ovate, apex acute or occasionally blunt, base cuneate to attenuate, margin entire, 4.5–19.5 cm × 1.5–7 cm, hair tufts present in vein axils on undersurface and scattered along midrib. Inflorescences short cymes of 5–10, rarely –30 flowers, peduncles 2–10 mm long, pedicels 1–1.5 cm long; calyx 2–3 mm long, lobes obtuse, 0.5–1 mm long; corolla white, deeply stellate, *ca* 1.5 cm diameter. Fruiting peduncles *ca* 1 cm long, pedicels up to 3 cm long, calyx not much enlarged, fruits bright orange-yellow, succulent, globose, *ca* 1–1.5 cm diameter.

Lever's Plateau on the McPherson Ra. in basalt derived soils in rainforest clearings or margins. Flowers summer.

**9. \**Solanum pseudocapsicum* L.**

MADEIRA WINTER CHERRY; JERUSALEM CHERRY

Shrub 1–2 m tall, unarmed, glabrous or sparsely pubescent on young growth. Leaves with petioles 0.2–2 cm long; blades elliptic, apex acute or acuminate, base cuneate, decurrent along petiole, margin undulate, 1.5–10.5 cm × 0.5–2.5 cm, veins prominent below. Inflorescences internodal, of few flowers, or solitary, peduncles 1–10 mm long, pedicels *ca* 1 cm long, at first deflexed, later erect in fruit; calyx 3–5 mm long, lobes triangular, 2–3 mm long; corolla white, stellate, *ca* 1 cm diameter. Fruiting pedicels *ca*

0.8–1.5 cm long, calyx lobes not much enlarged, covering base of fruit, fruits bright orange-red, globular, 1–1.5 cm diameter, often solitary.

Pantropical weed; cultivated as an ornamental but naturalized in more fertile areas of Moreton and Darling Downs districts, often near creek banks or rainforest. Flowers spring to autumn. Suspected of being poisonous but evidence vague.

**10. \**Solanum nigrum* L.**

**BLACKBERRY NIGHTSHADE**

Annual or perennial soft wooded herb or shrub, unarmed, pubescent with simple and/or almost sessile glandular hairs. Leaves with petioles 0.5–3 cm long; blades ovate, apex acute to bluntly acuminate, base cuneate, decurrent on petiole, margin entire, undulate to bluntly shallowly lobed, 1.5–13 cm × 0.8–7 cm. Inflorescences short racemes of 4–8 flowers, peduncles 1–2 cm long, pedicels *ca* 7 mm long, spreading in flower, reflexed in fruit; calyx 1.5–2 mm long, lobes acute, 1 mm long; corolla white, stellate, 0.8–1.2 cm diameter, lobes acute, appressed pubescent outside. Fruiting peduncles 1.5–3 cm long, pedicels 1–1.5 cm long, fruits dull black or purple-black, ± globular, *ca* 6–8 mm diameter, without sclerotic granules. **Fig. 57C.**

Cosmopolitan weed; naturalized throughout the region as a weed of pasture and waste areas. Flowers sporadically throughout the year. Reported to contain alkaloids.

**11. *Solanum opacum* A. Braun & Bouché**

**GREEN BERRY NIGHTSHADE**

*Solanum nigrum* L. var. *chlorocarpum* F. Muell. ex Domin nomen nudum; *S. nigrum* L. var. *humile* auct. non F. M. Bailey; *S. nigrum* L. var. *pteroaulon* auct. non Domin; *S. pterocaulum* auct. non Dunal; *S. pterocaulon* auct. non Dunal; *S. nodiflorum* auct. non Jacq.; *S. nigrum* auct. non L., Benth.

Sprawling almost prostrate annual herb up to 1 m diameter, unarmed, pubescent with appressed simple and minute ± sessile glandular hairs. Leaves with petioles 0.5–3.5 cm long; blades ovate, apex acute, base cuneate, decurrent on petiole, margin lobed, 1.5–7.5 cm × 1–3.5 cm. Inflorescences short racemes or subumbellate, 2–5-flowered, peduncles 1.5–2 cm long, pedicels 7–10 mm long; calyx 2–3 mm long, lobes *ca* 1 mm long; corolla white, stellate, *ca* 1 cm diameter. Fruiting peduncles 1.5–3 cm long, pedicels 0.7–1.2 cm long, calyx somewhat enlarged, fruits green, succulent, globular, *ca* 1 cm diameter; sclerotic granules 2, rarely 4 per fruit, 0.8–1.2 mm across at apex.

Throughout the region, usually as a weed of more fertile soils, e.g. pasture, rainforest margins, gardens. Flowers sporadically much of the year.

**12. \**Solanum americanum* Miller**

**GLOSSY NIGHTSHADE**

*Solanum nodiflorum* Jacq.; *S. nodiflorum* subsp. *nutans* R. Henderson; *S. nigrum* auct. non L., Benth.; *S. americanum* var. *nodiflorum* (Jacq.) Edmonds

Erect or straggly short lived herbaceous perennial up to 1.25 m tall, unarmed, glabrous or sparsely pubescent. Leaves with petioles 1–4(–9) cm long; blades ovate, apex acute to acuminate, occasionally blunt, base truncate to cuneate and decurrent on petiole, margin entire or bluntly lobed, 2–14 cm × 1–8 cm. Inflorescences of umbellate or subumbellate cymes of 4–8 flowers, extra-axillary, peduncles 0.8–2.5 cm long, pedicels 5–8 mm long; calyx 1–2 mm long, lobes obtuse, *ca* 1 mm long; corolla white or flushed purple, deeply stellate, 8–9 mm diameter. Fruiting peduncles enlarged up to 4 cm long, pedicels erect or decurved, 0.7–1 cm long, calyx somewhat enlarged and lobes reflexed, fruits glossy purplish black, succulent, globular, 6–9 mm diameter; sclerotic granules 0–4, rarely 8 per fruit, less than 0.6 mm diameter. **Fig. 57D.**

Cosmopolitan weed; naturalized mainly as a weed near habitation throughout the region, though one taxon previously separated as *S. nodiflorum* subsp. *nutans* is considered native. Flowers autumn to spring.

The correct names for these taxa are uncertain.

**13. \**Solanum capsicastrum* Link**

**FALSE JERUSALEM CHERRY**

Woody shrub up to *ca* 60 cm tall, unarmed, stems and young growth moderately stellate pubescent. Leaves with petioles 1–6 mm long; blades ovate to oblong-ovate, apex obtuse to acute, base obtuse to cuneate, margin sinuate to entire, 1.2–3.5 cm ×

0.55–1.5 cm, sparsely stellate and simple pubescent above, mainly along midrib, sparsely to moderately stellate pubescent beneath. Flowers usually solitary extra-axillary on peduncles 2–5 mm long; corolla white, *ca* 1–1.5 cm diameter. Fruiting peduncles *ca* 1 cm long, fruits reddish when ripe, succulent, globose, *ca* 1.2–1.5 cm diameter.

Native of Brazil and Uruguay; naturalized near habitation in the Moreton and Wide Bay districts. Flowers summer.

#### 14. *Solanum tetrahectum* F. Muell.

Erect subshrub up to 60 cm tall; prickles usually present on young or vigorous growth, reddish or brownish, straight, firm, up to 1 cm long, scattered on stem, less common elsewhere; all parts stellate tomentose. Leaves with petioles 0.25–2.5 cm long; blades oblong to narrowly ovate or ovate, apex acute to rounded, base rounded to subcordate, oblique, margin entire or slightly undulate, 2–9.5 cm × 0.75–4 cm, sparsely or densely stellate pubescent above, densely so below. Inflorescences extra-axillary 1–5-flowered cymes, peduncles up to 1.5 cm long, pedicels 0.5–1.5 cm long; calyx 3–5.5 mm long, lobes 1–2 mm long; corolla blue-purple, showy, stellate, 2–4 cm diameter, lobes often reflexed. Fruiting peduncles 2–4.5 cm long, pedicels deflexed, 0.8–1.5 cm long, calyx slightly enlarged, appressed, covering base of fruit, fruits greenish or pale yellow, globular or depressed globular, *ca* 1.5 cm diameter, readily shed with pedicel when ripe.

Darling Downs and Burnett districts and western areas of Moreton district often in brigalow areas. Flowers spring to autumn.

#### 15. *Solanum* sp. 1.

Erect shrub 1.5–2 m tall; young bark dark, not corky; prickles straight, up to 1 cm long, scattered on younger stems and leaves, sometimes absent; all parts stellate pubescent. Leaves with petioles 0.5–2 cm long; blades ovate to elliptic, apex acute to acuminate, base broadly cuneate to rounded, margin sinuate to bluntly shallowly lobed, 3–16 cm × 1.5–10 cm, very sparsely shortly stellate pubescent above, densely to moderately so beneath, often floccose. Inflorescences of condensed 3–9-flowered cymes, peduncles 0.3–1 cm long, pedicels *ca* 0.8–1.2 cm long; calyx 4–8 mm long, lobes 2–4 mm long, abruptly acuminate into linear point 2–4 mm long; corolla bluish purple, broadly stellate, 2.5–3.5 cm diameter, lobes often reflexed. Fruiting peduncles not much enlarged, pedicels up to 2.3 cm long, calyx lobes up to 1.8 mm long, fruits yellowish or greenish, globular or depressed globular, 1.5–2.5 cm diameter.

Rainforest or depauperate rainforest of the coastal districts and also Bunya Mts. and eastern edge of Darling Downs district, e.g. near Killarney. Flowers spring to autumn.

This taxon has been confused with *S. furfuraceum* R. Br., a central Queensland species. It differs from this species in the absence of corky bark, the sinuate to lobed leaf blades (rather than entire), the generally short ± sessile stellate indumentum and larger flowers and fruits.

#### 16. \**Solanum mauritianum* Scop.

#### WILD TOBACCO TREE

*Solanum auriculatum* Aiton

Large shrub or small tree up to 4 m tall, unarmed, all parts densely stellate pubescent, loose and floccose on young growth. Leaves with petioles 1–6.5 cm long; blades elliptic, apex acuminate, base cuneate, sometimes slightly unequal, margin entire, 7.5–40 cm × 3–15 cm, each leaf with 1–2 smaller auricular leaflets in axils, these sessile, rounded, but absent on smaller twigs or weak growth. Inflorescences dichotomously branched many-flowered corymbs, peduncles up to 15 cm long, pedicels 2–3 mm long; calyx *ca* 5 mm long, lobes acute, *ca* 2 mm long; corolla violet, stellate, 1.5–2.5 cm long. Fruiting pedicels 3–5 mm long, fruits dull yellowish, soft, globular, 1–1.5 cm diameter, pubescent, glabrous with age. **Fig. 57E.**

Native of South America; naturalized in coastal districts often on rainforest margins but also in eucalypt forest. Flowers autumn to spring. Poisonous to stock. Declared noxious under the Stock Routes and Rural Lands Protection Acts, 1944–1967.

**17. \**Solanum erianthum* D. Don**

POTATO TREE; TOBACCO TREE

*Solanum verbascifolium* auct. non L.

Shrub or small tree up to 4 m tall, rarely 8 m tall, unarmed, all parts densely and softly stellate pubescent. Leaves with petioles 0.5–5.5 cm long; blades ovate-elliptic, apex acute or acuminate, base rounded or obtuse, margin entire, 7–28 cm × 2.5–13 cm, often moderately pubescent above, axillary stipule-like leaves absent. Inflorescences of erect compound cymes borne above leaves, peduncles 3–5 cm long, pedicels 5–10 mm long; calyx 6–8 mm long, lobes bluntly triangular, *ca* 2 mm long; corolla white, stellate, *ca* 1.5 cm diameter, pubescent outside. Fruiting pedicels 7–10 mm long, fruits dull yellow, succulent, globular, *ca* 1 cm diameter, pubescent.

Native of tropical Central America; naturalized in coastal districts of the region. Flowers mainly autumn–winter.

**18. *Solanum esuriale* Lindl.**

QUENA; POTATO WEED

*Solanum pulchellum* F. Muell.; *S. ellipticum* R. Br. forma *inermis* Wawra; *S. esuriale* var. *sublobatum* Domin; *S. esuriale* forma *xanthocarpum* Domin; *S. esuriale* forma *rubro-aurantiacum* Domin

Herbaceous perennial up to 30 cm tall; prickles usually absent or fine, weak, *ca* 2–3 mm long, scattered along stems; all parts densely pale stellate tomentose. Leaves with petioles 0.8–4 cm long; blades oblong or ovate-oblong, apex obtuse or rarely ± acute, base cuneate, margin entire to sinuate in lower leaves, 1.5–12 cm × 0.5–2.5 cm. Inflorescences 2–6-flowered cymes, peduncles 1–4 cm long, pedicels 0.8–1.5 cm long; calyx 3–6 mm long, lobes linear, 1.5–3 mm long; corolla purple, rotate-stellate, 1.5–2.5 cm diameter. Fruiting peduncles 2–4.5 cm long, pedicels deflexed, 0.8–1.5 cm long, calyx slightly enlarged, covering base of fruit, appressed, fruits yellow-brown, firm, globular or sometimes obovoid with acute apex, 1–1.5 cm diameter.

Darling Downs district in lateritic or brigalow soils. Flowers spring to autumn. Fruits eaten by aborigines but has been suspected of poisoning sheep.

**19. *Solanum nemophilum* F. Muell.**

*Solanum nemophilum* var. *brachypodum* Domin; *S. nemophilum* var. *typicum* Domin  
Sparsely branched shrub up to 1.5 m tall, unarmed, all parts densely stellate pubescent, indumentum velvety. Leaves with petioles 0.5–2.7 cm long; blades narrowly ovate, ovate to elliptic, apex obtuse or acute, base rounded to cordate, often oblique, margin entire, 1.3–10 cm × 0.7–4 cm. Inflorescences of small clusters or condensed cymes of 1–4 flowers, extra-axillary, peduncles up to 5 mm long, pedicels 4–7 mm long; calyx 7–8 mm long, lobes linear-oblong, ± obtuse, 3–5 mm long; corolla purple-blue or occasionally white, broadly stellate, 1.8–2.5 cm diameter. Fruiting peduncles not much enlarged, pedicels 0.8–1.2 cm long, calyx lobes *ca* 8 mm long, longer than fruit, fruits bright red, succulent, globular, 5–8 mm diameter.

Darling Downs and Burnett districts, and drier areas of the Moreton district, in dry or stony soils in open forest. Flowers mainly spring to autumn.

**20. *Solanum densevestitum* F. Muell. ex Benth.**

Shrub up to 2 m tall, unarmed, all parts densely stellate villous, hairs with long central ray. Leaves with petioles 0.5–4 cm long; blades ovate to narrowly ovate, apex rounded, base cordate or subcordate, oblique, margin entire or sinuate or juveniles shallowly lobed, 3–12.5 cm × 1.5–5.7 cm, densely stellate villous. Inflorescences of clusters of 1–3 flowers, extra-axillary, peduncles 0.5–1 cm long, pedicels *ca* 1 cm long; calyx 0.7–1.5 cm long, lobes unequal, narrowly oblong-ovate, acute, 0.5–1.2 cm long; corolla violet to lavender, broadly stellate, 4–5-partite, 2.5–3.5 cm diameter. Fruiting peduncles up to 1 cm long, pedicels *ca* 1.3 cm long, calyx enlarged, lobes longer than and almost covering fruit, up to 1.7 cm × 0.5 cm, fruits bright red, succulent, globular, 6–7 mm diameter. **Fig. 57F.**

Coastal districts usually as understorey in moist eucalypt forests or rainforest fringes. Flowers autumn and late winter–spring.

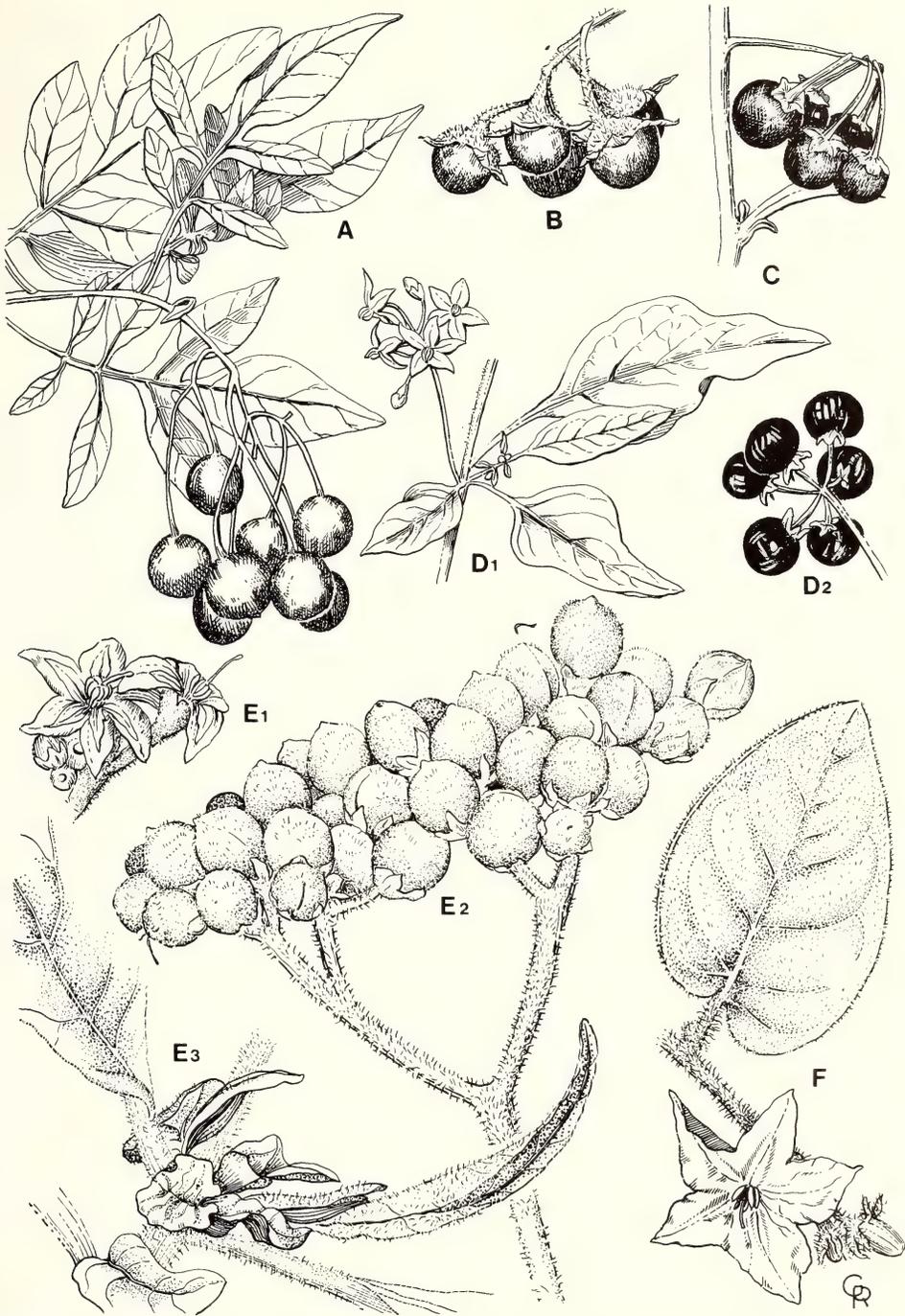


Fig. 57 SOLANACEAE — A–F *Solanum* spp. — A *S. seaforthianum*, part of fruiting branchlet x1; B *S. sarrachoides*, infructescence x1; C *S. nigrum*, infructescence x1; D<sub>1</sub>–D<sub>2</sub> *S. americanum*, D<sub>1</sub> part of fruiting branchlet x1, D<sub>2</sub> infructescence x1; E<sub>1</sub>–E<sub>3</sub> *S. mauritianum*, E<sub>1</sub> part of stem showing auricular stipules in leaf axils x1, E<sub>2</sub> flowers x1, E<sub>3</sub> infructescence x1; F *S. densevestitum*, leaf and flower x1.

**21. *Solanum* sp. 2.**

Woody shrub, unarmed, densely stellate villous. Leaves with petioles 1–3 cm long; blades ovate or oblong-elliptic; apex acute to obtuse, base obtuse, cordate or oblique, margin lobed, usually acutely so, 4.5–12.5 cm × 2.5–7.5 cm, stellate villous, with glandular hairs as well above, surface sticky. Inflorescences of extra-axillary pedunculate 2–6-flowered clusters or racemes, peduncles 0.5–2 cm long, pedicels 0.7–1 cm long; calyx 0.7–1 cm long, lobes ± triangular or narrowly ovate, unequal, 4–7 mm long; corolla blue to purple, *ca* 2–2.5 cm diameter. Fruiting peduncles 1.7–2 cm long, pedicels 1.2–1.5 cm long, calyx enlarged, almost covering fruit, lobes up to 1.1 cm × 0.35 cm, fruits reddish, succulent, globular to ovoid, *ca* 8–10 mm long.

Wide Bay district from the Gympie area northwards, in moist forests. Flowers spring and autumn.

This taxon is similar to *S. densevestitum* and has been confused with it, but differs in the glandular indumentum and the acute lobes on the leaf blade, the more tapered calyx lobes and larger fruits.

**22. *Solanum* sp. 3.**

Erect or straggling woody shrub up to 1.5 m tall; prickles numerous on stems, petioles, leaves (on veins), inflorescences but absent from calyces; glabrous or very sparsely stellate pubescent. Leaves with petioles 1.2–2.7 cm long; blades ovate to elliptic in outline, apex acute, base oblique, margin pinnatifid to pinnatisect with up to 5 lobes on each side, often lobes sinuate or lobed as well, 5–11 cm × 2.2–6 cm. Inflorescences of 2–15-flowered racemose cymes, peduncles *ca* 1 cm long, pedicels 5–7 mm long; calyx 3–5 mm long, lobes triangular-acute; corolla dark purple, stellate, 1.2–1.8 cm diameter. Fruiting peduncles 8–10 mm long, calyx not much enlarged, covering base of fruit, fruits dark reddish, succulent, 8–10 mm diameter.

Darling Downs district often associated with brigalow. Flowers spring and autumn.

This taxon is very similar to *S. semiarmatum* in appearance of leaves, flowers and fruit, but differs mainly by being glabrous or very sparsely pubescent.

**23. \**Solanum sisymbriifolium* Lam.**

Annual or short lived viscid perennial herb up to 1.5 m tall; stems petioles leaves peduncles and calyces abundantly prickly, prickles reddish or orange-red, acicular or base flattened, 0.1–1.5 cm long; all parts glandular pubescent. Leaves with petioles 1–4 cm long; blades ovate in outline, pinnately parted and lobed, lower lobes cut to midrib, petiolulate, or less deeply cut with blade continuing along main vein, 7–13 acute lobes on well developed leaves, major ones again lobed, 5–15 cm × 4–10 cm. Inflorescences cymes of up to 12 flowers, peduncles 1.5–5 cm long, pedicels 1–2 cm long; calyx 0.8–1.2 cm long, lobes acute, 5–7 mm long; corolla white or pale blue, rotate-stellate, up to *ca* 5 cm diameter, sparsely stellate pubescent outside, glabrous inside. Fruiting pedicels *ca* 2 cm long, calyx enlarged, covering at least half fruit, fruits bright shiny red, succulent, globular, 1.5–2 cm diameter.

Native of South America; naturalized in the vicinity of Toowoomba in the Darling Downs district. Flowers spring to autumn. Has been suspected of being poisonous but evidence inconclusive.

**24. \**Solanum capsicoides* All.****DEVIL'S APPLE**

*Solanum aculeatissimum* Jacq.

Annual or short lived perennial shrub up to 1 m tall; stems leaves pedicels and calyces bearing numerous sharp pale or straw coloured basally flattened prickles up to 1.7 cm long; sparsely pilose with long simple and minute glandular hairs. Leaves with petioles 1–8 cm long; blades broadly ovate, apex acute or obtuse, base truncate to subcordate, oblique, margin deeply or shallowly lobed, 3–21 cm × 2.5–18 cm, pilose above, minutely glandular pubescent below. Inflorescences 2–3-flowered, peduncles 3–4 mm long, or pedicellate and internodal on stems, pedicels 1–1.5 cm long; calyx 4–6 mm long, lobes acute, 2–3 mm long; corolla white, deeply stellate, *ca* 2–3 cm diameter.

Fruiting pedicels 2–4 cm long, fruits bright orange-scarlet, dryish when ripe, slightly depressed globular, *ca* 2–3.5 cm diameter.

Native of Central America, now cosmopolitan; naturalized in more fertile areas, e.g. creek banks, often with bordering rainforest of mainly the coastal districts. Flowers spring–summer. Has been suspected of poisoning stock.

**25. *Solanum papaverifolium* Symon**

Erect or sprawling herb up to 30 cm tall, rootstock perennial; prickles fine, straight, pale, up to 8 mm long, on stems, leaf surfaces, pedicels, calyces;  $\pm$  glabrous except for minute glandular hairs on young growth. Leaves with petioles 1–4.5 cm long; blades ovate in outline, deeply dissected into 5–11 lobes, lobes themselves with 1–5 lobes or teeth, apices acute, base cuneate, oblique, 2–7.5 cm  $\times$  1.5 cm. Inflorescences of 1–6-flowered cymes from upper parts of stems, peduncles *ca* 1 cm long, pedicels *ca* 1 cm long; calyx 5–8 mm long, lobes 3–5 mm long; corolla purple, stellate, *ca* 2 cm diameter. Fruiting pedicels 1–2 cm long, recurved, calyx enlarged to cover base of fruit, lobes enclosing and exceeding it, fruits greenish yellow, 1.2–1.8 cm  $\times$  1–1.2 cm.

Darling Downs district in heavy black soils, often a weed of cultivation. Flowers spring to autumn.

**26. \**Solanum torvum* Swartz**

**DEVIL'S FIG**

*Solanum largiflorum* C. T. White

Spreading or scrambling shrub 2–3 m tall; prickles scattered on stems, leaf surfaces, sparse on mature growth, slightly hooked, broad-based, 3–7 mm long; all parts stellate pubescent. Leaves with petioles 0.5–5 cm long; blades broadly ovate to elliptic in outline, base truncate or cordate, equal or unequal, margin with *ca* 7 broad lobes, lobes  $\pm$  triangular, apex acute or obtuse, *ca* 3–4 cm long, overall 5–21 cm  $\times$  3.5–16.5 cm, sparsely pubescent above, densely so below. Inflorescences compact branched 50–100-flowered corymbs, at first appearing terminal, later clearly lateral, peduncles 1–2 cm long, pedicels 5–10 mm long; calyx 3–4 mm long, lobes apiculate, 2–3 mm long; corolla white, stellate, up to 2.5 cm diameter. Fruiting pedicels 1–2 cm long, thickened below hardly enlarged calyx, fruits drab yellow, globular, 1–1.5 cm diameter, few produced.

Native of West Indies; naturalized weed in coastal districts. Flowers mainly spring. Suspected of being poisonous but evidence inconclusive. Declared noxious under the Stock Routes and Rural Lands Protection Acts, 1944–1967.

**27. \**Solanum hispidum* Pers.**

**GIANT DEVIL'S FIG**

Shrub or small tree up to 4 m tall; prickles usually sparse on stems, petioles and leaf veins, straight or slightly curved, flattened towards base, 2–6 mm long; all parts stellate pubescent, usually reddish on young growth. Leaves with petioles 1.5–12 cm long; blades broadly ovate in outline, apex acute, acuminate or obtuse, base equal or unequal, truncate or rounded, margin lobed  $\frac{1}{4}$ – $\frac{1}{2}$  way to midrib with 7–13 lobes, 9–35 cm  $\times$  5.5–30 cm. Inflorescences extra-axillary branched dense initially coiled 2-sided cymes with 50 or more flowers, peduncles 1–2 cm long, pedicels 1–1.5 cm long; calyx 7–10 mm long, lobes acuminate, 4–6 mm long, acumen 2–3 mm long; corolla white, stellate, 3–4.5 cm diameter, pubescent outside. Fruiting pedicels enlarged with marked corky thickening towards fruit attachment, *ca* 1.5 cm long, up to 5 mm thick, fruits yellowish to orange-yellow, not very fleshy, globose, 1–1.5 cm diameter, calyx lobes at first appressed, later somewhat reflexed, eventually broader and thicker.

Native of tropical Central America; naturalized in more fertile soils, e.g. along creek banks, of the Moreton district. Flowers autumn to spring. Declared noxious under the Stock Routes and Rural Lands Protection Acts, 1944–1967.

**28. \**Solanum elaeagnifolium* Cav.**

**SILVER LEAF NIGHTSHADE; WHITE HORSE NETTLE**

Erect herbaceous perennial up to 1 m tall, extensive underground root system producing usually annual vegetative growth; prickles usually present on stems, less often on petioles and leaves, sometimes very few, reddish, fine, straight, 2–5 mm long;

all parts densely stellate pubescent, hairs with short vertical central ray, and *ca* 10–12 horizontally radiating rays shortly united at their union with central ray. Leaves with petioles 0.4–3.7 cm long; blades oblong to narrowly oblong-ovate, apex acute or obtuse, base rounded or cuneate, margin entire or lowermost sinuate-undulate, 2–12 cm × 0.7–3.5 cm. Inflorescences 1–4-flowered racemes, at first appearing terminal, soon clearly lateral, peduncles 0.5–1 cm long, pedicels 1–1.5 cm long; calyx *ca* 1 cm long, lobes 4–6 mm long; corolla blue, rarely pale blue, white, deep purple or pinkish, rotate-stellate, often reflexed, 2–3 cm diameter. Fruiting pedicels reflexed, 2–3 cm long, calyx enlarged, fruits greenish yellow to orange-brown, usually firm, globular, 0.8–1.4 cm diameter. **Fig. 58D.**

Native of south-western United States of America and northern Mexico, and temperate South America, now widespread; naturalized weed of cultivation and farmland in the Darling Downs, Burnett and western Moreton districts. Flowers spring–summer. All parts, particularly the ripe fruits, poisonous to stock. Declared noxious under the Stock Routes and Rural Lands Protection Acts, 1944–1967.

### 29. *Solanum* sp. 4.

Shrub up to *ca* 2 m tall; prickles common on stems, occasional on petioles and calyces, yellowish or brown, fine, 5–8 mm long, all parts moderately stellate villous, central ray long. Leaves with petioles 1–3.5 cm long; blades ovate to oblong-ovate, apex acute, base oblique, margin sinuate or slightly irregularly undulate, 5–12.5 cm × 2.5–7.8 cm, often slightly discoloured, darker above, but both surfaces moderately stellate pubescent. Inflorescences extra-axillary, 3–several-flowered, peduncles *ca* 5–10 mm long, pedicels *ca* 1.2(–2.5) cm long; calyx *ca* 1.2 cm long; lobes acuminate, *ca* 7 mm long; corolla blue-mauve, stellate, up to 5 cm diameter. Fruiting peduncles and pedicels not much enlarged, calyx covering only base of fruit, fruits yellow-orange, depressed globose, 2.5–3 cm diameter, stellate pubescent.

Known mainly from the western Moreton district and eastern Darling Downs districts, e.g. Yarraman, Maidenwell, Gowrie Mt. areas. Flowers autumn, possibly also spring.

### 30. *Solanum dianthophorum* Dunal

*Solanum biflorum* auct. non Lour., R. Br.

Sprawling herbaceous perennial up to 1 m long; prickles scattered on stems and petioles, dense on calyx, dark, up to 1 cm long; all parts densely minutely stellate pubescent. Leaves with petioles 1.5–3.5 cm long; blades elliptic, ovate or oblong-ovate, apex acute, base rounded, slightly oblique, margin slightly undulate, 2.8–8.5 cm × 1–4 cm. Inflorescences 1–6-flowered cymes, peduncles 0–5 mm long, pedicels *ca* 5 mm long; calyx 5–6 mm long, tube prickly, lobes narrowly triangular to linear, 3–4 mm long; corolla white to pale lavender, stellate, 1.5–2 cm diameter. Fruiting pedicels 1–1.5 cm long, calyx enlarged to cover base of fruit, lobes triangular, points up to 5–6 mm long, fruits greenish suffused with purple, succulent, globular, 1–2 cm diameter.

Darling Downs district. Flowers summer.

### 31. *Solanum ellipticum* R. Br. POTATO BUSH; POTATO WEED; WILD GOOSEBERRY

*Solanum lithophilum* F. Muell.; *S. ellipticum* var. *mollibaccalis* J. Black; *S. ellipticum* var. *chillagoense* Domin; *S. ellipticum* var. *horridum* Domin; *S. ellipticum* forma *albiflora* Domin

Sprawling herbaceous perennial up to *ca* 1 m diameter, growing tips often tinged purple; prickles scattered to abundant on stems, petioles, peduncles and calyx lobes, pale, fine, up to 1 cm long; densely pale stellate pubescent, often tufted or woolly on stems or leaf undersurface. Leaves with petioles 0.6–5(–7.5) cm long; blades ovate to elliptic, apex acute or blunt to obtuse, base broadly cuneate to rounded, oblique, margin entire or undulate, 2–12.5(–20) cm × 1–5(–8.5) cm. Inflorescences extra-axillary 1–7-flowered cymes, peduncles 1–8 cm long, pedicels 0.8–1.2 cm long; calyx 0.6–1 cm long, lobes triangular with linear acumens 5–8 mm long; corolla purple, rotate to rotate-pentagonal, 2–3 cm diameter. Fruiting peduncles 1–8 cm long,

pedicels (1–)1.5–2 cm long; fruits pale yellow green often tinged purple, globular or slightly obovoid, 1.5–2 cm diameter.

Throughout the region in drier or disturbed areas, often a weed. Flowers mainly spring and autumn. Suspected of poisoning stock.

This species is extremely variable and further study may reveal more than one taxon under this name.

**S. lasiophyllum** Dunal, a native of Western Australia that has once been recorded from near Kolan South in the Wide Bay district, may key out here. It is easily distinguished by its triangular calyx lobes without linear points and the densely stellate villous calyx tube enlarging to  $\pm$  cover the fruit at maturity. There is no evidence that it has become naturalized in the region.

**32. \**Solanum rostratum* Dunal**

BUFFALO BURR

Annual herb up to 1 m tall; prickles abundant on stems, petioles, leaves, peduncles and calyces, pale or straw coloured, up to 1.2 cm long; all parts pubescent with stellate and simple minute glandular hairs. Leaves with petioles 1–5 cm long; blades ovate or ovate-oblong in outline, deeply or pinnately lobed with 5–7 main lobes; blade cut to midrib between lower lobes, each lobe oblong to  $\pm$  obovate, apex obtuse, margin irregularly sinuate, whole blade 1.2–11 cm  $\times$  1–8 cm. Inflorescences extra-axillary cymes of few–10 flowers, peduncles 2–3 cm long, pedicels erect, 5–10 mm long; calyx 6–9 mm long, lobes subulate, 3–5 mm long; corolla bright yellow, irregularly rotate, 3–4 cm diameter, 1–2 lobes often longer than rest. Fruiting pedicels 7–10 mm long, calyx enlarged and enclosing fruit, papery, fruits drying blackish, globular, *ca* 1 cm diameter. **Fig. 58A.**

Native of northern Mexico and southern United States of America; naturalized weed of cultivation in the Darling Downs and Burnett districts. Flowers spring–summer. Suspected of being poisonous to stock.

**33. *Solanum semiarmatum* F. Muell.**

GIN'S WHISKERS

*Solanum mitchellianum* Domin

Erect shrub up to 2 m tall; prickles abundant on stems, frequent on leaves, peduncles, calyces, reddish, fine, straight, up to 1.5 cm long; all parts stellate and glandular pubescent. Leaves with petioles 0.8–6.5(–9) cm long; blades ovate to elliptic-ovate, apex blunt or acute, base rounded to subcordate, often oblique, margin entire, sinuate or pinnatisect, lobes angular or oblong, sinuate or lobed, 3–16.5(–27) cm  $\times$  1.5–11(–18) cm, discolourous, sparsely pubescent above, densely so below, and often shaggy, particularly along midrib with bristles as well as prickles. Inflorescences simple or 2–3 times dichotomously branched cymes, flowers few–numerous, pedicels 3–10 mm long; calyx 4–7 mm long, lobes triangular, 2–4 mm long; corolla bluish purple, deeply stellate, 1–1.15 cm diameter. Fruiting pedicels *ca* 1 cm long, slightly thickened upwards, calyx not much enlarged, covering base of fruit, fruits dark red to finally black, succulent, globular, 0.8–1.2 cm diameter, shed when ripe. **Fig. 58B.**

Moreton, Darling Downs and Burnett districts in high altitude rainforest, depauperate rainforest or better quality brigalow forests. Flowers mainly autumn to spring.

There is considerable variation particularly in leaf size and indumentum in this species. Plants with large leaves with a very shaggy bristly indumentum appear to be confined to localities in the McPherson Ra. (Mt. Lindesay, Beechmont) and Killarney areas, while those with leaves with dense short indumentum without bristles are generally found in depauperate rainforests and brigalow forest mainly in the Darling Downs and Burnett districts. Although *S. mitchellianum* was originally used for these more western occurring plants, there does appear to be a continual graduation from one form to the other; consequently they have been grouped under the one name here.

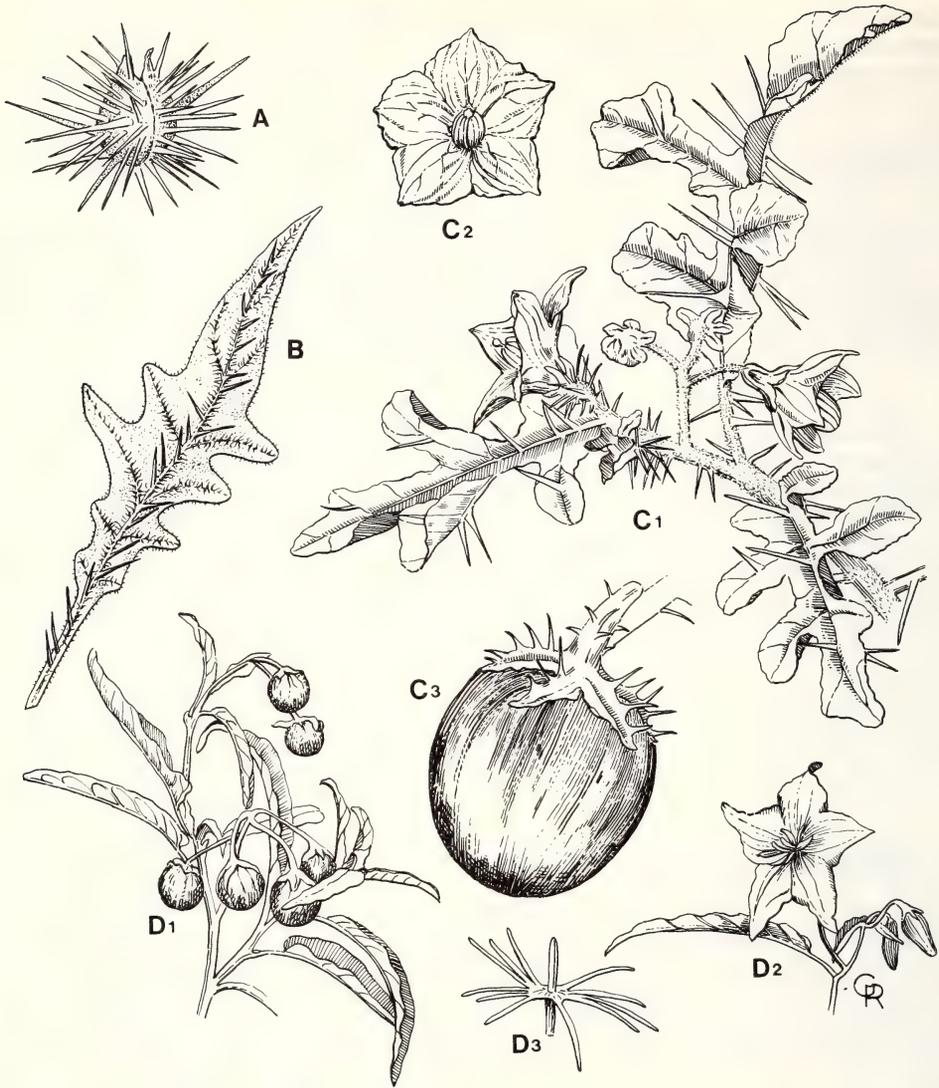


Fig. 58 SOLANACEAE — A–D *Solanum* spp. — A *S. rostratum*, fruit enveloped in prickly calyx x1; B *S. semiarmatum*, leaf surface showing bristles on midrib x1; C<sub>1</sub>–C<sub>3</sub> *S. hermannii*, C<sub>1</sub> part of flowering branchlet x1, C<sub>2</sub> flower x1, C<sub>3</sub> fruit x1; D<sub>1</sub>–D<sub>3</sub> *S. elaeagnifolium*, D<sub>1</sub> part of fruiting branchlet x1, D<sub>2</sub> flower x1, D<sub>3</sub> stellate hair x50.

### 34. *Solanum lacunarium* F. Muell.

### LAGOON NIGHTSHADE

Erect or sprawling herbaceous perennial up to 25 cm tall; prickles abundant, reddish brown, straight or slightly recurved, some flattened or broad-based, up to 1.2 cm long, all parts minutely stellate pubescent. Leaves with petioles 0.3–1.3 cm long; blades ± oblong or narrowly elliptic, apex rounded, base cuneate and decurrent on petiole, to truncate, often oblique, margin entire or broadly lobed, sometimes pinnatisect, 1–7(–9) cm × 0.5–2.5(–3) cm, sparsely stellate pubescent above, densely so below. Inflorescences of 4–10-flowered occasionally branched cymes, peduncles 1–3 cm long, pedicels ca 1 cm long, slender; calyx 3–6 mm long, prickly, lobes triangular; corolla

blue, rotate-pentagonal, 4–5-partite, 1.5–3 cm diameter. Fruiting peduncles and axes lengthening to 12 cm long, pedicels deflexed, 1–1.5 cm long, calyx enlarged, covering base of fruit, fruits pale yellow, globular or depressed globular, 1–1.5 cm diameter.

Darling Downs and Burnett districts, usually as a weed of pasture. Flowers spring and autumn.

**35. *Solanum cinereum* R. Br.**

NARRAWA BURR

Erect shrub up to 1 m tall; prickles abundant on stems, leaves, inflorescences, usually straight, up to 1.5 cm long; stems densely stellate pubescent. Leaves with petioles 2–4.5(–6) cm long; blades ovate-elliptic in outline, apex acute, base markedly oblique, margin pinnatifid with 5–10 main lobes, lobes slightly lobed or sinuate, 6–15(–26) cm × 3–9.5(–15) cm, densely pale stellate pubescent below, also minutely glandular. Inflorescences few–7-flowered cymes, extra-axillary, peduncles 2–10 mm long, pedicels 5–8 mm long; calyx 5–8 mm long, lobes linear, 3–5 mm long, all very prickly outside, prickles up to 8 mm long, corolla mauve-purple, campanulate-rotate, 1.5–2 cm long. Fruiting peduncles up to 1 cm long, pedicels 1–2 cm long, often firm, stout and decurved, calyx *ca* 1 cm long, appressed to fruit, fruits dark brown with firm papery skin, globular, 1.5–2 cm diameter.

Darling Downs and Moreton districts, mainly in sandy soils or soils derived from granite. Flowers spring–summer.

**36. \**Solanum hermannii* Dunal**

APPLE OF SODOM

*Solanum sodomeum* auct. non L.; *S. sodomeum* var. *hermannii* (Dunal) Dunal

Woody shrub up to 1.5 m tall; prickles straw coloured, ± straight, prominent, stout, up to 1.5 cm long; indumentum of stellate and minute glandular hairs. Leaves with petioles 0.4–2.5 cm long; blades elliptic in outline, apex obtuse or rounded, base truncate, usually oblique, margin pinnatisect <sup>3</sup>/<sub>4</sub> way to midrib with usually 5–7 lobes, 2.5–12 cm × 1.5–8 cm, sparsely stellate pubescent above, sparsely to moderately so below. Inflorescences stout internodal racemes of up to 6 flowers, peduncles up to 1.5 cm long, pedicels *ca* 1 cm long, densely prickly; calyx 7–8 mm long, densely prickly, lobes triangular, 2–3 mm long; corolla pale purple, rotate-stellate, *ca* 2 cm diameter. Fruiting pedicels thickened and recurved, up to 2.5 cm long, calyx somewhat enlarged, fruits mottled greenish cream, finally brownish, dry, globular, 2–3.5 cm diameter. **Fig. 58C.**

Native of South Africa and the Mediterranean region; naturalized in coastal districts in urban wasteland, rough pasture or sometimes in calcareous soils near beaches. Flowers spring–summer. Fruits poisonous to stock. Cultivated locally for alkaloid drugs used in treatment of skin cancers.

**37. *Solanum prinophyllum* Dunal**

*Solanum armatum* auct. non Forssk., R. Br.; *S. armatum* var. *cultum* Dunal; *S. xanthocarpum* auct. non Schrader, F. M. Bailey

Sprawling annual or short lived perennial up to 45 cm tall; prickles frequent on stems, petioles, blades and calyx, pale, straight, up to 1.2 cm long; most parts sparsely to moderately stellate pubescent, young parts with minute glandular hairs as well. Leaves with petioles 1.5–6 cm long; blades narrowly ovate to elliptic in outline, apex acute, base oblique, pinnatifid with 7–10 lobes, lobe margins toothed or lobed, 3.5–15 cm × 2.5–10 cm. Inflorescences 1–4-flowered clusters, peduncles 5–10 mm long, pedicels slender, 8–10 mm long; calyx 0.8–1.4 cm long, lobes subulate, 0.5–1.1 cm long; corolla lilac-blue or mauve, broadly stellate to campanulate, 1–1.5 cm long, lobes acute. Fruiting pedicels 1–2 cm long, calyx appressed, not greatly enlarged, fruits greenish or tinged purple, globular or obovoid, 1.5–2 cm × 1.5 cm.

Rainforest margins of Moreton and Wide Bay districts, generally at higher altitudes and rainforest of the southern Great Dividing Ra., e.g. Killarney area, Cunningham's Gap. Flowers late winter to summer.

This taxon is regarded as a “northern form” of *S. prinophyllum*, and differs from the typical form in that the leaf blades are often more pubescent than, and the calyx lobes almost twice as long as, those of the typical form.

**38. *Solanum* sp. 5.**

Erect shrub up to 4 m tall; prickles scattered on stems, petioles and leaves, rarely also pedicels and calyces, reddish, straight, strong, up to 1.2 cm long; densely finely stellate pubescent on stems, leaf undersurfaces and inflorescences, young growth and inflorescences often with dark stellate indumentum. Leaves with petioles 0.7–4.5(–6) cm long; blades ovate to elliptic, occasionally narrowly elliptic in outline, apex acute to blunt, base cordate to oblique, margin pinnatifid, to pinnatisect in juveniles, often with secondary lobes as well, 4–15(–25) cm × (1.5–)3–10(–17) cm, discolourous, dark green and sparsely pubescent above, densely pale pubescent below, pinnate venation somewhat impressed above, raised below. Inflorescences extra-axillary, 2–7-flowered, peduncles up to *ca* 8 mm long, pedicels 0.6–2.2 cm long; calyx 1–1.6 cm long, lobes 0.7–1.2 cm long, contracted into linear points 4–7 mm long, corolla violet-blue to mauve, rotate, up to *ca* 4 cm diameter. Fruiting peduncles and pedicels not much enlarged, fruits green with dark purple mottling on upper half, globose, *ca* 2.5 cm diameter.

Southern areas of Great Dividing Ra., e.g. mountains east of Killarney in rainforest margins and moist eucalypt forests. Flowers late spring.

This taxon has been included under *S. brownii* Dunal and *S. cinereum* R. Br. From the former it differs in the indumentum and lobing of the leaves and sizes of flowers and fruits. From the latter it differs in the degree of prickliness, leaf shape and indumentum, and sizes of flowers and fruits. It also occurs in different habitats.

**39. \**Solanum dimidiatum* Raf.****CAROLINA HORSE NETTLE**

*Solanum carolinense* auct. non L.

Herbaceous perennial up to 50 cm tall, reproducing freely from extensive underground root system; stems erect or sprawling; prickles few, pale, up to 7 mm long, all parts stellate puberulent. Leaves with petioles 1–4.5 cm long; blades ovate to broadly ovate in outline, apex acute to acuminate, base cuneate to truncate, margin pinnatifid up to halfway to midrib, with *ca* 7 broadly triangular acute or rounded lobes, 5–13.5 cm × 3–9.5 cm, discolourous, often minutely dotted. Inflorescences extra-axillary racemose cymes with few–15 flowers, peduncles *ca* 2 cm long, pedicels *ca* 1 cm long, calyx 6–7 mm long, lobes broadly triangular, 1–2 mm long; corolla lavender-violet, broadly stellate, 3–4 cm diameter. Fruiting pedicels curved, deflexed, slightly thickened and lengthened, calyx covering base of fruit, fruits yellow, mucilaginous, globular, 1.5–2.5 cm diameter.

Native of south-eastern United States of America; naturalized in the Bundaberg area of the Wide Bay district, a weed of sugar cane. Flowers spring–summer. Declared noxious under the Stock Routes and Rural Lands Protection Acts, 1944–1967 (as *S. carolinense*).

**40. *Solanum inaequilaterum* Domin**

*Solanum sporadotrichum* auct. non F. Muell.

Shrub up to *ca* 2 m tall; prickles dense on stem, abundant on leaves, 0.5–1.2 cm long; usually sparsely stellate pubescent, rarely densely so. Leaves with petioles 0.6–4 cm long; blades elliptic to ovate or oblong-ovate, apex acute to acuminate, base oblique, margin entire or with up to 7–9 shallow blunt lobes, juveniles deeply lobed, 6.5–14.5 cm × 2.7–6 cm. Inflorescences of congested cymes of up to 10 flowers, also solitary flowers, peduncles *ca* 1 cm long, pedicels *ca* 1 cm long; calyx *ca* 9–10 mm long, lobes ± linear, *ca* 8 mm long; corolla blue, broadly stellate, 2.5–3.5 cm diameter. Fruiting pedicels *ca* 2.3 cm long, somewhat thickened and swollen in upper half, calyx lobes slightly enlarged, fruits scarlet-red, succulent, globular or slightly ovoid, 1–2 cm diameter.

McPherson Ra. on rainforest margins. Flowers spring and autumn.

**41. *Solanum ferocissimum* Lindl.**

*Solanum leptophyllum* F. Muell.; *S. ferocissimum* var. *hastilobum* Domin; *S. ferocissimum* var. *rectispineum* Domin; *S. stenophyllum* auct. non Humb. & Bonpl. ex Dunal, Cunn.

Erect intricate shrub up to 2 m tall; prickles usually abundant on stems, leaves and peduncles, fine, 5–10 mm long; stellate pubescent, some minute glandular hairs. Leaves with petioles 0.1–1(–2.2) cm long; blades mostly linear or linear-hastate, apex acute or obtuse, base attenuate or sometimes hastately lobed when juvenile, margin occasionally slightly undulate, 1–6.5(–11.5) cm × 0.15–0.9(–2.8) cm, glabrous or very sparsely stellate pubescent above, sparsely to moderately stellate pubescent below, prickles mainly along midrib. Inflorescences 3–6-flowered, peduncles up to ca 3 mm long, pedicels 1–1.7 cm long, calyx 2–4 mm long, lobes 1–2 mm long; corolla white or blue, stellate, 1.5–2 cm diameter. Fruiting pedicels up to 2.5 cm long, calyx covering base of fruit, fruits dark red to almost blackish, globular, 5–8 mm diameter.

Western districts of the region. Flowers autumn–winter.

This species is doubtfully distinct from *S. parvifolium*.

**42. *Solanum parvifolium* R. Br.**

Erect woody shrub up to 1 m tall, rarely 2 m tall; prickles scattered or abundant on stems, rare or absent elsewhere, reddish brown, fine, straight, most parts densely minutely stellate pubescent. Leaves with petioles 2.5–10 mm long; blades oblong or very narrowly ovate, apex rounded or acute, base rounded, often oblique, margin entire or occasionally larger leaves slightly undulate, 1–8 cm × 0.3–1.5 cm, glabrous or sparsely pubescent above, densely pubescent below, prickles mostly absent from leaves. Inflorescences subumbellate 2–5-flowered cymes, sometimes flowers solitary, peduncles ca 6 mm long, pedicels 0.7–1.7 cm long; calyx ca 4 mm long, lobes oblong or bluntly triangular, ca 2 mm long; corolla pale blue or white, stellate, ca 1–1.5 cm diameter. Fruiting peduncle not much enlarged, pedicels up to 2.2(–3) cm long, slightly enlarged upwards, calyx covering base of fruit, fruits bright red, globular, 5–8 mm diameter.

Darling Downs and Burnett districts, usually in brigalow or open forests. Flowers mainly autumn to spring.

This taxon is doubtfully distinct from *S. ferocissimum*.

**43. *Solanum stelligerum* Smith****DEVIL'S NEEDLES**

*Solanum magnifolium* F. Muell.; *S. stelligerum* var. *magnifolium* (F. Muell.) Benth.; *S. lucorum* Domin; *S. accedens* Domin

Erect woody shrub up to 2 m tall, or occasionally prostrate; prickles scattered on stems, sometimes on leaves, often reddish, fine, straight; stellate pubescent. Leaves with petioles 0.2–5 cm long; blades narrowly ovate to elliptic, occasionally broadly ovate, apex acute to acuminate, occasionally blunt, base cuneate to rounded, margin entire or slightly irregular, 1.2–14 cm × 0.5–5 cm, ± glabrous except for veins above, densely stellate pubescent below. Inflorescences extra-axillary umbel-like 1–10-flowered cymes, peduncles up to 2 cm long, pedicels 1–1.5 cm long; calyx 3–6.5 mm long, lobes acute, 1.5–3 mm long; corolla pale lilac to almost white, deeply stellate, 2–2.5 cm diameter. Fruiting pedicels 1.5–3 cm long, thickened upwards, calyx lobes up to 8 mm long, fruits bright red, succulent, globular, 5–10 mm diameter.

Two varieties occur in the region:

- |   |   |
|---|---|
| 1. Stems erect; leaf blades narrowly ovate to elliptic, apex acute to acuminate | <i>S. stelligerum</i> var. <i>stelligerum</i> |
| Stems prostrate; leaf blades broadly ovate, apex blunt                          | <i>S. stelligerum</i> var. <i>procumbens</i>  |

*S. stelligerum* var. *stelligerum* (Fig. 59B.) is found throughout the region in rainforest margins or in eucalypt forests on more fertile or moister soils, while *S. stelligerum* var. *procumbens* C. T. White (Fig. 59C.) has been recorded from the southern Moreton district, e.g. Mt. Tamborine, head of Little Nerang R. and Currumbin Ck. Flowers spring to autumn.

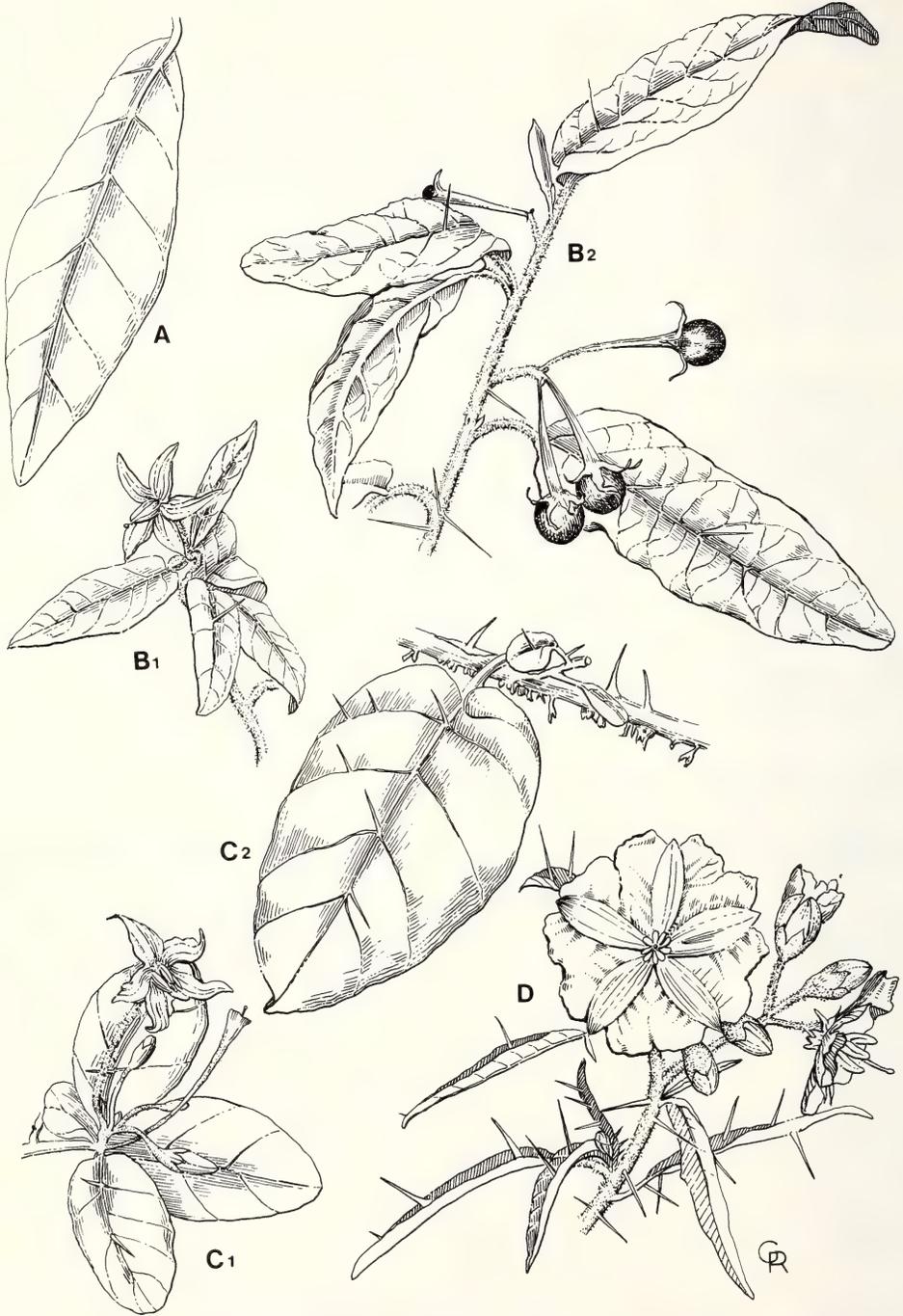


Fig. 59 SOLANACEAE — A–D *Solanum* spp. — A *S. corifolium*, leaf x1; B<sub>1</sub>–B<sub>2</sub> *S. stelligerum* var. *stelligerum*, B<sub>1</sub> part of flowering branchlet x1, B<sub>2</sub> part of fruiting branchlet x1; C<sub>1</sub>–C<sub>2</sub> *S. stelligerum* var. *procumbens*, C<sub>1</sub> part of flowering branchlet x1, C<sub>2</sub> leaf and stem with adventitious roots x1; D *S. elegans*, part of flowering branchlet x1.

**44. *Solanum corifolium* F. Muell.**

*Solanum shirleyanum* Domin; *S. discolor* R. Br. var. *procumbens* C. T. White; *S. discolor* auct. non R. Br., F. M. Bailey

Erect or sprawling shrub up to 1.5 m tall, sometimes procumbent and lower branches sometimes rooting; prickles dark reddish brown, slender, straight, up to 1 cm long. Leaves with petioles 0.2–1.5 cm long; blades elliptic, apex acute or rounded, base oblique, cuneate or rounded, margin shallowly lobed to sinuate, 2.5–12.5 cm × 1–5 cm, glabrous or sparsely pubescent on veins above, densely stellate pubescent below. Inflorescences of few–12-flowered extra-axillary cymes, peduncles ca 5 mm long, pedicels ca 1 cm long; calyx 4–6 mm long, lobes oblong, 2–3 mm long; corolla white or violet, deeply stellate, (1.5–) ca 2 cm diameter. Fruiting pedicels deflexed, up to 2.5 cm long but generally not greatly enlarged; fruits bright red, succulent, globular, (0.5–)1–1.5 cm diameter. **Fig. 59A.**

Rainforest or depauperate rainforest of the region. Flowers summer–autumn.

This species is quite variable and the procumbent form is probably worth recognizing as a distinct variety.

**45. *Solanum elegans* Dunal**

*Solanum amblymerum* Dunal; *S. violaceum* R. Br. var. *amblymerum* (Dunal) Maiden & Betche

Erect shrub up to 2 m tall, usually much smaller; prickles scattered on stems, petioles, leaf blades and peduncles, pale or reddish, straight, 1–8 mm long; stellate pubescent. Leaves with petioles 0.6–2(–2.5) cm long; blades narrowly ovate, apex rounded or acute, base cuneate, rounded or truncate, sometimes slightly oblique, margin entire, sinuate, or juveniles shallowly lobed, 2.5–12.5(–13.5) cm × 0.3–3.5(–4.2) cm, discolourous, sparsely stellate pubescent above, densely so below. Inflorescences extra-axillary 1–6-flowered cymes, peduncles up to 1 cm long, sometimes absent, pedicels ca 1 cm long; calyx 5–6 mm long, lobes acute to acuminate, 2–3 mm long; corolla purplish to white, broadly stellate, 2.5–3 cm diameter. Fruiting pedicels deflexed, 1.5–2 cm long, calyx appressed to fruit, not much enlarged, fruits red, globular, 1–1.5 cm diameter. **Fig. 59D.**

Southern Moreton and Darling Downs districts, e.g. Lever's Plateau and Cunningham's Gap etc., and around Kumbia in the Burnett district. Flowers autumn to spring.

**11. PHYSALIS L.**

Annuals or rhizomatous herbaceous perennials to subwoody short lived shrubs, glabrous or variously pubescent. Leaves alternate, often in pairs, petiolate. Flowers solitary, axillary or in stem forks, pedunculate; corolla campanulate to rotate with an expanded limb, nectaries present near base; stamens 5, filaments attached near base of corolla tube, anthers oblong, opening by slits; ovary 2-carpellate, ovules numerous on enlarged placenta, style simple, erect. Fruits berries enclosed in enlarged calyx tubes; seeds numerous, lenticular.

100 species cosmopolitan, especially America; 9 species Australia; 7 species south-eastern Queensland.

- |  |                            |   |
|--|----------------------------|---|
| 1. Annuals or rhizomatous perennials; calyces longer than 9 mm;<br>corollas longer than 10 mm                          |                            | 2 |
| Annuals; calyces 3–5 mm long; corollas 5–8 mm long   |                            | 5 |
| 2. Plants densely softly pubescent with hairs up to 1 mm long  | 1. <i>P. peruviana</i>     |   |
| Plants glabrous or young parts minutely pubescent with simple or<br>forked hairs                                       |                            | 3 |
| 3. Annual herbs; corollas ca 1.5 cm long; anthers twisted after<br>dehiscence; berries 1.7–3 cm diameter               | 2. <i>P. philadelphica</i> |   |
| Perennial rhizomatous herbs; corollas 1–1.3 cm long; anthers not<br>twisted after dehiscence; berries ca 1 cm diameter |                            | 4 |

- |  |                          |
|--|--------------------------|
| 4. Tomentum of sparse minute forked hairs, rarely simple; leaf blades narrowly ovate, toothed or sinuate . . . . .   | 3. <i>P. viscosa</i>     |
| Tomentum of sparse simple hairs; leaf blades elliptic, often with few weakly developed lobes . . . . .   | 4. <i>P. virginiana</i>  |
| 5. Leaf blades narrowly elliptic, entire or sinuate, rarely elliptic and toothed; flowers on slender peduncles 2–5 cm long; corollas white at margin grading into yellow . . . . . | 5. <i>P. lanceifolia</i> |
| Leaf blades ovate or elliptic, almost always toothed or lobed; flowers on peduncles 0.5–2.5 cm long; corollas pale yellow to creamy yellow . . . . .                               | 6                        |
| 6. Flowers on peduncles 0.5–1 cm long; styles 2–2.5 mm long; fruiting calyces ± circular in cross section . . . . .  | 6. <i>P. ixocarpa</i>    |
| Flowers on peduncles 1.2–2.5 cm long; styles 4–5 mm long; fruiting calyces angular in cross section . . . . .  | 7. <i>P. minima</i>      |

### 1. \**Physalis peruviana* L.

### CAPE GOOSEBERRY

Soft wooded, short lived shrub up to *ca* 1 m tall, all parts densely pubescent, hairs simple and glandular, up to 1 mm long. Leaves in alternate unequal pairs; petioles 0.6–6 cm long; blades ovate, apex acuminate, base cordate to subcordate or almost truncate, margin entire or with few blunt angular lobes, 2.5–13 cm × 1.5–13 cm. Flowers on peduncles 0.7–1.2 cm long; calyx 1–1.5 cm long, lobes triangular-acuminate, 5–8 mm long; corolla yellow with well defined purple blotches towards base, rotate to shallowly 10-lobed, 1.5–2 cm long; style 5–7 mm long. Berries pale ochre yellow, globular, 1.5–2 cm diameter, totally enclosed in inflated angular calyx tube 3–3.5 cm long, lobes free at apex, up to 1 cm long. **Fig. 60E.**

Native of South America; naturalized near habitation in the Moreton district. Flowers much of the year. Cultivated for its edible fruits which are often made into jam. Suspected of poisoning stock but not proven toxic.

### 2. \**Physalis philadelphica* Lam.

### TOMATILLO

Annual herb up to 50 cm tall, young parts sparsely pubescent. Leaves with petioles 0.5–7 cm long; blades ovate or narrowly ovate, apex acute or blunt, base cuneate, oblique, margin irregularly toothed, 2.4–12 cm × 1–8 cm. Flowers on peduncles 0.3–1.3 cm long; calyx 9–10 mm long, lobes 4–5 mm long; corolla yellow with 5 brownish blotches, rotate, *ca* 1.5 cm long; tops of anthers twisted after dehiscence towards stigma; style 8–9 mm long. Berries green, slightly sticky, ± globular-oblong, 1.7–3 cm diameter, enclosed in calyx 2–3.5 cm long, calyx almost circular in cross section.

Native of Central America, sparingly naturalized in the Moreton and Darling Downs districts. Flowers mainly summer–autumn. Occasionally cultivated for its edible fruits which are usually made into jam.

### 3. \**Physalis viscosa* L. STICKY CAPE GOOSEBERRY; STICKY GROUND CHERRY; PERENNIAL GROUND CHERRY

Herbaceous perennial up to 30 cm tall with extensive rhizomatous root system from which new plants arise, sparsely pubescent with minute forked hairs. Leaves with petioles 0.3–2 cm long; blades narrowly ovate, apex acute, base cuneate, often oblique, margin entire to sinuate, 1.5–5 cm × 0.5–3 cm. Flowers on peduncles *ca* 1 cm long; calyx 9–10 mm long, lobes triangular, *ca* 4–5 mm long; corolla pale yellow with dark olive-yellow spots towards base, rotate pentagonal, *ca* 1.3 cm long; style *ca* 9 mm long. Berries greenish yellow, *ca* 1 cm diameter, enclosed by calyx up to 2 cm long.

Native of South America; naturalized weed of Moreton and Darling Downs districts in pasture and cultivation. Flowers summer.

### 4. \**Physalis virginiana* Miller

### PERENNIAL GROUND CHERRY

*Physalis virginiana* var. *sonorae* (Torrey) Waterfall

Herbaceous perennial up to 50 cm tall with extensive rhizomatous root system, young parts sparsely pubescent with simple hairs. Leaves with petioles 0.8–4 cm long; blades elliptic or narrowly so, apex acute, base cuneate to attenuate, margin entire or slightly lobed or dentate, 2.5–9 cm × 0.8–3.5 cm. Flowers on peduncles *ca* 1 cm long; calyx

1–1.2 cm long, lobes triangular-acuminate, 5–6 mm long; corolla greenish yellow with darker basal spots, rotate, 1–1.2 cm long; style 6–8 mm long. Berries *ca* 1 cm diameter, calyx enlarged,  $\pm$  10-angled, 1.5–2.5 cm long.

Native of North and Central America; naturalized weed of cultivation in Moreton, Darling Downs and Burnett districts. Flowers mainly summer.

**5. \**Physalis lanceifolia* Nees**

*Physalis pendula* auct. Qld. non Rydb.

Annual herb up to 50 cm tall, young parts minutely pubescent, becoming glabrous. Leaves with petioles 0.6–4(–9) cm long; blades narrowly elliptic or rarely elliptic, apex obtuse to acute, base attenuate, margin usually entire or sinuate, sometimes with several forward pointing lobes, 2.2–7(–13) cm  $\times$  0.7–2.5(–7) cm. Flowers with slender peduncles 2–5 cm long; calyx 4–5 mm long, lobes triangular, *ca* 1.5 mm long; corolla deep yellow grading to almost white at margin with deeper yellow blotches, ill-defined, pentagonal, *ca* 6 mm long; style 2.5–3 mm long. Berries olive-green suffused with purple, sticky,  $\pm$  globular, (0.7–)1.1–1.2(–1.5) cm diameter, enlarged calyx 2–3 cm long, 10-angled, veins purplish.

Native of southern United States of America and Mexico; naturalized weed in seasonally wet areas with heavy clay soils, mainly in the Darling Downs district but also Moreton and Wide Bay districts. Flowers mainly summer.

**6. \**Physalis ixocarpa* Brot. ex Hornem.**

**ANNUAL GROUND CHERRY**

*Physalis angulata* auct. Qld. non L.

Annual herb up to 50 cm tall, sparsely pubescent with simple hairs, becoming glabrous. Leaves with petioles 0.5–6 cm long; blades ovate, apex acute to acuminate, base cuneate, oblique, margin irregularly toothed or lobed, 2–10 cm  $\times$  1–4.5 cm. Flowers on peduncles 0.5–1 cm long; calyx *ca* 5 mm long, lobes triangular, 1.5–2 mm long; corolla pale yellow with 5 dull brownish blotches, pentagonal to broadly stellate, 5–7 mm long; style 2–2.5 mm long, stigma below level of anthers. Berries green, slightly sticky, globular, 1.1–1.4 cm diameter, enlarged calyx 2–2.5 cm long, circular in cross section, ribs scarcely evident. **Fig. 60D.**

Origin obscure, now cosmopolitan; aggressive weed of cultivation, waste places and roadsides throughout the region. Flowers spring to autumn, mainly summer.

**7. *Physalis minima* L.**

**WILD GOOSEBERRY**

*Physalis parviflora* R. Br.

Bushy annual herb up to 50 cm tall, young parts minutely pubescent, becoming glabrous. Leaves with petioles 0.5–7 cm long; blades ovate to elliptic, apex acute to acuminate, base cuneate to broadly so, or oblique, margin with teeth up to 5 mm long, or shallow angular lobes, or occasionally  $\pm$  entire, 2.5–12 cm  $\times$  1.2–6 cm. Flowers on peduncles (1.5–)2–2.5 cm long at anthesis; calyx 4–5 mm long, lobes 2–2.5 mm long; corolla pale creamy yellow with 5 relatively large brownish spots, pentagonal, 7–8 mm long; style 4–5 mm long, stigma at same height as anthers. Fruits globular, 0.8–1.4 cm diameter, enlarged calyx 2.5–3 cm long, angular, with 5 major and 5 minor veins. **Fig. 60C.**

Possibly introduced from Asia but probably before European settlement; weed of cultivation, wasteland, creek banks etc. Flowers mainly summer–autumn.

**12. CAPSICUM L.**

Erect or spreading herbs or short lived, soft wooded shrubs, glabrous or sparsely pubescent with simple hairs. Leaves petiolate, simple, often in pairs. Inflorescences of 1–few pedunculate flowers in leaf axils often decurved at anthesis and erect in fruit; flowers 5-partite; calyx shortly tubular, truncate, lobes short, tooth-like or absent; corolla deeply or broadly stellate; stamens equal, filaments inserted at base of corolla tube, anthers dehiscing by slits; ovary 2-locular, ovules numerous, style erect, stigma capitate. Fruits dry or sub-fleshy berries; seeds compressed.

50 species Central and South America, or 10–12 species sens. str.; 2 species Australia, occurring in south-eastern Queensland.

- |  |   |
|--|---|
| 1. Corollas white or bluish white; fruits globose, ovoid or oblong-conical | 1. <i>C. annuum</i> var. <i>glabriusculum</i> |
| Corollas white or greenish-white; fruits ellipsoid, or narrowly ovoid      | 2. <i>C. frutescens</i>                       |

1. \***Capsicum annuum** L. var. **glabriusculum** (Dunal) Heiser & Pickersgill

BIRD PEPPER

*Capsicum hispidum* Dunal var. *glabriusculum* Dunal; *C. frutescens* L. var. *queenslandicum* Domin; *C. fastigiatum* auct. non Blume, F. M. Bailey

Erect or sprawling short lived shrub up to 2 m tall, ± glabrous with age. Leaves with petioles 0.5–4 cm long; blades ovate, apex acute to acuminate, base cuneate to rounded, usually oblique, margin entire, 1.5–12 cm × 1–5 cm. Flowers solitary or rarely 2 per leaf axil, peduncles 1.5–2 cm long; calyx cupular, truncate, 2–3 mm long, lobes minute; corolla deeply stellate, *ca* 1.5 cm diameter, lobes triangular. Fruits on stiffly erect peduncles 2–3.5 cm long, berries bright orange-red, globose, ovoid or oblong-conical, 1–2.5 cm × 0.7–1 cm, calyx scarcely enlarged. **Fig. 60F.**

Native of Central America; naturalized weed of waste places, roadsides and creek banks in mainly coastal districts of the region, but also Burnett district.

*C. annuum* var. *annuum* is widely cultivated as a crop and ornamental, and occasionally persists as a volunteer. It can be distinguished by its larger fruit, mostly more than 1 cm diameter.

2. \***Capsicum frutescens** L.

BIRD PEPPER

Herb or shrub up to 2 m tall, ± glabrous with age. Leaves with petioles 0.5–3 cm long; blades narrowly ovate to ovate, apex acuminate, base cuneate to rounded, often oblique, margin entire, 2–10 cm × 1.2–5 cm. Flowers several per leaf axil on peduncles 1–1.5 cm long; calyx cupular, truncate, 2–3 mm long, lobes minute or absent; corolla stellate, *ca* 8 mm long, lobes triangular. Fruits on erect peduncles *ca* 2 cm or more long, berries red, narrow conical, ellipsoid or fusiform, 1–1.5 cm × 0.5 cm, calyx scarcely enlarged.

Originally native to tropical America, now cosmopolitan; naturalized in the coastal districts in well watered areas.

### 13. LYCIUM L.

Shrubs, main branches bearing short leafy or leafless lateral branches mostly ending in a spine. Leaves alternate on youngest branches, clustered on very short axillary branchlets on older branches, ± sessile, simple. Flowers solitary or in small clusters at nodes, pedunculate; calyx tubular or campanulate, unequally 4–5-lobed, sometimes 2-lipped; corolla funnellform, lobes 4–5, inserted on throat or tube, usually unequal, filaments densely pilose near insertion; anthers dorsifixed, dehiscing longitudinally; ovary 2-locular on short gynophore surrounded at base by annular disc, ovules numerous, style long, slender, stigma capitate. Fruits 2-locular succulent berries partly covered by slightly accrescent calyx; seeds compressed.

80–90 species temperate and subtropical; 1 native and 3 naturalized species Australia; 2 species south-eastern Queensland.

- |  |                           |
|--|---------------------------|
| 1. Leaves all ± obovate; berries ± globose                       | 1. <i>L. ferocissimum</i> |
| At least some leaves ovate; berries oblong or narrowly ellipsoid | 2. <i>L. barbarum</i>     |

1. \***Lycium ferocissimum** Miers

AFRICAN BOXTHORN

*L. europaeum* auct. non L., F. M. Bailey

Intricately branched shrub up to 2 m tall, rarely more, with long rigid branches decurved at tips and short leafy lateral branches ending in a spine. Leaves with petioles 1–10 mm long; blades obovate or narrowly so, apex obtuse, base cuneate to attenuate, 0.6–3(–4) cm × 0.2–1.2 cm, ± glabrous. Flowers usually solitary at nodes, peduncles 0.5–1.6 cm long; calyx 4–7 mm long, lobes 4–5, 0.5–1.5 mm long; corolla

pale lilac to white, fading dull pale brown, 1–1.2 cm long, lobes 4–5, strongly reflexed, 3.5–4.5 mm long; stamens 5, exerted. Berries dull orange-red, globose to ovoid, (0.5–)0.8–1.2 cm × 0.5–1 cm, calyx persistent, accrescent, split irregularly, reaching halfway along berry; 2 sclerotic granules present amongst seeds. **Fig. 60G.**

Native of South America, naturalized in the Darling Downs and western Moreton district, often in brigalow areas. Flowers mainly spring–summer, but also sporadically throughout the year. Suspected of being poisonous to stock but not proven toxic. Declared noxious under the Stock Routes and Rural Lands Protection Acts, 1944–1967.

## 2. \**Lycium barbarum* L.

*Lycium chinense* auct. non Miller, F. M. Bailey

Shrub up to 2.5 m tall with weak arched branches, lateral branches often few, reduced to leafless spines 2–10 mm long. Leaves with petioles 0.2–1 cm long; blades mostly ovate to elliptic but often a few obovate on same branch, apex acute to obtuse, base cuneate to attenuate, 0.7–5 cm × 0.3–1.5 cm. Flowers 1–2 at nodes, peduncles 0.6–1.5 cm long; calyx 3–4 mm long, lobes 4–5 or sometimes 2-lipped, 0.5–3 mm long; corolla pale mauve with deep mauve lobes, to reddish mauve, fading to dull pale brown, funnellform, 1–1.2 cm long, limb 4–5-lobed, 3.5–5 mm long, strongly reflexed; stamens 5, exerted. Berries red, ellipsoid, sometimes apiculate, 5–9 mm × 3–4 mm, accrescent calyx reaching  $\frac{1}{3}$  of way along berry, split deeply once or twice; sclerotic granules absent.

Native of central China; naturalized in a few areas near habitation in waste ground in Moreton and Darling Downs districts. Flowers summer.

## 14. SALPICHROA Miers

Scrambling or climbing soft wooded perennial, hairs simple. Leaves alternate or opposite, simple. Flowers solitary, axillary, pedunculate; calyx deeply 5-lobed; corolla urceolate or tubular, 5-lobed; stamens inserted *ca* middle of corolla tube, filaments straight, glabrous, anthers narrow, sagittate below, splitting along full length; ovary surrounded by annular fleshy disc, style filiform, stigma subcapitate. Fruits succulent berries; seeds compressed, rugulose.

25 species warm America; 1 species cultivated and naturalized Australia, occurring in south-eastern Queensland.

### 1. \**Salpichroa organifolia* (Lam.) Baillon

*Physalis organifolia* Lam.; *Salpichroa rhomboidea* (Hook.) Miers

Scrambling perennial several metres long with stout rootstock and rhizomes giving rise to new plants, young parts sparsely to densely pubescent, old stems with pale corky epidermis. Leaves alternate in unequal sized pairs, smaller leaf  $\frac{3}{4}$  size of larger; petioles 0.5–2.5 cm long; blades ovate to rhombic-ovate, apex obtuse to acute, base cuneate, 1–5 cm × 0.5–3 cm, sparsely to densely pubescent. Flowers on peduncles 7–10 mm long; calyx campanulate, tube *ca* 1.5 mm long, lobes narrowly triangular, reflexed, *ca* 2 mm long; corolla white or cream, urceolate, *ca* 7 mm long, lobes triangular, reflexed, *ca* 2 mm long. Berries translucent white to pale yellowish, succulent, ovoid, 1.3–1.8 cm × 0.7–0.8 cm.

Native of South America; originally cultivated, now naturalized, mainly in urban areas and often difficult to eradicate because of extensive root system. Flowers summer–autumn.

## 15. CESTRUM L.

Woody shrubs or small trees, glabrous or with simple dendritic hairs. Leaves petiolate, simple, sometimes in pairs. Inflorescences axillary or terminal, often congested racemes or panicles; corolla tubular, sometimes slightly zygomorphic, tube obconic or slightly inflated, lobes short; stamens 5, mostly subequal, filaments inserted on corolla



Fig. 60 SOLANACEAE — A *Nicandra physalodes*, leaf and flower x1; B *Cyphanthera albicans*, part of flowering branchlet x1; C-E *Physalis* spp. — C *P. minima*, part of fertile branchlet x1/4; D *P. ixocarpa*, part of flowering branchlet x1/2; E *P. peruviana*, part of fertile branchlet x1/2; F *Capsicum annuum* var. *glabriusculum*, part of fruiting branchlet x1/2; G *Lycium ferocissimum*, part of flowering branchlet x1; H *Cestrum parqui*, leaf and inflorescence x1.

tube, variously pubescent, anthers included; ovary inserted on small disc, 2-locular, stigma capitate, *ca* same level as anthers. Fruits succulent berries; seeds prismatic.

150 species warm America, West Indies; several species cultivated, 4 species naturalized Australia; 3 species south-eastern Queensland.

- |   |                          |
|---|--------------------------|
| 1. Plants softly pubescent, especially around inflorescences; flowers reddish; fruits red | 1. <i>C. elegans</i>     |
| Plants sparsely pubescent to ± glabrous; flowers greenish yellow or orange-yellow         | 2                        |
| 2. Corollas greenish yellow; ripe fruits black  | 2. <i>C. parqui</i>      |
| Corollas orange-yellow; ripe fruits white   | 3. <i>C. aurantiacum</i> |

**1. \**Cestrum elegans* (Brongn. ex Neumann) Schlechtendal**

*Habrothamnus elegans* Brongn. ex Neumann

Shrub up to 2 m tall, pubescent with simple, forked and dendritic hairs, dense and purple near inflorescence. Leaves with petioles 0.5–3 cm long; blades narrowly ovate to ovate, apex acuminate, base rounded, 1.2–17 cm × 2.5–9 cm. Inflorescences of congested terminal panicles of subspicate racemes, lower flowers subtended by bracts 3–7 mm long, pedicels up to 1 mm long; calyx tube *ca* 5 mm long, lobes triangular, *ca* 3 mm long; corolla reddish, tube 1.5–2 cm long, 4–6 mm diameter just below lobes, lobes triangular, *ca* 4 mm long, pubescent, strongly reflexed. Berries red, succulent, globular, *ca* 1 cm diameter.

Native of Central America; cultivated, naturalized in a few areas of high rainfall in the Moreton district. Flowers may be found much of the year.

**2. \**Cestrum parqui* L'Hérit.**

GREEN CESTRUM; GREEN POISONBERRY

Shrub up to 2 m tall, rarely 5 m tall, suckering, young parts minutely pubescent, glabrous with age. Leaves with petioles 0.3–1.2 cm long; blades narrowly ovate, apex acute to acuminate, base cuneate to attenuate, 2–10.5 cm × 0.5–2.4 cm. Inflorescences of congested terminal panicles, lower flowers sometimes subtended by linear bracts, pedicels up to 0.5 mm long; calyx tube *ca* 3–4 mm long, lobes triangular, 1–1.5 mm long; corolla greenish yellow, tube 1.2–1.7 cm long, 3–5 mm diameter just below lobes, lobes triangular, 3–5 mm long, pubescent on margins. Berries shining black, succulent, ovoid, 1–1.5 cm long. **Fig. 60H.**

Native of South America; naturalized usually near habitation in the region, occasionally roadsides, wasteplaces etc. Flowers may be found much of the year. Toxic to stock. Declared noxious under the Stock Routes and Rural Lands Protection Acts, 1944–1967.

**3. \**Cestrum aurantiacum* Lindl.**

ORANGE CESTRUM

Shrub up to *ca* 4 m tall, sprawling, clambering, suckering, young parts sparsely pubescent. Leaves with petioles 0.7–3 cm long; blades ovate, apex acute to acuminate, base cuneate to rounded, 3–10 cm × 1.5–5 cm. Inflorescences axillary and terminal subspicate racemes of 10–15 flowers, often congested towards apex, flowers ± sessile, most subtended by a bract; calyx tube 4–6 mm long, lobes linear, 1–3 mm long; corolla orange-yellow, tube 1.7–2 cm long, lobes 5–7, triangular, 4–5 mm long. Berries white, 0.8–1.2 cm long.

Native of Central America; naturalized sporadically near habitation in the Moreton district. Flowers may be found much of the year. Toxic to stock.

## 137. SCROPHULARIACEAE

Herbs or shrubs, rarely small trees. Leaves alternate opposite or verticillate, exstipulate. Flowers mostly zygomorphic; corolla 4–5-lobed, rarely 6–8-lobed, usually ± 2-lipped, lobes imbricate in bud; stamens 4 and didynamous or 2, inserted on corolla tube and alternate with lobes, fifth stamen represented by staminode or absent, rarely perfect; ovary superior, sessile, usually 2-locular, ovules numerous. Fruits capsules, rarely berries; seeds numerous.

220 genera with 3000 species, cosmopolitan; *ca* 40 genera with *ca* 122 species Australia; 22 genera with 39 species south-eastern Queensland.

1. Perfect stamens 5	1. <i>Verbascum</i>	2
Perfect stamens 2 or 4		
2. Perfect stamens 2		3
Perfect stamens 4		8
3. Calyces divided almost to base into 4 or 5 segments		4
Calyces tubular with 5 very short lobes or campanulate and 3-4-lobed		7
4. Stamens exerted	2. <i>Veronica</i>	
Stamens included in corolla		5
5. Bracteoles present under calyx	3. <i>Gratiola</i>	
Bracteoles absent		6
6. Calyces 4-lobed	4. <i>Calceolaria</i>	
Calyces 5-lobed	5. <i>Lindernia</i>	
7. Calyces 3-4-lobed	6. <i>Glossostigma</i>	
Calyces 5-lobed	7. <i>Peplidium</i>	
8. Anthers all 1-locular		9
Anthers all or at least 2, 2-locular		12
9. Erect rigid herbs		10
Creeping herbs		11
10. Bracteoles 2 at base of calyx; corolla lobes $\pm$ equal	8. <i>Buchnera</i>	
Bracteoles absent; corollas distinctly bilabiate	9. <i>Striga</i>	
11. Calyces 3-4-lobed	6. <i>Glossostigma</i>	
Calyces 5-lobed	10. <i>Limosella</i>	
12. Bracts or bracteoles present at base of calyx		13
Bracts and bracteoles absent from base of calyx		17
13. Calyces obliquely split down lower edge	11. <i>Centranthera</i>	
Calyces divided into 5 distinct lobes		14
14. Anther loculi quite separate	12. <i>Limnophila</i>	
Anther loculi touching		15
15. Corolla tubes prolonged into a basal spur	13. <i>Linaria</i>	
Corolla tubes not prolonged into a basal spur		16
16. Capsules oblique; plants usually erect	14. <i>Misopates</i>	
Capsules not oblique; plants usually prostrate	15. <i>Bacopa</i>	
17. Corollas only slightly zygomorphic, rotate; leaves mostly whorled	16. <i>Scoparia</i>	
Corollas zygomorphic; leaves mostly opposite		18
18. Corollas pouched or spurred		19
Corollas not pouched nor spurred		20
19. Corollas spurred at base	17. <i>Kickxia</i>	
Corollas pouched at base	18. <i>Maurandya</i>	
20. Calyces 4-lobed	19. <i>Euphrasia</i>	
Calyces 5-lobed or of 5 segments		21
21. Calyces divided $\pm$ to base into 5 segments		22
Calyces tubular or campanulate		24
22. Filaments of lower stamens with a broad appendage near base	20. <i>Artanema</i>	
Filaments without appendages		23
23. Three outer calyx lobes broad, 2 inner narrow	15. <i>Bacopa</i>	
All calyx lobes $\pm$ equal	5. <i>Lindernia</i>	
24. Calyces broadly campanulate, 5-lobed	21. <i>Mazus</i>	
Calyces tubular, with 5 teeth		25

25. Leaves ovate or broadly ovate, usually  $\pm$  toothed in south-eastern Queensland . . . . . 5. *Lindernia*  
 Leaves narrowly ovate or linear in south-eastern Queensland . . . . . 22. *Mimulus*

## 1. VERBASCUM L.

Annual biennial or perennial herbs, rarely small shrubs. Leaves alternate or rarely opposite, basal ones forming rosette. Flowers in terminal racemes spikes or panicles; calyx equally or rarely unequally divided into 5 lobes; corolla  $\pm$  actinomorphic, rotate, 5-lobed; stamens mostly 5; filaments hairy, rarely glabrous, 2 or 3 upper anthers reniform and transversely medifixed, 2 lower anthers similar or elongated and longitudinally inserted and decurrent or rarely obliquely inserted on filament; style narrow, stigma hemispherical. Capsules septicidal.

360 species northern temperate Eurasia; 3 species naturalized Australia; 2 species south-eastern Queensland.

1. Plants tomentose with velvety stellate hairs . . . . . 1. *V. thapsus*  
 Plants pubescent with simple and glandular hairs . . . . . 2. *V. virgatum*

### 1. \**Verbascum thapsus* L.

GREAT MULLEIN; AARON'S ROD

*Verbascum blattaria* auct. non L.

Biennial 0.3–2 m tall,  $\pm$  densely greyish or whitish tomentose, hairs stellate; stems robust, usually simple. Basal leaves sessile or petioles up to 5 cm long, blades ovate to oblong, apex obtuse to acute, base narrowed, margin crenate or crenulate, 8–50 cm  $\times$  2.5–14 cm; cauline leaves decurrent, blades narrowly obovate to obovate, apex acute to shortly acuminate, smaller than basal leaves, reducing upwards. Inflorescences dense bracteate racemes, usually simple with clusters of 2–7 flowers, bracts 1.2–1.8 cm long, pedicels 1–5 mm long; calyx 0.7–1.2 cm long; corolla yellow, 1.2–2 cm diameter, pubescent outside, with numerous glandular dots; stamens 5, 3 upper filaments woolly hairy, 2 lower glabrous or sparsely hairy with anthers decurrent or obliquely inserted. Capsules 7–10 mm  $\times$  4–6 mm, tomentose.

Native of Europe; probably introduced as a garden plant for its attractive flowers and foliage, naturalized in the south-eastern Darling Downs district, also recorded from the Moreton district. Flowers spring–summer.

### 2. \**Verbascum virgatum* Stokes

TWIGGY MULLEIN

Biennial up to *ca* 2 m tall, rarely taller, pubescent with simple or glandular hairs; stems occasionally branched. Basal leaves with winged petioles up to *ca* 3 cm long, blades oblong-ovate, apex acute, margin irregularly toothed or crenulate, 15–30 cm  $\times$  4–8 cm; upper leaves becoming smaller and stem clasping. Flowers in clusters of 2–4 or upper ones solitary, forming bracteate racemes, sometimes branched, bracts 0.5–1.8 cm long, pedicels 1–2 mm long in flower, 3–4 mm long in fruit; calyx 6–8 mm long; corolla yellow, 3–4 mm diameter, lobes somewhat unequal; stamens 5, filaments villous with purple and white hairs, lower 2 anthers decurrent and obliquely fixed on filaments. Capsules globular, *ca* 8 mm long. **Fig. 61A.**

Native of Europe; widely naturalized in the region. Flowers mainly spring.

## 2. VERONICA L. sens. lat.

Annual or perennial herbs or woody shrubs. Leaves opposite or sometimes upper ones alternate. Inflorescences simple or compound racemes or spikes or corymbs or flowers solitary and axillary; calyx 4-lobed, sometimes 5-lobed, upper one very small; corolla irregularly rotate, lobes 4, unequal, upper lobe largest, lower lobe usually smaller than 2 laterals; stamens 2, exerted, anthers 2-locular. Capsules  $\pm$  flattened or inflated, grooved on each side, dehiscent in one of three ways: septicidally with septum splitting so that two carpels separate readily and  $\pm$  completely; loculicidally and also

less deeply septically with the valves separate to some extent from the central septum; loculicidally with valves remaining joined to central septum.

About 300 species, abundant in New Zealand and in temperate and colder regions of the Northern Hemisphere, also in Australia and South America; 10–12 endemic and *ca* 4 naturalized species Australia; 7 species south-eastern Queensland.

The above description is that of the genus **Veronica** in the broad sense, which includes **Hebe** Comm. ex Juss. and **Parahebe** W. R. B. Oliver. This concept is being retained until the status of **V. arenaria** is determined. Further research will probably show it belongs to the genus **Parahebe**. The tall perennial **V. derwentiana** Andr. has been named **Parahebe derwentiana** (Andr.) B. G. Briggs & Ehrendorfer.

- |   |                            |
|---|----------------------------|
| 1. Capsules septically dehiscent, turgid when mature . . . . .  | 2                          |
| Capsules loculicidally dehiscent, flattened . . . . .   | 3                          |
| 2. Leaves ovate, apex acuminate, 5–12 cm long . . . . .   | 1. <i>V. derwentiana</i>   |
| Leaves linear, often toothed, mostly less than 5 cm long . . . . .  | 2. <i>V. arenaria</i>      |
| 3. Lower leaves mostly greater than 3 cm long and greater than 1 cm<br>broad; stems stout, erect, often more than 30 cm tall  |                            |
| Lower leaves mostly less than 2.5 cm long or if greater than 2.5 cm<br>long then less than 1 cm broad; stems slender, if erect then<br>usually not above 30 cm tall . . . . . | 3. <i>V. notabilis</i>     |
|   | 4                          |
| 4. Flowers in loose axillary racemes or flowers solitary, axillary . . . . .  | 5                          |
| Flowers in terminal racemes . . . . .   | 6                          |
| 5. Flowers solitary in axils . . . . .  | 4. <i>V. persica</i>       |
| Flowers in loose axillary racemes . . . . .   | 5. <i>V. plebeia</i>       |
| 6. Perennials with shortly creeping much branched stems forming<br>leafy mat; corollas slightly exceeding calyces . . . . .   | 6. <i>V. serpyllifolia</i> |
| Annuals with erect or ascending stems; corollas shorter than<br>calyces . . . . .   | 7. <i>V. arvensis</i>      |

### 1. *Veronica derwentiana* Andr.

### DERWENT SPEEDWELL

*Parahebe derwentiana* (Andr.) B. G. Briggs & Ehrendorfer — see notes above.

Erect, up to *ca* 90 cm tall; flowering stems annual from woody perennial base. Leaves sessile, ovate, apex long acuminate or acuminate, base rounded, margin serrate, 5–12 cm × 1–4 cm. Racemes many-flowered in upper axils, forming leafy panicles, rachis and pedicels pubescent; calyx 2–3 mm long, divided to middle into 4 acuminate lobes, usually with small fifth lobe; corolla blue or white, lobes 6–8 mm long. Capsules up to *ca* 5 mm long. **Fig. 61D.**

Southern Moreton district, rare. Flowers spring–summer.

### 2. *Veronica arenaria* Cunn. ex Benth.

Erect, up to *ca* 60 cm tall, stems probably annual from perennial base. Leaves sessile, linear or very narrowly ovate, apex acute, margin entire, toothed or with linear-triangular lobes up to *ca* 1 cm long, blade up to *ca* 8 cm long, glabrous. Racemes slender, rachis and pedicels minutely hairy, calyx *ca* 2 mm long in flower, lengthening to *ca* 4 mm long in fruit; corolla lobes 6–8 mm long. Capsules not seen mature.

Known from a few specimens from the Granite Belt of the southern Darling Downs district.

### 3. *Veronica notabilis* F. Muell. ex Benth.

### FOREST SPEEDWELL

Perennial, ascending or erect, often more than 30 cm tall; stems from creeping or decumbent base, loosely pubescent or hirsute. Leaves with petioles 0.5–1.5 cm long; blades narrowly ovate, apex acute, base rounded to cuneate, margin coarsely toothed, mostly 2–6 cm × 1–3 cm, occasionally smaller. Racemes in upper axils; calyx *ca* 4 mm long; corolla whitish or bluish with purple markings, scarcely exceeding calyx. Capsules shorter than calyx.

Known from the McPherson Ra., rare. Flowers spring–summer.

**4. \**Veronica persica* Poiret****PERSIAN SPEEDWELL**

Annual, decumbent, stems up to *ca* 60 cm long, hirsute. Leaves with petioles up to *ca* 5 mm long; blades ovate, apex acute, base  $\pm$  truncate, margin crenate-dentate, *ca* 5 mm  $\times$  5 mm in Queensland specimens but up to *ca* 2 cm long elsewhere. Flowers solitary, axillary, pedicels longer than leaves; calyx *ca* 4 mm long; corolla blue, longer than calyx. Capsules  $\pm$  as long as calyx. **Fig. 61B.**

Native of Europe and western Asia; naturalized in a few areas in the Darling Downs district. Flowers spring to autumn.

**5. *Veronica plebeia* R. Br.****TRAILING SPEEDWELL**

Procumbent perennial; stems from creeping rootstock, slender, usually minutely pubescent, occasionally  $\pm$  hirsute. Leaves with petioles up to *ca* 1.1 cm long; blades broadly ovate or sometimes almost triangular, apex obtuse to acute, base truncate or cordate, margin deeply irregularly toothed, 0.8–3 cm  $\times$  0.7–3 cm, sparsely pubescent. Racemes axillary, pedicels shorter than leaves; calyx *ca* 4 mm long; corolla pinkish or bluish, scarcely longer than calyx. Capsules shorter than calyx.

Widespread in the region. Flowers spring to autumn.

**6. *Veronica serpyllifolia* L.****THYME SPEEDWELL**

Prostrate perennial forming small flat leafy tufts, flowering branches ascending, up to *ca* 15 cm tall, whole plant minutely pubescent or  $\pm$  glabrous. Lower leaves with petioles up to *ca* 5 mm long, upper leaves  $\pm$  sessile; blades ovate or elliptic, apex obtuse, base obtuse or somewhat cuneate, margin crenulate, 0.5–1.2 cm  $\times$  0.3–0.7 cm. Racemes terminal, pedicels up to *ca* 3 mm long; calyx *ca* 2 mm long in flower, somewhat enlarged in fruit; corolla blue or white, shorter than or longer than calyx. Capsules  $\pm$  as long as calyx.

Known from near the border with New South Wales, rare.

**7. *Veronica arvensis* L.****WANDERING SPEEDWELL**

Erect or ascending annual up to *ca* 20 cm tall, glabrous or minutely glandular pubescent. Lowest leaves with petioles up to *ca* 3 mm long, upper sessile; blades ovate or oblong, narrowly so above, apex obtuse to acute, base rounded, cuneate or  $\pm$  acute, 0.5–1.3 cm  $\times$  0.2–1.3 cm. Racemes terminal, leafy, pedicels 0.5–1.5 mm long; calyx *ca* 2 mm long; corolla blue,  $\pm$  as long as calyx. Capsules  $\pm$  as long as calyx.

Native of Europe; naturalized, recorded from the eastern Darling Downs district and in the Moreton district, occasionally a weed of shaded lawns. Flowers probably spring.

**3. GRATIOLA L.**

Erect or procumbent herbs, glabrous or glandular pubescent. Flowers axillary, with pair of bracteoles close under calyx; calyx divided to base into 5  $\pm$  equal segments; corolla tubular at base, upper lip broad and entire or 2-lobed, lower lip 3-lobed; stamens 2, staminodes 2 or absent; style dilated and turned aside at summit, stigma entire or with 2 short lobes. Capsules 4-valved.

About 20 species from temperate Northern and Southern Hemispheres and tropical mountains; *ca* 3 species Australia; 2 species south-eastern Queensland.

- |  |                          |
|--|--------------------------|
| 1. Flowers sessile or on peduncles less than 0.2 cm long . . . . . | 1. <i>G. peruviana</i>   |
| Flowers on peduncles 1–2 cm long . . . . .                         | 2. <i>G. pedunculata</i> |

**1. *Gratiola peruviana* L. sens. lat.**

Ascending or erect, 15–30 cm tall; stems from procumbent or creeping rootstock, often rooting at lower nodes; whole plant glabrous or sprinkled with glandular hairs. Leaves sessile, stem clasping, ovate or narrowly ovate, apex obtuse or acute, base rounded, margin serrate or almost entire, 1–3 cm  $\times$  0.6–1.8 cm. Flowers sessile or on peduncles less than 2 mm long; calyx 4–6 mm long in flower; corolla pink or purplish, 1.2–1.5 cm long, lips much shorter than tube; anthers connivent, staminodes filiform

with minute globular heads, sometimes whole staminode so slender as to be difficult to find. Capsules ovoid-globular,  $\pm$  as long as calyx. **Fig. 61C.**

Known from a few collections from around Stanthorpe in the southern Darling Downs district.

Some authors consider the Australian material of this taxon to be different from the South American material and several different names including *G. latifolia* R. Br. have been applied to it. A critical revision is required to establish the standing of this Australian material and the names applied to it. For the present it seems best to retain the name *G. peruviana* for the material in south-eastern Queensland.

## 2. *Gratiola pedunculata* R. Br.

Erect or ascending, 15–30 cm tall; stems from shortly decumbent or creeping base; whole plant minutely glandular hairy, rarely glabrous. Leaves sessile, stem clasping, narrowly ovate to oblong or ovate, apex acute, base narrowed or rounded, margin toothed or almost entire, 1–3.5 cm  $\times$  0.3–1.2 cm. Flowers on peduncles 1–2 cm long; calyx 4–5 mm long; corolla white or yellowish, *ca* 10 mm long; anthers connivent, staminodes absent. Capsules ovoid-globular, slightly longer than calyx.

Known from the Moreton and Darling Downs districts, not common, probably also to be found in the Wide Bay district. Flowers spring to autumn.

## 4. CALCEOLARIA L.

Annual or perennial, herbs, vines or shrubs. Leaves opposite or sometimes in whorls of 3, rarely alternate or fasciculate, entire, toothed, lobed, pinnate or twice pinnate. Flowers solitary axillary, or forming irregular inflorescences, these usually terminal; calyx of 4 lobes fused only at base, lobes slightly unequal; corolla very strongly modified, upper lip truncately rounded, entire, lower often large and inflated, concave, slipper shaped; stamens 2, of 2 distinct kinds, either anther loculi contiguous and both loculi fertile or loculi separated on connective and both loculi or only one fertile. Capsules with numerous seeds.

About 300–400 species Mexico to South America; 1 species naturalized Australia, occurring in south-eastern Queensland.

### 1. \**Calceolaria tripartita* Ruiz & Pavon

### LADY'S SLIPPER

*Calceolaria scabiosifolia* Sims

Annual *ca* 10–30 cm tall, pubescent when young. Leaves opposite; petioles up to *ca* 2.5 cm long; blades pinnate or pinnatifid, leaflets or lobes with acuminate tips and serrate margins, whole blade mostly 3–8 cm  $\times$  3–5 cm, glabrous to pilose on one or both surfaces. Corolla yellow, 1–2 cm long.

Native of South America, reported naturalized early this century in the Moreton and Wide Bay districts but the Queensland Herbarium has no recent records of the species.

## 5. LINDERNIA All.

Herbs, glabrous or hairy. Leaves opposite. Flowers solitary or few together in leaf axils, or in axillary or terminal racemes, bracts absent; calyx 5-lobed or 5-partite; corolla bilabiate, upper lip entire, emarginate or 2-lobed, lower lip 3-lobed or 3-fid; stamens 4, didynamous or 2 with 2 staminodes, anthers 2-locular. Capsules 2–3-valved.

100 species warm areas, especially Asia and Africa; *ca* 10 species Australia; 3 species south-eastern Queensland.

- |   |                         |   |
|---|-------------------------|---|
| 1. Calyx segments united into a 5-toothed calyx at least in flower,<br>often splitting in fruit | 1. <i>L. crustacea</i>  | 2 |
| Calyx segments divided almost to base in flower   |                         |   |
| 2. Leaves linear-subulate, margin entire, usually 2 mm or less broad                            | 2. <i>L. subulata</i>   |   |
| Leaves ovate or $\pm$ orbicular, margin usually toothed, mostly more<br>than 2 mm broad         | 3. <i>L. alsinoides</i> |   |

**1. *Lindernia crustacea* (L.) F. Muell.***Capraria crustacea* L.; *Vandellia crustacea* (L.) Benth.

Diffuse annual up to *ca* 30 cm tall, glabrous or with few scattered hairs. Leaves with petioles up to *ca* 5 mm long; leaf blades broadly ovate or ovate, apex obtuse, acute or obtusely acuminate, base rounded or almost cordate, margin crenate or entire, 0.5–2.5 cm × 0.3–1.5 cm. Flowers usually axillary, sometimes forming loose leafy racemes, pedicels 1–3 cm long; calyx 4–5 mm long, 5-toothed; corolla purple or mauve, *ca* 8 mm long; stamens 4. Capsules ovoid or ± oblongoid, 3–4 mm long.

Known from a few records in the Wide Bay district in open forest or woodland. Flowers most of the year.

**2. *Lindernia subulata* R. Br.***Vandellia subulata* (R. Br.) Benth.

Erect or diffuse annual up to 30 cm tall, glabrous. Leaves sessile or petioles very short; blades linear-subulate, 0.6–2 cm × 0.15–0.25 cm. Flowers solitary or few together in cluster with many floral leaves at base, peduncles filiform, 1–5 cm long; calyx 4–5 mm long, divided almost to base into 5 segments; corolla blue or mauve, *ca* 1 cm long; stamens 4. Capsules ovoid-oblongoid, usually ± globular, *ca* 4 mm long. **Fig. 61F.**

Usually found in swampy near-coastal areas. Flowers most of year except mid summer.

**3. *Lindernia alsinoides* R. Br.***Vandellia alsinoides* (R. Br.) Benth.

Erect or diffuse annual up to 15 cm tall, glabrous. Leaves with petioles up to *ca* 3 mm long; blades ovate, broadly ovate or ± orbicular at base of plant, almost linear in floral parts of plant, apex acute, base rounded or cuneate, margin toothed or upper leaves entire, up to 1.5 cm × 1.2 cm, reducing upwards. Flowers usually solitary in axils, sometimes few clustered together towards top of plant, pedicels 1–2 cm long; calyx 3–4 mm long, divided almost to base into 5 segments; corolla bluish, *ca* 8 mm long; stamens 4. Capsules ovoid-oblongoid, *ca* 3.5–4.5 mm long.

Swampy areas of the region, widespread but not common. Flowers found most of the year.

**6. GLOSSOSTIGMA Wight & Arn. ex Arn.**

Dwarf creeping herbs, rooting at nodes, glabrous. Leaves opposite or often clustered at nodes. Flowers axillary; calyx campanulate, shortly and obtusely 3–4-lobed; corolla with short tube, lobes 5, subequal; stamens 2 or 4, anthers 1-locular; style short, dilated upwards into broad spatulate lamina curved over stamens in bud. Capsules globular or ovoid, included in calyx.

About 5 species India, Australia and New Zealand; 3–4 species Australia; 1 species south-eastern Queensland.

**1. *Glossostigma diandrum* (L.) Kuntze***Limosella diandra* L.; *Glossostigma spathulatum* Wight & Arn.

Slender minute intricately branched glabrous herbs. Leaves with petioles 4–7 mm long; blades linear-spathulate, 5–6 mm × 1–2 mm. Peduncles up to *ca* 1.2 cm long; calyx *ca* 1.5 mm long in flower, up to 3 mm long in fruit, unequally 3-lobed; corolla blue or mauve, slightly exceeding calyx; stamens 2. **Fig. 61G.**

Known in the region from a single collection from near Chinchilla in the Darling Downs district.

**7. PEPLIDIUM Delile**

Creeping or prostrate herbs. Leaves opposite. Flowers small, axillary, bracteoles absent; calyx tubular, 5-angled, 5-lobed or 5-toothed; corolla with short tube, lobes 5, nearly equal; stamens 2, anthers 1-locular; style short, dilated upwards into broad spatulate lamina curved over stamens. Capsules indehiscent or irregularly bursting or 2–4-valved.

About 9 species tropical Africa to Australia; *ca* 8 species Australia; 1 species south-eastern Queensland.

**1. *Peplidium* sp. 1.**

*Peplidium maritimum* auct. Aust. non (L.f.) Wettst.

Prostrate herb, creeping and rooting at nodes. Leaves with petioles 1–4 mm long; blades ovate, obovate or orbicular, apex obtuse, base contracted into petiole, margin entire, 0.3–2.8 cm × 0.25–1.3 cm, usually minutely glandular punctate, glabrous or sparsely hairy. Flowers sessile; calyx *ca* 2 mm long in flower, pilose; corolla pale blue, *ca* 2 mm long. Capsules ± globular, *ca* 3 mm long, indehiscent or at length bursting irregularly, enclosed in enlarged calyx.

Known from the western Darling Downs district. Flowers autumn–winter.

**8. BUCHNERA L.**

Stiff erect herbs. Lower leaves in rosette, lower stem leaves opposite, upper ones alternate, gradually passing into bracts. Flowers sessile, each in axil of bracts forming terminal spikes, bracteoles 2 at base of calyx; calyx tubular, 5-toothed; corolla straight or slightly curved, lobes 5, spreading, almost equal; stamens 4, included, anthers 1-locular; style club shaped at top.

100 species tropical and subtropical regions, mostly Asia and Africa; 7 species Australia; 2 species south-eastern Queensland.

- |   |                          |
|---|--------------------------|
| 1. Corollas glabrous; basal leaves broad . . . . .                | 1. <i>B. urticifolia</i> |
| Corollas pubescent or hispid outside; leaves all narrow . . . . . | 2. <i>B. ramosissima</i> |

**1. *Buchnera urticifolia* R. Br.****BLACKROD**

Erect up to 50 cm tall, scabrous or occasionally almost glabrous. Radical and lower leaves ± sessile, obovate or broadly oblong, apex obtuse, margin entire or slightly sinuate-toothed, 2–6 cm × 1–2 cm; upper leaves linear or linear-ovate, apex acute, 2–6 cm × 0.3–0.8 cm. Bracteoles *ca* half as long as calyx; calyx up to *ca* 4 mm long, teeth acute; corolla purplish or nearly white, tube up to *ca* 7 mm long, lobes *ca* 2–3 mm long. Capsules oblongoid, 4–6 mm long.

Eastern parts of region, usually on sandy soil, not common. Flowers summer to early winter.

**2. *Buchnera ramosissima* R. Br.****BLACKROD**

Erect up to *ca* 60 cm tall, scabrous. Leaves with petioles up to *ca* 3 mm long; lower blades oblong, apex obtuse, base attenuate, 1.5–4 cm × 0.3–0.5 cm, upper blades linear, apex ± obtuse, margin entire, 2–4 cm × 0.2–0.4 cm. Bracteoles up to *ca* 6 mm long; calyx 4–6 mm long, teeth acute; corolla purplish or white, tube *ca* 6 mm long, lobes *ca* 3 mm long. Capsules oblongoid, 6–7 mm long.

Recorded from the Burnett district. Flowers summer to early winter.

**9. STRIGA Lour.**

Rigid erect annuals parasitic on roots of other plants, usually scabrous and drying black. Leaves sessile, lower leaves opposite, upper ones alternate and gradually passing into bracts. Flowers sessile, forming terminal interrupted bracteate spikes; calyx tubular-campanulate, prominently nerved, 4–5-lobed or -toothed; corolla bilabiate, tube slender, abruptly bent at or above middle, upper lip emarginate or 2-lobed, lower lip 3-lobed; stamens 4, didynamous, anthers 1-locular; stigma club shaped. Capsules 2-locular.

40 species tropical and southern Africa, Asia and Australia; *ca* 4 species Australia; 2 species south-eastern Queensland.

The genus in Australia is in need of review.

- |  |                         |
|--|-------------------------|
| 1. Lower corolla lip more than 5 mm long . . . . . | 1. <i>S. curviflora</i> |
| Lower corolla lip less than 5 mm long . . . . .    | 2. <i>S. parviflora</i> |

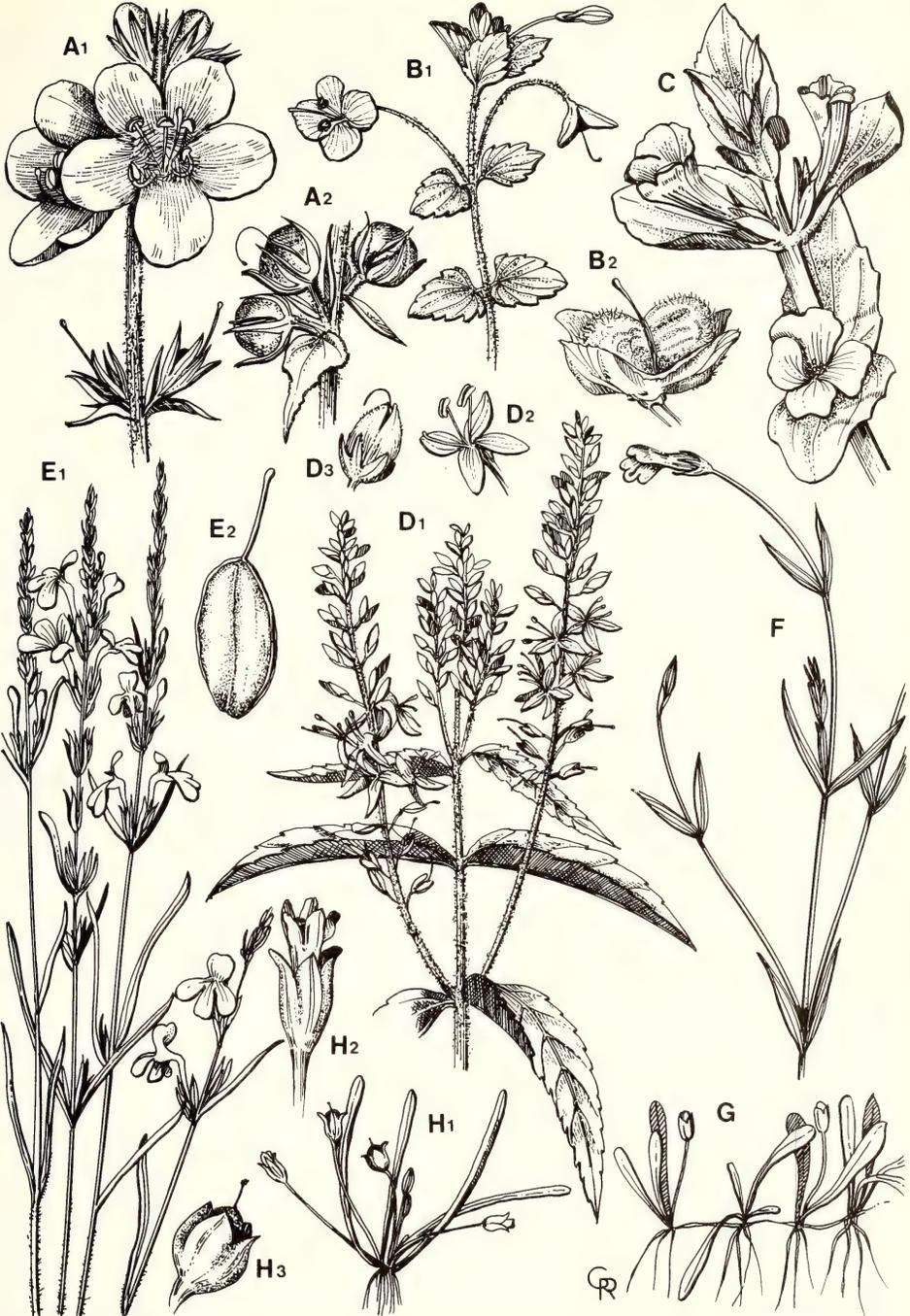


Fig. 61 SCROPHULARIACEAE — A<sub>1</sub>–A<sub>2</sub> *Verbascum virgatum*, A<sub>1</sub> portion of flowering inflorescence x1, A<sub>2</sub> portion of fruiting inflorescence x1; B<sub>1</sub>–B<sub>2</sub> *Veronica persica*, B<sub>1</sub> portion of flowering stem x1, B<sub>2</sub> fruit x1½; C *Gratiola peruviana*, portion of flowering stem x2; D<sub>1</sub>–D<sub>3</sub> *Veronica derwentiana*, D<sub>1</sub> portion of fertile stem x1, D<sub>2</sub> flower x1½; D<sub>3</sub> fruit x2; E<sub>1</sub>–E<sub>2</sub> *Striga curviflora*, E<sub>1</sub> flowering stems x1, E<sub>2</sub> fruit x3; F *Lindernia subulata*, portion of flowering plant x1; G *Glossostigma diandrum*, habit x1; H<sub>1</sub>–H<sub>3</sub> *Limosella australis*, H<sub>1</sub> habit x1, H<sub>2</sub> flower x6, H<sub>3</sub> fruit x3.

**1. *Striga curviflora* (R. Br.) Benth.**

WITCHWEED

*Buchnera curviflora* R. Br.

Slightly branched, up to 40 cm tall, very scabrous. Leaves linear, up to *ca* 5 cm × 0.4 cm at base of plant, gradually reducing upwards. Calyx 6–8 mm long, tube with 5 prominent ribs, lobes subulate; corolla purplish or pinkish or whitish, up to 1.8 cm long, lower lip *ca* 0.55–1.1 cm long. Capsules enclosed in calyx. **Fig. 61E.**

Rare in the region. The Queensland Herbarium has one specimen from the Moreton district and two inadequate specimens possibly of this species from the Wide Bay district. Flowers spring to autumn.

**2. *Striga parviflora* (R. Br.) Benth.**

WITCHWEED

*Buchnera parviflora* R. Br.

Slightly branched, up to 40 cm tall, very scabrous. Leaves linear, up to *ca* 5 cm × 0.3 cm at base of plant, gradually reducing upwards. Calyx 5–8 mm long, tube with 5 prominent ribs, lobes subulate; corolla purplish or pinkish, up to *ca* 1 cm long, lower lip 2–4.5 mm long. Capsules enclosed in calyx.

Eastern parts of the region, sometimes found as a weed of sugar cane. Flowers spring to autumn.

**10. LIMOSELLA L.**

Small annual herbs growing in marshy areas, tufted creeping or floating. Leaves radical or some alternate on short barren shoots. Flowers clustered with leaves, sessile or pedunculate; calyx campanulate, shortly 5-lobed; corolla broadly campanulate or rotate, lobes 5, almost equal; stamens 4, anthers 1-locular; style short with capitate stigma. Capsules globular, 2-valved.

15 species, cosmopolitan; 2 species Australia; 1 species south-eastern Queensland.

**1. *Limosella australis* R. Br.**

MUDWORT

*Limosella lineata* Gluck; *L. aquatica* auct. non L., Benth.

Stoloniferous, glabrous. Leaves in tufts along stolons; petioles 0.3–4 cm long; blades linear-oblong or sometimes ± cuneate, 0.2–2 cm × 0.1–0.25 cm, occasionally reduced, leaving only linear-terete petiole. Flowers on peduncles 0.6–1.2 cm long, occasionally longer, shorter than leaves; calyx *ca* 2 mm long; corolla purple, pink or whitish, *ca* 3 mm long. Capsules slightly exceeding calyx. **Fig. 61H.**

Known from near Wallangarra in the southern Darling Downs district. Flowers summer.

**11. CENTRANTHERA R. Br.**

Scabrous herbs. Leaves opposite or upper alternate. Flowers ± sessile, axillary or in interrupted terminal spikes, bracteoles 2 at base of calyx; calyx compressed, obliquely split down lower edge, 5-toothed or entire at top; corolla tube curved, dilated at top, lobes 5, subequal; stamens 4, included in tube, anthers in pairs, loculi transverse with an awn-like point at one end, one loculus smaller than other and infertile; stigma tongue shaped. Capsules 2-valved; seeds numerous.

9 species China, south-eastern Asia and Australia; 1 species Australia, occurring in south-eastern Queensland.

**1. *Centranthera cochinchinensis* (Lour.) Merr.***Digitalis cochinchinensis* Lour.; *Centranthera hispida* R. Br.

Erect annual up to *ca* 40 cm tall, scabrous with minute hairs or tubercules. Leaves sessile, linear or very narrowly ovate, apex obtuse, 0.8–4 cm × 0.15–0.4 cm, larger at base of plant. Flowers in upper axils, fugacious; calyx 0.6–1.2 cm long; corolla pink, purple or white, also said to have yellow forms, 2–2.5 cm long. Capsules ovoid to globose, *ca* 0.6–1 cm long.

Swampy areas in eastern parts of region, not common. Flowers summer–autumn.

## 12. LIMNOPHILA R. Br.

Herbs usually growing in marshy places or shallow water, usually scented and marked with pellucid dots. Leaves opposite or whorled, toothed or deeply cut, submerged ones in some species divided into numerous fine segments. Flowers solitary in axils or forming terminal spikes or racemes, bracteoles 2 at base of calyx or absent; calyx 5-lobed, lobes subequal or one larger; corolla bilabiate; stamens 4, didynamous, anthers 2-locular with loculi quite separate; style deflexed at summit, stigma 2-lobed. Capsules 4-valved.

35 species tropical Africa, Asia, Australia and Pacific Is.; *ca* 4 species Australia; 2 species south-eastern Queensland.

- |   |                        |
|---|------------------------|
| 1. At least submerged leaves deeply divided, in whorls of 6–13, upper leaves usually opposite | 1. <i>L. indica</i>    |
| Leaves undivided, all leaves opposite   | 2. <i>L. aromatica</i> |

1. *Limnophila indica* (L.) Druce

*Hottonia indica* L.; *Limnophila gratioides* R. Br.

Freshwater marsh or aquatic herb up to *ca* 60 cm tall but usually less than 20 cm tall; stems from creeping base, ascending or erect or sometimes decumbent, whole plant glabrous, submerged leaves verticillate, divided into short linear or filiform segments, whole leaf 0.5–2.5 cm long; emergent leaves dissected into narrow forward pointing or  $\pm$  spreading lobes or undivided but toothed in upper part, 1–2.5 cm  $\times$  0.3–0.9 cm, leaves near waterline may be intermediate between above described forms. Flowers solitary in axils, peduncles 0.5–2 cm long; calyx 3–5 mm long in flower, somewhat longer in fruit; corolla pink, purplish or yellowish, 0.8–1.2 cm long. Capsules 3–4 mm long. **Fig. 62A.**

Recorded from the Burnett district, possibly also occurs in the Wide Bay district. Flowers spring–summer.

2. *Limnophila aromatica* (Lam.) Merr.

*Ambulia aromatica* Lam.; *Limnophila punctata* Blume

Freshwater marsh herb up to *ca* 60 cm tall but mostly *ca* 30 cm tall; stems ascending or erect, whole plant glabrous or almost so. Leaves opposite, or rarely in whorls of 3, sessile, ovate-oblong, margin serrate, 1–5.5 cm  $\times$  0.2–1.6 cm, upper smallest. Flowers solitary in axils or upper ones forming loose leafy racemes, peduncles 0.4–1.2 cm long in flower, up to *ca* 1.7 cm long in fruit; calyx 6–8 mm long; corolla blue to purple or pinkish, 1.2–1.8 cm long. Capsules 5–7 mm long.

Widespread and moderately common in eastern parts of the region. Flowers spring–summer.

## 13. LINARIA Miller

Annual or perennial herbs. Leaves of flowering stems alternate, simple, sessile, entire; non flowering shoots at base of plants often with verticillate leaves which are often wider than those of flowering stems. Flowers in bracteate racemes; calyx deeply 5-fid; corolla bilabiate, tube prolonged into basal spur, upper lip 2-lobed, lower lip 3-lobed with pouched swelling which closes throat; stamens 4, didynamous. Capsules dehiscent by several vertical slits in upper half.

150 species temperate northern hemisphere, especially Mediterranean region; *ca* 4 species naturalized Australia; 2 species south-eastern Queensland.

- |                                       |                          |
|---------------------------------------|--------------------------|
| 1. Corollas with spur 0.7–0.9 cm long | 1. <i>L. pelisserana</i> |
| Corollas with spur 1 cm or more long  | 2. <i>L. maroccana</i>   |

1. \**Linaria pelisserana* (L.) Miller

PELISSER'S TOADFLAX

*Antirrhinum pelisseranum* L.

Erect slender glabrous annual up to *ca* 40 cm tall. Sterile shoots with leaves in whorls of 3, blades elliptic-ovate, 2–8 mm  $\times$  1.5–2.5 mm; leaves of fertile branches with alternate leaves, blades linear, 1–4 cm  $\times$  0.1–0.2 cm. Racemes at first short and dense,

lengthening in fruit up to *ca* 25 cm long; calyx divided almost to base, 4–5 mm long; corolla deep blue or deep purplish blue, spur 7–9 mm long, remainder of corolla 0.8–1.2 cm long. Capsules  $\pm$  globular, 2.5–3 mm long. **Fig. 62C.**

Native of western and southern Europe and Mediterranean region; naturalized in Darling Downs and Moreton districts. Flowers spring.

**2. \**Linaria maroccana* J. D. Hook.**

Erect annual up to *ca* 40 cm tall, glabrous in lower part,  $\pm$  viscid pubescent in upper part. Sterile shoots with leaves in whorls, blades linear-elliptic, 4–6 cm  $\times$  0.3–0.5 cm; leaves of fertile branches linear, 1.5–4 cm  $\times$  *ca* 0.1 cm. Racemes at first short, lengthening in fruit up to *ca* 25 cm long; calyx divided almost to base, *ca* 4 mm long; corolla mostly purple with yellow spot on lower lip but orange and yellow horticultural forms occur. Spur 1–1.5 cm long, remainder of corolla 0.8–1.2 cm long. Capsules *ca* 2.5–3 mm long.

Native of Morocco; commonly cultivated, collected once apparently naturalized in the northern Moreton district.

## 14. MISOPATES Raf.

Annuals. Leaves opposite below, usually alternate above, entire. Flowers in bracteate racemes, bracts usually foliaceous; calyx lobes 5, conspicuously unequal, longer than corolla tube; corolla tube gibbous on lower side, bilabiate; stamens 4, didynamous, included. Capsules with 1 loculus indehiscent, other opening by 2 apical pores; seeds compressed, one face smooth, keeled, produced into narrow wing, other face papillose with wide raised sinuate papillose border.

2 species native of Europe; 1 species naturalized Australia, occurring in south-eastern Queensland.

**1. \**Misopates orontium* (L.) Raf.**

LESSER SNAPDRAGON

*Antirrhinum orontium* L.

Erect up to 70 cm tall. Leaves  $\pm$  linear, 2–5 cm  $\times$  0.1–0.5 cm. Racemes lax, glandular pubescent; flowers in axils of leafy bracts forming terminal racemes, pedicels up to 1 mm long in flower, up to *ca* 4 mm long in fruit; calyx segments linear, hirsute; corolla pink, 1–1.5 cm long. Capsules oblique, beaked, 8–10 mm long, glandular hirsute; seeds *ca* 1 mm long.

Native of Europe; naturalized in region, widespread but not common. Flowers late winter to autumn.

## 15. BACOPA Aubl.

Herbs, sometimes aquatic. Leaves opposite, sometimes dimorphic. Flowers solitary, axillary; calyx divided almost to base into 5 lobes, 3 outer lobes broadest, 2 inner narrow; corolla bilabiate, upper lip emarginate or 2-lobed, lower lip with 3 subequal segments; fertile stamens 4, didynamous, included, rarely 5; style apex thickened, entire or shortly 2-lobed. Capsules enclosed in calyx, 2- or 4-valved; seeds numerous.

About 100 species from tropical and warm temperate parts of the world; 2 native and 1 naturalized species Australia; 2 species south-eastern Queensland.

- |   |   |   |   |   |                         |
|---|---|---|---|---|-------------------------|
| 1. Flowers yellow; leaf margins serrate         | . | . | . | . | 1. <i>B. procumbens</i> |
| Flowers white or pale blue; leaf margins entire | . | . | . | . | 2. <i>B. monnieri</i>   |

**1. \**Bacopa procumbens* (Miller) Greenman**

*Erinus procumbens* Miller; *Herpestis chamaedryoides* Kunth

Annuals or perennials, prostrate or erect, glabrous; stems up to *ca* 30 cm long. Leaves with petioles up to *ca* 1.5 mm long; blades ovate, apex rounded or acute, base  $\pm$  shortly attenuate, margin serrate, 0.5–2.5 cm  $\times$  0.3–1.2 cm. Pedicels slender, up to 6 mm long in flower, lengthening up to *ca* 2.5 cm long in fruit, without bracteoles; 3 outer sepals ovate and subacute, 5–8 mm long, 2 inner sepals linear, 4–8 mm long; corolla yellow, up to *ca* 1 cm long. Capsules oblongoid, up to *ca* 8 mm long.

Native of Central and South America; naturalized in eastern parts of the region, often in damp areas, not common. Flowers found most of the year, but mostly spring–summer.

**2. *Bacopa monnieri* (L.) Wettst.**

*Lysimachia monnieri* L.; *Herpestis monnieri* (L.) Kunth; the specific name is often misspelt *monniera* or *monnieria*.

Prostrate perennial, glabrous, rooting at nodes, often forming dense mats. Leaves sessile, cuneate-oblong or cuneate-obovate, apex rounded, base attenuate, margin entire, 0.6–2 cm × 0.3–0.8 cm, often ± succulent. Pedicels *ca* 6 mm long in flower, lengthening to *ca* 2 cm long in fruit, bracteoles 2, linear or narrowly ellipsoid, *ca* 5 mm long; 3 outer sepals ovate, 4–7 mm × 1.5–3 mm, 2 inner sepals less than 1 mm broad; corolla white or pale blue, up to *ca* 8 mm long. Capsules ovoid or ellipsoid, shorter than calyx.

Widespread in eastern districts, also known from the Burnett district, usually on the edge of freshwater pools or streams, sometimes submerged if there is a rapid rise in water level. Flowers spring to autumn.

**16. SCOPARIA L.**

Much-branched herbs or low shrubs. Leaves opposite or whorled, glandular punctate below. Flowers axillary, usually 2 together, bracteoles absent; calyx divided to base into 4–5 segments; corolla rotate, deeply 4-lobed, hairy at throat; stamens 4, anthers 2-locular. Capsules 2- or 4-valved.

About 20 species tropical America; 1 species naturalized Australia, occurring in south-eastern Queensland.

**1. \**Scoparia dulcis* L.**

SCOPARIA

Annual, erect or decumbent at base, mostly *ca* 30 cm tall, but sometimes up to *ca* 90 cm tall. Leaves usually in whorls of 3; petioles 1.5–7 mm long; blades narrowly oblong-ovate or upper ones linear, apex acute, base attenuate, margin irregularly serrate, 0.7–4 cm × 0.15–1.4 cm. Peduncles 4–8 mm long; calyx segments 4, 1.5–3 mm long; corolla white, *ca* 6 mm across. Capsules 2.5–4 mm long. **Fig. 62F.**

Native of tropical America; naturalized and widespread in eastern parts of the region, moderately common. Flowers spring to autumn.

**17. KICKXIA Dumort.**

Annual or perennial herbs; stems prostrate. Leaves opposite or alternate. Flowers solitary, axillary or forming terminal leafy racemes; calyx 5-partite; corolla 2-lipped, tube produced at base into spur; stamens 4. Capsules ± globose, with 2 equal loculi, each opening by pore with deciduous lid.

25 species Mediterranean region to western India; 3 species naturalized Australia; 1 species south-eastern Queensland.

**1. \**Kickxia elatine* (L.) Dumort. subsp. *crinita* (Mabille) Greuter** POINTED TOADFLAX

*Linaria crinita* Mabille

Annual, prostrate, villous or hirsute. Leaves ovate, apex obtuse, often mucronate, base hastate or sagittate at least in middle and upper leaves, lower leaves often with base rounded, margin entire or sometimes ± dentate, up to 4 cm × 3 cm, gradually reducing in size towards tips of stems. Pedicels up to *ca* 2 cm long; calyx 2.5–3.5 mm long in flower, up to *ca* 5 mm long in fruit; corolla yellow with dark purple upper lip, 8–10 mm long, spur *ca* 5 mm long. Capsules *ca* 3 mm long. **Fig. 62B.**

Native of the Mediterranean region; naturalized in the Moreton district and also collected in the Burnett district. Flowers spring to autumn.

## 18. MAURANDYA Ort.

Usually herbaceous vines, glabrous or pubescent. Leaves alternate or lowermost opposite. Flowers solitary, axillary, showy; calyx 5–6-partite; corolla bilabiate, pouched at base, upper lip 2-lobed, lower lip 3-lobed; stamens 4, didynamous; stigma very shortly 2-lobed. Capsules globose, dehiscent by 2 irregular subapical openings.

About 10 species from tropical America; 2 species naturalized Australia, occurring in south-eastern Queensland.

- |  |                         |
|--|-------------------------|
| 1. Leaves glabrous; calyx segments linear-ovate, apex long attenuate . . . . .                               | 1. <i>M. barclaiana</i> |
| Leaves sparsely or densely villous; calyx segments ovate or broadly ovate, apex obtuse or subacute . . . . . | 2. <i>M. erubescens</i> |

1. \**Maurandya barclaiana* Lindl.

Slender herbaceous vine, glabrous except calyx. Leaves with petioles 1–1.5 cm long; blades triangular-cordate or triangular-hastate, apex acute to attenuate, basal lobes acute or obtuse, occasionally margin at base with few minute teeth, 1–3.5 cm × 0.8–2 cm. Peduncles 2–5 cm long; calyx divided almost to base into 5 segments, segments linear-ovate, apex long attenuate, 1–1.5 cm long in flower, up to 2 cm long in fruit; corolla purple, 3–4.5 cm long. Capsules *ca* 1 cm long; seeds 1–1.5 mm long with irregular corky tuberculate ridges, not winged. **Fig. 62H.**

Native of southern Mexico; occasionally cultivated for its showy flowers, apparently naturalized in the southern Moreton district. Flowers spring to autumn.

2. \**Maurandya erubescens* (D. Don) A. Gray

*Lophospermum erubescens* D. Don

Slender herbaceous vine climbing by climbing petioles and peduncles; stems glandular puberulent or pilose. Leaves with petioles 2–5 cm long; blades triangular-hastate, triangular-cordate or obscurely 5-lobed, apex acuminate, margin dentate, 4–7 cm × 4–7 cm or even larger in some cultivated specimens, villous. Peduncles 2–6.5 cm long; calyx divided almost to base into 5 segments, segments ovate or broadly ovate, apex obtuse or subacute, 1.5–2.5 cm long; corolla pink-purple, 4–7 cm long, almost glabrous or finely pubescent outside. Capsules *ca* 1.5 cm long; seeds corky-tuberculate, with broad pale wing.

Native of Central America; sometimes cultivated for its showy flowers, naturalized in the ranges along the New South Wales border.

## 19. EUPHRASIA L.

Annual or perennial herbs, believed to be partially parasitic on roots of other species. Leaves opposite rarely alternate, toothed or lobed. Flowers in terminal leafy spikes or racemes, bracteoles absent; calyx tubular or campanulate, 4-lobed; corolla tubular at base, 2-lipped, upper lip concave or hood shaped, with 2 broad spreading lobes, lower lip spreading, 3-lobed; stamens 4, didynamous, anthers 2-locular, locules mucronate, often hairy; stigma obtuse, entire or with small upper lobe. Capsules oblong, compressed.

About 200 species from temperate Northern Hemisphere, Malaysia to New Zealand and temperate South America; 20 species Australia; 3 species south-eastern Queensland.

- |   |   |
|---|---|
| 1. Annuals; corolla yellow; pedicels less than 1 mm long . . . . .  | 1. <i>E. orthocheila</i>                    |
| Perennials; corolla blue to pink; pedicels 1 mm or more long . . . . .                                    | 2   |
| 2. Plants usually decumbent; known from high altitudes on or near Mt. Merino in the McPherson Ra. . . . . | 2. <i>E. bella</i>                          |
| Plants ± erect; known from the vicinity of Stanthorpe in the southern Darling Downs district . . . . .    | 3. <i>E. collina</i> subsp. <i>paludosa</i> |

**1. *Euphrasia orthocheila* W. R. Barker***E. scabra* auct. non R. Br.

Annual, erect, up to *ca* 50 cm tall. Leaf blades  $\pm$  linear or sometimes narrowly oblong-ovate, margin entire or with 1–2 teeth on each side, 0.4–1.1 cm  $\times$  0.05–0.25 cm. Inflorescences  $\pm$  dense racemes, pedicels less than 1 mm long; calyx 3–4.5 mm long; corolla yellow, 1–1.4 cm long. Capsules 4–5 mm long.

Rare, known from a few localities in the vicinity of Stanthorpe in the southern Darling Downs district. Flowers spring.

**2. *Euphrasia bella* S. T. Blake**

Perennial subshrub,  $\pm$  decumbent, up to 30 cm tall; stems sometimes rooting in lower parts, young parts with glandular hairs. Leaf blades obovate or oblong, apex obtuse, base cuneate, margin coarsely dentate-serrate with 2–3 rounded or  $\pm$  triangular teeth on each side, 0.8–1.3 cm  $\times$  0.4–0.7 cm. Inflorescences loose terminal leafy racemes, pedicels 3–8(–9) mm long; calyx 5–8 mm long; corolla mauve to deep blue with yellow marks on lower lip, 0.9–1.5 cm long. Capsules *ca* 6.5–9 mm long.

Rare, known only from on or near Mt. Merino in the McPherson Ra. at high altitudes. Flowers spring.

**3. *Euphrasia collina* R. Br. subsp. *paludosa* (R. Br.) W. R. Barker***Euphrasia paludosa* R. Br.; *E. nova-cambriae* Gandoger

Perennial subshrub,  $\pm$  erect, up to 50 cm tall. Leaf blades elliptic or oblong-elliptic, margin with 1–3 teeth on each side, 0.6–1.5 cm  $\times$  0.3–0.7 cm. Inflorescences moderately dense racemes, pedicels 1–7 mm long; calyx 4–8 mm long, almost glabrous except for margin of teeth; corolla blue to purple to pink, 0.9–1.4 cm long. Capsules 0.7–1 cm long.

Rare, known from a few localities in the vicinity of Stanthorpe in the southern Darling Downs district. Flowers spring.

**20. ARTANEMA D. Don**

Erect herbs. Leaves opposite. Flowers in terminal racemes each in axil of a bract; calyx deeply 5-lobed, lobes dilated at base; corolla bilabiate, upper lip emarginate, lower lip 3-lobed; stamens 4, didynamous, anthers cohering in pairs, upper stamens included in tube, filaments of lower ones adnate almost to throat, long and arched, with broad appendage near base; style with 2 flat stigmatic lobes. Capsules globose; seeds numerous.

4 species tropical Africa, Indomalaysia, Australia; 1 species endemic in Australia, occurring in south-eastern Queensland.

**1. *Artanema fimbriatum* D. Don**

Coarse herb 30–60 cm tall. Leaves with petioles up to *ca* 1.5 cm long on lower leaves, becoming shorter upwards, often  $\pm$  absent near inflorescence; blades narrowly ovate, occasionally ovate, apex acute, base attenuate, margin serrate or rarely entire, 2–10 cm  $\times$  0.3–2.2 cm, upper surface scabrous, otherwise glabrous. Flowers in distant pairs forming loose terminal racemes, bracts *ca* 4 mm long; calyx segments *ca* 6–8 mm long, points  $\pm$  recurved; corolla violet, rarely white, 2–3 cm long. Capsules 6–8 mm diameter. **Fig. 62D.**

Widespread but not common in Moreton, Wide Bay and Burnett districts. Flowers spring to autumn.

**21. MAZUS Lour.**

Low herbs. Lower leaves opposite, upper ones alternate, or all nearly rosulate. Flowers in terminal racemes or solitary; calyx broadly campanulate, 5-lobed; corolla bilabiate, upper lip erect, 2-fid, lower lip broadly 3-lobed with 2 slight protuberances at its base in throat; stamens 4; stigma 2-lobed. Capsules 2-valved.

20 species eastern and south-eastern Asia to Australia and New Zealand; 1 species Australia, occurring in south-eastern Queensland.

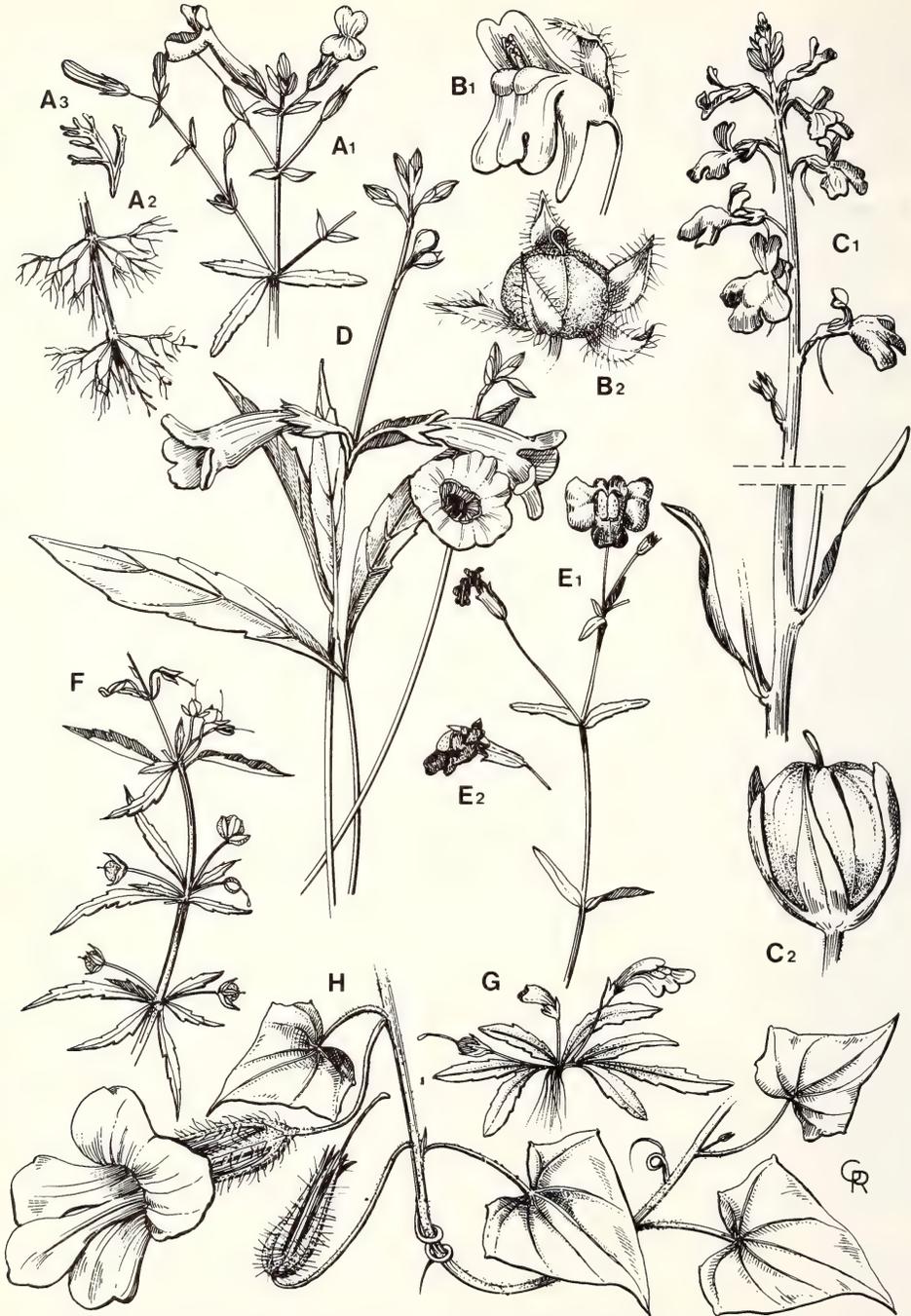


Fig. 62 SCROPHULARIACEAE — A<sub>1</sub>–A<sub>3</sub> *Limnophila indica*, A<sub>1</sub> portion of flowering emergent stem x1, A<sub>2</sub> portion of submerged stem x1, A<sub>3</sub> intermediate leaf x1; B<sub>1</sub>–B<sub>2</sub> *Kickxia elatine* subsp. *crinita*, B<sub>1</sub> flower x3, B<sub>2</sub> fruit x3; C<sub>1</sub>–C<sub>2</sub> *Linaria pelisserana*, C<sub>1</sub> inflorescence x1, C<sub>2</sub> fruit x6; D *Artanema fimbriatum*, portion of flowering plant x1; E<sub>1</sub>–E<sub>2</sub> *Mimulus gracilis*, E<sub>1</sub> portion of flowering stem x1, E<sub>2</sub> flower x1; F *Scoparia dulcis*, portion of fruiting stem x1; G *Mazus pumilio*, flowering and fruiting plant x1; H *Maurandya barclaiana*, portion of flowering stem x1.

**1. *Mazus pumilio* R. Br.**

Small perennial with creeping rhizome; stems very short or scarcely any besides peduncle. Leaves forming an erect tuft; petioles 1–6 cm long; blades obovate or oblong, apex obtuse or ± acute, base attenuate, margin entire or toothed, 1.5–4 cm × 0.7–1.5 cm, with few hairs above, usually glabrous below. Scapes 1–few-flowered, longer than leaves, pedicels 1–3 cm long; calyx *ca* 4 mm long; corolla purple, *ca* 8–9 mm long. Capsules enclosed in calyx. **Fig. 62G.**

Not common, recorded from the eastern Darling Downs district and the Moreton district. Flowers spring and autumn.

**22. MIMULUS L.**

Erect or prostrate herbs. Leaves opposite. Flowers solitary, axillary, upper ones sometimes forming terminal racemes, bracteoles absent; calyx tubular, with 5 prominent angles ending in 5 small teeth; corolla bilabiate, upper lip 2-lobed, erect or spreading, lower lip 3-lobed, usually with 2 protuberances at its base; stamens 4, didynamous; stigma 2-lobed. Capsules 2-valved.

100 species, cosmopolitan but especially the Americas; 5 species, 3 endemic, Australia; 1 species south-eastern Queensland.

**1. *Mimulus gracilis* R. Br.**

Plants up to *ca* 25 cm tall; stems ± erect from perennial somewhat creeping rhizome, glabrous. Leaves sessile, linear-oblong or narrowly oblong-ovate, apex obtuse, margin entire, 1–3(–4) cm × 0.15–0.5(–1.2) cm. Peduncles filiform, 1.5–6.5 cm long; calyx *ca* 4–6 mm long, teeth short, acute; corolla blue to purple or violet, 1.2–1.5 cm long. Capsules oblongoid, enclosed by calyx. **Fig. 62E.**

Widespread in Moreton and Darling Downs districts, often in damp areas on heavy soils, probably also to be found in Burnett district. Flowers most of the year.

**138. BIGNONIACEAE**

Trees shrubs or climbers, rarely herbs. Leaves opposite, exstipulate, mostly compound. Flowers bisexual, often showy, ± zygomorphic; calyx truncate or 5-toothed or 5-lobed; corolla with 5 imbricate lobes sometimes forming 2 lips; stamens 4 or 2, alternate with corolla lobes, anthers connivent in pairs or rarely free, staminodes 1–3, short or sometimes absent; ovary superior, style terminal, 2-lipped. Fruits capsules or fleshy; seeds often winged.

120 genera with 650 species mostly tropical areas; 10 genera with *ca* 17 species Australia; 4 genera with 6 species south-eastern Queensland.

- |   |                      |
|---|----------------------|
| 1. Trees or shrubs; flowers yellow . . . . .                  | 1. <i>Tecoma</i>     |
| Climbers or if erect then flowers white or cream . . . . .    | 2                    |
| 2. Plants with 3-fid tendrils . . . . .                       | 2. <i>Macfadyena</i> |
| Plants without tendrils . . . . .                             | 3                    |
| 3. Flowers in short racemes, corollas 5–8.5 cm long . . . . . | 3. <i>Tecomathe</i>  |
| Flowers in thyrses, corollas 1–5 cm long . . . . .            | 4. <i>Pandorea</i>   |

**1. TECOMA Juss.**

Shrubs or small trees. Leaves simple or imparipinnate, leaflets serrate. Inflorescences terminal racemes or racemose panicles; calyx cupular, shallowly 5-lobed; corolla tubular, campanulate or funnelform; stamens exerted or included. Fruits linear capsules; seeds winged.

About 12 species from southern United States of America to northern Argentina; 1 species naturalized Australia, occurring in south-eastern Queensland.

1. \**Tecoma stans* (L.) Kunth

## TECOMA

*Bignonia stans* L.; *Stenolobium stans* (L.) Seem.

Shrub or small tree up to ca 5 m tall. Leaves with petioles 1–9 cm long; leaflets 3–13; leaflet blades narrowly ovate, apex acute to acuminate, base cuneate or attenuate, margin serrate, 2.5–10 cm × 0.8–3 cm. Inflorescences terminal or subterminal racemes; calyx 5–7 mm long; corolla yellow with reddish lines in throat, tube 3–4.5 cm long, lobes 1–1.6 cm long, with long hairs on ridges in throat. Capsules 10–30 cm × 0.5–0.8 cm. **Fig. 63A.**

Native of Mexico to Peru and Ecuador; cultivated as an ornamental, apparently naturalized in a few places, mainly along creeks. Flowers spring.

## 2. MACFADYENA A. DC.

Climbers, usually with conspicuously swollen tubers; juvenile plants growing closely appressed against tree or post, climbing by means of their recurved tendrils. Leaves 2-foliolate, often with terminal 3-fid tendrils. Inflorescences contracted axillary few-several-flowered cymes or panicles, often reduced to single flower; calyx membranous, irregularly lobed; corolla tubular-campanulate. Fruits linear-compressed capsules; seeds 2-winged.

2–3 species tropical America; 1 species naturalized Australia, occurring in south-eastern Queensland.

1. \**Macfadyena unguis-cati* (L.) A. Gentry

## CAT'S CLAW CREEPER

*Bignonia unguis-cati* L.; *Doxantha unguis-cati* (L.) Miers

Rampant woody climber, attached to supporting tree or post by adventitious rootlets. Leaves with petioles 0.5–2.5 cm long, petiolules 0.5–2.5 cm long; leaflet blades narrowly ovate to ovate, apex acute to acuminate, base cuneate to truncate, 1–5 cm × 0.4–2 cm, juvenile leaves smaller; tendrils 3-fid, up to 3.5 cm long to point of branching, 3 arms each 0.3–1.7 cm long. Inflorescences axillary panicles, sometimes reduced to 1 or 3 flowers; calyx cupular, 0.8–1.2 cm long; corolla yellow with orange lines in tube, tubular-campanulate, 4–8 cm long, lobes 1–2 cm long. Capsules up to ca 40 cm long. **Fig. 63B.**

Native of tropical America; introduced as an ornamental, now naturalized in the region. The extensive tuberous roots capable of sending up shoots make control difficult. It is often seen climbing high into trees, up telephone or electricity poles or covering fences. Flowers spring.

## 3. TECOMANTHE Baillon

Climbers or creepers. Leaves pinnate to 1-foliolate. Inflorescences racemes arising from old wood or occasionally terminal or axillary; calyx 5-lobed; corolla funnelform, scarcely zygomorphic; stamens didynamous, mostly included. Capsules linear-terete or flattened, stipitate and beaked; seeds with membranous wings.

5 species Moluccas, New Guinea, Solomon Is., Australia and New Zealand; 1 species Australia, occurring in south-eastern Queensland.

1. *Tecomantie hillii* (F. Muell.) van Steenis

## FRASER ISLAND CREEPER

*Tecomantie hillii* F. Muell.

Rampant climber, secondary branches often pendant. Leaflets 5; leaflet blades narrowly ovate, apex acuminate, base rounded, ± oblique, margin entire, 2.5–8 cm × 1.5–3.5 cm, glabrous. Racemes with up to 10 flowers, pedicels 1–1.5 cm long; calyx 2–2.5 cm long; corolla pink-purple, paler inside, 5–8.5 cm long, lobes appressed hairy, otherwise glabrous.

Known from Fraser I. and adjacent mainland areas of the Wide Bay district, in coastal rainforest. Flowers winter-spring. An attractive creeper for cultivation.

## 4. PANDOREA (Endl.) Spach

Climbers, rarely erect. Leaves pinnate. Inflorescences terminal thyrses sometimes also upper axillary, occasionally appearing racemose; calyx cup shaped to campanulate, shallowly lobed; corolla tubular; stamens didynamous, almost always included. Capsules stipitate, beaked; seeds thin winged.

6 species south-eastern Asia, Australia, New Guinea to New Caledonia; 4 species Australia; 3 species south-eastern Queensland.

- |   |                          |   |
|---|--------------------------|---|
| 1. Corollas 4–5 cm long, tube puberulous outside . . . . .                | 1. <i>P. jasminoides</i> |   |
| Corollas up to 2.5 cm long, tube glabrous or puberulous outside . . . . . |                          | 2 |
| 2. Corolla tubes glabrous; leaves up to 13 cm long . . . . .              | 2. <i>P. pandorana</i>   |   |
| Corolla tubes puberulous; leaves up to 60 cm long . . . . .               | 3. <i>P. baileyana</i>   |   |

1. *Pandorea jasminoides* (Lindl.) K. SchumBOWER PLANT; JASMINE  
LEAVED WONGA VINE

*Tecoma jasminoides* Lindl.

Tall woody climber. Leaves up to *ca* 14 cm long; leaflets 5–9, rarely 3, leaflet blades ovate to narrowly ovate, apex acuminate, base cuneate to rounded, margin entire, 2.5–8.5 cm × 1.2–3.8 cm, glabrous. Calyx tube truncate or obscurely 5-toothed, 6–8 mm long; corolla white or pink, throat red, 4–5 cm long, lobes up to *ca* 2 cm long, throat scarcely bearded, outer surface with minute appressed hairs. Capsules ovoid or ellipsoid, up to *ca* 12 cm long.

Rainforest or fringing rainforest along creeks. Flowers spring–summer. Widely cultivated.

2. *Pandorea pandorana* (Andr.) van Steenis

WONGA VINE

*Bignonia pandorana* Andr.; *Tecoma australis* R. Br.; *T. oxleyi* Cunn. ex DC.; *T. doratoxylon* J. M. Black; *Pandorea doratoxylon* (J. M. Black) J. M. Black

Very variable, climber, scrambler, bushy or even erect. Leaves up to *ca* 13 cm long; leaflets 3–13, leaflet blades ovate to elliptic to narrowly ovate to linear, apex acute to acuminate, base cuneate, sometimes oblique, margin entire in mature plants, coarsely toothed in juvenile plants, 1.5–10 cm × 0.2–4 cm, smaller in juveniles, glabrous. Thyrses terminal and upper axillary, rarely from old wood, up to *ca* 20 cm long, rarely inflorescences racemose; calyx 2–3 mm long; corolla white or cream, sometimes with deep red lobes and upper tube, with dark streaks in throat, 1–2.5 cm long, throat bearded, glabrous outside. Capsules ± cylindrical with acute tip, up to *ca* 12 cm long.

Widespread in the region. Flowers midwinter to midsummer. Cultivated as an ornamental.

This is a very variable species. Plants from rainforest have 3–5 ovate to elliptic leaflets; in drier eucalypt forests plants have 5–13 narrowly ovate leaflets, while in more arid parts plants have 5–13 ± linear leaflets. The latter form may be scrambling, bushy or even erect (SPEARWOOD BUSH) and carry racemose inflorescences. Intermediates occur between each of the forms.

3. *Pandorana baileyana* (Maiden & R. T. Baker) van Steenis

*Tecoma baileyana* Maiden & R. T. Baker

Rampant vine, secondary branches usually pendant. Leaves opposite or occasionally in whorls of 3–4, up to *ca* 60 cm long; leaflets 7–9, leaflet blades ovate, apex acuminate, base rounded or slightly tapering, oblique, margin entire, 3.5–12.5 cm × 1.5–7 cm, glabrous. Thyrses terminal and upper axillary, up to *ca* 30 cm long; calyx 5-toothed, *ca* 4 mm long; corolla cream with pink throat, 1–2 cm long, puberulous outside, not bearded inside.

Known from rainforest on mountains and ranges of the Moreton district along the border with New South Wales. Flowers spring.

### 139. THUNBERGIACEAE

Shrubs, erect or twining. Leaves opposite, exstipulate. Flowers solitary axillary or combined into terminal racemes, bisexual, actinomorphic or slightly zygomorphic, bracteoles 2, large, spathaceous; calyx small, either truncate or shallowly lobed or with 5–18 segments; corolla tubular, lobes 5, often inflated above; stamens 4, didynamous, staminodes minute or absent; ovary 2-locular, ovules 2 per loculus; style with large funnellform or bilobed stigma. Fruits globose 2-locular loculicidal capsules with ensiform beak.

4 genera with 205 species from tropical regions of the world; 1 genus with 3–4 species Australia; 1 genus with 1 species south-eastern Queensland.

#### 1. THUNBERGIA Retz.

Erect or twining shrubs. Bracteoles enclosing calyx and corolla tube, caducous; calyx small, either truncate or shallowly lobed or with 10–18 narrow segments; corolla tube curved, widened upwards; stamens inserted near base of corolla; stigmatic lobes 2, mostly broad, equal or unequal, posterior one often inrolled.

About 200 species tropical regions of the world; 1 endemic and 2–3 naturalized species Australia; 1 species south-eastern Queensland.

#### 1. \**Thunbergia alata* Bojer ex Sims

#### BLACK EYED SUSAN

Climber. Leaves with petioles *ca* 1.5–6 cm long, narrowly winged; blades ovate, apex acute, mucronate, base sagittate or subhastate, margin entire to ± dentate, 2.5–5 cm × 2–4 cm, ± pubescent. Flowers axillary, peduncles up to *ca* 6 cm long, bracteoles 1.5–2.3 cm long; calyx 1.5–3 mm long, segments 11–14; corolla orange or yellow, usually with dark purple tube, tube 1.5–2 cm long, limb 2.5–4 cm across. Globular base of capsule 0.8–1 cm diameter, beak 1–1.2 cm long. **Fig. 63H.**

Introduced from eastern tropical Africa; cultivated and naturalized in eastern parts of the region, not common. Flowers found most of the year but mainly summer–autumn.

### 140. ACANTHACEAE

Herbs or shrubs. Leaves opposite, exstipulate, often with distinct cystoliths. Flowers bisexual, often with conspicuous bracteoles; calyx segments or lobes 4–5; corolla zygomorphic or actinomorphic, 2-lipped or sometimes 1-lipped; stamens 4, didynamous or 2, inserted on corolla tube and alternate with corolla lobes; filaments sometimes partially connate in pairs; disc present; ovary superior, sessile on disc, 2-locular, ovules 2 or more per loculus, style simple. Fruits capsules, often club shaped.

About 250 genera with 2,500 species, chiefly tropical but also Mediterranean region and southern United States of America; 18 genera with 35 species Australia; 7 genera with 14 species south-eastern Queensland.

1. Perfect stamens 4 . . . . .	2
Perfect stamens 2 . . . . .	4
2. Corollas 2-lipped . . . . .	1. <i>Hygrophila</i>
Corollas campanulate . . . . .	3
3. Bracteoles conspicuous, larger and broader than calyx segments . . . . .	2. <i>Dipteracanthus</i>
Bracteoles none or narrow, if present not or scarcely broader than calyx segments . . . . .	3. <i>Ruellia</i>
4. Corollas ± actinomorphic . . . . .	4. <i>Pseuderanthemum</i>
Corollas distinctly 2-lipped . . . . .	5
5. Anthers 1-locular . . . . .	5. <i>Hypoestes</i>
Anthers 2-locular . . . . .	6

- |   |                         |
|---|-------------------------|
| 6. Shrubs; anther loculi parallel, nearly equal, not spurred . . . . .            | 6. <i>Graptophyllum</i> |
| Herbs; anther loculi oblique, one attached higher up, lower one spurred . . . . . | 7. <i>Justicia</i>      |

### 1. HYGROPHILA R. Br.

Erect or decumbent herbs. Leaf blades beset with cystoliths. Flowers sessile in axillary clusters, often forming pseudowhorls by reduction of axillary branches; calyx  $\pm$  deeply divided into 5 or rarely 4 lobes or segments; corolla 2-lipped, upper lip 2-lobed, lower 3-lobed, lobes usually short; stamens 4, didynamous; style subulate with small upper tooth. Capsules oblongoid or linear, 2-locular from base.

80 species from tropical marshy areas of the world; 1 species Australia, occurring in south-eastern Queensland.

#### 1. *Hygrophila salicifolia* (Vahl) Nees

*Ruellia salicifolia* Vahl

Erect or ascending, 15–45 cm tall, glabrous or with few appressed hairs. Leaves with petioles 0.2–2 cm long; blades narrowly ovate or almost linear, 3–15 cm  $\times$  0.3–2 cm. Flowers 2–3 in axils or many together in pseudowhorls; calyx tubular, 8–10 mm long, lobes shorter than tube; corolla violet, 1–2 cm long; stamens inserted near top of tube. Capsules 1.2–1.8 cm long. **Fig. 63G.**

Swampy ground in eastern parts of the region, uncommon, also recorded from the Burnett district. Flowers spring to autumn.

### 2. DIPTERACANTHUS Nees

Perennial herbs. Flowers subsessile, 1–2 in axils, bracts leaf-like, stalked, exceeding calyx; calyx segments 5, erect, subequal; corolla campanulate; stamens 4, included, didynamous, filaments of pairs connected at base by membrane, anther connective apically produced, staminode present; 1 stigmatic lobe minute, 1 flattened. Capsules clavate, seedless at base; seeds villous on ribs, margins with mucilaginous hairs.

10 species tropical Africa, Asia and Australia; 3 species Australia; 1 species south-eastern Queensland.

#### 1. *Dipteracanthus corynothecus* (F. Muell. ex Benth.) Bremek.

*Ruellia corynotheca* F. Muell. ex Benth.

Decumbent or erect, up to *ca* 30 cm tall, plant shortly scabrous-pubescent. Leaves with petioles up to *ca* 5 mm long; blades ovate or broadly ovate, apex acute to obtuse, base rounded to cuneate, margin repand-dentate, 0.4–2.5 cm  $\times$  0.4–1.5 cm. Bracteoles oblong-linear or oblong, up to *ca* 6 mm long, longer than calyx; calyx 3–4 mm long; corolla white, pale blue or mauve, tube 6–10 mm long, lobes up to *ca* 5 mm long. Capsules clavate, *ca* 10 mm long.

Known from the Darling Downs district. Flowers spring to early winter.

### 3. RUELLIA L.

Perennial herbs or shrubs. Flowers usually showy, solitary or clustered in axils or borne in terminal or axillary cymose panicles, bracts present or absent; calyx usually 5-partite; corolla funnelform or salverform, often  $\pm$  campanulate, limb of 5 obtuse  $\pm$  spreading lobes; stamens 4, didynamous; stigma lobes unequal, 1 usually much reduced.

About 200 species, mainly from tropical and subtropical regions of the world; *ca* 8 species Australia, 4 naturalized; 2 species south-eastern Queensland.

This is a taxonomically difficult genus which has been divided by some authors into smaller but not clearly differentiated genera. The genus is in need of revision on a worldwide basis.

- |   |                          |
|---|--------------------------|
| 1. Leaves up to 6 times as long as broad; flowers up to <i>ca</i> 2.5 cm long | 1. <i>R. australis</i>   |
| Leaves at least 8 times as long as broad; flowers 2.5 cm or more long         | 2. <i>R. brittoniana</i> |

### 1. *Ruellia australis* R. Br.

*Aporuella australis* (R. Br.) Domin; *Brunoniella australis* (R. Br.) Bremek.

Perennial with tuberous roots; stems 5–30 cm tall, all except flowers hirsute with at least a few multicelled hairs to almost glabrous. Leaves with petioles 0.4–2 cm long; blades obovate to oblong to oblong-ovate, apex obtuse to  $\pm$  acute, base cuneate to rounded, margin entire or repand-dentate, 1–5 cm  $\times$  0.8–3 cm. Flowers sessile, bracteoles linear or very narrowly ovate, shorter than or rarely as long as calyx; calyx segments linear or very narrowly ovate, 6–10 mm long; corolla pale blue, tube longer than calyx, lobes spreading, up to *ca* 10 mm long. Capsules 1–1.5 cm long. **Fig. 63D.**

Widespread in the region. Flowers mainly summer–autumn.

### 2. \**Ruellia brittoniana* Leonard

Somewhat woody; stems several, up to *ca* 1 m tall. Leaves with petioles 1–2 cm long; blades linear or linear-ovate, apex acute-acuminate, base attenuate, margin entire, 6–20 cm  $\times$  0.4–2 cm. Flowers in upper axillary cymes, bracts linear, *ca* 6 mm long; calyx 5–10 mm long; corolla lavender, 2.5–4 cm long. Capsules 2–2.5 cm long.

Native of Mexico; introduced as an ornamental, naturalized in the eastern Wide Bay district.

## 4. PSEUDERANTHEMUM Radlk.

Herbs or shrubs. Flowers solitary or in terminal or axillary panicles racemes or cymes, bracts small; calyx deeply 5-partite; corolla tube long and slender, 5-lobed; stamens 2, inserted near top of corolla tube, staminodes 2, small. Capsules  $\pm$  clavate, seedless at base.

About 120 species, tropical parts of the world; 3–4 species Australia; 2 species south-eastern Queensland.

- |  |                        |
|--|------------------------|
| 1. Herbs up to <i>ca</i> 30 cm tall with creeping rhizome and erect stems; |                        |
| flowers in cymes arranged in racemes                                       | 1. <i>P. variabile</i> |
| Shrubs up to <i>ca</i> 1 m tall, erect; flowers solitary in axils          | 2. <i>P. tenellum</i>  |

### 1. *Pseuderanthemum variabile* (R. Br.) Radlk. ex Lindau

*Eranthemum variabile* R. Br.

Perennial with creeping rhizome; stems erect or ascending, up to *ca* 30 cm tall, whole plant glabrous to hirsute. Leaves with petioles 0.3–1.8 cm long; blades ovate-oblong to narrowly ovate to  $\pm$  linear, apex obtuse to acuminate, base rounded to cuneate, margin entire, 2–9.5 cm  $\times$  0.2–4 cm. Flowers in cymes of 3–5 in axils of small bracts, cymes arranged in racemes; calyx 4–8 mm long, mostly glandular hairy; corolla white to pink to mauve, tube 0.8–1.6 cm long, lobes 0.5–1 cm long. Capsules *ca* 1–1.4 cm long. **Fig. 63F.**

Common and widespread in the region. Flowers spring to autumn.

### 2. *Pseuderanthemum tenellum* (Benth.) Domin

*Eranthemum tenellum* Benth.

Erect shrub up to *ca* 1 m tall, branches scabrous-pubescent to glabrous. Leaves with petioles 2–5 mm long; blades narrowly ovate or narrowly oblong to ovate or oblong, apex obtuse to acute, base cuneate to attenuate, 0.8–3 cm  $\times$  0.25–1.2 cm. Flowers solitary, axillary; calyx *ca* 3–4 mm long, glandular pubescent; corolla white, tube 1–1.5 cm long, lobes 5–8 mm long. Capsules not seen.

Rainforest and depauperate rainforest of the region, not common. Flowers spring to autumn.

## 5. **HYPOESTES** Solander ex R. Br.

Herbs or shrubs. Flowers solitary or 2 or 3 together within a cylindrical or clavate involucre of 2 pairs of bracts often united to middle, inner pair alternating with outer, involucre in axillary clusters or spikes or in terminal panicles; calyx  $\pm$  deeply divided into 5 lobes or segments; corolla with slender tube, deeply 2-lipped, upper lip narrow, entire or rarely notched, lower 3-lobed; stamens 2, inserted at top of corolla tube, exserted, stamens 1-locular, staminodes absent; style bifid at top. Capsules clavate, contracted basal part seedless.

150 species tropical regions; 3 species Australia; 1 species south-eastern Queensland.

### 1. **Hypoestes floribunda** R. Br.

Erect up to *ca* 1 m tall. Leaves with petioles 0.2–3 mm long; leaf blades ovate or narrowly ovate, apex acute to acuminate, base cuneate, margin entire, 2–10 cm  $\times$  0.6–4 cm, glabrous to densely pubescent. Involucre in axillary clusters or racemes or loose terminal panicles, each involucre tubular, 4–8 mm long, 4-lobed to about middle, flowers solitary or rarely 2–3 together in involucre; calyx shorter than involucre; corolla mauve to purple, 1.5–2 cm long. Capsules 1–1.2 cm long.

Widespread in the region, often in or near rainforest or depauperate rainforest. Flowers autumn.

A number of varieties and forms of this species have been described. The species needs to be critically studied to ascertain whether any of the infraspecific taxa described should be recognised.

## 6. **GRAPTOPHYLLUM** Nees

Shrubs or small trees. Flowers in axillary or terminal clusters or short racemes, bracteoles very small; calyx divided to base into 5 segments; corolla tube incurved, 2-lipped, upper lip concave, incurved, notched, lower lip divided to base into 3 nearly equal lobes; stamens 2, ascending under upper lip, staminodes 2. Capsules oblong-clavate, contracted into solid seedless base; seeds flat.

10 species tropical Africa, New Guinea, Australia, Polynesia; 4 species, all endemic, Australia; 1 species south-eastern Queensland.

### 1. **Graptophyllum spinigerum** F. Muell.

Shrub up to *ca* 2 m tall; stems slender, armed with axillary spines 0.5–1.2 cm long. Leaves with petioles up to 1 mm long; blades elliptic, apex acute, base cuneate, margin entire to dentate, 1.5–6 cm  $\times$  0.7–3.5 cm, glabrous, shining. Flowers axillary, up to 3 on very short peduncles, pedicels *ca* 2–5 mm long; calyx 3–5 mm long; corolla white with pink spots inside, *ca* 1 cm long, lobes half length of tube; anthers exserted. Capsules clavate, 1–1.5 cm long. **Fig. 63E.**

Rare in south-eastern Queensland; the Queensland Herbarium has a few specimens of it from the region collected around Eumundi and Kin Kin before 1917. Cultivated as an ornamental.

## 7. **JUSTICIA** L.

Herbs or shrubs. Leaves usually petiolate. Inflorescences usually terminal spikes, sometimes fascicles cymes or panicles or flowers solitary axillary, bracts various; calyx deeply divided into 4–5-segments; corolla bilabiate, upper lip 2-lobed, lower lip 3-lobed; stamens 2, inserted in upper part of tube, anthers with 2 usually dissimilar locules, one usually higher than other; ovary with 2 ovules per loculus, style entire or 2-lobed. Capsules oblongoid or obovoid, sometimes stalked, 4-seeded.

About 300 species worldwide, mostly in tropics; 8–9 species Australia; 6 species south-eastern Queensland.



Fig. 63 A-B BIGNONIACEAE — A<sub>1</sub>-A<sub>2</sub> *Tecoma stans*, A<sub>1</sub> portion of flowering stem x1, A<sub>2</sub> fruit x1; B *Macfadyena unguis-cati*, leaf with tendril x1; C-G ACANTHACEAE — C *Justicia procumbens*, stamen x1; D *Ruellia australis*, portion of flowering and fruiting stem x1; E<sub>1</sub>-E<sub>2</sub> *Graptophyllum spinigerum*, E<sub>1</sub> portion of flowering and fruiting stem x1, E<sub>2</sub> flower x3; F<sub>1</sub>-F<sub>2</sub> *Pseuderanthemum variabile*, F<sub>1</sub> portion of flowering stem x1, F<sub>2</sub> fruit x1; G *Hygrophila salicifolia*, portion of flowering stem x1; H THUNBERGIACEAE — H<sub>1</sub>-H<sub>2</sub> *Thunbergia alata*, H<sub>1</sub> portion of flowering stem x1, H<sub>2</sub> fruit with one enclosing bracteole removed x1.

The genus in Australia is in need of revision.

- |  |                              |
|--|------------------------------|
| 1. Flowers in axillary clusters or in pairs on axillary peduncles . . . . .                                      | 2                            |
| Flowers in terminal inflorescences . . . . .   | 3                            |
| 2. Flowers in sessile axillary clusters surrounded by broad bracts . . . . .                                     | 1. <i>J. hygrophiloides</i>  |
| Flowers in pairs on axillary simple or forked peduncles; bracts setaceous . . . . .                              | 2. <i>J. cavernarum</i>      |
| 3. Flowers few in terminal dichotomous panicles; corollas 1–2 cm long . . . . .                                  | 3. <i>J. eranthemoides</i>   |
| Flowers in dense terminal spikes, occasionally spikes arranged in panicles; corollas up to 1.2 cm long . . . . . | 4                            |
| 4. Glabrous erect herbs; leaf bases cordate; plants drying ± glaucous . . . . .                                  | 4. <i>J. glauco-violacea</i> |
| Prostrate to erect herbs; leaf bases rounded to cuneate; plants not drying glaucous . . . . .                    | 5                            |
| 5. Bracts 1.5–3 mm wide, mostly obtuse . . . . .   | 5. <i>J. peploides</i>       |
| Bracts up to 1.5 mm wide, acute-acuminate . . . . .  | 6. <i>J. procumbens</i>      |

### 1. *Justicia hygrophiloides* F. Muell.

Erect densely branched shrub up to *ca* 1.5 m tall, glabrous or with minute hairs. Leaves with petioles up to *ca* 1 cm long; blades ovate to narrowly ovate, apex obtuse to acute to acuminate, base cuneate, margin entire or shallowly crenate, 2.5–10 cm × 1–4 cm. Flowers in axillary clusters of 2–6, surrounded by 3 or 4 broadly obcordate or 2-lobed leafy bracts 0.8–1.2 cm × 0.8–1.5 cm; calyx segments 5, rarely 4, 6–8 mm long; corolla white, 1.4–2 cm long. Capsules about as long as calyx.

Rainforest or depauperate rainforest of the region. Flowers mainly autumn to spring.

### 2. *Justicia cavernarum* F. Muell.

Branches slender, apparently decumbent or divaricate. Leaves petiolate; blades ovate, 2–3 cm × 0.4–*ca* 1 cm. Peduncles in one axil of pair of leaves, longer than leaves, bearing 2 sessile flowers at end or forked with 2 sessile flowers at end of each branch, bracts setaceous, *ca* 4 mm long; calyx *ca* 3 mm long; corolla *ca* 1 cm long, minutely hairy outside.

Rare; the Queensland Herbarium has a single specimen of it from the region from near Chinchilla in the Darling Downs district. The species has also been recorded from near Rockhampton and from Cape York Peninsula.

### 3. *Justicia eranthemoides* F. Muell.

Herb up to *ca* 30 cm tall, branches, inflorescences and often at least veins of undersides of leaves pubescent. Leaves with petioles up to *ca* 2.5 cm long; blades narrowly ovate to ovate, apex obtuse to acute to acuminate, base rounded to cuneate, margin entire or somewhat crenate, 1.5–10 cm × 1–2.8 cm, often one leaf of opposite pair smaller than other. Flowers few in inflorescences, bracts linear-subulate, *ca* 3–5 mm long; calyx 4–5 mm long; corolla 1–2 cm long. Capsules 1–1.5 cm long.

Rare; few specimens from southern parts of the region. Flowers probably spring–summer.

### 4. *Justicia glauco-violacea* Domin

Herb up to *ca* 40 cm tall, glabrous, drying ± glaucous. Leaves sessile, narrowly ovate to ovate, apex obtuse to acute, base cordate, margin entire or irregularly shallowly crenate, 2–6 cm × 1–1.6 cm. Spikes terminal and occasionally upper axillary, up to *ca* 15 cm long, bracts subulate, *ca* 4–8 mm long; calyx *ca* 3.5–6 mm long; corolla *ca* 8–10 mm long. Capsules 5–8 mm long in those seen, described as *ca* 1.5 cm long.

Recorded once in south-eastern Queensland from the western Moreton district.

### 5. *Justicia peploides* (Nees) T. Anders.

*Rostellularia peploides* Nees; *Justicia procumbens* L. var. *peploides* (Nees) F. M. Bailey

Procumbent ascending or erect herb up to *ca* 30 cm tall. Leaves with petioles 2–8 mm long; blades ovate or oblong, apex obtuse, base cuneate, margin entire or somewhat

crenate, 1.2–3 cm × 0.8–1.5 cm, with sparse spreading or ± appressed hairs above and below. Spikes terminal, compact, occasionally forming terminal panicles, up to *ca* 6 cm long, bracts 3–6 mm × 1.5–3 mm, apex obtuse; calyx subulate, 4–7 mm long, slightly longer than bracts; corolla white to purple, *ca* 6–9 mm long. Capsules *ca* 6 mm long.

Eastern parts of the region, often in open forests, not common. Flowers spring to autumn.

### 6. *Justicia procumbens* L.

*Rostellularia procumbens* (L.) Nees; *Rostellularia pogonanthera* F. Muell.

Proscumbent prostrate or erect herb up to *ca* 30 cm tall, ± scabrous with short hairs. Leaves with petioles 1–5 mm long; blades very variable, linear-ovate or linear-oblong to ovate or oblong, apex obtuse to acute, base cuneate, margin entire or somewhat crenate, 1–5 cm × 0.15–1.1 cm. Spikes terminal, compact, occasionally forming terminal panicles, up to *ca* 7 cm long, bracts subulate, 3–6 mm × up to *ca* 1.5 mm; calyx lobes 4, mostly with reduced fifth lobe, rarely 5, 4–7 mm long; corolla white to purple, up to *ca* 1.5 cm long. Capsules *ca* 7 mm long. **Fig. 63C.**

Widespread and moderately common in the region. Flowers mostly spring to autumn.

Further study may show the Australian plants are specifically distinct from *J. procumbens*.

## 141. MARTYNIACEAE

Perennial or annual herbs, glutinous villous. Leaves alternate or opposite, exstipulate. Flowers in terminal racemes, bisexual, zygomorphic; calyx segments 5, free or partly united, sometimes spathaceous; corolla tubular, 5-lobed; fertile stamens 2 or 4, staminodes present, anther loculi divaricate; ovary superior, 1-locular with 2 parietal placetas, ovules numerous, style long with 2 stigmas. Fruits capsules, ± long horned, pericarp soft, deciduous, endocarp woody, echinate or sculptured, loculicidally dehiscent.

4 genera with 16 species from tropical and subtropical America; 3 genera with 4 species Australia; 2 genera with 3 species south-eastern Queensland.

- |  |                       |
|--|-----------------------|
| 1. Calyces of 5 sepals; body of endocarps echinate; flowers yellow   | 1. <i>Ibicella</i>    |
| Calyces ± spathaceous, dentate or lobed above, split to base below; body of endocarps roughly sculptured; flowers purplish to cream in Australia | 2. <i>Proboscidea</i> |

### 1. *IBICELLA* van Eselt.

Annuals. Leaves entire. Inflorescences dense; calyx of 5 free sepals, upper 3 linear-ovate to obovate, lower 2 much broader; corolla oblique-campanulate; fertile stamens 4. Endocarp of body of capsules echinate.

3 species tropical America; 1 species naturalized Australia, occurring in south-eastern Queensland.

#### 1. \**Ibicella lutea* (Lindl.) van Eselt. YELLOW FLOWER DEVIL'S CLAW

*Martynia lutea* Lindl.; *Proboscidea lutea* (Lindl.) Stapf

Spreading up to *ca* 1 m diameter, glandular pubescent. Leaves with petioles *ca* 10–15 cm long; blades circular or transversely ovate, margin shortly toothed, base cordate, mostly 8–20 cm across. Racemes few-flowered, dense; calyx *ca* 1–2 cm long; corolla deep yellow with dark spots within, up to *ca* 4 cm long. Capsules up to *ca* 15 cm long, exocarp ± fleshy, with slender horn longer than body. **Fig. 64A.**

Native of tropical South America; widespread but not common in the region, often as a weed of cultivation. Flowers mostly summer–autumn.

## 2. PROBOSCIDEA Keller

Coarse viscid pubescent annuals or perennials. Leaves entire or shallowly lobed. Racemes with few-many flowers; calyx 5-toothed or 5-lobed, spathaceous, split ventrally to base, corolla limb flaring; fertile stamens 4. Endocarp of body of fruit roughly sculptured.

About 9 species, warm or subtropical America; 2 species naturalized Australia, both occurring in south-eastern Queensland.

- |   |                          |
|---|--------------------------|
| 1. Flowers violet to red-purple; leaf blades mostly 5-7-lobed . . . . . | 1. <i>P. fragrans</i>    |
| Flowers lavender to cream; leaf blades entire or sinuate . . . . .      | 2. <i>P. louisianica</i> |

### 1. \**Proboscidea fragrans* (Lindl.) Decaisne FRAGRANT DEVIL'S CLAW *Martynia fragrans* Lindl.

Viscid pubescent annual, spreading to 2 m in diameter and up to *ca* 60 cm tall. Leaves with petioles up to *ca* 20 cm long; blades broadly triangular to broadly ovate, base mostly  $\pm$  cordate, margin mostly 5-7-lobed, 5-25 cm  $\times$  5-25 cm. Racemes loose; calyx up to *ca* 2.5 cm long; corolla mostly violet to red-purple, 3.5-6.5 cm long. Capsule body up to *ca* 10 cm long, horns up to 20 cm long.

Native of south-western United States of America; known in the region from a few records from the Darling Downs and Burnett districts. Flowers summer-autumn.

### 2. \**Proboscidea louisianica* (Miller) Thell. PURPLE FLOWER DEVIL'S CLAW *Martynia louisianica* Miller; *Proboscidea jussieui* Schmid.

Viscid pubescent annual; branches prostrate or ascending, up to 1 m long. Leaves with petioles up to *ca* 20 cm long; blades orbicular-reniform to broadly ovate, base mostly  $\pm$  cordate, margin entire or sinuate, up to *ca* 30 cm wide. Racemes loose; calyx up to *ca* 2 cm long; corolla lavender to cream, 2-5 cm long. Capsule body up to *ca* 10 cm long, horns 15-30 cm long.

Native of the southern United States of America; doubtfully recorded from south-eastern Queensland.

## 142. OROBANCHACEAE

Herbs parasitic on roots, often covered with scales at base, without chlorophyll; stems with alternate often crowded scales. Flowers solitary in axils of bracts, often crowded, bisexual, zygomorphic; calyx 4-5-toothed or lobed or variously split; corolla sympetalous, limb oblique or 2-lipped, lobes 5; stamens 4, didynamous, inserted below middle of corolla tube, alternate with lobes, staminodes 1 or absent, anthers often connivent in pairs, opening lengthwise; ovary superior, 1-locular, ovules numerous, style terminal. Fruits capsules, often enveloped by calyx.

13 genera with 180 species chiefly northern temperate Eurasia, a few from the Americas and tropical regions; 1 genus with 2 species Australia; 1 genus with 1 species south-eastern Queensland.

### 1. OROBANCHE L.

Annuals biennials or perennials. Flowers arranged in usually dense spikes or racemes, bracteoles if present adnate to calyx; calyx tube cylindrical to campanulate, teeth 4, rarely 5 or calyx divided into 2 lateral entire or bifid segments; corolla strongly 2-lipped, lower lip 3-lobed, at least as long as upper; stamens included.

About 140 species from temperate and subtropical areas of the world; 2 species, 1 naturalized, Australia; 1 species possibly naturalized south-eastern Queensland.

#### 1. \**Orobanche minor* Smith LESSER BROOMRAPE Erect, up to *ca* 25 cm tall. Leaf scales linear-ovate, apex acute, up to *ca* 1.5 cm long. Flowers in spikes, bracts *ca* 0.7-1.5 cm long; calyx *ca* 0.7-1.2 cm long; corolla cream flushed and veined purple, *ca* 1-1.8 cm long; stigma purple.

Native of Europe; probably introduced to Australia as a horticultural novelty, cultivated to a limited extent in the region and in the Darling Downs district persists in home gardens where it is sometimes considered a nuisance. It is probably not truly naturalized in the region.

## 143. LENTIBULARIACEAE

Small carnivorous herbs, aquatic or terrestrial or (extra Australian) epiphytic. Leaves rosulate alternate or verticillate, sometimes not clearly differentiated or apparently absent, simple or dissected into capillary segments. Flowers racemose or solitary scapose, bisexual; calyx of 2, 4 or 5 lobes; corolla bilabiate, lower lip usually larger and spurred; stamens 2, inserted at base of corolla, anthers 2-locular, sometimes obscurely so, usually  $\pm$  sessile; ovary with free basal placenta and 2-many ovules, stigma 2-lobed. Fruits capsules, rarely indehiscent, usually valvate or circumscissile; seeds small, very varied in shape.

4 genera with ca 260 species, cosmopolitan but mainly tropical; 2 genera with ca 55 species Australia; 1 genus with 10 species south-eastern Queensland.

## 1. UTRICULARIA L.

Aquatic or terrestrial herbs, latter always in damp places or anchored in shallow water. Leaves in aquatic species dissected into capillary segments, in terrestrial species entire, linear to obovate, often apparently absent; small  $\pm$  globose bladders (traps) always present on leaves or other vegetative organs. Inflorescences racemes but sometimes 1-flowered; flowers alternate, rarely opposite or verticillate, bracteate and often bracteolate, sterile bracts (scales) often present on peduncle and sometimes also on inflorescence axis; calyx lobes 2; lower lip of corolla often with conspicuous ridges or markings in throat. Fruits indehiscent or usually dehiscent, calyx persistent and often accrescent.

About 200 species almost cosmopolitan but mostly tropical; ca 52 species Australia; 10 species south-eastern Queensland.

- |  |                           |
|--|---------------------------|
| 1. Leaves dissected into capillary segments, ultimate segments terminally and usually laterally minutely setulose . . . . .  | 2                         |
| Leaves entire, never setulose, often apparently absent . . . . .   | 3                         |
| 2. Ultimate segments few; flowers 1-3 . . . . .  | 1. <i>U. exoleta</i>      |
| Ultimate segments very numerous; flowers more than 3 . . . . .   | 2. <i>U. aurea</i>        |
| 3. Peduncles without scales . . . . .  | 4                         |
| Peduncles with scales . . . . .  | 7                         |
| 4. Corollas with lower lip 5-lobed, white, ca 2 mm wide . . . . .  | 3. <i>U. sp. 1.</i>       |
| Corollas with lower lip 3-lobed, or $\pm$ entire, yellow or mauve, more than 4 mm wide . . . . .   | 5                         |
| 5. Lower lip of corollas violet on upper surface, orange on lower surface; bracts and bracteoles ciliate; base of peduncle hispid . . . . .                            | 4. <i>U. sp. 2.</i>       |
| Lower lip of corollas mauve or violet on both surfaces; whole plant glabrous . . . . .   | 6                         |
| 6. Central yellow ridges in throat of lower lip projecting some distance beyond lateral violet ridges; flowers usually more than 3, opposite or verticillate . . . . . | 5. <i>U. dichotoma</i>    |
| Central yellow ridges in throat of lower lip not longer than lateral white or mauve ridges; flowers usually solitary . . . . .   | 6. <i>U. uniflora</i>     |
| 7. Bracts produced below point of attachment . . . . .   | 8                         |
| Bracts not produced below point of attachment . . . . .  | 9                         |
| 8. Bracteoles absent; lower lip of corollas 2-lobed . . . . .  | 7. <i>U. biloba</i>       |
| Bracteoles present; lower lip of corollas entire . . . . .   | 8. <i>U. caerulea</i>     |
| 9. Calyx lobes acute; corollas with acute spur and conspicuous hump on lower lip . . . . .   | 9. <i>U. uliginosa</i>    |
| Calyx lobes obtuse; corollas with obtuse or shortly bifid spur and without conspicuous hump on lower lip . . . . .   | 10. <i>U. lateriflora</i> |

**1. *Utricularia exoleta* R. Br.**

Aquatic or subaquatic. Leaves sparsely dissected into capillary segments, total length up to 10 mm, segments up to *ca* 0.1 mm wide, usually bearing conspicuous, often black, traps. Inflorescences 2–10 cm tall, peduncles glabrous, usually with single scale near mid point; flowers 1–3, somewhat distant, pedicels 5–10 mm long, bracts basifixed; corolla bright yellow with few brown lines on palate, 5–10 mm long, lower lip  $\pm$  orbicular with prominent basal hump, spur narrowly conical, obtuse or subacute, about as long as or slightly longer than lower lip, upper lip broadly ovate, margin obscurely 3-lobed, incurved. Capsules globose, 2-valvate.

In mud and shallow water in swamps and lagoons of the Moreton and Wide Bay districts, usually flowering only when the vegetative parts are in contact with the substrate which may be a floating mat of vegetation in deep water. Flowers probably most of the year.

**2. *Utricularia aurea* Lour.**

*Utricularia flexuosa* Vahl

Suspended aquatic. Leaves repeatedly dissected into capillary segments, total length up to 30 cm, segments up to *ca* 0.1 mm wide, usually bearing conspicuous traps near base of secondary and tertiary segments. Inflorescences 5–25 cm tall, peduncles glabrous; flowers 4–10, apically congested becoming  $\pm$  distant below, pedicels 5–10 mm long, bracts basifixed; corolla yellow, 1–1.5 cm long, lower lip transversely elliptic with conspicuous hump at base, spur cylindrical, about as long as lower lip, upper lip broadly ovate. Capsules globose with conspicuous persistent style, circumscissile. **Fig. 64C.**

Found in eastern parts of the region, in lagoons and swamps, usually amongst other vegetation. Flowers summer to winter.

**3. *Utricularia* sp. 1.**

*Utricularia albiflora* auct. non R. Br., F. Muell.; *U. quinquedentata* F. Muell. nomen nudum

Terrestrial. Leaves long petiolate; blades obovate-spathulate, *ca* 1 mm  $\times$  0.3 mm. Inflorescences 3–4 cm long, peduncles glabrous, extremely slender; flowers solitary, pedicels *ca* 1 mm long, bracts and bracteoles basifixed; corolla creamy white with some pale yellow in throat, *ca* 2 mm long, lower lip fan shaped, deeply 5-lobed, spur subacute, upper lip oblong, deeply 2-lobed. Capsules ellipsoid, 1-valvate.

In damp sandy soils in coastal areas. Flowers spring to autumn.

This, perhaps one of the smallest of flowering plants, was tentatively and incorrectly identified as *U. albiflora* R. Br. by F. Mueller who suggested the name *U. quinquedentata* should it prove to be distinct, but no valid description has yet been published.

**4. *Utricularia* sp. 2.**

Terrestrial. Leaves long petiolate; blades obovate-spathulate, *ca* 1 mm  $\times$  0.5 mm. Inflorescences 4–17 cm long, peduncles hispid towards base; flowers 1 or 2, pedicels 1.5–3 cm long, bracts and bracteoles basifixed, ciliate; lower lip of corolla violet on upper surface, orange on lower surface, with two small yellow ridges on palate of lower lip, 1–1.5 cm long, lower lip fan shaped, shallowly 3-lobed, spur subacute, upper lip obovate. Capsules globose, 1-valvate.

In damp sandy soils in coastal areas. Flowers spring to summer.

This species is clearly closely allied to *U. lasiocaulis* F. Muell. and in a broad sense could be included under that species. The group, which is distributed from south-eastern Queensland to the Kimberleys in Western Australia requires further study.

**5. *Utricularia dichotoma* Labill.***Utricularia speciosa* R. Br.; *U. oppositiflora* R. Br.

Terrestrial. Leaves rosulate and narrowly obovate or diffuse and narrowly linear in submerged forms, 0.2–10 cm × 0.1–0.4 cm. Inflorescences (5–)10–30(–50) cm tall; flowers in short terminal racemes of opposite pairs or whorls of 3, pedicels 0.5–1.5 cm long, bracts and bracteoles shortly obtusely produced below point of attachment; corolla usually deep violet with 2–7 long orange-yellow ridges in throat, 1–1.5(–2) cm long, lower lip ± semiorbicular or fan shaped, spur obtuse, upper lip oblong. Capsules globose, 1-valvate. **Fig. 64B.**

Widespread, in damp coastal areas, hillside seepages and beside streams. Flowers autumn to spring.

This species is extremely variable, especially in overall size and size of its individual flowers. The smaller forms may be confused with the following smaller species which is tetraploid, *U. dichotoma* being diploid, but the difference in the ridges in the throat appears to be quite constant.

**6. *Utricularia uniflora* R. Br.***Utricularia dichotoma* Labill. var. *uniflora* (R. Br.) Benth.

Terrestrial. Leaves long petiolate; blades obovate-spathulate, 1.5–4 mm × 1–2 mm. Inflorescences 10–20(–25) cm tall; flowers terminal, solitary, pedicels 5–10 mm long, bracts and bracteoles shortly, sometimes very shortly produced below point of attachment; corolla usually pale mauve with 2 short yellow ridges, 1–1.5 cm long, lower lip reniform to semi-orbicular, spur obtuse, upper lip oblong. Capsules broadly ovoid, 1-valvate.

Rare in the region, in damp coastal areas and by rocky streamsides. Flowers spring.

**7. *Utricularia biloba* R. Br.***Utricularia baueri* R. Br.; *U. lawsonii* Lloyd

Terrestrial or affixed subaquatic. Leaves ± petiolate; blades narrowly linear, 3–6 mm × 0.2–0.5 mm, abundant and conspicuous when submerged, much less so when terrestrial. Inflorescences 10–30 cm tall, peduncles glabrous; flowers 2–10, apically congested becoming distant below, pedicels 3–6 mm long, bracts acutely produced below point of attachment; corolla dark blue with white and yellow marks in throat, 6–10 mm long, lower lip transversely oblong, shallowly but distinctly 2-lobed, spur cylindrical, obtuse, scarcely as long as lower lip, upper lip broadly obovate. Capsules globose, 1-valvate.

Rare in the region, known from damp sandy areas on Fraser I. Flowers summer.

**8. *Utricularia caerulea* L.***Utricularia baueri* auct. non R. Br., Benth.

Terrestrial. Leaves petiolate; blades obovate-spathulate, ca 4 mm × 2 mm. Inflorescences (5–)10–30(–50) cm tall, peduncles glabrous; flowers 1–30 but mostly 3–10, distant to densely congested, pedicels 0.5–2 mm long, bracts and bracteoles produced below point of attachment; corolla purple, mauve or white, 5–10 mm long, lower lip ± orbicular, spur subulate, longer than lower lip, upper lip narrowly oblong to obovate. Capsules globose, 1-valvate.

In damp sandy soils of coastal areas of Moreton and Wide Bay districts. Flowers spring to autumn.

**9. *Utricularia uliginosa* Vahl***Utricularia cyanea* R. Br.; *U. graminifolia* R. Br. non Vahl

Terrestrial or affixed subaquatic. Leaves ± petiolate; blades linear, very variable in size and reaching 10 cm × 0.3 cm when submerged and luxuriant, much smaller when terrestrial. Inflorescences 4–30 cm tall, peduncles glabrous; flowers 2–8, distant, pedicels 1.5–4 mm long, distinctly winged, bracts and bracteoles basifixed; corolla violet or mauve usually with darker veins, sometimes wholly white, 4–8 mm long, lower lip ± orbicular with pronounced central hump, spur subulate, curved, acute,

upper lip oblong or obovate. Capsules ovoid, dorsiventrally compressed, 1-valvate. **Fig. 64D.**

In damp sandy areas, by margins of lagoons and by margins of streams in the Moreton and Wide Bay districts. Flowers spring to autumn.

**10. *Utricularia lateriflora* R. Br.**

*Utricularia parviflora* R. Br.

Terrestrial. Leaves petiolate; blades linear, 2–4 mm × *ca* 0.5 mm. Inflorescences 5–15(–25) cm tall, peduncles normally dark red, stiff, wiry, glabrous; flowers 2–6, rarely 1, distant, with sterile scales on inflorescence axis between flowers, pedicels *ca* 0.5 mm long, bracts and bracteoles basifixed; corolla usually pale mauve but may be white or darker reddish purple, 6–8 mm long, lower lip ± orbicular, margin obscurely 4-crenate, spur cylindrical, obtuse or shortly bifid, about as long as lower lip, upper lip narrowly oblong. Capsules globose, 1-valvate.

In damp sandy soils in coastal areas. Flowers spring to autumn.

**144. MYOPORACEAE**

Shrubs or rarely trees. Leaves alternate, rarely opposite, exstipulate, simple. Flowers axillary, solitary or fasciculate; calyx 5-lobed or 5-fid; corolla usually 5-lobed; stamens 4, rarely 5, inserted on corolla tube and alternate with lobes; ovary superior, style simple. Fruits drupes.

4 genera with *ca* 90 species chiefly Australia and South Pacific Is., but also in southern Africa, Mauritius, eastern Asia, Hawaii and West Indies; 2 genera with *ca* 70 species Australia; 2 genera with 10 species south-eastern Queensland.

- 1. Stamens all ± equal; flowers ± actinomorphic . . . . . 1. *Myoporum*
- Stamens didynamous; flowers ± zygomorphic . . . . . 2. *Eremophila*

**1. MYOPORUM Solander ex G. Forster**

Trees, shrubs or prostrate plants. Leaves alternate or rarely opposite, entire or toothed. Flowers axillary, often clustered; calyx divided to middle or nearly to base into 5 lobes or segments, not enlarging after flowering; corolla tube usually short, ± campanulate or shortly tubular at base, lobes nearly equal and regular or lower larger; ovary usually 2–4-locular. Drupes ± succulent.

32 species, Mauritius, eastern Asia, New Guinea, Australia, Pacific Is. and New Zealand; 15 species Australia; 6 species south-eastern Queensland.

- 1. Leaves completely entire . . . . . 2
- Some leaves with at least few teeth, often only at base or tip . . . . . 4
- 2. Stamens 5; drupes yellow . . . . . 1. *M. deserti*
- Stamens 4; drupes bluish, purplish or reddish . . . . . 3
- 3. Leaves mostly 4 or more times as long as broad; plants not of coastal sands, mangrove areas or headlands . . . . . 2. *M. montanum*
- Leaves less than 4 times as long as broad; plants of coastal sands, mangrove areas or headlands . . . . . 3. *M. acuminatum*
- 4. Prostrate shrubs; leaves with at least a few coarse teeth . . . . . 4. *M. debile*
- Erect shrubs or trees; leaves with fine teeth . . . . . 5
- 5. Drupes ovoid, laterally compressed, apex acute . . . . . 5. *M. platycarpum*
- Drupes ± globular . . . . . 6. *M. betcheanum*

**1. *Myoporum deserti* Cunn. ex Benth.**

**ELLANGOWAN POISON BUSH**

Glabrous shrub up to *ca* 4 m tall. Leaves with petioles up to *ca* 3 mm long; blades linear to narrowly ovate or narrowly obovate, apex acute or rarely almost obtuse, base narrowed, margin entire, 2–5.5 cm × 0.1–0.6 cm. Flowers 1–4 together, peduncles

drooping; calyx 2–3 mm long; corolla white, *ca* 8 mm long; stamens 5, included in corolla tube. Drupes yellow, ovoid or  $\pm$  globular, 7–8 mm long. **Fig. 64G.**

Moderately common in western parts of the region. Flowers mainly autumn to spring. The species is poisonous to stock, usually sheep or cattle travelling on stock routes.

**2. *Myoporum montanum* R. Br.** BOOBIALLA; WATER BUSH  
*Myoporum acuminatum* R. Br. var. *angustifolium* Benth.; *Myoporum cunninghamii* R. Br.

Erect shrub up to *ca* 5 m tall. Leaves with petioles up to *ca* 1.5 cm long; blades ovate-elliptic, apex and base acuminate, margin entire, 3–10.5 cm  $\times$  0.4–2 cm, mostly 4 or more times longer than broad. Flowers white, solitary or few together, 3–7 mm long,  $\pm$  bearded inside as well as tube; stamens 4, very shortly exerted if at all. Drupes globular, up to *ca* 8 mm diameter when fresh.

Widespread throughout the region in a variety of habitats but usually not near the sea. Flowers most of the year. This species may be poisonous to stock under stress of droving or drought.

See note under **M. acuminatum**.

**3. *Myoporum acuminatum* R. Br. sens. lat.**

Erect or prostrate glabrous shrub. Leaves very variable in shape and size from broadly ovate or obovate to elliptic to narrowly ovate, apex obtuse to acute to acuminate, base cuneate or abruptly narrowed, margin entire, 1.5–10 cm  $\times$  0.6–3.5 cm, mostly less than 4 times longer than broad. Flowers white, very variable in size, in axillary clusters of 2 or more, rarely solitary, mostly 3–8 mm long; calyx tube very short, lobes up to *ca* 3.5 mm long; corolla  $\pm$  campanulate, lobes  $\pm$  equal,  $\pm$  bearded inside as well as tube, occasionally almost absent from lobes; stamens 4, anthers very shortly exerted if at all. Drupes  $\pm$  globular, up to *ca* 8 mm diameter when fresh.

Sandy coastal areas, rocky headlands, along tidal creeks etc., moderately common. Flowers most of the year. Animals under stress of droving or drought may eat sufficient to cause death.

This is an extremely variable species. Obtuse leaf forms have been called **M. ellipticum** R. Br. or **M. acuminatum** var. **ellipticum** Benth. However there is a complete gradation in leaf size and shape throughout the range of variation of the species. This species also overlaps with **M. montanum**. A revision of the complex on an Australia wide basis is needed.

**4. *Myoporum debile* (Andr.) R. Br.** WINTER APPLE  
*Pogonia debilis* Andr.

Prostrate or ascending glabrous shrub with thick rootstock. Leaves shortly petiolate; blades elliptic to ovate or narrowly ovate, apex acute-acuminate, base narrowed, margin usually with at least few teeth at base, often toothed to apex, rarely entire, 3–12 cm  $\times$  (0.5–)0.8–2.5 cm. Flowers 1–2 together, peduncles up to *ca* 6 mm long; calyx leaf-like, narrow, apex acute, *ca* 6–8 mm long; corolla pink or purplish, 0.9–1.2 cm long. Fruits reddish, ovoid, somewhat compressed, 6–8 mm long. **Fig. 64F.**

Widespread in the region, moderately common. Flowers found most of the year.

**5. *Myoporum platycarpum* R. Br.** SUGARWOOD

Glabrous shrub or small tree up to *ca* 5 m tall. Leaves with petioles up to *ca* 8 mm long; blades narrowly ovate or narrowly elliptic, apex acute to acuminate, base cuneate to attenuate, margin entire or remotely serrate, 3–8 cm  $\times$  0.4–1.5 cm. Flowers 1–8 together, calyx segments 1–2 mm long; corolla 4–6 mm long; stamens 4, exerted. Drupes  $\pm$  ovoid, laterally compressed, apex acute, *ca* 6 mm long. **Fig. 64E.**

Known from the extreme southern Darling Downs district, rare. Flowers spring.

**6. *Myoporum betcheanum* L. S. Smith**

Tree up to *ca* 8 m tall and stem diameter up to *ca* 15 cm. Leaves with petioles up to *ca* 8 mm long; leaf blades narrowly ovate or narrowly elliptic, apex long attenuate, base narrowed, margin serrate, 5.5–10.5 cm  $\times$  0.6–1.4 cm. Flowers white, 1–8 together in

axils, pedicels 0.8–1.1 cm long; calyx segments *ca* 2–3(–4.5) mm long; corolla *ca* 3 mm long; stamens 4, exserted. Drupes  $\pm$  globular, not compressed, 5–6 mm diameter.

Two varieties occur in the region:

- |  |   |
|--|---|
| 1. Stems, leaves, pedicels and calyces glabrous . . . . .        | <i>M. betcheanum</i> var. <i>betcheanum</i> |
| Stems, leaves, pedicels and calyces minutely pubescent . . . . . | <i>M. betcheanum</i> var. <i>pubescens</i>  |

**M. betcheanum** var. **betcheanum** is known from rainforests in a few places in the mountains and ranges along the border with New South Wales as far west as the Cunningham's Gap area in the south-eastern Darling Downs district. **M. betcheanum** var. **pubescens** L. S. Smith has been recorded only from The Head near Killarney in the south-eastern Darling Downs district. Both varieties probably flower summer–autumn.

## 2. EREMOPHILA R. Br.

Woody subshrubs to small trees. Leaves alternate or occasionally opposite. Flowers axillary, solitary, or rarely up to 4 per axil; calyx divided  $\pm$  to base into 5, rarely 4 lobes, rarely divided to about middle and 5-lobed; corolla tubular, lobes 5,  $\pm$  bilabiate; stamens 4, didynamous, rarely 5; ovary 2-locular. Fruits drupes, 4-locular,  $\pm$  dry or succulent.

45 species all endemic in Australia; 4 species south-eastern Queensland.

- |   |                         |   |
|---|-------------------------|---|
| 1. Branches with indumentum of stellate hairs . . . . .     | 1. <i>E. glabra</i>     | 2 |
| Branches with indumentum of simple hairs . . . . .          |                         |   |
| 2. Flowers white or cream; stamens included . . . . .       | 2. <i>E. mitchellii</i> | 3 |
| Flowers pink, red or brownish; stamens exserted . . . . .   |                         |   |
| 3. Drupes 1.5–2.2 cm long; pedicels 1–2.5 cm long . . . . . | 3. <i>E. maculata</i>   |   |
| Drupes 0.5–1.1 cm long; pedicels 0.4–0.9 cm long . . . . .  | 4. <i>E. longifolia</i> |   |

### 1. *Eremophila glabra* (R. Br.) Ostenf.

### BLACK FUCHSIA

*Stenochilus glaber* R. Br.; *Eremophila brownii* F. Muell.

Erect bushy shrub 0.5–1.5 m tall, branchlets shortly stellate-pubescent, or at length glabrous, ultimate ones  $\pm$  viscid. Leaves alternate; petioles 1–7 mm long; blades narrowly ovate to linear-ovate, more rarely  $\pm$  elliptic, apex acute or shortly acuminate, base tapered, margin entire or rarely with few obscure teeth, (1.5–)2–5(–6.5) cm  $\times$  (0.15–)0.25–0.6(–0.8) cm, younger ones stellate pubescent, soon glabrous, viscid. Flowers solitary, pedicels 4–9 mm long; calyx segments unequal, 3 outer ones 5–9 mm long, 2 inner ones 4.5–7.5 mm long; corolla reddish, 2.5–3 cm long, glabrescent to glandular pubescent outside, more sparsely so within, lobes very unequal, lower much longer than others. Drupes ovoid, up to *ca* 1 cm long, not or scarcely exceeding calyx, glabrous. **Fig. 64J.**

Western Darling Downs district, not common. Flowers mostly spring and autumn.

### 2. *Eremophila mitchellii* Benth.

### BUDDA; BASTARD SANDALWOOD

Shrub or small tree 2–7(–9) m tall, branchlets sparsely glandular puberulous towards tip or glabrous. Leaves alternate; petioles 1–3 mm long; blades linear-ovate, apex acute, tipped by hooked point, or rarely obtuse, base narrowed, margin entire, (1.5)2.5–4(–6) cm  $\times$  (0.1–)0.2–0.4(–0.7) cm, glabrous, viscid. Flowers solitary or paired in axils, pedicels 0.5–1 cm long; calyx 0.5–1.1 cm long, becoming scarious and reticulately veined; corolla white or pale cream, 1.1–1.8 cm long, glabrous or sparsely glandular puberulent outside, pubescent on margin of lobes,  $\pm$  bearded within from middle of lower lobe to insertion of stamens. Drupes ovoid, 4.5–7 mm long, villous, also with short glandular hairs. **Fig. 64K.**

Western Darling Downs district. Flowers mainly spring.



Fig. 64 A MARTYNIACEAE — A *Ibicella lutea*, fruit  $\times 1/2$ ; B-D LENTIBULARIACEAE — *Utricularia* spp. — B<sub>1</sub>-B<sub>2</sub> *U. dichotoma*, B<sub>1</sub> flowering plant with traps  $\times 1$ , B<sub>2</sub> trap  $\times 6$ ; C<sub>1</sub>-C<sub>3</sub> *U. aurea*, C<sub>1</sub> portion of fertile plant with traps  $\times 1$ , C<sub>2</sub> flower  $\times 2$ , C<sub>3</sub> trap  $\times 6$ ; D *U. uliginosa*, portion of inflorescence  $\times 3$ ; E-K MYOPORACEAE — E-G *Myoporium* spp. — E<sub>1</sub>-E<sub>2</sub> *M. platycarpum*, E<sub>1</sub> portion of flowering stem  $\times 1$ , E<sub>2</sub> fruit  $\times 3$ ; F *M. debile*, portion of fruiting stem  $\times 1$ ; G *M. deserti*, portion of flowering stem  $\times 1$ ; H-K *Eremophila* spp. — H *E. maculata*, portion of flowering stem  $\times 1$ ; I *E. longifolia*, portion of flowering stem  $\times 1$ ; J *E. glabra*, flower  $\times 1$ ; K *E. mitchellii*, portion of flowering stem  $\times 1$ .

**3. *Eremophila maculata* (Ker-Gawl.) F. Muell.**

FUCHSIA BUSH

*Stenochilus maculatus* Ker-Gawl.

Low compact shrub 0.5–1.5 m tall, branchlets  $\pm$  softly pubescent or tomentose, sometimes  $\pm$  glabrous. Leaves alternate; petioles *ca* 1–6 mm long; blades narrowly obovate to elliptic or rarely linear-ovate, base narrowed, (1–)1.5–3.5(–5) cm  $\times$  (0.15–)0.25–0.7(–0.9) cm, glabrous or immature ones glandular puberulent. Flowers solitary, pedicels slender, 1–2.5 cm long; calyx 4–8 mm long; corolla pink, crimson or red, 2.2–3.5 cm long, tube 1–1.8 cm long, limb  $\pm$  bearded on inside of upper lip. Drupes broadly ovoid, 1.5–2.2 cm long, much exceeding calyx. **Fig. 64H.**

Western Darling Downs district, not common. Flowers mostly spring. It can be poisonous to stock under stress of droving or drought.

**4. *Eremophila longifolia* (R. Br.) F. Muell.**

BERRIGAN

*Stenochilus longifolius* R. Br.; *Eremophila salicina* (Benth.) Domin

Shrub or small tree up to *ca* 6 m tall with  $\pm$  drooping foliage and branchlets, branchlets sparsely to densely greyish or yellowish pubescent with short simple appressed hairs or rarely with longer hairs or with glandular ones. Leaves alternate; petioles *ca* 1–7 mm long; blades linear to linear-ovate, apex acute with hooked or recurved point, base narrowed to petiole, (3–)5–12(–20) cm  $\times$  (0.12–)0.2–0.7(–1) cm,  $\pm$  hoary or yellowish pubescent when young, soon  $\pm$  glabrous. Flowers 1–3, rarely 4 per leaf axil, pedicels 4–9 mm long; calyx 2–8 mm long; corolla pinkish to reddish brown, spotted inside, 1.3–3 cm long, tube 1–2 cm long, lower lobe 0.4–1.2 cm  $\times$  0.2–0.7 cm, coarsely pubescent outside, sparsely glandular pubescent within. Drupes ovoid to subglobular, 0.5–1.1 cm long. **Fig. 64I.**

Western Darling Downs and Burnett districts, not common. Flowers mostly spring–summer but a few flowers found at other times.

**145. HYDROPHYLLACEAE**

Annual or perennial herbs, rarely small shrubs, often hairy or scabrid, sometimes spiny. Leaves radical or alternate, rarely opposite, entire to pinnately or palmately lobed. Inflorescences mostly boragoid; flowers bisexual, actinomorphic; calyx segments mostly 5, often with appendages between; corolla sympetalous, mostly 5-lobed; stamens same number as corolla lobes, alternate with them, epipetalous, anthers 2-locular, opening lengthwise; ovary superior, 1–2-locular, ovules often numerous, styles 1–2. Fruits capsules.

18 genera with 250 species found throughout the world except Europe and Australia; 2 genera with 2 species naturalized Australia; 1 genus with 1 species south-eastern Queensland.

**1. WIGANDIA Kunth**

Herbs, large, somewhat woody at base, sometimes tree-like, frequently with stinging hairs. Inflorescences boragoid; calyx usually divided to base; corolla large, mostly funnelform to campanulate; stamens somewhat exserted, partly adnate with corolla tube, filaments barbed; styles 2, elongate, stigma capitate-clavate. Capsules loculicidally and septicidally dehiscent; seeds numerous, winged.

About 6 species restricted to Central and South America; 1 species naturalized Australia, occurring in south-eastern Queensland.

**1. \**Wigandia caracasana* Kunth**

Erect robust perennial, often shrub-like, up to *ca* 3 m tall, pubescent with stiff or short whitish hairs, hairs often coarse and stinging, often with glandular hairs interspersed with small viscid globules. Leaves alternate; petioles 1.5–10 cm long; blades broadly ovate to oblong-elliptic to  $\pm$  orbicular, apex obtuse, base subcordate, margin coarsely and irregularly doubly crenate to doubly serrate, up to 50 cm  $\times$  37 cm. Inflorescences

boragoid, arranged in terminal thyrses or panicles; sepals 5, 0.5–1.8 cm long; corolla violet to blue, up to *ca* 3 cm broad, lobes 5, equal in length to tube. Capsules equal to or longer than calyx.

Native from southern Mexico to Colombia and Venezuela; probably introduced into Australia as an ornamental, apparently naturalized in a few places in the region. Flowers late summer to spring.

## 146. GESNERIACEAE

Herbs shrubs or rarely trees. Leaves radical or opposite, equal or one large and one small, sometimes smaller one stipule-like, sometimes one altogether reduced. Flowers bisexual, usually zygomorphic, often large and showy; calyx lobes or sepals 5, free or completely adnate to ovary; corolla sympetalous with oblique limb, 5-lobed, often  $\pm$  2-lipped; stamens 4 or 2, often with an additional staminode, anthers connate or connivent in pairs, 2-locular, opening lengthwise; ovary superior to inferior, usually 1-locular, ovules numerous. Fruits capsules, rarely berries.

120 genera with *ca* 2000 species mostly tropical and subtropical regions worldwide; 5 genera with 5 species Australia; 1 genus with 1 species south-eastern Queensland.

### 1. FIELDIA Cunn.

Woody climbers or epiphytes. Leaves opposite, unequal. Peduncles axillary, 1-flowered, bracteoles under calyx herbaceous; calyx segments divided to base; corolla tubular, somewhat 2-lipped; stamens 4; stigma 2-lobed. Fruits slightly pulpy, indehiscent.

1 species endemic in Australia, occurring in south-eastern Queensland.

#### 1. *Fieldia australis* Cunn.

Climber or epiphyte clinging to tree trunks by adventitious roots, branches foliage and inflorescences hirsute with articulate hairs. Leaves usually very unequal in each pair; larger ones with petiole 1.5–2 mm long, blades obovate-elliptic or oblong, apex acute, base narrowed to petiole, margin coarsely toothed, 3–7.5 cm  $\times$  1.2–3 cm; smaller ones usually less than half size of larger ones, rarely both  $\pm$  equal. Peduncles shorter than larger leaves, bracteoles up to *ca* 1.2 cm long; calyx *ca* 0.7–1.2 cm long; corolla creamy white, *ca* 2.5–3 cm long. Fruits whitish, *ca* 0.7–1.2 cm long.

Rainforest of south-eastern parts of the region. Flowers summer–autumn.

## 147. PEDALIACEAE

Annual or perennial herbs, rarely shrubs. Leaves opposite, or upper alternate, exstipulate, simple, rarely compound. Flowers axillary, bisexual, zygomorphic, mostly with characteristic glands at base of peduncles; calyx of 5, rarely 4 basally connate sepals; corolla tubular, limb often oblique, 5-lobed; stamens 4, didynamous, usually with small staminode; anthers free or cohering in pairs, 2-locular, opening lengthwise; ovary usually superior, rarely inferior, of 2 fused carpels, 2–4-locular, ovules 1–many, style terminal. Fruits capsules or nuts or subdrupaceous; endocarp hard and often horned or prickly.

12 genera with 50 species tropical and southern Africa, Madagascar, India, south-eastern Asia and northern Australia; 2 genera with 3 species, 1 endemic, Australia; 1 genus with 1 species south-eastern Queensland.

### 1. SESAMUM L.

Erect or decumbent herbs. Larger leaves sometimes compound or deeply divided, smaller ones simple, entire or serrate-dentate. Flowers solitary in upper axils; calyx

persistent, small; corolla tube decurved, gradually widened upwards, lobes rounded; anthers free with bifid base, connective gland tipped, staminode minute or absent; ovary 2-locular. Capsules unarmed, with 4 longitudinal grooves.

About 18 species from Africa and Asia; 1 species naturalized Australia, occurring in south-eastern Queensland.

1. \**Sesamum indicum* L.

SESAME

Strong smelling annual up to ca 1.5 m tall. Leaves opposite below, alternate above; petioles 0.5–15 cm long; blades ovate, apex acute or ± obtuse, base rounded, in robust specimens often 3-lobed, 3-partite or palmately 3-foliolate in others, undivided except occasionally for few irregular teeth, up to 20 cm × 15 cm. Peduncles 2–5 mm long; calyx 4–7 mm long; corolla white to violet, 2–3.5 cm long. Capsules 1.5–3 cm long, pubescent.

Herb of ancient cultivation, native country not known; naturalized in a few places in the region, seldom met with.

148. PLANTAGINACEAE

Herbs. Leaves radical alternate or opposite, exstipulate, simple. Inflorescences spicate, rarely capitate; flowers usually bisexual, actinomorphic; calyx 4-lobed or -partite, or sometimes lower pair united; corolla sympetalous, scarious, 3–4-lobed, lobes imbricate; stamens 4, rarely 1–2, inserted on corolla tube and alternate with lobes, or hypogynous, anthers 2-locular; ovary superior, 1–4-locular, ovules 1 or more per loculus, style simple. Fruits circumscissile capsules or bony nuts; seeds peltately attached.

3 genera with 270 species cosmopolitan; 1 genus with ca 24 native and ca 8 naturalized species Australia; 1 genus with 9 species south-eastern Queensland.

1. PLANTAGO L.

Annual or perennial herbs. Leaves usually radical. Flowers in pedunculate bracteate spikes, 4-merous; sepals persistent; corolla tube ca as long as calyx, lobes spreading or eventually reflexed, whole withering on capsule; stamens inserted at base of corolla tube, exserted; ovary 2–4-locular, ovules 1–6, rarely –8 per loculus. Capsules circumscissile, with upper part ± hardened and deciduous, lower membranous and persistent.

265 species cosmopolitan; ca 32 species Australia; 9 species south-eastern Queensland.

- 1. Plants with opposite cauline ± linear leaves, without basal rosette . . . . . 1. *P. indica* . . . . . 2  
Plants without cauline leaves, leaves all rosulate . . . . .
- 2. Leaves deeply pinnatifid or bipinnately lobed; lower half of corolla tube puberulent on outside . . . . . 2. *P. coronopus* . . . . . 3  
Leaves entire or dentate, corolla tube glabrous . . . . .
- 3. Capsules 8–16-seeded; leaf blades ovate, abruptly narrowed into petioles usually as long as blades . . . . . 3. *P. major* . . . . . 4  
Capsules up to 5-seeded; leaf blades usually narrower or with shorter petioles . . . . .
- 4. Corolla lobes erect and rigid after anthesis . . . . . 4. *P. myosuroides* . . . . . 5  
Corolla lobes spreading, not rigid after anthesis . . . . .
- 5. Scapes with regular longitudinal ridges; bracts acuminate; anterior sepals fused, bilobed . . . . . 5. *P. lanceolata* . . . . . 6  
Scapes without regular longitudinal ridges; bracts acute or obtuse; all sepals free . . . . .
- 6. Sepals 2–3 mm long; corolla lobes 1.5–2 mm long . . . . . 7  
Sepals 1.5–2 mm long; corolla lobes 1–1.5 mm long . . . . . 8

7. Leaves narrowly obovate to narrowly oblong, short white pubescent; bracts and sepals white pubescent; found in rock crevices of southern Granite Belt

Leaves linear to linear-obovate,  $\pm$  glabrous or sericeous pubescent; bracts and sepals at most puberulent; found in moist sandy soils on Granite Belt

8. Capsules  $\pm$  tapering to apex from middle; spikes usually lax at maturity

Capsules distinctly constricted in upper third, break  $\pm$  conical; spikes usually compact at maturity

6. *P. hispida*

7. *P. gaudichaudii*

8. *P. debilis*

9. *P. cunninghamii*

### 1. \**Plantago indica* L.

#### SAND PLANTAIN

*Plantago arenaria* Waldst. & Kit.

Annual herb usually 20–30 cm tall; stems  $\pm$  erect, glandular pubescent. Leaves cauline,  $\pm$  opposite,  $\pm$  linear, apex acute, margin usually distantly dentate, 1.5–6 cm  $\times$  0.1–0.2 cm, pubescent or puberulent. Inflorescences axillary, peduncles 1.5–4(–8) cm long, glandular pubescent, spikes globose to ovoid, compact, up to 2 cm long, bracts acuminate; sepals unequal, 3–4.5 mm long, pubescent; corolla tube 3–3.5 mm long, lobes *ca* 2 mm long. Capsules ovoid, 2–2.5 mm long.

Native of south and central Europe and south-western Asia; recorded from the Darling Downs district. Flowers spring.

### 2. \**Plantago coronopus* L.

#### BUCK'S HORN PLANTAIN

Usually perennial with persistent taproot. Leaves rosulate, pinnatifid to pinnatisect, oblong to obovate in outline, usually 4–15 cm  $\times$  1–3 cm, lobes linear-oblong, acute, pubescent or puberulent, 1 prominent midvein present. Scapes generally 5–20(–30) cm long, pubescent, spikes cylindrical, compact, 1–7.5 cm long, bracts acuminate; sepals 2–3 mm long, often puberulent; corolla tube 1–2 mm long, pubescent or puberulent, lobes *ca* 1 mm long. Capsules ovoid, 2–2.5 mm long.

Two subspecies occur in the region:

1. Scapes slender, mostly up to 1 mm diameter, mostly longer than leaves; spikes dense but flowers slightly spreading, bracts tapering to elongated tip,  $\pm$  longer than sepals

*P. coronopus* subsp. *coronopus*

Scapes stout, mostly more than 1 mm diameter, mostly shorter than leaves; spikes very dense, flowers imbricate, bracts acute or obtuse, mostly shorter than sepals

*P. coronopus* subsp. *commutata*

*P. coronopus* subsp. *coronopus*, a native of Europe and western Asia, has been collected in the vicinity of Brisbane and Wallangarra while *P. coronopus* subsp. *commutata* (Guss.) Pilger (*P. commutata* Guss.), a native of the Mediterranean region, has been recorded near Brisbane. Both flower mainly spring–summer.

### 3. \**Plantago major* L.

#### GREATER PLANTAIN

Short lived perennial. Leaves rosulate; petioles relatively well-defined, broad, 1.5–33 cm long; blades ovate, apex obtuse, base truncate or sharply contracted, margin irregularly crenate or undulate, or sometimes lobed, 3.5–28 cm  $\times$  2–13 cm, glabrous or sparsely pubescent, 5–7-nerved. Scapes 15–45 cm long, spikes cylindrical,  $\pm$  compact in flower, 7.5–45 cm long, bracts obtuse to acute; sepals *ca* 2 mm long; corolla tube *ca* 1.5 mm long, lobes *ca* 1 mm long. Capsules ovoid, 3–4 mm long; seeds 8–16.

Native of Europe and northern and central Asia; naturalized in the coastal districts and eastern Darling Downs district, usually in moist or fertile areas. Flowers mainly spring–summer.

### 4. \**Plantago myosuroides* Lam.

Annual herb with persistent taproot. Leaves rosulate; petioles ill-defined, up to *ca* 2 cm long; blades obovate or elliptic-obovate, apex obtuse, base attenuate, margin irregularly dentate, usually 3–10 cm  $\times$  0.8–2.8 cm, hirsute both surfaces, 3–5-nerved, laterals indistinct. Scapes 3–20 cm long, pubescent, spikes cylindrical, compact, 4–10(–25) cm long, bracts acute; sepals unequal, 1.5–2.5 mm long; corolla tube *ca* 1 mm long, lobes erect, rigid, 2.5–3 mm long, enclosing stamens and style. Capsules ovoid, *ca* 2–2.5 cm long. **Fig. 65C.**

Native of South America; naturalized around Brisbane and probably other areas of the Moreton district. Flowers spring.

**5. \**Plantago lanceolata* L.**

RIBWORT; COMMON PLANTAIN

Annual or biennial herb with thick taproot. Leaves rosulate; petioles indistinct, up to 20 cm long; blades very narrowly elliptic to elliptic or ovate, apex acute, base attenuate, margin remotely denticulate, 4.5–20 cm × 0.4–4.5 cm, glabrous to sparsely villous, broader blades with 5 prominent ± parallel nerves. Scapes 20–60(–80) cm long, longitudinally ridged, ± pubescent, spikes ovoid to cylindrical, compact, 1–10 cm long, bracts acuminate; sepals 2–4.5 mm long, anterior fused, bifid at apex, posterior free; corolla tube 2–3 mm long, lobes 2–2.5 mm long. Capsules ovoid, 3–4 mm long. **Fig. 65B.**

Native of Europe and northern and central Asia; naturalized mainly in the Moreton district, also eastern Darling Downs district. Flowers spring to autumn.

**6. *Plantago hispida* R. Br.**

Small perennial herb with stout taproot. Leaves rosulate; petioles indistinct, up to 4 cm long; blades narrowly obovate or narrowly oblong, apex acute, base attenuate, margin irregularly dentate, 1–6 cm × 0.4–1 cm, white pubescent both surfaces. Scapes 3–15(–30) cm long, white pubescent, spikes usually cylindrical, 1–6(–10) cm long, bracts acute, pubescent; sepals unequal, 2–3 mm long, pubescent; corolla tube *ca* 2 mm long, lobes 1.5–2 mm long. Capsules ovoid, *ca* 3 mm long.

Recorded from near Wallangarra, growing in shallow soil in crevices of granite boulders. Flowers spring.

**7. *Plantago gaudichaudii* Barnéoud***Plantago sericophylla* Decaisne

Herb with long thick taproot. Leaves rosulate, linear to linear-elliptic or linear-obovate, apex attenuate or finally blunt, base attenuate, margin entire or irregularly dentate, 5.5–22 cm × 0.25–0.8 cm, more than 10 usually 15 times as long as broad, ± glabrous or sericeous pubescent. Scapes 7–20 cm long, pubescent to sericeous, spikes cylindrical, lax at maturity, 4–15 cm long, bracts obtuse or acute; sepals 2.5–3 mm long, glabrous or puberulent; corolla tube 2–3 mm long, lobes 1.5–2 mm long. Capsules ovoid, *ca* 3 mm long.

Granite Belt area of the Darling Downs district in moist, but not swampy areas. Flowers spring and autumn.

**8. *Plantago debilis* R. Br.***Plantago varia* R. Br. var. *debilis* (R. Br.) Maiden & Betche

Usually perennial herb with persistent taproot. Leaves rosulate; petioles ill-defined, up to 15 cm long; blades obovate or elliptic, rarely ovate, sometimes narrowly so, apex obtuse or acute, base attenuate, margin ± entire or dentate, sometimes lobed, 2–17 cm × 0.5–5.5 cm, usually pubescent or puberulent, 3–5-nerved. Scapes 2–32 cm long, pubescent or puberulent, spikes usually lax at maturity, 0.5–25 cm long, bracts acute, glabrous or pubescent; sepals 1.5–2 mm long, glabrous or pubescent; corolla tubes 1–2 mm long, lobes *ca* 1 mm long. Capsules ovoid, but tapered towards apex, *ca* 2–3 mm long. **Fig. 65A.**

Widespread throughout much of the region, often in disturbed sites or cleared areas. Flowers much of the year.

**9. *Plantago cunninghamii* Decaisne**

SAGO WEED

Probably annual herb. Leaves rosulate; petioles ill-defined, up to 7.5 cm long; blades elliptic or obovate, apex obtuse or acute, base attenuate, margin irregularly dentate, 3–10 cm × 0.7–3.5 cm, pubescent. Scapes up to 20 cm long, pubescent, spikes ± cylindrical, ± compact, 2–10(–15) cm long, bracts acute or obtuse, glabrous or pubescent; sepals 1.5–2 mm long, glabrous; corolla tube 1–1.5 mm long, lobes 1–1.5 mm long. Capsules ovoid, but apex contracted into ± conical beak, 3–3.5 mm long. **Fig. 65D.**

Recorded in western Darling Downs district in heavy soils. Flowers spring.

Another closely related species, *P. turrifera* B. G. Briggs, Carolin & Pulley reported from more western areas in New South Wales may be found in the western Darling Downs district. It can be distinguished from *P. cunninghamii* by the beak on the capsule being  $\pm$  cylindrical, truncate and obscurely 4-lobed at the apex. There is considerable variation in the shape of the beak of *P. cunninghamii* even on the one plant however, and distinguishing between these two, and at times between them and *P. debilis* can be quite difficult.

## 149. CAPRIFOLIACEAE

Shrubs or small trees, rarely herbs. Leaves opposite; sometimes stipulate; blades simple, usually entire. Flowers usually in cymes, bisexual, actinomorphic or zygomorphic; calyx adnate to ovary, 5-4-lobed; corolla sympetalous, lobes 5-4, imbricate, sometimes 2-lipped; stamens 4-5, epipetalous, alternate with corolla lobes, anthers 2-locular; ovary inferior, 2-5, rarely-8-locular with 1-many ovules per loculus, style simple, stigma capitate. Fruits fleshy berries or drupes, achenes or capsules; seeds with fleshy endosperm.

12 genera with 450 species, mostly Northern temperate region and tropical mountains; 3 genera with 3 species naturalized Australia; 1 genus with 1 species south-eastern Queensland.

### 1. LONICERA L.

Mostly erect shrubs, sometimes vines, often pubescent. Leaves mostly exstipulate. Inflorescences of numerous 2-3-flowered cymes; flowers 5-merous; calyx lobes small or absent; corolla with 1-5 nectaries along inside of tube, lobes quincuncial in bud; stamens 5, inserted in corolla tube, anthers introrse; ovary 2-3, rarely-5-locular, ovules 3-8 per loculus, style elongate, stigma small, indistinctly lobed. Fruits fleshy few-seeded berries usually crowned by calyx lobes.

About 200 species North America, Eurasia; 1 species naturalized Australia, occurring in south-eastern Queensland.

#### 1. \**Lonicera japonica* Thunb.

#### JAPANESE HONEYSUCKLE

*Lonicera confusa* DC.

Woody climber up to 10 m long, usually with ferruginous retrorse glandular indumentum. Leaves with petioles 2-8 mm long; blades ovate or oblong-ovate, apex acute, base rounded, margin entire, 2.5-6 cm  $\times$  1-3 cm,  $\pm$  glabrous with age. Flowers in axillary pedunculate pairs subtended by pair of foliaceous bracts; calyx lobes 1-1.5 mm long, ciliate; corolla white, turning yellow with age, strongly 2-lipped, 4-5 cm long, glandular pubescent, tube *ca* 2-2.5 cm long, upper lip 4-lobed; stamens and stigma *ca* as long as corolla. Fruits shiny black, succulent, *ca* 5 mm long.

Native of eastern Asia and Japan; cultivated, but reported to be naturalized in some areas near habitation. Flowers autumn.

## 150. SAMBUCACEAE

Tall shrubs or rarely herbs, lenticels prominent in bark. Leaves opposite, stipulate, pinnate, sometimes glandular. Flowers in cymes, bisexual, actinomorphic; calyx tube adnate to ovary, 3-5-toothed; corolla tube short, lobes 3-5, spreading, imbricate or valvate in bud; anthers as many as corolla lobes and alternate with them, sessile, inserted on corolla tube, free, extrorse, 2-locular; ovary inferior, 3-5-locular, ovules solitary, pendulous in each loculus, style terminal, often slender. Fruits succulent drupes with 3-5, 1-seeded pyrenes.

1 genus with *ca* 40 species cosmopolitan; 2 native and 1 naturalized species Australia; 2 species south-eastern Queensland.



Fig. 65 A-D PLANTAGINACEAE — *Plantago* spp. — A<sub>1</sub>–A<sub>3</sub> *P. debilis*, A<sub>1</sub> part of fertile plant x1, A<sub>2</sub> flower with reflexed petals x6, A<sub>3</sub> fruit showing tapered apex x6; B *P. lanceolata*, inflorescence and part of ridged scape x1; C *P. myosuroides*, flower with erect petals x6; D *P. cunninghamii*, fruit with abruptly contracted apex x6; E SAMBUCACEAE — *Sambucus gaudichaudiana*, leaf showing smallest pair of leaflets very close to stem x1/2.

## 1. SAMBUCUS L.

Characters as for family.

- |  |                             |
|--|-----------------------------|
| 1. Leaves with lowest pair of leaflets very close to stem, stipule-like; flowers mostly 4-merous; fruits white . . . . . | 1. <i>S. gaudichaudiana</i> |
| Leaves without stipule-like pair of leaflets; flowers mostly 3-merous; fruits yellow . . . . .                           | 2. <i>S. australasica</i>   |

### 1. *Sambucus gaudichaudiana* DC.

WHITE ELDER

Small shrub with herbaceous stems arising from perennial tuberous rootstock. Leaves imparipinnate, up to 35 cm long; leaflets 5–11, ± opposite, with 1 pair at base of rachis appearing like large stipules, often lower leaflets with basal lobes also; petiolules 0.3–1.2(–3) cm long; leaflet blades ovate, or terminal one elliptic, apex acuminate, base cuneate or unequal and oblique on laterals, margin coarsely dentate, 3–17 cm × 1–1.5 cm, sparsely hispid. Flowers in terminal cymose panicles, usually 4-merous; calyx teeth ± acute; corolla white, tube 0.5–1 mm long, lobes ca 3–4 mm long. Fruits white, succulent, small. Fig. 65E.

Scattered throughout the moister parts of the region, often growing in cleared rainforest areas; sometimes a weed of cultivation. Flowers spring to autumn.

### 2. *Sambucus australasica* (Lindl.) Fritsch

AN ELDERBERRY

*Tripetalus australasicus* Lindl.; *Sambucus xanthocarpa* F. Muell.

Shrub or small tree up to ca 4.5 m tall, ± glabrous. Leaves imparipinnate, up to 20 cm long; leaflets 3–5, ± opposite without a pair at base of rachis; petiolules 0.2–1.2 cm long; leaflet blades elliptic or obovate, apex acuminate, base cuneate, rarely oblique, margin coarsely dentate, 1.8–11 cm × 0.4–4 cm. Flowers in terminal

cymose panicles, usually 3-merous; calyx lobes usually obtuse; corolla white, tube 0.5–1 mm long, lobes *ca* 2 mm long. Fruits yellow,  $\pm$  globular, *ca* 5 mm diameter, pendulous.

Rainforest areas of the region. Flowers spring to autumn.

**S. canadensis** L., AMERICAN ELDER; SWEET ELDER, is cultivated in the region and may be met with as a stray from cultivation. It can be distinguished from the above species by the leaves not having a stipule-like pair of leaflets, flowers 5-merous, occasionally 4-merous, and the fruits being purple-black when ripe.

## 151. CAMPANULACEAE

Herbs, rarely small shrubs or trees, often with milky sap. Leaves alternate, rarely opposite, exstipulate, simple. Flowers bisexual, rarely unisexual; calyx adnate to ovary, 3–10-lobed, but usually 5-lobed; corolla sympetalous, actinomorphic or zygomorphic, 1–2-lipped, usually epigynous, lobes valvate; stamens as many as corolla lobes and alternate with them, inserted near base of corolla or on disc, filaments free from each other at base, anthers free or cohering into tube around style, ovary  $\pm$  inferior, 2–10-locular, ovules numerous, placentation axile, style simple or 2–3-, rarely 5-lobed. Fruits fleshy or capsular and dehiscent, usually crowned by persistent calyx lobes; seeds numerous, small.

60–70 genera with 2 000 species, temperate, subtropical or tropical mountains; 7 genera with *ca* 71 species Australia; 4 genera with 20 species south-eastern Queensland.

- |  |                        |   |
|--|------------------------|---|
| 1. Corolla actinomorphic; anthers free . . . . .   | 1. <i>Wahlenbergia</i> | 2 |
| Corolla $\pm$ zygomorphic; anthers united . . . . .  |                        |   |
| 2. Corolla limbs almost regular, tubes not slit to base; anthers inserted near top of tube . . . . . | 2. <i>Isotoma</i>      |   |
| Corolla limbs irregular, tubes slit $\pm$ to base; anthers inserted at base of tube . . . . .        |                        | 3 |
| 3. Corollas 2-lipped, 3 lower lobes larger and broader than 2 upper . . . . .                        | 3. <i>Lobelia</i>      |   |
| Corollas not 2-lipped, all 5 lobes equal or subequal . . . . .                                       | 4. <i>Pratia</i>       |   |

### 1. WAHLENBERGIA Schrader ex Roth

Annual or perennial, erect or sprawling, sometimes woody based herbs. Leaves alternate, rarely opposite or whorled. Inflorescences terminal or axillary, usually sparsely flowered, or flowers solitary; calyx usually 5-lobed; corolla actinomorphic, usually 5-lobed, valvate; stamens 5, free; ovary 3–5-locular, rarely 2-locular, style *ca* as long as corolla tube, stigmas as many as ovary loculi. Capsules opening by as many apical valves as ovary loculi.

About 150 species chiefly southern temperate zone; 22 species Australia; 9 species south-eastern Queensland.

Most species are commonly called AUSTRALIAN BLUEBELL or BLUEBELL.

- |   |                          |   |
|---|--------------------------|---|
| 1. Flowers terminal, solitary on peduncles . . . . .                  |                          | 2 |
| Flowers in lax terminal panicles . . . . .                            |                          | 3 |
| 2. Plants glabrous . . . . .  | 1. <i>W.</i> sp. 1.      |   |
| Plants hirsute . . . . .  | 2. <i>W.</i> sp. 2.      |   |
| 3. Corolla lobes more than 4 times as long as tube . . . . .          |                          | 4 |
| Corolla lobes less than 4 times as long as tube . . . . .             |                          | 5 |
| 4. Plants glabrous or minutely hairy . . . . .                        | 3. <i>W. fluminalis</i>  |   |
| Plants with hirsute hairs on upper stems and inflorescences . . . . . | 4. <i>W. multicaulis</i> |   |

- |   |                          |   |
|---|--------------------------|---|
| 5. Corolla lobes 2–4 times as long as tube . . . . .  | 5. <i>W. graniticola</i> | 6 |
| Corolla lobes less than twice as long as tube . . . . .   |                          |   |
| 6. Corolla lobes less than 5 mm long . . . . .  | 6. <i>W. gracilis</i>    | 7 |
| Corolla lobes more than 5 mm long . . . . .   |                          |   |
| 7. Most leaves opposite; calyx lobes at least 5 mm long . . . . .                                   | 7. <i>W. stricta</i>     | 8 |
| Most leaves alternate; calyx lobes up to 4 mm long . . . . .  |                          |   |
| 8. Lower parts of plant hirsute; capsules hemispherical to globose,<br>3–5 mm long                  | 8. <i>W. sp. 3.</i>      |   |
| Lower parts of plant glabrous; capsules obconical to<br>elongated-obconical, 7–10 mm long . . . . . | 9. <i>W. communis</i>    |   |

### 1. *Wahlenbergia* sp. 1.

Decumbent herb, glabrous. Lowest leaves opposite or alternate; petioles up to 4 mm long; blades linear or narrowly elliptic to narrowly obovate, apex acute, base attenuate, margin entire or denticulate, 0.5–2.5 cm × 0.05–0.35 cm. Flowers terminal, solitary; calyx tube hemispherical, 1–2 mm long, lobes oblong, erect, 2–2.5 mm long; corolla blue, tube 4–6 mm long, lobes 6–8 mm long, lobes less than twice as long as tube. Capsules hemispherical, 2.5–4 mm long.

McPherson Ra. in rock crevices in damp areas. Flowers usually summer.

### 2. *Wahlenbergia* sp. 2.

Small tufted herb forming dense mats, stems and leaves hirsute. Lowest leaves alternate or opposite, alternate above; petioles 0.5–2 mm long; blades narrowly elliptic to ovate, apex acute to obtuse, base cuneate, margin denticulate, 3–10 mm × 1–4.5 mm, hirsute. Flowers terminal, solitary; calyx tube hemispherical, *ca* 2 mm long, lobes spreading, *ca* 2 mm long; corolla blue, tube *ca* 4 mm long, lobes *ca* 6 mm long, lobes less than twice as long as tube. Capsules hemispherical, 3–5 mm long. **Fig. 66A.**

Cliff faces, ledges and rock crevices on Mt. Lindesay in the southern Moreton district. Flowers autumn to spring.

### 3. *Wahlenbergia fluminalis* (J. M. Black) E. Wimmer ex H. Eichler

*Cephalostigma fluminale* J. M. Black

Small erect or sprawling glabrous or minutely hairy herb. Lowest leaves alternate, very narrowly obovate, apex acute, base attenuate, 1–4 cm × 0.2–0.5 cm; cauline leaves linear to linear-elliptic, apex acute, 0.5–3.5 cm × 0.05–0.2 cm. Flowers in lax terminal panicles; calyx tube hemispherical, 1.5–2 mm long, lobes 1–2 mm long; corolla blue, tube 0.75–1(–1.5) mm long, lobes 3–6(–8) mm long, lobes more than 4 times as long as tube. Capsules hemispherical, 2.5–4 mm long.

Northern Darling Downs district, usually in clay loam. Flowers spring–summer.

### 4. *Wahlenbergia multicaulis* Benth.

Erect or ascending herb up to 30 cm tall, upper stems ± hirsute. Leaves mainly basal with few cauline, alternate, sessile or sometimes with petioles up to 1.7 cm long; blades narrowly ovate or oblong, elliptic or obovate, apex acute or obtuse, margin entire or denticulate, 0.6–4 cm × 0.15–0.75 cm, often hirsute. Flowers in lax terminal ± hirsute panicles; calyx tube hemispherical to obconical, 1.5–2 mm long, usually hirsute, lobes 2–3 mm long; corolla blue, tube 1–2 mm long, lobes 5.5–9.5 mm long, lobes more than 4 times as long as tube. Capsules hemispherical, 3–6 mm long. **Fig. 66C.**

Granite belt area in Darling Downs district. Flowers spring to autumn.

### 5. *Wahlenbergia graniticola* Carolin

Erect or ascending many-branched herb up to 60 cm tall. Leaves alternate; lowermost sessile or with petioles up to 1.5 cm long, blades narrowly obovate, apex usually acute, base attenuate, margin undulate, 1.5–7 cm × 0.5–1.2 cm; cauline sessile, linear-elliptic to narrowly obovate, apex acute or obtuse, margin undulate to dentate, 1–6 cm ×

0.1–0.4 cm, glabrous or scabrous. Flowers in lax terminal panicles; calyx tube obconical, 2–3.5 mm long, glabrous or puberulent, lobes 3–5 mm long; corolla blue, tube 3–5 mm long, lobes 0.6–1.3 cm long, lobes 2–4 times as long as tube. Capsules obconical to elongated obconical, 5–10 mm long. **Fig. 66B.**

Throughout the region, usually in distributed sites, e.g. cleared areas or roadsides, in a variety of soils. Flowers much of the year, mainly spring.

#### 6. *Wahlenbergia gracilis* (G. Forster) Schrader

Sprawling or erect herb up to 50 cm tall. Lowest leaves alternate, sessile or with petioles 0.5–1.5 cm long, blades elliptic to obovate, apex usually obtuse, base cuneate, margin often undulate, 0.5–3.5 cm × 0.3–1 cm; cauline leaves sessile, linear-elliptic to narrowly elliptic or sometimes narrowly obovate, apex acute, base attenuate, margin undulate or crenate on wider leaves, 1–5.5(–6.5) cm × 0.15–0.7 cm, glabrous or puberulent. Flowers in lax terminal panicles; calyx tube obconical, 1.5–2.5 mm long, lobes 3–5, 2–3 mm long; corolla blue, tube 2–5 mm long, lobes 3–5, 2–5 mm long, lobes *ca* as long as tube. Capsules obconical to elongated obconical, 3–8 mm long. **Fig. 66D.**

Scattered mainly in the southern districts usually in disturbed or cleared areas in a variety of soils. Flowers spring to autumn.

#### 7. *Wahlenbergia stricta* Sweet

Sprawling weak glabrous or pubescent herb. Leaves mostly opposite; blades sessile, oblong-elliptic, elliptic or obovate, apex obtuse or acute, margin undulate, occasionally denticulate or crenate, 0.5–4.5(–6.5) cm × 0.2–1.3 cm, glabrous or pubescent. Flowers in lax terminal panicles; calyx tube hemispherical, 2.5–3.5 mm long, usually pubescent, lobes 0.5–0.9(–1.2) cm long; corolla blue, tube 0.7–1.1 cm long, lobes 0.7–1.5 cm long, lobes less than twice as long as tube. Capsules hemispherical to globose or ellipsoid. **Fig. 66F.**

Scattered in the region in sand or sandy soil on sand dunes or under eucalypt forest. Flowers may be found most of the year.

#### 8. *Wahlenbergia* sp. 3.

Erect or ascending herb, glabrous or puberulent. Leaves alternate; sessile or occasionally lowermost with ill-defined petioles *ca* 5 mm long and obovate blades up to 2 cm × 0.5 cm, otherwise blades linear to linear-elliptic or subulate, very rarely ovate, apex acute, margin entire to dentate, 1–5.5 cm × 0.05–0.4(–0.5) cm, glabrous or puberulent. Flowers in lax terminal panicles; calyx tube hemispherical, 2–3 mm long, lobes 2–4 mm long; corolla blue, tube 5–7 mm long, lobes 6–9 mm long, lobes less than twice as long as tube. Capsules hemispherical to sometimes globose, *ca* 3–5 mm long.

Scattered in the region, often in sandy soils under eucalypt forest. Flowers winter–spring.

#### 9. *Wahlenbergia communis* Carolin

Erect or ascending herb up to *ca* 30 cm tall, glabrous or puberulent. Lowest leaves clustered, elliptic or narrowly obovate, 2.5–8 cm × 0.5–0.8 cm, soon disappearing; cauline leaves alternate, sessile, linear-elliptic to narrowly obovate, apex acute, base attenuate, margin sometimes undulate, 1–9 cm × 0.1–0.4 cm, glabrous or puberulent. Flowers in terminal lax panicles; calyx tube obconical to elongated obconical, 2.5–4 mm long, lobes 2.5–4 mm long; corolla blue to lilac, tube 4–7 mm long, lobes 0.6–1.2 cm long, lobes less than twice as long as tube. Capsules obconical to elongated obconical, 7–10 mm long. **Fig. 66E.**

Scattered throughout the region in grassland or under eucalypt forest or on roadsides etc. in a variety of soils. Flowers much of the year, mainly late winter–spring.

## 2. ISOTOMA (R. Br.) Lindl.

Annual or perennial herbs with milky sap. Leaves alternate, coarsely dentate or pinnatifid. Flowers solitary axillary; calyx 5-lobed; corolla tube entire, long, slender, 5-lobed, only slightly zygomorphic, lobes spreading; stamens 5, inserted on corolla tube above middle, anthers connate; ovary inferior, 2-locular, stigma 2-lobed. Fruits 2-valved capsules.

11 species Australia, central and southern America; 10 species Australia; 3 species south-eastern Queensland.

- |   |   |
|---|---|
| 1. Prostrate herbs rooting at nodes; corolla tubes less than 6 mm long            | 1. <i>I. fluviatilis</i> subsp. <i>borealis</i> |
| Erect or ascending herbs, not rooting at nodes; corolla tubes more than 9 mm long | 2   |
| 2. Corollas deep to pale blue, tube 2–3.5 cm long                                 | 2. <i>I. axillaris</i>                          |
| Corollas white to pink, tube 0.9–1.5 cm long                                      | 3. <i>I. anethifolia</i>                        |

### 1. *Isotoma fluviatilis* (R. Br.) F. Muell. ex Benth. subsp. *borealis* J. McComb

#### SWAMP ISOTOME

Prostrate herb; stems rooting at nodes. Leaves sessile or with petioles up to 1 mm long; blades obovate or elliptic, apex obtuse to subacute, base cuneate, margin  $\pm$  entire to crenate or serrate, 0.4–1.2 cm  $\times$  0.2–0.6 cm, glabrous. Flowers on erect peduncles 0.5–3 cm long, rarely longer; calyx tube obconical, lobes 1–1.5 mm long; corolla pale blue, tube 3–5 mm long, lobes 3–5 mm long, pubescent inside. Capsules obconical to obovoid, *ca* 3–4 mm long.

Granite Belt in moist sand or mud on edge of streams or seepage areas. Flowers late spring–summer. Reported to be poisonous to stock.

### 2. *Isotoma axillaris* Lindl.

#### AUSTRALIAN HAREBELL

*Laurentia axillaris* (Lindl.) E. Wimmer

Erect or ascending perennial herb up to 50 cm tall, stems very shortly puberulent. Leaves pinnatifid, ovate or obovate in outline, 2–10 cm  $\times$  0.5–3 cm, lobes  $\pm$  linear-acute, margin often again dentate, glabrous. Flowers on peduncles 4–10 cm long; calyx tube obconical, lobes 3–8 mm long; corolla deep to pale blue, tube (1.8–)2–3.5 cm long, lobes 1–1.8 mm long. Capsules hemispherical or obconical, 0.7–1.4 cm long.

Damp crevices on rocky cliffs or mountains of most of the region except the Granite Belt. Flowers spring to autumn. Reported to be poisonous to stock.

### 3. *Isotoma anethifolia* Summerh.

*Laurentia anethifolia* (Summerh.) E. Wimmer

Tufted herb up to 40 cm tall, stems shortly puberulent. Leaves pinnatisect, elliptic to obovate in outline, 2–8 cm  $\times$  0.6–4 cm, lobes linear-acute, glabrous. Flowers on peduncles 4–9 cm long; calyx tube obconical, lobes 3–6 mm long; corolla white usually flushed with pink, tube 0.9–1.5 cm long, lobes 1–1.5 cm long. Capsules ellipsoid to obconical, 7–10 mm long. **Fig. 66H.**

Damp crevices or pockets of humus in rocky areas of the Granite Belt. Flowers late spring–summer.

## 3. LOBELIA L.

Annual or perennial herbs, rarely shrubs or trees, often with milky sap. Leaves alternate or rosulate. Flowers axillary or in racemes or panicles; calyx 5-lobed; corolla split  $\pm$  to base, 5-lobed, 3 lower lobes broader and larger than upper 2 which are often recurved, valvate in bud; stamens 5, alternate with lobes, free or adnate to corolla tube, anthers basifixed, introrse, 2-locular; ovary 2-locular, ovules numerous, style 1, stigmas 2 with ring of hairs below them. Capsules apically 2-valved.

200–300 species cosmopolitan, mostly tropical and subtropical; *ca* 20 species Australia; 7 species south-eastern Queensland.

- |  |                            |
|--|----------------------------|
| 1. Flowers in terminal few-several-flowered racemes . . . . .  | 2                          |
| Flowers solitary, axillary . . . . .   | 4                          |
| 2. Prostrate trailing herbs; leaves ovate or broadly ovate with truncate to cordate base . . . . .                                     | 1. <i>L. trigonocaulis</i> |
| Erect or ascending herbs; leaves linear-elliptic to ovate or obovate with cuneate base . . . . .                                       | 3                          |
| 3. Leaves linear to narrowly elliptic; pedicels 0.3–0.8(–1.5) cm long . . . . .  | 2. <i>L. gibbosa</i>       |
| Leaves elliptic, ovate or obovate; pedicels (0.5–)1–7 cm long . . . . .  | 3. <i>L. gracilis</i>      |
| 4. Stems, particularly young ones, winged; capsules 0.8–1.3 cm long . . . . .  | 4. <i>L. alata</i>         |
| Stems never winged; capsules or fruits less than 0.8 cm long . . . . .   | 5                          |
| 5. Leaves linear-elliptic to narrowly elliptic; corolla tubes slit, but apparently not to base; capsules <i>ca</i> 4 mm long . . . . . | 5. <i>L. stenophylla</i>   |
| Leaves usually ovate, sometimes elliptic or obovate; corolla tubes slit to base; capsules or fruits 5–8 mm long . . . . .              | 6                          |
| 6. Leaves thin, green; fruits obconical capsules . . . . .   | 6. <i>L. membranacea</i>   |
| Leaves thick, often purplish beneath; fruits somewhat succulent, obovoid or spherical . . . . .  | 7. <i>L. purpurascens</i>  |

### 1. *Lobelia trigonocaulis* F. Muell.

Prostrate or trailing herb rooting at nodes. Leaves with petioles 0.6–5 cm long; blades ovate to broadly ovate, apex acute or obtuse, mucronate, base truncate to cordate, margin deeply crenate, 1–5 cm × 1–4 cm, puberulent with short coarse hairs particularly on young growth. Flowers in terminal racemes, pedicels 3–7 mm long; calyx tube hemispherical, lobes 2–4 mm long; corolla blue with white throat, 1.2–2 cm long; anthers tipped with bristles. Capsules hemispherical, *ca* 5–6 mm long.

Rainforest margins or moist areas along creek banks in shade, more common in the coastal districts. Flowers mainly late spring to autumn.

### 2. *Lobelia gibbosa* Labill.

Erect few-branched glabrous herb up to 50 cm tall. Leaves linear to linear-elliptic or sometimes lowermost narrowly elliptic, apex acute, base attenuate, margin entire or irregularly dentate, 0.5–5 cm × 0.05–0.6 cm. Flowers in terminal narrow 1-sided racemes, pedicels usually 3–8 mm long, rarely more; calyx tube gibbous, lobes 2–3 mm long; corolla deep blue, 0.8–2.5 cm long; anthers tipped with bristles. Capsules broadly and obliquely obovate, gibbous above, 0.6–1.2 cm long. **Fig. 66J.**

Rocky areas or areas of shallow soil scattered throughout the region. Flowers mainly spring.

### 3. *Lobelia gracilis* Andr.

Erect or ascending ± glabrous herb up to *ca* 40 cm tall. Leaves with petioles 0.3–1.5 cm long; blades elliptic, ovate or obovate, apex acute, base cuneate, margin coarsely dentate to pinnatifid, 1–3.5 cm × 0.4–1.5 cm, ± glabrous. Flowers in terminal racemes, pedicels (0.5–)1–7 cm long; calyx tube hemispherical, lobes 3–5 mm long; corolla deep blue with white throat, 0.8–1.7 cm long; anthers tipped with bristles. Capsules broadly obovate, 6–8 mm long.

Mainly in moist areas or in pockets of humus in rocky areas or cliffs of the Granite Belt and mountains of the southern Moreton district, but also Gurulmundi area in sandy soil. Flowers spring to autumn.

### 4. *Lobelia alata* Labill.

#### *Lobelia anceps* Thunb.

Glabrous procumbent ascending or erect perennial herb; stems winged. Leaves sessile, decurrent on stems, very narrowly obovate to obovate, apex acute or obtuse, base attenuate, margin entire to coarsely dentate, 1.2–8 cm × 0.3–2 cm, glabrous. Flowers solitary axillary on peduncles 3–7(–10) mm long; calyx tube obconical to oblong, lobes broad, 1–1.5 mm long; corolla deep blue to pale mauve, *ca* 7–9 mm long; 2 anthers tipped with bristles. Capsule oblong-obconical, 0.8–1.3 cm long.

Swampy wallum areas or on seepage lines or crevices on rocky headlands in the coastal districts. Flowers spring to autumn.

**5. *Lobelia stenophylla* Benth.**

Decumbent weak or sprawling glabrous herb. Leaves sessile or with ill-defined petioles up to 2.5 mm long; blades linear-elliptic to narrowly elliptic, apex acute, base attenuate, margin entire to denticulate, 1–7 cm × 0.1–0.5 cm, glabrous. Flowers solitary axillary on peduncles 3–11 cm long; calyx tube obconical to rounded, lobes 1.5–3 mm long; corolla blue, 0.8–1.2 cm long, slit between 2 upper lobes but apparently not to base; anthers glabrous. Capsules obconical, *ca* 4 mm long.

Swampy areas, often with poor soil. Flowers spring to autumn.

**6. *Lobelia membranacea* R. Br.**

Prostrate herb; stems often rooting at nodes, glabrous. Leaves with petioles 0.5–5 mm long; blades usually ovate, sometimes elliptic or obovate, apex obtuse to acute, base cuneate, rounded or cordate, margin denticulate, dentate or crenate, 0.5–2 cm × 0.3–1.5 cm, glabrous. Flowers solitary axillary on peduncles (1.6–)3–11 cm long; calyx tube obconical, lobes 1.5–2.5 mm long; corolla blue, *ca* 0.7–1.1 mm long; 2 anthers tipped with bristles. Capsules obconical, 5–7 mm long.

Moist or swampy situations often in sandy soils or coastal wallum areas. Flowers spring to autumn.

**7. *Lobelia purpurascens* R. Br.****WHITE ROOT**

*Pratia purpurascens* (R. Br.) E. Wimmer

Prostrate or sometimes ascending herb with white rhizomes and glabrous usually purplish stems. Leaves with petioles 1–4 mm long; blades ovate, sometimes broadly so, apex acute or obtuse, base cuneate to rounded, sometimes slightly oblique, margin serrate, 0.6–3 cm × 0.35–1.4 cm, glabrous, often purplish beneath. Flowers solitary axillary on peduncles 1.2–6.5 cm long; calyx tube hemispherical, lobes 2–2.5 mm long; corolla white or blue, rarely pinkish, 0.9–1.2 cm long; 2 anthers tipped with bristles. Fruits somewhat succulent, spherical or obovoid, 5–8 mm long. **Fig. 66I.**

Throughout the region in open eucalypt forest, moist shady areas, river flats, or coastal headlands; often a troublesome weed of lawns or cultivation. Flowers spring to autumn. Suspected of poisoning stock.

**4. PRATIA Gaudich.**

Usually herbs. Leaves alternate. Flowers solitary, axillary, often unisexual; calyx 5-lobed; corolla tube slit to base, lobes 5, ± equal but oblique; stamens 5, alternating with lobes; ovary inferior, 2-locular, style 1, stigmas 2 with ring of hairs below them. Fruits ovoid or globose, crowned by persistent calyx lobes, indehiscent, often succulent.

35 species, South America, tropical Africa, tropical Asia, Australia, New Zealand; 13 species Australia; 1 species south-eastern Queensland.

**1. *Pratia concolor* (R. Br.) Druce****POISON PRATIA**

*Lobelia concolor* R. Br.; *Pratia erecta* Gaudich.

Prostrate or weakly ascending herb with milky sap; stems sometimes zigzag, glabrous or very shortly puberulent. Leaves with petioles up to 2 mm long; blades narrowly ovate, ovate or oblong-ovate, sometimes falcate, apex acute, base rounded, oblique to subcordate, margin serrulate to serrate, 1.2–5.8 cm × 0.3–2.2 cm, glabrous. Flowers solitary axillary on peduncles shorter than leaves, usually 5–10 mm long; calyx tube of male flowers shortly obconical, females ± hemispherical, glabrous or puberulent, lobes *ca* 2 mm long; corolla white, *ca* 6–9 mm long, lobes 5, linear-subulate, all ± equal, shorter than tube. Fruits succulent, ellipsoid to spherical, 8–10 mm long. **Fig. 66G.**

Throughout the region, usually in damp soil, sometimes a pest in cultivation. Suspected of poisoning stock.



Fig. 66 CAMPANULACEAE — A–F *Wahlenbergia* spp. — A *W.* sp. 2., stem with flower showing very long corolla lobes x1; B *W. graniticola*, stem and flower showing corolla lobes 2–4 times as long as tube x1; C *W. multicaulis*, stem and flowers showing very long corolla lobes x1; D<sub>1</sub>–D<sub>2</sub> *W. gracilis*, D<sub>1</sub> fertile stems x1, D<sub>2</sub> flower showing short corolla lobes x2; E *W. communis*, part of fertile stem x1; F *W. stricta*, part of stem showing opposite leaves, and flower with long calyx lobes x1; G<sub>1</sub>–G<sub>2</sub> *Pratia concolor*, G<sub>1</sub> part of flowering stem x1, G<sub>2</sub> flower showing subequal corolla lobes x2; H *Isotoma anethifolia*, part of flowering stem x1; I<sub>1</sub>–I<sub>2</sub> *L. purpurascens*, I<sub>1</sub> part of flowering stem x1, I<sub>2</sub> flower showing unequal corolla lobes x2; J *L. gibbosa*, inflorescence x1.

## 152. GOODENIACEAE

Herbs or undershrubs, rarely spinescent. Leaves alternate, rarely opposite, sometimes all radical, exstipulate. Flowers solitary to paniculate, bisexual, zygomorphic; calyx tubular, adnate to ovary, rarely free, lobes usually 5; corolla 5-lobed, 2- or rarely 1-lipped, lobes valvate, often induplicate; stamens 5, alternate with corolla lobes, free or rarely shortly adnate to corolla tube, anthers free or connivent around style, 2-locular, opening longitudinally; ovary mostly inferior, 1-2-, rarely 4-locular, ovules 1 or more per loculus, style simple or divided, stigma surrounded by cup shaped often ciliate indusium. Fruits drupaceous, nut-like or capsular; seeds small, flat with straight embryo in middle of copious endosperm.

16 genera with 308 species, mainly Australia but reaching south-eastern Asia; 16 genera with 308 species Australia; 5 genera with 31 species south-eastern Queensland.

Most species are commonly called FAN FLOWER.

- |   |                       |
|---|-----------------------|
| 1. Flowers yellow . . . . .   | 2                     |
| Flowers blue, purple, pinkish or white . . . . .  | 3                     |
| 2. Sepals free; ovaries superior . . . . .  | 1. <i>Velleia</i>     |
| Calyx tubes fused to ovary, lobes free; ovaries wholly or partly inferior . . . . .   | 2. <i>Goodenia</i>    |
| 3. Corolla tubes slit to base; fruits indehiscent, often succulent . . . . .  | 3. <i>Scaevola</i>    |
| Corollas with definite tubes though sometimes very short; fruits capsules or indehiscent . . . . .                              | 4                     |
| 4. Anthers connate into tube around style; 2 upper corolla lobes each with thick concave auricle enclosing style apex . . . . . | 4. <i>Dampiera</i>    |
| Anthers not connate; 2 upper corolla lobes without thick concave auricle enclosing style apex . . . . .                         | 5                     |
| 5. Corollas with barbed hairs inside at throat . . . . .  | 5. <i>Cooperookia</i> |
| Corollas usually glabrous inside, rarely pubescent and then hairs not barbed . . . . .  | 2. <i>Goodenia</i>    |

## 1. VELLEIA Smith

Annual or perennial herbs with taproot. Leaves usually in basal rosette, simple. Flowers arranged in a series of dichotomous axillary cymes, each cyme borne on a usually elongated erect ascending or prostrate peduncle, bracteoles 2, opposite; sepals 5 or 3, free from ovary or posterior one adnate for some distance at midrib, free from each other or  $\pm$  connate; corolla basally tubular with anterior spur, lobes 5, laterally winged, wings induplicate in bud,  $\pm$  epigynous, 2 upper lobes usually more deeply cut than rest, auriculate; stamens 5, free but  $\pm$  epigynous; ovary incompletely 2-locular, ovules 4-*ca* 20 in 2 rows on either side of incomplete dissepiment, style simple, indusium suborbicular to oblong, usually ciliate, stigma notched or undivided. Fruits 4- or 2-valved capsules; seeds compressed, winged or with thickened rim.

20 species endemic in Australia; 3 species south-eastern Queensland.

- |   |                         |
|---|-------------------------|
| 1. Bracteoles connate on one side . . . . . | 1. <i>V. sp. 1.</i>     |
| Bracteoles free . . . . .                   | 2                       |
| 2. Sepals 5 . . . . .                       | 2. <i>V. paradoxa</i>   |
| Sepals 3 . . . . .                          | 3. <i>V. spathulata</i> |

1. *Velleia* sp. 1.

Rosulate herb. Leaves with ill-defined petioles up to 1 cm long; blades obovate in outline, pinnatisect, largest lobes at apex, apex acute, 2-7 cm  $\times$  0.3-1 cm, glabrous. Inflorescences up to 30 cm long, much-branched, peduncles glabrous or sparsely pubescent below flowers, bracteoles connate along one side, lower ones ovate, acute,

margin coarsely dentate at base, up to 2.5 cm × 1 cm, glabrous, upper ± entire; sepals 3, free, cordate, entire or toothed basally, up to 1.2 cm × 0.7 cm, glabrous outside, pubescent inside; corolla yellow, 1–1.5 cm long, pubescent outside, glabrous inside. Capsules ± ellipsoid, *ca* 5 mm × 4 mm, valves 4, puberulent. **Fig. 67B.**

Recorded from Gurulmundi area of northern Darling Downs district on weathered sandstone soils. Flowers spring.

### 2. *Velleia paradoxa* R. Br.

Perennial rosulate herb. Leaves with ill-defined petioles up to 5 cm long; blades narrowly obovate, rarely obovate, apex obtuse, base long attenuate, margin ± dentate to crenate, ciliate, 2.5–15 cm × 1–4 cm, ± pubescent to glabrescent with age. Peduncles usually erect or ascending, 10–40 cm long, pubescent with simple spreading hairs, bracteoles free, lower ones often deeply dentate, up to 3 cm × 0.6 cm, upper entire, ± pubescent; sepals 5, free, up to 9 mm × 3.5 mm, pubescent; corolla yellow with reddish purple base, 1.4–2 cm long, pubescent outside, glabrous inside. Capsules ovoid, up to *ca* 9 mm × 5 mm, valves 4, puberulent. **Fig. 67A.**

Throughout the region often in open eucalypt forest. Flowers spring to autumn.

### 3. *Velleia spathulata* R. Br.

Perennial rosulate herb. Leaves with ill-defined petioles up to 3 cm long; blades narrowly obovate to obovate, apex obtuse, base long attenuate, margin irregularly denticulate, 2.5–12 cm × 0.5–3 cm, ± glabrous. Peduncles prostrate to weakly ascending, 5–25 cm long, pubescent with appressed villous hairs, bracteoles free, lower ones narrowly ovate or elliptic, entire, up to 1.2 cm long, ± glabrous; sepals 3, free, ovate to oblong, up to 7 mm × 3 mm, glabrous outside, pubescent inside; corolla yellow, often with brownish purple base, 1–1.5 cm long, pubescent outside, glabrous inside. Capsules ovoid, up to 5 mm long, valves 4, glabrous.

Coastal districts of the region, often in sandy soils. Flowers late winter to autumn.

## 2. GOODENIA Smith

Herbs or shrubs. Leaves alternate or radical, entire, dentate or rarely pinnatifid. Flowers in terminal racemes or panicles, or flowers axillary, solitary, cymose or clustered on a peduncle, with or without bracteoles; calyx tube adnate to and usually slightly shorter than ovary, lobes 5; corolla tube short, sometimes spurred, lobes 5, 2 upper separated lower down, arching over style, or rarely all nearly equal, all winged; stamens free; ovary ± inferior, ± 2-locular, dissepiment from almost rudimentary to nearly reaching top of cavity, ovules ascending, usually several in 2 rows, sometimes crowded, rarely solitary per loculus, style undivided, indusium cup shaped enclosing truncate or 2-lobed stigma. Fruits capsules, opening in 2 valves parallel to dissepiment or rarely splitting into 4 valves; seeds usually flat with callous or winged margin.

110 species Indochina, Malaysia, Australia; 110 species Australia; 18 species south-eastern Queensland.

- |   |                          |
|---|--------------------------|
| 1. Bracteoles absent . . . . .                                  | 2                        |
| Bracteoles present though sometimes obscured by hairs . . . . . | 7                        |
| 2. Corollas spurred, spurs sometimes small . . . . .            | 1. <i>G. cycloptera</i>  |
| Corollas not spurred . . . . .                                  | 3                        |
| 3. Corollas pubescent inside . . . . .                          | 4                        |
| Corollas not pubescent inside . . . . .                         | 5                        |
| 4. Corollas 0.8–1.2 cm long; fruits 0.5–0.65 cm long . . . . .  | 2. <i>G. sp. 1.</i>      |
| Corollas 2–3 cm long; fruits 1–1.5 cm long . . . . .            | 3. <i>G. grandiflora</i> |
| 5. Corollas glabrous outside . . . . .                          | 4. <i>G. pinnatifida</i> |
| Corollas pubescent outside . . . . .                            | 6                        |

6. Corollas <i>ca</i> 1 cm long . . . . .	5. <i>G. heteromera</i>	
Corollas 1.5–2 cm long . . . . .	6. <i>G. fascicularis</i>	
7. Corollas glabrous outside . . . . .		8
Corollas pubescent outside . . . . .		9
8. Prostrate herbs with stems radiating from central rosette; leaves obovate	7. <i>G. glabra</i>	
Sprawling shrub up to 1.5 m tall; leaves ovate . . . . .	8. <i>G. ovata</i>	
9. Corollas with stellate hairs outside, usually with 1 branch longer than the others	9. <i>G. stelligera</i>	
Corollas with various indumentums but not stellate . . . . .		10
10. Corollas with simple and gland tipped hairs . . . . .		11
Corollas with simple hairs only . . . . .		13
11. Indusiums folded so that 2 halves of lower lip lie against each other	10. <i>G. gracilis</i>	
Indusiums sometimes convex but not folded as above . . . . .		12
12. Corollas 0.6–0.9 cm long; bracteoles 1–1.5 mm long; fruits 3–4 mm long	11. <i>G. sp. 2.</i>	
Corollas 1–1.5 cm long; bracteoles 2–4 mm long; fruits 4–5 mm long . . . . .	12. <i>G. paniculata</i>	
13. Flowers in narrow panicles on scapes 25–50 cm long . . . . .	13. <i>G. bellidifolia</i>	
Flowers on peduncles less than 10 cm long arising from leaf axils on stems . . . . .		14
14. Leaves linear or narrow; bases attenuate or narrowly attenuate . . . . .		15
Leaves ovate, orbicular or broadly obovate, bases cuneate, rounded or cordate . . . . .		16
15. Generally small erect herbs; corollas 0.7–1.3 cm long; fruits 4–6 mm long	14. <i>G. disperma</i>	
Generally sprawling herbs; corollas 1.2–1.8 cm long; fruits 6–8 mm long . . . . .	15. <i>G. sp. 3.</i>	
16. Indumentum of appressed strigose hairs, sometimes only a few on leaf margins and corolla	6. <i>G. fascicularis</i>	
Indumentum not of appressed strigose hairs . . . . .		17
17. Leaves glabrous or with short matted indumentum, sometimes glaucous; fruits 8–10 mm long	16. <i>G. hederacea</i>	
Leaves puberulent to densely pubescent with spreading villous hairs; fruits 4–8 mm long . . . . .		18
18. Corollas 0.8–1.2 cm long; bracteoles 2–3 mm long; styles sparsely pubescent	17. <i>G. heterophylla</i>	
Corollas 1.2–1.8 cm long; bracteoles 4–10 mm long; styles glabrous . . . . .	18. <i>G. rotundifolia</i>	

### 1. *Goodenia cycloptera* R. Br.

Procumbent or ascending herb. Leaves rosulate, and alternate along stems; petioles 0.4–4 cm long; blades narrowly elliptic to obovate or broadly obovate, apex acute, base attenuate, margin entire, denticulate or pinnatifid, 1.5–7.5 cm × 0.4–2.8 cm, softly pubescent or puberulent with spreading simple hairs. Flowers solitary on pubescent peduncles 2–5 cm long, bracteoles absent; calyx present, lobes 3–4 mm long; corolla yellow, 1.5–2 cm long, pubescent outside, spur usually 1–1.5 mm long; style glabrous, indusium with few hairs on back. Fruits ellipsoid to spherical, *ca* 7–8 mm long. **Fig. 67C.**

Darling Downs district in sandy or red soils. Flowers autumn to spring.

### 2. *Goodenia* sp. 1.

Softly pubescent herb. Leaves ± sessile; blades obovate to elliptic or oblong-elliptic, apex acute, base cuneate to attenuate, margin serrate at least in upper half, 1.2–3.2 cm × 0.4–1.2 cm, softly pubescent. Flowers solitary axillary on peduncles 0.4–1.2 cm long,

often bent just below flower, or into sigmoid curve, bracteoles absent; calyx softly pubescent, lobes 1.5–2.5 mm long; corolla yellow, glandular, 0.8–1.1 cm long, pubescent outside, puberulent inside with straight stiff hairs, not spurred; style glabrous, base of indusium with few hairs. Fruits ellipsoid to spherical, somewhat compressed, 5–6.5 mm long.

Recorded from near Broadwater Lagoon south-west of Dalby in the Darling Downs district. Flowers summer.

### 3. *Goodenia grandiflora* Sims

Herb or shrub up to 1 m tall, pubescent, often viscid. Leaves alternate; petioles 0.5–6 cm long; blades ovate, apex acute, base truncate to cordate, margin serrate or crenate, 1–10 cm × 0.7–7 cm, sometimes appearing pinnatisect with few small lobes scattered below main terminal lobe on petiole, pubescent with simple spreading and glandular hairs. Flowers solitary axillary on usually glandular pubescent peduncles 1–2(–4) cm long, bracteoles absent; calyx with glandular and/or simple hairs, lobes *ca* 5 mm long; corolla yellow, 2–3 cm long, villous pubescent inside, scattered short hairs outside, not spurred; style and back of indusium pubescent. Fruits ellipsoid to obovoid, 1–1.5 cm long.

Rocky hillsides or cliffs of the region. Flowers may be found much of the year, mainly in late winter–spring, and autumn.

### 4. *Goodenia pinnatifida* Schlechtendal

Rosulate ± pubescent herb. Leaves with petioles 0.5–5(–10) cm long, pinnatifid to pinnatisect in rosulate leaves, ± entire in few cauline leaves or bracts, obovate in outline, apex obtuse, base attenuate, 1.5–5.5 cm × 1–2.5 cm, glabrous or puberulent. Flowers solitary axillary on peduncles 4–14 cm long, bracteoles absent; calyx usually glabrous, lobes 3–5 mm long; corolla yellow, 1.3–2.3 cm long, ± glabrous, not spurred; style glabrous or puberulent, back of indusium puberulent to pubescent. Fruits obovoid to spherical, *ca* 5 mm long.

Darling Downs district. Flowers spring to autumn.

### 5. *Goodenia heteromera* F. Muell.

Rosulate or stoloniferous herb. Leaves in basal rosette or clustered at nodes, often rooting at that point; petioles 0.3–3.5 cm long; blades narrowly obovate to obovate, apex obtuse to acute, base long attenuate, margin entire or pinnatifid in rosulate leaves, 1.2–3.5 cm × 0.3–1.1 cm, sometimes larger, glabrous or sparsely appressed pubescent, tuft of hairs at base of petiole. Flowers solitary on peduncles 1–3.5 cm long, bracteoles absent; calyx appressed pubescent, lobes 2–3 mm long; corolla yellow, *ca* 1 cm long, pubescent outside, not spurred; style glabrous, back of indusium pubescent. Fruits obovoid, 6–8 mm long.

Darling Downs district. Flowers spring to autumn.

### 6. *Goodenia fascicularis* F. Muell. & Tate

*Goodenia subintegra* F. Muell. ex Tate

Tufted herb with deep root system, sometimes rhizomatous, indumentum of appressed strigose hairs, sometimes sparse. Leaves rosulate and alternate on stems; petioles ill-defined, up to 10 cm long; blades linear-elliptic to very narrowly obovate, apex acute, base long attenuate, margin entire or sometimes pinnatifid, 2–15 cm × 0.15–1 cm, usually puberulent, rarely only few strigose hairs near margin. Flowers solitary axillary on pubescent peduncles 2.5–7 cm long, sometimes tuft of woolly hairs in axils, bracteoles usually absent, but when present 3–6 mm long; calyx puberulent, lobes 2–3 mm long; corolla yellow, 1.5–2 cm long, appressed strigose pubescent on back, not spurred; style glabrous, back of indusium with scattered hairs. Fruits globose to ellipsoid, 5–9 mm long. **Fig. 67D.**

Western Moreton and Darling Downs districts in heavy or clay soils, sometimes a weed of cultivation. Flowers spring to autumn.

**7. *Goodenia glabra* R. Br.**

Prostrate herb, several stems radiating from central rosette. Leaves rosulate or alternate; those of rosette with petioles 0.6–5 cm long, blades narrowly elliptic to obovate, apex obtuse or acute, base attenuate, margin denticulate, coarsely dentate to pinnatifid, 2–6 cm × 0.6–1.5(–2) cm, glabrous or sparsely puberulent; cauline ones with petioles up to 3 mm long, blades obovate, apex acute or obtuse, mucronate, base obliquely lobed on one side, margin denticulate to coarsely dentate, 1–3 cm × 0.5–2 cm, ± glabrous. Flowers solitary axillary on ± glabrous peduncles 2–5 cm long, bracteoles 2–6 mm long, close to axil; calyx puberulent, lobes 3–5 mm long; corolla yellow, 1.5–2 cm long, glabrous outside, not spurred; style and indusium ± glabrous. Fruits obovoid, 0.8–1.2 cm long. **Fig. 67E.**

Darling Downs and Burnett districts and westernmost part of the Moreton district on sandy or clay soils. Flowers spring to autumn.

**8. *Goodenia ovata* Smith**

Sprawling shrub up to 1.5 m tall, glabrous except for occasional hair tufts in leaf axils, often viscid. Leaves alternate; petioles 0.4–1.2 cm long; blades narrowly ovate to ovate, apex acute, base cuneate to rounded, margin serrate to serrulate, 3.5–8 cm × 0.6–4 cm. Flowers in 1–few-flowered axillary clusters on peduncles 1–1.5 cm long, bracteoles 1.5–2 mm long; calyx lobes 3–4 mm long; corolla yellow, 1.5–1.8 cm long, glabrous outside, not spurred; style and back of indusium with long simple hairs. Fruits cylindrical to narrowly obovoid, *ca* 1–1.2 cm long.

Moreton and Wide Bay districts in open forest, often in mountain areas, e.g. Mt. Ernest, D'Aguilar Ra.; not often collected. Flowers spring and autumn.

**9. *Goodenia stelligera* R. Br.**

Robust rosulate herb, occasionally few leaves or leafy bracts on flower scape. Leaves linear or linear-obovate, apex ± acute, base long attenuate, margin entire or remotely denticulate, 6–37 cm × 0.3–1 cm, glabrous. Flowers in very narrow panicles or racemes on scapes up to 1 m long, bracteoles 2–5 mm long; calyx pubescent, lobes 4–6 mm long; corolla yellow, 1–1.6 cm long, pubescent outside with stellate hairs with one branch usually longer than remainder, not spurred; style and base of indusium puberulent to pubescent. Fruits obovoid, 6–8 mm long. **Fig. 67G.**

Coastal districts in swampy wallum flats or wallum heath. Flowers winter–spring and autumn.

**10. *Goodenia gracilis* R. Br.**

Rosulate herb, sometimes few leaves on flowering stem. Leaves linear, linear-obovate to narrowly obovate, apex acute, base long attenuate, margin entire to remotely denticulate, 2–20 cm × 0.1–0.6 cm, glabrous or with tuft of hairs in axils. Flowers in panicles 10–50 cm long, bracteoles slender, *ca* 1.5–2 mm long; calyx glabrous or with scattered glandular hairs, lobes 1–2 mm long; corolla yellow, *ca* 1 cm long, glandular pubescent outside, sometimes also simple hairs, not spurred; style and usually back of indusium pubescent, indusium folded so that two lobes of lower lip lie against each other. Fruits ellipsoid to hemispherical, 3–5 mm long. **Fig. 67F.**

Scattered throughout the region in melonholes or swampy areas in heavy soils. Flowers spring to autumn.

**11. *Goodenia* sp. 2.**

Slender erect herb. Leaves rosulate, or sometimes few alternate on stem; petioles absent or ill-defined, up to 9 cm long; blades linear to linear-obovate, apex acute, base long attenuate, margin entire to remotely denticulate, 1–8 cm × 0.1–0.6 cm, glabrous or sometimes with hair tuft in axil. Flowers in panicles 15–30(–45) cm long, bracteoles *ca* 1–1.5 mm long; calyx glandular pubescent, sometimes simple hairs also, lobes 1.5–2 mm long; corolla yellow, 6–9 mm long, pubescent outside with simple and glandular hairs, not spurred; style and back of indusium sparsely pubescent. Fruits ellipsoid to obovoid, *ca* 3–4 mm long.

Granite Belt in the Darling Downs district, usually in moist or seepage areas. Flowers summer.

**12. *Goodenia paniculata* Smith**

Rosulate herb, occasionally with few leaves on stem, glabrous or pubescent. Leaves with ill-defined petioles up to 10 cm long; blades linear-obovate to obovate, apex acute or obtuse, mucronate, base usually attenuate, margin entire or denticulate to coarsely serrate, 2–13 cm × 0.5–2(–4) cm, usually glabrous but sometimes pubescent. Flowers in terminal panicles 10–45 cm long, bracteoles 2–4 mm long; calyx pubescent with simple and glandular hairs, lobes 1.5–2 mm long; corolla yellow, *ca* 1–1.5 cm long, pubescent outside, not spurred; style and base of indusium sparsely pubescent. Fruits hemispherical to ellipsoid, 4–5 mm long.

Throughout the region, often in damp or seepage areas. Flowers spring to autumn.

**13. *Goodenia bellidifolia* Smith**

Rosulate herb. Leaves with ill-defined petioles up to 5 cm long; blades narrowly obovate to obovate, apex obtuse, base attenuate, margin entire, remotely denticulate or pinnatifid, 3–7.5 cm × 0.4–2.5 cm, glabrous. Flowers in very narrow panicles on puberulent scapes 25–50 cm long, bracts leaf-like, up to 3 cm long, bracteoles *ca* 1.5–2 mm long; calyx pubescent, lobes *ca* 2 mm long; corolla yellow, 0.8–1.5 cm long, pubescent outside; style glabrous, back of indusium sparsely pubescent. Fruits ovoid, *ca* 3.5 mm long.

Mainly in sandy or sandstone derived soils in coastal wallum or heath areas, or as an understorey component in eucalypt forest. Flowers spring to autumn.

**14. *Goodenia disperma* F. Muell.**

Erect herb *ca* 30–40 cm tall, young stems appressed woolly pubescent. Leaves alternate, linear to linear-obovate, apex acute, apiculate, base long attenuate, margin entire or remotely denticulate, 2–6 cm × 0.1–0.3 cm, glabrous or woolly puberulent. Flowers solitary axillary on pubescent peduncles (1–)3–6 mm long, bracteoles 1–3.5 mm long, but sometimes obscured by hairs; calyx pubescent to puberulent, lobes 1.5–5 mm long; corolla white to cream or pale yellow, 0.7–1.3 cm long, puberulent outside, not spurred; style and indusium ± pubescent. Fruits obovoid, 4–6 mm long.

Darling Downs district. Flowers spring to autumn.

**15. *Goodenia* sp. 3.**

*Goodenia boormanii* auct. non Krause

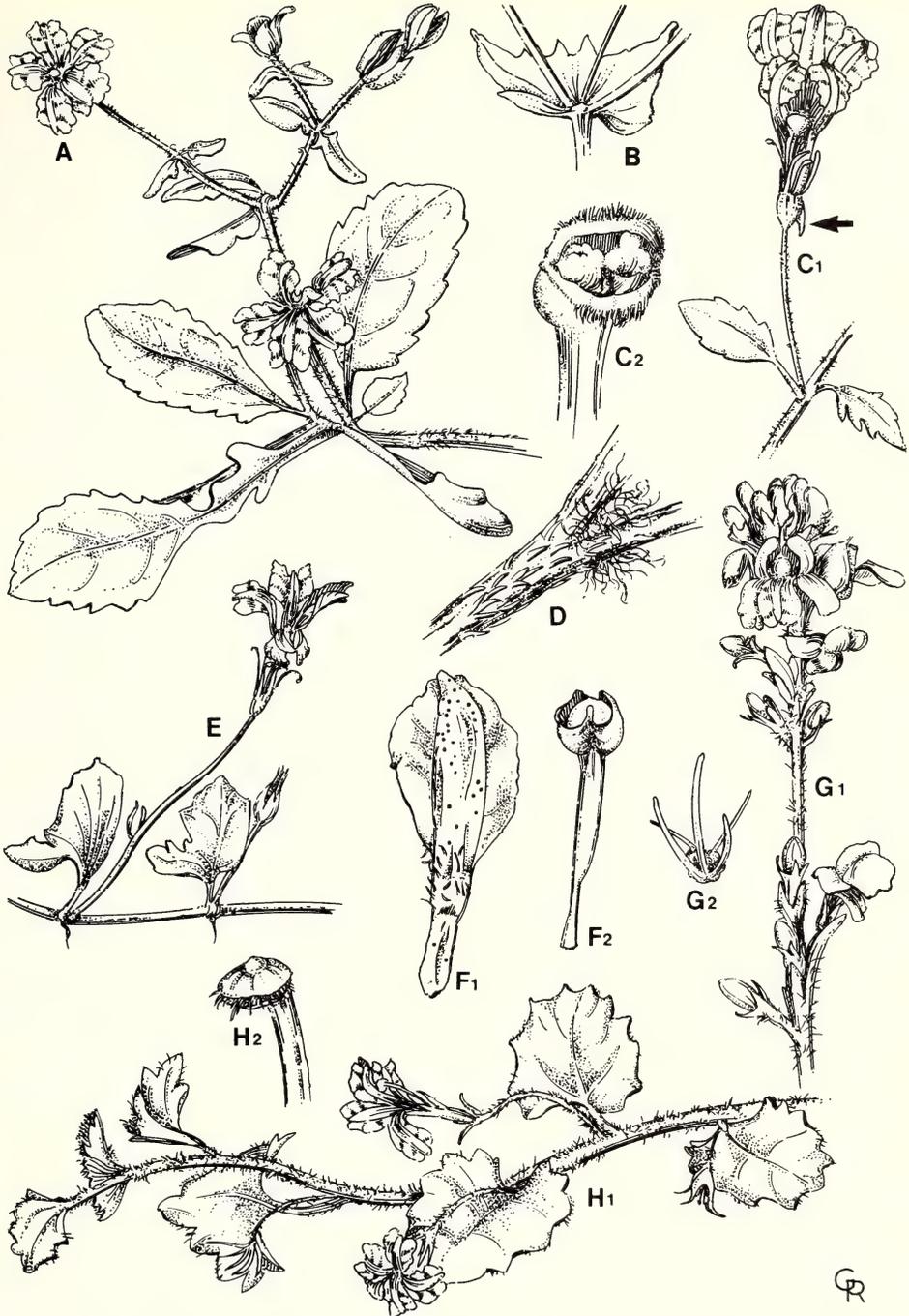
Sprawling herb. Leaves rosulate and alternate along stems; petioles 0.5–4 cm long; blades linear-obovate to obovate or sometimes narrowly elliptic-oblong, apex acute or obtuse, base attenuate, margin entire, denticulate or sometimes pinnatifid, 1.5–5.5 cm × 0.2–2 cm, glabrous above, usually sparsely pubescent below. Flowers solitary axillary on glabrous or puberulent peduncles 1.5–3 cm long, bracteoles 2–3.5 cm long; calyx puberulent, lobes 2–3 mm long; corolla yellow, *ca* 1.2–1.8 cm long, pubescent outside, not spurred; style and indusium puberulent. Fruits obovoid, *ca* 6–8 mm long.

Drier parts of the region, often in sandy soil as an understorey component in eucalypt forest, sometimes in areas of poor drainage. Flowers much of the year, mainly spring and autumn.

**16. *Goodenia hederacea* Smith**

Rosulate or stoloniferous herb. Leaves radical or alternate; petioles 0.2–6.5 cm long; blades ovate, elliptic, obovate or orbicular, apex obtuse or acute, base cuneate to rounded, margin entire, denticulate to coarsely deeply serrate, 1.2–8 cm × 0.3–4 cm, short woolly pubescent below, sometimes also above, or glabrous, green or sometimes glaucous. Flowers 1–few together on axillary peduncles 2–10 cm long, bracteoles slender, *ca* 2–4 mm long; calyx pubescent, lobes 2–5 mm long; corolla yellow, 1.2–1.8 cm long, ± pubescent outside, not spurred; style glabrous or with scattered hairs at apex and back of indusium. Fruits obovoid, *ca* 8–10 mm long.

Usually rocky or stony areas of the region, e.g. Granite Belt, Springbrook, Ipswich area. Flowers spring to autumn.



**Fig. 67** GOODENIACEAE — A–B *Velleia* spp. — A *V. paradoxa*, part of plant showing free bracts and free sepals x1; B *V.* sp. 1., section of stem showing bracts connate on one side x1; C–H *Goodenia* spp. — C<sub>1</sub>–C<sub>2</sub> *G. cycloptera*, C<sub>1</sub> flower showing peduncle without bracts and corolla with spur x1, C<sub>2</sub> apex of style showing cup-shaped indusium enclosing stigma x6; D *G. fascicularis*, section of stem showing 2 types of hairs x6; E *G. glabra*, flowering stem showing bracts on peduncle, corolla without spur x1; F<sub>1</sub>–F<sub>2</sub> *G. gracilis*, F<sub>1</sub> corolla lobe showing simple and glandular hairs on back x6, F<sub>2</sub> style showing folded indusium x6; G<sub>1</sub>–G<sub>2</sub> *G. stelligera*, G<sub>1</sub> part of inflorescence x1, G<sub>2</sub> stellate hair x50; H<sub>1</sub>–H<sub>2</sub> *G. rotundifolia*, H<sub>1</sub> part of flowering stem x1, H<sub>2</sub> apex of style with reflexed indusium x6.

**17. *Goodenia heterophylla* Smith**

Decumbent or ascending pubescent herb; stems often flexuose, up to 1 m long. Leaves alternate; petioles 1–6 mm long; blades ovate to broadly ovate, sometimes deeply 3-lobed near base, apex acute, base truncate or subcordate, margin coarsely dentate or crenate, 0.8–4.5 cm × 0.4–2 cm, pubescent or puberulent with spreading simple hairs. Flowers solitary axillary on pubescent peduncles 1–4 cm long, bracteoles slender, 2–3 mm long; calyx pubescent, lobes 3–4 mm long; corolla yellow, 0.8–1.2 cm long, pubescent outside, not spurred; style sparsely pubescent. Fruits obovoid, *ca* 4–5 mm long.

Rocky or mountainous areas of the coastal districts, e.g. Glasshouse Mts., Pearson's Falls area near Helidon. Flowers spring.

**18. *Goodenia rotundifolia* R. Br.**

Prostrate or sprawling to erect perennial pubescent herb. Leaves alternate; petioles 0.2–2.5 cm long; blades broadly ovate, apex obtuse or acute, base cuneate to cordate, margin coarsely crenate or serrate, 0.8–4.5 cm × 0.8–4.5 cm, puberulent to villous pubescent. Flowers usually solitary axillary, sometimes few together, on pubescent peduncles 0.5–2.5(–4) cm long, bracteoles 4–10 mm long; calyx pubescent, lobes 4–6 mm long; corolla yellow, 1.2–1.8 cm long, pubescent outside, not spurred; style and indusium glabrous. Fruits spherical to obovoid, 4–8 mm long. **Fig. 67H.**

Coastal districts and eastern parts of Burnett and Darling Downs districts, usually in open forest. Flowers may be found much of the year, but mainly in spring and autumn.

**3. SCAEVOLA L.**

Herbs or shrubs. Leaves alternate except one species. Flowers solitary axillary or in few-flowered cymes, bracteolate; calyx tube adnate to ovary, lobes 5, or cup shaped; corolla tube slit to base, lobes 5, ± equal or upper ones shorter; stamens 5, free; ovary ± inferior, 2-locular, 1 ovule per loculus, or rarely 1-locular with 1 or 2 ovules, style simple, indusium cup shaped, stigma simple or 2-lobed. Fruits indehiscent, with often succulent exocarp and woody or bony endocarp; seeds 1 per loculus.

80–100 species tropical and subtropical, especially Australia, Polynesia; 70 species Australia; 5 species south-eastern Queensland.

- |   |                           |
|---|---------------------------|
| 1. Flowers sessile . . . . .  | 2                         |
| Flowers pedunculate . . . . .   | 4                         |
| 2. Leaves succulent; anthers apically ciliate; fruits succulent . . . . .   | 1. <i>S. calendulacea</i> |
| Leaves not succulent; anthers glabrous; fruits not or slightly succulent . . . . .  | 3                         |
| 3. Top of style at back of indusium with dense tuft of white or purple hairs at least as long as indusium; ovaries and fruits 2-locular . . . . . | 2. <i>S. aemula</i>       |
| Top of style or indusium with purplish hairs up to half as long as indusium; ovaries 1-locular . . . . .  | 3. <i>S. albida</i>       |
| 4. Branchlets usually with spinescent tips; corollas <i>ca</i> 1–1.5 cm long . . . . .  | 4. <i>S. spinescens</i>   |
| Branchlets never with spinescent tips; corollas <i>ca</i> 2.5–3.5 cm long . . . . .   | 5. <i>S. ramosissima</i>  |

**1. *Scaevola calendulacea* (Andr.) Druce**

*Goodenia calendulacea* Andr.; *Scaevola suaveolens* R. Br.

Sprawling or decumbent multi-stemmed herb, often forming dense mats, puberulent. Leaves succulent; petioles ill-defined, up to 2.5 cm long; blades narrowly to broadly obovate, apex obtuse to acute, base attenuate, margin entire or dentate towards apex, 1.2–5 cm × 0.5–3 cm, puberulent. Flowers scented, solitary axillary sessile, bracteoles 6–8 mm long; calyx minutely lobed; corolla blue with yellow throat, 1–1.7 cm long; anthers apically ciliate; indusium only sparsely pubescent. Fruits deep bluish purple, succulent, 1–1.5 cm long. **Fig. 68B.**

Sand dunes along the coast. Flowers much of the year.

**2. *Scaevola aemula* R. Br.**

Ascending perennial herb, coarsely pubescent to puberulent. Leaves with ill-defined petioles up to 1 cm long; blades oblong to obovate or narrowly obovate, apex acute or obtuse, base attenuate, margin usually deeply dentate particularly on lower leaves, 1.5–4.5 cm × 0.7–3 cm, puberulent to pubescent. Flowers solitary axillary sessile, bracteoles slender, 6–8 mm long; calyx lobes minute; corolla white, pale blue or lavender, 1.5–2.5 cm long; anthers glabrous; style glabrous or puberulent but with dense tuft of often purplish hairs at back of indusium at least as long as indusium. Fruits ellipsoid to cylindrical, *ca* 4 mm long, 2-locular.

Mainly Darling Downs and Burnett districts in drier or sandy areas, sometimes a weed of cultivation. Flowers spring to autumn. Cultivated as an ornamental.

**3. *Scaevola albida* (Smith) Druce**

*Goodenia albida* Smith; *Scaevola microcarpa* Cav.

Small diffuse or ascending herb up to *ca* 50 cm tall, ± softly appressed pubescent. Leaves with petioles 0.2–2 cm long; blades narrowly to broadly obovate, apex obtuse, base attenuate, margin coarsely dentate, 0.7–3.5 cm × 0.7–3 cm, pubescent. Flowers solitary axillary sessile, bracteoles slender, 6–8 mm long; calyx lobes minute; corolla lavender to blue, 1.5–2.3 cm long; anthers glabrous; style pubescent, indusium usually with purple hairs on back but not more than half as long as indusium.

Throughout the eastern parts of the region and in moister areas of the western districts, usually in open forest. Flowers spring to autumn.

**4. *Scaevola spinescens* R. Br.****PRICKLY FANFLOWER**

Compact or intricately branched shrub up to 2 m tall, branchlets often with spinescent tips. Leaves usually clustered on short branchlets or at nodes; petioles up to 4 mm long; blades very narrowly obovate, apex obtuse or subacute, base attenuate, 0.6–3 cm × 0.1–0.5 cm, glabrous. Flowers solitary axillary on curved peduncles 0.4–1.5 cm long, bracteoles *ca* 2 mm long; calyx truncate; corolla white inside, greenish outside, *ca* 1–1.5 cm long; indusium softly villous puberulent. Fruits ellipsoid, *ca* 5 mm long. **Fig. 68A.**

Darling Downs district, usually in open forest. Flowers late winter to autumn.

**5. *Scaevola ramosissima* (Smith) Krause**

*Goodenia ramosissima* Smith; *Scaevola hispida* Cav.

Decumbent herb or sprawling subshrub, hispid. Leaves few, scattered, sessile; lower ones narrowly obovate, sometimes narrowly ovate or falcate, apex acute, margin often coarsely dentate, 2.5–7.5 cm × 0.7–2 cm; upper ones ± linear, up to 7.5 cm long. Flowers solitary axillary or sometimes few together on peduncles up to 10 cm long, bracteoles linear, 1–2 cm long; calyx lobes 5, linear, 5–10 mm long; corolla blue, 2.5–3.5 cm long; anthers with pubescent tips; indusium puberulent. Fruits ellipsoid, *ca* 7 mm long, crowned by persistent calyx lobes.

Sandstone or rocky outcrops or soils derived from these, in the Moreton and Wide Bay districts. Flowers spring–summer.

**4. DAMPIERA R. Br.**

Perennial herbs or shrubs, indumentum usually stellate or branched, cottony or woolly. Flowers solitary or in irregular clusters or cymes, or ± sessile forming terminal spikes; calyx tube adnate to ovary, lobes 5, minute or obsolete; corolla tube deeply slit on upper side, but usually entire and persistent at base, upper part circumscissile and deciduous, 2 upper lobes deeply separated, unequally winged, erect and connivent, enclosing style apex in 2 thick concave auricles, one on outer side of each lobe below wing, 3 lower lobes broadly winged and spreading; anthers cohering in tube around style; ovary 1-locular with 1 ovule, or rarely 2-locular, 1 ovule per loculus, indusium 2-lipped, not ciliate. Fruits indehiscent, small.

60 species endemic in Australia; 5 species south-eastern Queensland.

- |   |  |   |
|---|--|---|
| 1. Leaves densely white cottony tomentose below even when mature<br>Leaves glabrous or only sparsely pubescent when mature . . . . .  | 1. <i>D. discolor</i> . . . . .                                  | 2 |
| 2. Leaf blades with bases rounded or broadly cuneate, contracted<br>into distinct petioles 0.2–1.5 cm long . . . . .<br>Leaf blades sessile or bases long attenuate into ill-defined petioles<br>up to 0.4 cm long . . . . .                          | 2. <i>D. purpurea</i> . . . . .                                  | 3 |
| 3. Leaves usually less than twice as long as wide in Queensland<br>specimens; hairs on inflorescences ferruginous or yellowish<br>brown . . . . .<br>Leaves never less than twice as long as wide; hairs on<br>inflorescences brown or grey . . . . . | 3. <i>D. stricta</i> . . . . .                                   | 4 |
| 4. Calyx lobes 1–2 mm long, subulate; plants of swampy wallum<br>heath areas or coastal sands . . . . .<br>Calyx lobes less than 1 mm long, obtuse; plants of inland districts<br>in sandy clay soil or on ridges . . . . .                           | 4. <i>D. sp. 1.</i> . . . . .<br>5. <i>D. adpressa</i> . . . . . |   |

### 1. *Dampiera discolor* (de Vriese) Krause

*Linschotenia discolor* de Vriese; *Dampiera linschotenii* F. Muell.

Shrub up to 2 m tall, indumentum white to greyish, dense, cottony. Leaves with petioles 0.5–1.5 cm long; blades narrowly ovate, ovate or elliptic, apex obtuse to acute, base cuneate to attenuate, margin entire, slightly undulate or incurved, 2–9.5 cm × 0.5–2.8 cm, dark green, glabrous above, densely white pubescent below and on margin. Flowers several–many in terminal spicate racemes or panicles, densely white or grey pubescent, bracteoles ovate, *ca* 4–5 mm long; calyx lobes minute; corolla deep blue, 0.8–1.2 cm long, densely pubescent outside. Fruits *ca* 4 mm long, densely pubescent.

Northern Darling Downs and Burnett districts, growing on hard or stony ridges. Flowers late winter–spring.

### 2. *Dampiera purpurea* R. Br.

*Dampiera brownii* F. Muell.

Herb or straggly shrub up to 1 m tall. Leaves with petioles 0.2–1.5 cm long; blades ovate, occasionally oblong-elliptic, apex obtuse, sometimes mucronate, base cuneate to contracted, margin entire or irregularly dentate, 0.8–7.5 cm × 0.4–3.5 cm, glabrous or stellate pubescent below, sometimes also above particularly in young growth. Flowers few together on pubescent peduncles *ca* 1–2.5 cm long, bracteoles slender, 6–8 mm long; calyx lobes minute; corolla deep blue to violet, 1–1.5 cm long, densely long grey or whitish pubescent outside. Fruits *ca* 5 mm long, pubescent. **Fig. 68C.**

Cliffs or rocky hillsides of the region, e.g. Granite Belt area, Mt. Barney, Mt. Walsh. Flowers spring to autumn.

### 3. *Dampiera stricta* (Smith) R. Br.

*Goodenia stricta* Smith

Herb or small shrub up to *ca* 60 cm tall, young parts finely stellate puberulent. Leaves sessile; blades ovate, elliptic or obovate, sometimes broadly so, apex obtuse or subacute, base cuneate, margin coarsely to remotely dentate or ± entire in upper leaves, 1.3–3.5 cm × 0.4–2.8 cm, glabrous. Flowers solitary or few together on peduncles up to 5 mm long, bracteoles slender, *ca* 3–4 mm long; calyx lobes *ca* 0.75 mm long; corolla deep blue, *ca* 1–1.3 cm long, densely long ferruginous to yellowish pubescent outside. Fruits *ca* 3 mm long, ferruginous pubescent.

Girraween National Park and near Wallangarra in the Darling Downs district. Flowers spring–early summer.

### 4. *Dampiera* sp. 1.

*Dampiera stricta* auct. non (Smith) R. Br.

Usually procumbent herb, often with weak unbranched stems up to 1.5 m long, young parts with long grey or brown stellate hairs, otherwise glabrous. Leaves usually alternate but sometimes also clustered at nodes, sessile; blades narrowly elliptic, ovate,

obovate, or narrowly oblong, apex obtuse, mucronate, or obtuse, base attenuate, margin entire or remotely denticulate, 1.3–10.5 cm × 0.25–2 cm, glabrous. Flowers usually few together on peduncles 0.7–2.5 cm long, bracteoles ± triangular, *ca* 5 mm long, calyx lobes 1–2 mm long, pubescent; corolla deep blue, 1.2–1.8 cm long, pubescent with long brownish greyish hairs outside. Fruits *ca* 5 mm long, calyx lobes continuing as decurrent lines down side of fruits, eventually glabrous.

Sandy, seasonally flooded or swampy wallum country in the coastal districts. Flowers spring to autumn.

#### 5. *Dampiera adpressa* Cunn. ex DC.

Herb or small shrub 30–40 cm tall, young parts stellate pubescent, glabrous with age. Leaves with ill-defined petioles up to 4 mm long; blades narrowly oblong, narrowly elliptic or narrowly obovate, rarely obovate, apex obtuse, base cuneate, margin entire or remotely dentate, 1–5 cm × 0.15–0.7(–1.5) cm, glabrous. Flowers solitary or few together on peduncles 3–10 cm long, sometimes longer, bracteoles slender, *ca* 6 mm long; calyx lobes less than 1 mm long; corolla deep blue, *ca* 1–1.5 cm long, densely long grey pubescent outside. Fruits *ca* 4–5 mm long, pubescent.

Darling Downs district in sandstone derived or sandy-clay soils. Flowers mainly spring to autumn.

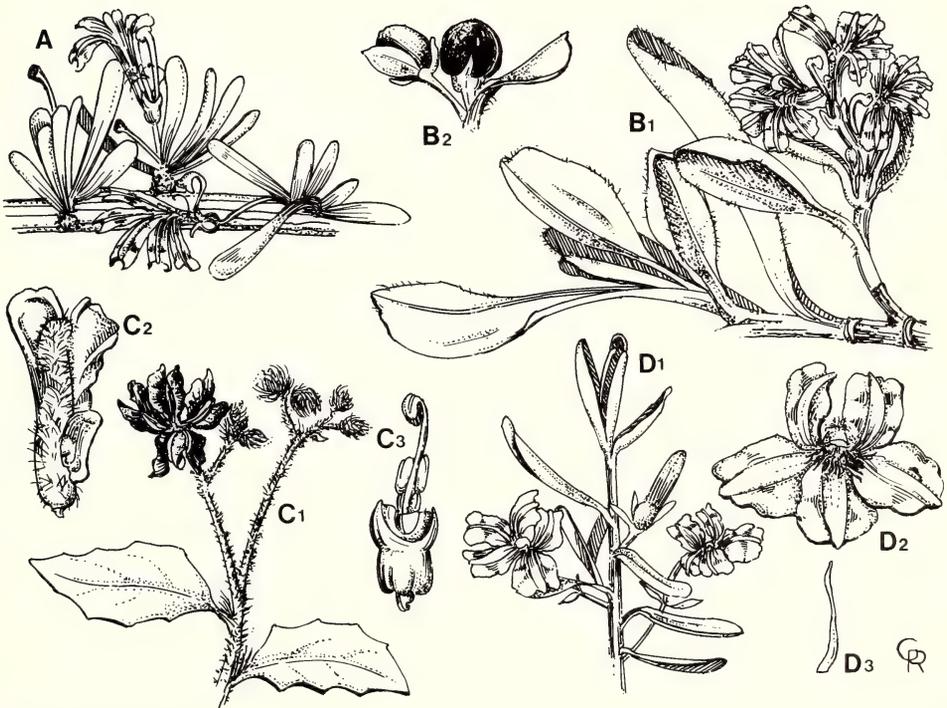


Fig. 68 GOODENIACEAE — A–B *Scaevola* spp. — A *S. spinescens*, part of flowering stem  $\times 1$ ; B<sub>1</sub>–B<sub>2</sub> *S. calendulacea*, B<sub>1</sub> part of flowering stem showing sessile flowers  $\times 1/3$ , B<sub>2</sub> fruit  $\times 1/3$ ; C<sub>1</sub>–C<sub>3</sub> *Dampiera purpurea*, C<sub>1</sub> part of flowering stem  $\times 1/3$ , C<sub>2</sub> flower showing corolla enclosing style  $\times 3$ , C<sub>3</sub> flower with corolla removed showing style and connate stamens  $\times 3$ ; D<sub>1</sub>–D<sub>3</sub> *Cooperookia scabridiuscula*, D<sub>1</sub> part of flowering stem  $\times 1$ , D<sub>2</sub> flower with barbed hairs at throat  $\times 2$ , D<sub>3</sub> hair  $\times 6$ .

### 5. COOPERNOOKIA Carolin

Perennial undershrubs. Leaves alternate, simple, stellate, usually glandular hairy, usually viscid or varnished. Flowers in terminal racemes or few-flowered thyrses, sessile or shortly pedicellate, bracts leafy; calyx adnate to ovary, lobes 5, glandular and/or stellate pubescent, free from each other; corolla basally tubular with an obscure anterior pocket, lobes 5, broadly winged, stellate and glandular pubescent outside, barbed inside at throat, auricle scarcely differentiated; stamens 5, epigynous, free from each other, anthers minutely apiculate; ovary with short basal dissepiment with 2–8 ovules, style simple, indusium with ciliate margin; stigma bifid. Fruits 2-valved inferior capsules, each valve often 2-fid; seeds 2–6, strophiolate, wingless.

6 species endemic in Australia; 1 species south-eastern Queensland.

#### 1. *Coopernookia scabridiuscula* Carolin

Perennial weak shrub up to 1 m tall, stems glandular hispid. Leaves sessile; blades very narrowly obovate, apex acute, base truncate, margin remotely denticulate, recurved or revolute, 2–8 cm × 0.4–1 cm, glandular hispid. Flowers solitary axillary on peduncles 1–2 cm long, bracteoles very narrowly elliptic, *ca* 5–6 mm long; calyx lobes very narrowly ovate, *ca* 6–8 mm long, glandular pubescent; corolla pinkish purple, 1.5–2 cm long, stellate and glandular pubescent outside, glabrous inside except for filiform processes *ca* 1 mm long towards throat. Fruits capsules, *ca* 6–7 mm long. **Fig. 68D.**

Cliffs or crevices on rocky mountains, e.g. Mt. Maroon, Mt. Walsh. Flowers late winter to summer.

## 153. BRUNONIACEAE

Perennial herbs. Leaves radical, exstipulate. Inflorescences dense pedunculate heads, bracteate; flowers bisexual, actinomorphic; calyx tubular, free from ovary, 5-lobed; corolla tubular, inserted at base of calyx tube, lobes 5, valvate, spreading; stamens 5, inserted near base of corolla tube, anthers connate around style, 2-locular, introrse, opening by slits lengthwise; ovary superior, 1-locular, ovule 1, erect, style with small stigma surrounded by cupular indusium. Fruits dry, indehiscent, enclosed by persistent calyx; seeds without endosperm.

1 genus with 1 species endemic in Australia, occurring in south-eastern Queensland.

### 1. BRUNONIA Smith

Characters of the family.

#### 1. *Brunonia australis* Smith

Tufted perennial herb, densely long silky pubescent. Leaves with petioles 1–7.5 cm long, sometimes ill-defined; blades narrowly obovate to obovate, apex acute, base cuneate to long attenuate, 1–4.5 cm × 0.4–1.4 cm, sparsely to densely appressed silky pubescent. Scapes 5–45 cm long, with bracteate flower heads 1–2.5 cm diameter; calyx tube 1.5–2 mm long, lobes *ca* 3 mm long, all densely pubescent; corolla blue, tube 3–4 mm long, hirsute, lobes 4–7 mm long, glabrous inside. Fruits obovoid, *ca* 1.5 mm long. **Fig. 69E.**

Darling Downs district, e.g. near Westmar, Miles, Barakula. Flowers mainly spring–summer.

## 154. STYLIDIACEAE

Herbs, rarely subshrubs. Leaves radical or fasciculate on stems, exstipulate or rarely with scales. Flowers in racemes or corymbs, unisexual or bisexual, mostly zygomorphic; calyx tubular, tube adnate to ovary, lobes 5–7, free or connate and

2-lipped; corolla 5-lobed, lobes imbricate, mostly unequal, lowermost forming lip; stamens 2, filaments connate into column around style but free from corolla; disc present, sometimes glandular, or absent; ovary inferior, 2-locular or 1-locular at base, ovules numerous per loculus, style divided at apex of staminal column. Fruits capsules, 2-locular or 1-locular by disappearance of septum, rarely indehiscent; seeds small.

5 genera with 150 species tropical Asia, Australia, New Zealand, temperate South America; 3 genera with 123 species Australia; 1 genus with 7 species south-eastern Queensland.

1. STYLIDIUM Swartz ex Willd.

Herbs. Inflorescences on terminal peduncles or radical scapes; calyx lobes 5, often ± united, 2-lipped; corolla zygomorphic, 1 lobe or labellum much smaller and turned down, or rarely nearly as long and curved upwards, other 4 ascending in pairs; column elongated, bent down or folded, mostly sensitive to stimuli; ovary 2-locular, stigma undivided.

136 species south-eastern Asia, Australia, New Zealand; ca 130 species Australia; 7 species south-eastern Queensland.

Most species are commonly called TRIGGER PLANTS.

- 1. Leaves 8–50 times as long as broad . . . . . 2  
 Leaves less than 6 times as long as broad . . . . . 4
- 2. Leaves in basal rosettes . . . . . 1. *S. graminifolium*  
 Leaves crowded along stems or in dense tufts along stems with scattered leaves between them . . . . . 3
- 3. Leaves crowded along stems; shrubs up to 1 m tall; flowers in panicles . . . . . 2. *S. laricifolium*  
 Leaves in dense tufts at base and ends of branchlets with scattered leaves between; herbs up to 0.3 m tall; flowers in racemes . . . . . 3. *S. eglandulosum*
- 4. Leaf margins woolly pubescent . . . . . 4. *S. eriorhizum*  
 Leaf margins glabrous . . . . . 5
- 5. Flowers sessile, white . . . . . 5. *S. uliginosum*  
 Flowers pedicellate, pink . . . . . 6
- 6. Petals glandular pubescent; fruits ± cylindrical to ellipsoid; leaves often cauline as well as radical . . . . . 6. *S. debile*  
 Petals glabrous; fruits obovoid; leaves radical . . . . . 7. *S. ornatum*

1. *Stylidium graminifolium* Swartz ex Willd. GRASS TRIGGER PLANT

Rosulate herb. Leaves sessile, linear to linear-elliptic, apex acute, margin serrulate, 5–30(–40) cm × 0.1–0.6 cm, ± glabrous. Flowers in bracteate spikes or very slender racemes up to 75 cm long, glandular pubescent; calyx tube ca 4 mm long, lobes 2–3 mm long, glandular pubescent; corolla pink, lobes 7–9 mm long, glandular pubescent. Fruits ellipsoid, 6–8 mm long. Fig. 69A.

Widespread throughout the region in sandy wallum or rocky areas, or in sandy soil. Flowers spring to autumn.

*S. lineare* Swartz ex Willd. was reported by F. M. Bailey in “Qd. Fl.” 3:887 (1900) to occur on Fraser I., but there are no specimens in the Queensland Herbarium to authenticate this. It seems likely that the specimen referred to by Bailey was a depauperate specimen of *S. graminifolium* as plants of the latter species in the Fraser I. area have extremely narrow leaves, though not as short as those of *S. lineare*, and with more flowers than *S. lineare*.

## 2. *Stylidium laricifolium* Rich.

Shrub up to 1 m tall, often multi-stemmed. Leaves crowded along stem, sessile, linear, apex acute, margin often revolute, 1–5.5 cm × 0.1 cm, ± glabrous. Flowers in terminal bracteate panicles 5–30 cm long, glandular puberulent; corolla pink, lobes 3–7 mm long, glandular pubescent. Fruits ± obovoid, 0.8–1.5 cm long.

Usually rocky areas, e.g. Granite Belt area, Mt. Barney, Mt. Maroon etc. Flowers late winter–spring.

## 3. *Stylidium eglandulosum* F. Muell.

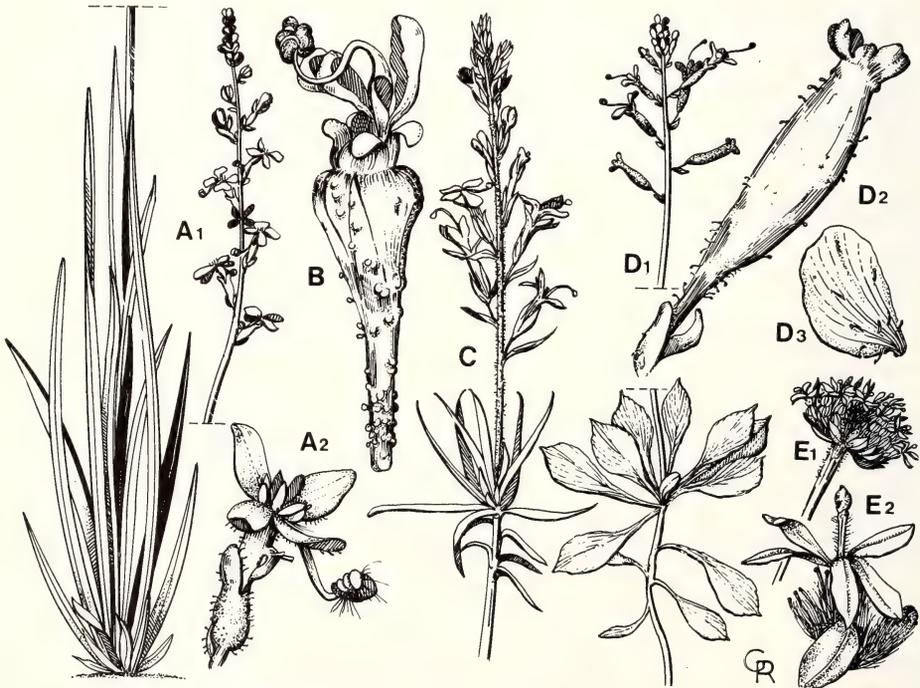
Herb up to ca 30 cm tall, thick tufts of woolly hairs at leaf bases. Leaves crowded in dense tufts at base and ends of branchlets with scattered intermediate ones, sessile, linear to linear-elliptic, apex acute, 0.8–3.5 cm × ca 0.1 cm, glabrous. Flowers in terminal bracteate racemes 5–20 cm long, pubescent with simple woolly hairs; calyx tube 4–6 mm long, lobes 3–4 mm long, glabrous; corolla white or cream, lobes 4–5 mm long, glabrous. Fruits cylindrical to ellipsoid, 7–10 mm long. **Fig. 69C.**

Western Darling Downs district, often on ridges. Flowers summer–autumn.

## 4. *Stylidium eriorhizum* R. Br.

Rosulate herb, thick tufts of woolly hairs at base of leaves. Leaves with ill-defined petioles usually up to 1.5 cm long, rarely 2.5 cm long; blades narrowly obovate to obovate, apex obtuse but usually with aristate tip up to 7 mm long, base attenuate, margin often undulate, woolly pubescent, 0.5–4.5 cm × 0.3–1.2 cm, ± glabrous other than margin. Flowers in slender panicles 8–20 cm long, glandular pubescent; calyx tube 2–3 mm long, lobes ca 1.5 mm long, glandular pubescent; corolla pink to whitish, lobes 2–3 mm long, glandular pubescent. Fruits ovoid to ellipsoid, ca 5 mm long.

Recorded from the Eidsvold area. Flowers spring–summer.



**Fig. 69** A–D STYLIDIACEAE — *Stylidium* spp. — A<sub>1</sub>–A<sub>2</sub> *S. graminifolium*, A<sub>1</sub> flowering plant x<sup>1/2</sup>, A<sub>2</sub> flower with reflexed style x2; B *S. ornatum*, developing obovoid fruit with persistent glabrous petals x6; C *S. eglandulosum*, part of stem with tufts of leaves, and inflorescence x1; D<sub>1</sub>–D<sub>3</sub> *S. debile*, D<sub>1</sub> stem with leaves and terminal inflorescence x1, D<sub>2</sub> ellipsoid fruit x6, D<sub>3</sub> glandular pubescent petal x6; E BRUNONIACEAE — E<sub>1</sub>–E<sub>2</sub> *Brunonia australis*, E<sub>1</sub> inflorescence x1, E<sub>2</sub> flower x3.

**5. *Stylidium uliginosum* Swartz ex Willd.**

Small  $\pm$  rosulate herb. Leaves with petioles 1–6 mm long; blades broadly ovate, ovate or elliptic, apex obtuse, rarely subacute, base broadly cuneate to  $\pm$  truncate, 0.4–1.2 cm  $\times$  0.3–0.8 cm, glabrous. Flowers sessile, few–several on simple or branched sparsely glandular pubescent rachis 3–15 cm long, rarely longer; calyx tube 4–6 mm long, lobes *ca* 2 mm long, sparsely glandular pubescent; corolla white, lobes *ca* 2 mm long, glabrous. Fruits very narrowly cylindrical, 6–10 mm long.

Swampy areas, wallum areas, or along drainage lines mainly in the coastal districts. Flowers winter–spring.

**S. capillare** R. Br., a very small rosulate herb with 1 or 2 pedicellate flowers was recorded by F. M. Bailey in “Qd. Fl.” 3:889 (1900) as occurring at “Brisbane River” but all specimens with that name at Queensland Herbarium, on close examination, were found to represent depauperate forms of **S. uliginosum**. It is doubtful therefore that Bailey’s record is correct.

**6. *Stylidium debile* F. Muell.**

Small slender herb. Leaves rosulate or alternate along stem; petioles ill-defined, up to 1.5 cm long; blades narrowly obovate to obovate, apex obtuse, mucronate, to acute, base cuneate to attenuate, 0.5–3 cm  $\times$  0.2–1.5 cm, glabrous. Flowers in bracteate racemes or panicles 5–35 cm long, sparsely glandular pubescent; calyx tube narrowly conical, 4–7 mm long, lobes *ca* 1 mm long, glandular pubescent; corolla pink, lobes oblong-obovate, 2–4 mm long, glandular puberulent. Fruits  $\pm$  cylindrical, up to 7 mm long. **Fig. 69D.**

Throughout the region in swampy or seepage areas or along creek banks. Flowers spring to autumn.

**7. *Stylidium ornatum* S. T. Blake**

Small slender rosulate herb. Leaves with ill-defined petioles up to 3 cm long; blades narrowly obovate to obovate, apex obtuse to acute, base cuneate to attenuate, 0.8–3 cm  $\times$  0.2–1 cm, glabrous. Flowers in slender bracteate panicles, occasionally racemes, 8–30 cm long, scapes generally stout, sparsely glandular pubescent; calyx tube conical or oblong, *ca* 2 mm long, lobes 1–1.5 mm long, glandular pubescent; corolla pink, lobes ovate, 3–4 mm long, glabrous. Fruits  $\pm$  obovoid, *ca* 4–5 mm long. **Fig. 69B.**

Coastal wallum swampy areas. Flowers spring to autumn.

## 155. ASTERACEAE (COMPOSITAE)

Herbs, shrubs or rarely small trees. Leaves alternate or opposite, exstipulate. Flowers or florets collected together in heads surrounded by involucre of few–many bracts in 1–many rows, whole head having appearance of a single flower; sometimes compound heads are formed when individual heads, in this case called partial heads, are clustered together; individual florets inserted on receptacle, receptacle naked or bearing scales or hairs or bristles between florets; calyx absent or converted into a ring or rings of hairs or scales on top of ovary known as pappus; either florets all bisexual, corollas tubular and toothed or truncate at top or with slender corolla tube and strap shaped lamina known as ligule, or florets of centre of head, (the disc), bisexual or male with tubular toothed florets and those of circumference bisexual or female with ligulate florets, the ligule known as a ray, and the florets known as ray florets, occasionally outer florets female but without ligule; stamens 5, rarely 4, inserted in corolla tube, anthers linear, united in sheath around style, 2-locular, connective often produced into appendage, basal lobes sometimes prolonged into variously shaped tails; ovary inferior, style filiform, usually divided at top into 2 short stigmatic branches. Fruits small seed-like achenes, rarely drupes crowned by pappus or naked.

About 900 genera with 13 000 species worldwide; *ca* 200 genera, *ca* 55 endemic, with *ca* 700 species Australia; 107 genera with 251 species south-eastern Queensland.

- |  |                           |    |
|--|---------------------------|----|
| 1. Florets all ligulate . . . . .  |                           | 2  |
| Florets all tubular or florets of disc tubular and outer florets (ray florets) ligulate . . . . .  |                           | 14 |
| 2. Florets blue or purple-violet . . . . .   |                           | 3  |
| Florets yellow or white . . . . .  |                           | 4  |
| 3. Leaves grass-like; achenes beaked; pappus of long plumose bristles with few non plumose bristles . . . . .  | 107. <i>Tragopogon</i>    |    |
| Leaves not grass-like; achenes not beaked; pappus of minute scales . . . . .   | 96. <i>Cichorium</i>      |    |
| 4. Pappus absent . . . . .   | 95. <i>Scolymus</i>       |    |
| Pappus of at least inner achenes of plumose, scabrid or simple bristles . . . . .  |                           | 5  |
| 5. Pappus of outer and inner achenes dissimilar, pappus of outer achenes 1 mm or less long, that of inner achenes usually 2 mm or more long . . . . .                              |                           | 6  |
| Pappus of all achenes similar . . . . .  |                           | 8  |
| 6. Inner involucre bracts hardened in fruit, incurved, tightly enfolding marginal achenes . . . . .  | 98. <i>Hedypnois</i>      |    |
| Inner involucre bracts not hardened, not enfolding achenes . . . . .   |                           | 7  |
| 7. Pappus of inner achenes plumose bristles; indumentum of forked hairs; achenes <i>ca</i> 5 mm long in Australian species . . . . .   | 102. <i>Leontodon</i>     |    |
| Pappus of inner achenes barbellate; indumentum of simple hairs; achenes 1–2 mm long in Australian species . . . . .  | 97. <i>Tolpis</i>         |    |
| 8. Pappus bristles plumose or at least those of inner achenes . . . . .  |                           | 9  |
| Pappus bristles not plumose, mostly scabrous or barbellate . . . . .   |                           | 10 |
| 9. Leaves mostly radical; achenes ribbed . . . . .   | 101. <i>Hypochoeris</i>   |    |
| Leaves alternate cauline; achenes transversely wrinkled and longitudinally furrowed . . . . .  | 99. <i>Picris</i>         |    |
| 10. Achenes scaly-muricate or muricate-spinulose in upper part . . . . .   |                           | 11 |
| Achenes not scaly-muricate nor muricate-spinulose in upper part . . . . .  |                           | 12 |
| 11. Heads solitary, terminal on long simple scapes . . . . .   | 103. <i>Taraxacum</i>     |    |
| Heads axillary, subsessile, solitary or few together in large branched leafy inflorescences . . . . .  | 104. <i>Chondrilla</i>    |    |
| 12. Achenes $\pm$ terete, leaves mostly radical in Australian specimens . . . . .  | 100. <i>Youngia</i>       |    |
| Achenes compressed; cauline leaves always present . . . . .  |                           | 13 |
| 13. Involucres ovoid or campanulate; pappus dimorphic, of fine hairs intermixed with coarser bristles; achenes glabrous, often winged . . . . .                                    | 106. <i>Sonchus</i>       |    |
| Involucres narrowly cylindrical; pappus of fine hairs only; achenes with ascending marginal hairs, not winged . . . . .  | 105. <i>Lactuca</i>       |    |
| 14. Heads unisexual, male and female heads on the same plant but dissimilar; involucre bracts of female heads enclosing achenes at maturity and forming a burr . . . . .           |                           | 15 |
| Heads bisexual, all heads similar, or heads unisexual but male and female on separate plants; involucre bracts not forming a burr except in <b><i>Acanthospermum</i></b> . . . . . |                           | 16 |
| 15. Burrs without hooked appendages . . . . .  | 42. <i>Ambrosia</i>       |    |
| Burrs with hooked appendages . . . . .   | 43. <i>Xanthium</i>       |    |
| 16. Heads unisexual, male and female heads on separate plants . . . . .  | 18. <i>Baccharis</i>      |    |
| Heads bisexual . . . . .   |                           | 17 |
| 17. Achenes clasped by an inner involucre bract . . . . .  |                           | 18 |
| Achenes free of involucre bracts, or only ray achenes clasped by involucre bracts in <b><i>Sigesbeckia</i></b> . . . . .   |                           | 19 |
| 18. Achenes in a whorl of 5–8, each achene clasped by involucre bract which develops hooked spines; leaves opposite . . . . .  | 40. <i>Acanthospermum</i> |    |

Achenes not in whorls, clasped by involucre bract and 2 receptacle scales; leaves alternate . . . . .	41. <i>Parthenium</i>	
19. Ray achenes clasped by glandular hairy involucre bracts, disc achenes clasped by receptacle scales . . . . .	45. <i>Sigesbeckia</i>	20
All achenes free of involucre bracts . . . . .		
20. Involucre bracts cohering or valvate in 1 row to form $\pm$ cylindrical involucre, sometimes with $\pm$ spreading bractlets at base of main involucre; heads never compound . . . . .		21
Involucre bracts in 2 or more rows, imbricate, cohering at base only or if in 1 row then not forming $\pm$ cylindrical involucre; heads sometimes compound . . . . .		27
21. Ray florets present, though sometimes small . . . . .		22
Ray florets absent . . . . .		23
22. Rays creamy white; strong smelling plants . . . . .	63. <i>Tagetes</i>	
Rays yellow; not strong smelling plants . . . . .	77. <i>Senecio</i>	
23. Pappus drying purplish . . . . .	73. <i>Erechtites</i>	
Pappus whitish . . . . .		24
24. Florets yellow . . . . .		25
Florets purplish or orange-purple or orange-brown . . . . .		26
25. Involucres 1 cm or more long . . . . .	74. <i>Gynura</i>	
Involucres less than 1 cm long . . . . .	77. <i>Senecio</i>	
26. Leaves petiolate . . . . .	75. <i>Crassocephalum</i>	
Leaves sessile, stem clasping or lower ones with winged petioles with stem clasping auricles at base . . . . .	76. <i>Emilia</i>	
27. Leaves opposite, or opposite on non flowering stems and alternate in flowering branches . . . . .		28
Leaves alternate, or all leaves in basal rosettes . . . . .		50
28. Ray florets absent . . . . .		29
Ray florets present . . . . .		33
29. Heads compound, consisting of numerous partial heads clustered together; compound heads terminal, solitary	34. <i>Calocephalus</i>	
Heads simple, in $\pm$ corymbose inflorescences . . . . .		30
30. Pappus of 2-4 thick rigid barbed awns . . . . .	57. <i>Bidens</i>	
Pappus of scales or bristles . . . . .		31
31. Pappus of numerous scabrid bristles . . . . .	5. <i>Eupatorium</i>	
Pappus of 3-5 scales or bristles . . . . .		32
32. Pappus of 3-5 gland tipped bristles . . . . .	3. <i>Adenostemma</i>	
Pappus of 5 awn tipped scales . . . . .	4. <i>Ageratum</i>	
33. Achenes winged . . . . .		34
Achenes often compressed, but not winged . . . . .		35
34. Petioles with stem clasping auricles at base . . . . .	52. <i>Verbesina</i>	
Petioles without stem clasping auricles . . . . .	55. <i>Coreopsis</i>	
35. Pappus absent or a minute rim . . . . .		36
Pappus present, though sometimes of 1 or few awns or scales . . . . .		42
36. Involucres of 4 bracts . . . . .	47. <i>Enydra</i>	
Involucres of more than 4 bracts . . . . .		37
37. Heads compound, consisting of numerous partial heads clustered together	62. <i>Flaveria</i>	
Heads simple . . . . .		38
38. Heads in leafy corymbose panicles . . . . .	46. <i>Guizotia</i>	
Heads solitary or few together on peduncles . . . . .		39

39. Involucres more than 1 cm across at flowering Involucres up to 1 cm across at flowering	51. <i>Helianthus</i>	40
40. Receptacles $\pm$ flat Receptacles $\pm$ conical	48. <i>Eclipta</i>	41
41. Achenes oblong, flattened, faces smooth, ciliate along margins at least in south-eastern Queensland specimens Achenes obovoid, scarcely or conspicuously flattened, 3-4-ribbed, ribs often conspicuous, not ciliate	53. <i>Spilanthes</i> 49. <i>Wedelia</i>	
42. Pappus of numerous plumose bristles Pappus of 1-many scales or awns	60. <i>Tridax</i>	43
43. Pappus of 2-4 awns with ascending or retrorse barbs Pappus of scales or 1-3 fine bristles or 1 smooth awn		44 46
44. Awns with ascending barbs Awns with retrorse barbs	54. <i>Calypocarpus</i>	45
45. Achenes narrowed into a beak Achenes not beaked	56. <i>Cosmos</i> 57. <i>Bidens</i>	
46. Pappus of scales Pappus of bristles or awns		47 48
47. Pappus of numerous fimbriate scales; rays white Pappus of 1-3 narrow scales; rays yellow	59. <i>Galinsoga</i> 51. <i>Helianthus</i>	
48. Peduncles hollow and swollen at least immediately below head; pappus of a single awn Peduncles not hollow and swollen	44. <i>Zinnia</i>	49
49. Achenes oblong, flattened, faces smooth, ciliate along margins at least in south-eastern Queensland Achenes obovoid, scarcely or conspicuously flattened, 3-4-ribbed, ribs often conspicuous, not ciliate	53. <i>Spilanthes</i> 49. <i>Wedelia</i>	
50. Ray florets present though sometimes minute or solitary Ray florets absent		51 78
51. Pappus absent or a minute crown Pappus present, of bristles scales or awns		52 60
52. Fruits drupes Fruits not drupes	79. <i>Chrysanthemoides</i>	53
53. Rays up to 2.5 mm long Rays more than 2.5 mm long		54 57
54. Achenes $\pm$ cylindrical, 5-ribbed; pappus a minute crown Achenes compressed, not ribbed; pappus absent	71. <i>Tanacetum</i>	55
55. Leaves mostly cauline, 1-3-pinnately divided Leaves mostly radical, margin toothed	66. <i>Achillea</i>	56
56. Achenes with short glandular beak summounted by thickened rim Achenes not beaked	8. <i>Lagenifera</i> 9. <i>Solenogyne</i>	
57. Ray florets white to blue Ray florets yellow		58 59
58. Achenes turbinate with 8-11 tuberculate ribs, never winged; leaves 2-3-pinnate Achenes not as above, sometimes winged; leaves 1-pinnately divided or not divided	67. <i>Anthemis</i> 10. <i>Brachyscome</i>	
59. Achenes of two types, outer curved, inner curved $\pm$ into ring Achenes $\pm$ smooth on back, with deeply cavernous concave face	78. <i>Calendula</i> 80. <i>Cymbonotus</i>	

60. Pappus of scales or awns . . . . .		61
Pappus of fine bristles . . . . .		70
61. Pappus of rigid awns, with recurved barbs, sometimes with smaller awns or scales also present . . . . .		62
Pappus of scales, or scales and awns but then the awns not with recurved barbs . . . . .		63
62. Fruiting heads globular, burr-like; pappus represented by 2 or more rigid barbed awns usually with smaller awns or scales . . . . .	12. <i>Calotis</i>	
Fruiting heads not globular, not burr-like; pappus of 2 erect or spreading barbed awns without smaller awns or scales . . . . .	58. <i>Glossogyne</i>	
63. Ray florets 1 per head . . . . .	61. <i>Schkuhria</i>	
Ray florets several per head . . . . .		64
64. Pappus of a ring of scales and 2 awns; large plants usually 1–3 m tall . . . . .	50. <i>Tithonia</i>	
Pappus not as above . . . . .		65
65. Achenes winged, wings incurved and deeply grooved on inner face; pappus of 7–8 scales . . . . .	82. <i>Arctotis</i>	
Achenes not winged, not deeply grooved . . . . .		66
66. Disk florets purple . . . . .		67
Disk florets yellow . . . . .		68
67. Erect plants; pappus of 2 scales . . . . .	51. <i>Helianthus</i>	
Prostrate or ascending plants; pappus of several minute scales . . . . .	81. <i>Arctotheca</i>	
68. Leaves with dense white cottony hairs below, green above . . . . .	83. <i>Gazania</i>	
Leaves without white cottony hairs below . . . . .		69
69. Involucral bracts in 2 rows; pappus <i>ca</i> 1 mm long in Australian species . . . . .	64. <i>Helenium</i>	
Involucral bracts in 3 rows; pappus <i>ca</i> 5 mm long in Australian species . . . . .	65. <i>Gaillardia</i>	
70. Rays yellow . . . . .		71
Rays white to mauve to blue . . . . .		73
71. Heads in Australian species in dense terminal panicles, the heads borne on upper side of branches . . . . .	6. <i>Solidago</i>	
Not as above . . . . .		72
72. Involucral bracts scarious; plants without minute glandular hairs, not strong smelling . . . . .	37. <i>Podolepis</i>	
Involucral bracts green, not scarious; whole plant covered with minute glandular hairs, strong smelling . . . . .	38. <i>Dittrichia</i>	
73. Pappus much shorter than achene . . . . .	10. <i>Brachyscome</i>	
Pappus longer than achene . . . . .		74
74. Ray florets in 1 row . . . . .	14. <i>Olearia</i>	
Ray florets in 2 or more rows . . . . .		75
75. Heads in terminal leafy panicles . . . . .	13. <i>Aster</i>	
Heads solitary . . . . .		76
76. Achenes of disc florets sterile; ray achenes of south-eastern Queensland species up to 1.1 mm long . . . . .	11. <i>Minuria</i>	
Achenes of disc florets fertile; all achenes of south-eastern Queensland 2.5 mm long or longer . . . . .		77
77. Achenes obovate to oblanceolate; plants with glandular hairs usually present as well as septate hairs . . . . .	15. <i>Vittadinia</i>	
Achenes linear to compressed cylindrical; plants with glandular hairs absent or obscure, longer hairs webby or woolly . . . . .	16. <i>Camptacra</i>	
78. Heads compound, consisting of numerous partial heads clustered together . . . . .		79
Heads simple . . . . .		86

79. Compound heads yellow . . . . .		80
Compound heads white woolly . . . . .		83
80. Pappus of a minute jagged crown in south-eastern Queensland . . . . .		81
Pappus of several fine bristles . . . . .		82
81. Bracts subtending partial heads similar to inner bracts which surround the partial heads . . . . .	32. <i>Angianthus</i>	
Bracts subtending partial heads unlike the inner bracts which surround the partial head . . . . .	33. <i>Chrysocoryne</i>	
82. Involucral bracts with pale yellow laminas . . . . .	34. <i>Calocephalus</i>	
Involucral bracts scarious . . . . .	36. <i>Craspedia</i>	
83. Pappus absent or of 1 fine bristle in south-eastern Queensland species . . . . .	31. <i>Myriocephalus</i>	
Pappus of numerous bristles . . . . .		84
84. Dwarf plants; stems $\pm$ prostrate, up to <i>ca</i> 6 cm long in south-eastern Queensland . . . . .	35. <i>Actinobole</i>	
Erect plants up to <i>ca</i> 1.2 m tall . . . . .		85
85. Stems winged or if not winged then compound heads arranged in interrupted terminal spikes, the individual heads not subtended by leaves . . . . .	21. <i>Pterocaulon</i>	
Stems not winged; if compound heads arranged in spikes then individual heads subtended by leaves . . . . .	22. <i>Gnaphalium</i>	
86. At least inner involucral bracts ending in spines (minute in <i>Mantiscalca</i> ) . . . . .		87
Bracts not ending in spines . . . . .		95
87. Outer involucral bracts larger than inner bracts and resembling leaves . . . . .		88
Involucral bracts all similar, not leaf-like . . . . .		89
88. Pappus absent or of narrow scales; achenes 4-angled without oblique hollow at base . . . . .	94. <i>Carthamus</i>	
Pappus of 10 long bristles and 10 shorter inner ones; achenes many-ribbed, with oblique hollow at base . . . . .	85. <i>Cnicus</i>	
89. Leaves mottled with white along veins . . . . .	88. <i>Silybum</i>	
Leaves not mottled . . . . .		90
90. Pappus absent . . . . .	90. <i>Centaurea</i>	
Pappus present . . . . .		91
91. Pappus of plumose bristles . . . . .		92
Pappus of simple or scabrid bristles . . . . .		93
92. Stems with interrupted spiny wings . . . . .	86. <i>Cirsium</i>	
Stems not winged . . . . .	87. <i>Cynara</i>	
93. Stems with spiny wings . . . . .	84. <i>Carduus</i>	
Stems not spiny winged . . . . .		94
94. Innermost row of pappus a ring bearing 1 long bristle; involucral spines minute; florets purple . . . . .	93. <i>Mantiscalca</i>	
Innermost row of pappus of simple bristles; florets yellow . . . . .	90. <i>Centaurea</i>	
95. Pappus of fine bristles in south-eastern Queensland . . . . .		96
Pappus absent or of a crown or cup or of scales ( <i>Soliva</i> spp. have persistent rigid styles but no true pappus) . . . . .		110
96. Involucral bracts herbaceous, green . . . . .		97
Involucral bracts scarious or papery, often coloured . . . . .		104
97. Florets yellow . . . . .		98
Florets purple or whitish . . . . .		99
98. Achenes 2-2.5 mm long . . . . .	27. <i>Ixiolaena</i>	
Achenes <i>ca</i> 1 mm long . . . . .	19. <i>Blumea</i>	

99. Florets purplish . . . . .		100
Florets whitish . . . . .		103
100. Heads <i>ca</i> 5 mm wide . . . . .		101
Heads 8 mm or more wide . . . . .		102
101. Pappus in 1 row . . . . .	19. <i>Blumea</i>	
Pappus in 2 rows . . . . .	2. <i>Vernonia</i>	
102. Leaves deeply pinnatifid; pappus bristles cohering in a ring at base . . . . .	89. <i>Saussurea</i>	
Leaves toothed or with rounded lobes; pappus bristles free at base . . . . .	1. <i>Centratherum</i>	
103. Achenes compressed . . . . .	17. <i>Conyza</i>	
Achenes cylindrical . . . . .	2. <i>Vernonia</i>	
104. Florets purple or pink or if white then rhizomatous perennials . . . . .		105
Florets yellow or white, not rhizomatous . . . . .		107
105. Pappus shorter than achene . . . . .	90. <i>Centaurea</i>	
Pappus longer than achene . . . . .		106
106. Rhizomatous plants; pappus <i>ca</i> 2 cm long . . . . .	92. <i>Acroptilon</i>	
Non rhizomatous; pappus up to <i>ca</i> 1 cm long . . . . .	91. <i>Leuza</i>	
107. Achenes contracted at top; herbs; involuclral bracts never spreading, never petal-like . . . . .	23. <i>Leptorhynchos</i>	
Achenes not contracted at top; herbs or shrubs; involuclral bracts often spreading, often papery, often petal-like . . . . .		108
108. Pappus bristles plumose from base . . . . .	24. <i>Helipterum</i>	
Pappus bristles not plumose or plumose only in upper part . . . . .		109
109. Receptacles with chaffy scales between florets . . . . .	26. <i>Cassinia</i>	
Receptacles without scales . . . . .	25. <i>Helichrysum</i>	
110. Pappus of 2 or more scales . . . . .		111
Pappus absent or a minute crown or a membranous cup . . . . .		112
111. Pappus of 2 minute scales . . . . .	7. <i>Dichrocephala</i>	
Pappus of 8–12 scales . . . . .	28. <i>Rutidosus</i>	
112. Pappus a membranous cup . . . . .	29. <i>Ammobium</i>	
Pappus absent or a minute crown . . . . .		113
113. Styles persistent on achenes, spine-like . . . . .	70. <i>Soliva</i>	
Styles not persistent . . . . .		114
114. Heads in terminal panicles . . . . .	72. <i>Artemisia</i>	
Heads solitary or not forming panicles . . . . .		115
115. Florets purple . . . . .	90. <i>Centaurea</i>	
Florets yellow, creamy or greenish . . . . .		116
116. Heads sessile or peduncles less than 1 cm long . . . . .		117
Heads on peduncles longer than 1 cm . . . . .		118
117. Involuclral bracts in 2 rows, margins scarious . . . . .	69. <i>Centipeda</i>	
Involuclral bracts in 3–4 rows, margins not scarious . . . . .	20. <i>Epalties</i>	
118. Prostrate or decumbent herbs . . . . .	68. <i>Cotula</i>	
Erect herbs . . . . .		119
119. Achenes tapering to a short beak surmounted by minute crown; heads 1–1.5 cm broad . . . . .	39. <i>Carpesium</i>	
Achenes not beaked, without crown; heads 0.6–1 cm broad . . . . .	30. <i>Acomis</i>	

### 1. CENTRATHERUM Cass.

Herbs or subshrubs. Leaves alternate. Heads sessile, terminal on axillary branches, occasionally 2 or 3 clustered together; involucre cylindrical-campanulate, involucre bracts in several series, outer foliaceous; receptacle scales absent; ray florets absent, florets all tubular, 5-lobed; anthers obtuse at base; style lobes subulate. Achenes cylindrical to obconical; pappus of single series of straw coloured bristles, occasionally absent.

2 species tropical America, Australia and Philippines; 1 species Australia, occurring in south-eastern Queensland.

#### 1. *Centratherum punctatum* Cass.

Sprawling to erect perennial herb, becoming shrubby with age. Leaves sessile or with petioles up to *ca* 1 cm long; blades ovate to elliptic to rhombic or spatulate, margins serrate or shallowly lobed, 1–8.3 cm × 0.5–3.9 cm. Florets purple, 0.5–1.4 cm long. Achenes cylindrical to obconical.

Two subspecies occur in the region:

- |   |  |
|---|--|
| 1. Leaf margins with up to 8 rounded lobes or teeth on either side; involucre usually less than 1.5 cm across . . . . . | <i>C. punctatum</i> subsp. <i>australianum</i> |
| Leaf margins with many irregular teeth on either side; involucre 1.5 cm or more across . . . . .                        | <i>C. punctatum</i> subsp. <i>punctatum</i>    |

*C. punctatum* subsp. *australianum* Kirkman (*C. muticum* auct. Aust. non (Kunth) Less.) is native to Australia and is found in eucalypt forests of eastern parts of the region. It flowers summer–autumn. \**C. punctatum* subsp. *punctatum* is native to South and Central America and the West Indies and is cultivated in the region as an ornamental. It persists in old gardens and can spread into nearby wasteland. It flowers most of the year.

### 2. VERNONIA Schreber

Herbs, shrubs or trees. Leaves alternate. Flowers in cymes or panicles, rarely solitary; involucre campanulate or ovoid, involucre bracts in few–many rows; receptacle scales absent; ray florets absent; disc florets tubular, 5-lobed; anther bases obtuse; style arms subulate. Achenes cylindrical or turbinate; pappus mostly of 2 rows, inner row of ciliate bristles, outer row much shorter, of ciliate bristles, hairs on scales.

About 650 species tropical and temperate America, Africa, Madagascar, Asia, New Guinea and Australia; 1 species Australia, occurring in south-eastern Queensland.

#### 1. *Vernonia cinerea* (L.) Less.

#### VERNONIA

*Conyza cinerea* L.

Erect perennial herb up to *ca* 60 cm tall. Leaves subsessile or with petioles up to 2 cm long; blades very variable, linear, elliptic, elliptic-ovate, ovate, ovate-rhombic, apex ± obtuse to acute, base abruptly or gradually narrowed to petiole, margin repand-serrate, undulate or ± entire, 1–4 cm × 0.3–2.5 cm, from glabrous to densely grey woolly. Heads forming terminal leafless cymose panicles; involucre campanulate, *ca* 5 mm wide, involucre bracts in 4 series, inner largest, 3–5 mm long; florets purple or white. Achenes 1–2 mm long, pubescent; pappus 4–5 mm long. **Fig. 70A.**

Widespread and moderately common throughout the region except drier western parts. Flowers mainly summer–autumn.

A number of varieties of this species have been described (Koster, *Nova Guinea, Botany*, 24: 509–512 (1966)) some names of which can probably be applied to Australian specimens. However the species as it occurs in Australia is in need of a critical review to determine which infraspecific taxa occur here.

### 3. ADENOSTEMMA J. R. & G. Forster

Herbs. Leaves mostly opposite. Heads small, in lax corymbose panicles; involucre campanulate or hemispherical, involucre bracts  $\pm$  connate at base; receptacles without scales; ray florets absent; disc florets tubular, 5-lobed; anthers without apical appendage or minutely apiculate, base obtuse or subtruncate; style branches long, dilated above, obtuse, sometimes subpetaloid, papillose on outer surface. Achenes obovoid-oblong, 3–5-angled; pappus of 3–5 short rigid gland tipped bristles arising from an apical ring.

About 14 species from tropical and subtropical America and Africa, tropical Asia and Australia; 2 species Australia, both occurring in south-eastern Queensland.

- |   |                           |
|---|---------------------------|
| 1. Mature achenes densely tuberculate . . . . .               | 1. <i>A. lavenia</i>      |
| Mature achenes smooth except for glandular granules . . . . . | 2. <i>A. macrophyllum</i> |

#### 1. *Adenostemma lavenia* (L.) Kuntze

*Verbesina lavenia* L.; *Adenostemma viscosum* J. R. & G. Forster

Annual,  $\pm$  erect, up to *ca* 1 m tall. Leaves opposite, except under inflorescences; petioles up to *ca* 3 cm long, usually reducing upwards; blades ovate, ovate-oblong or narrowly ovate, apex acuminate or acute, base narrowed, or rounded on upper ones, margin irregularly dentate or serrate, up to *ca* 20 cm  $\times$  7 cm, reducing in size upwards, veins usually with some hairs, remainder of leaf glabrous or subglabrous. Heads  $\pm$  globose, 3–7 mm wide; involucre bracts up to *ca* 4 mm long; florets white, 1–2 mm long. Achenes 3-angled, 2–4 mm long, when mature with dense tubercles; pappus usually of 3 bristles. **Fig. 70B.**

Found in damp shaded places of the Moreton and Wide Bay districts. Flowers late summer–autumn.

#### 2. *Adenostemma macrophyllum* (Blume) DC.

*Lavenia macrophylla* Blume

Annual,  $\pm$  erect, up to *ca* 1 m tall. Leaves opposite; petioles up to 9 cm long, reducing upwards; blades ovate or broadly ovate, apex acute or acuminate, base abruptly narrowed or sometimes almost truncate, margin crenate-serrate, up to 20 cm  $\times$  12 cm, reducing in size upwards, glabrous or with some hairs on veins. Heads subglobose, 5–7 mm wide; involucre bracts 4–5 mm long; florets *ca* 3 mm long. Achenes 3-angled, 3–4 mm long, when mature smooth except for glandular granules on surface. **Fig. 70C.**

Known from the Moreton district and probably also to be found in the Wide Bay district; found on edges of rainforest. Flowers summer–autumn.

### 4. AGERATUM L.

Erect herbs or shrubs. Leaves opposite or upper alternate. Heads small, in dense corymbs, rarely in lax panicles; involucre campanulate, involucre bracts in 2–3 series; ray florets absent; disc florets tubular, 5-lobed; anther bases obtuse; style branches long, obtuse, somewhat clavate, papillose outside. Achenes 5-angled; pappus of 5 short free or connate awn tipped scales or of 10–20 narrow unequal scales.

About 30 species from tropical and subtropical America, 2 species have become weeds in many parts of the world; these 2 species Australia, both occurring in south-eastern Queensland.

- |  |                           |
|--|---------------------------|
| 1. Involucre bracts sparsely hairy or glabrous on back, hairs not glandular; pappus slightly longer than florets . . . . . | 1. <i>A. conyzoides</i>   |
| Involucre bracts conspicuously pilose on back, some hairs glandular; pappus shorter than florets . . . . .                 | 2. <i>A. houstonianum</i> |

#### 1. \**Ageratum conyzoides* L.

BILLYGOAT WEED

Erect annual or short lived perennial herb up to *ca* 1 m tall, softly hairy. Leaves with petioles 0.5–5 cm long; blades ovate, triangular-ovate or rhombic-ovate, apex acute or obtuse or sometimes acuminate, base subcordate, rounded or narrowed, margin crenate-dentate, 1–10 cm  $\times$  0.5–5 cm, thinly hairy, glandular below. Heads 4–5 mm across; involucre bracts *ca* 3 mm long, glabrous or sparsely hairy, hairs never

glandular; florets violet to whitish, 1–1.5 mm long, not or scarcely exerted from bracts. Achenes 1.5–2 mm long; pappus of 5 awn-tipped scales, slightly longer than florets.

Native of tropical America; naturalized and widespread in eastern parts of the region but not common; weed of disturbed areas. Flowers mostly autumn to spring.

**2. \**Ageratum houstonianum* Miller** **BLUE BILLYGOAT WEED**

Erect annual or short lived perennial up to *ca* 1 m tall, softly hairy. Leaves with petioles 0.5–6.5 cm long; blades triangular-ovate, or ovate, apex obtuse to acute, base ± cordate, truncate or rounded, margin crenate-dentate, 1–10 cm × 1–6 cm, thinly hairy, glandular below. Heads 5–7 mm across; involucre bracts 3–4.5 mm long, conspicuously pilose, some hairs glandular; florets violet to whitish, 2–3 mm long, exerted from bracts. Achenes *ca* 2 mm long; pappus of 5 awn tipped scales, shorter than corolla. **Fig. 70D.**

Native of tropical America; naturalized and widespread in eastern parts of the region; weed of disturbed areas. Flowers found most of the year.

**5. EUPATORIUM L.**

Perennial herbs or subshrubs. Leaves opposite. Heads in terminal corymbose inflorescences; involucre bracts 1-seriate; receptacle scales absent; ray florets absent; disc florets bisexual; corolla tubular, 4–5-lobed; anthers obtuse at base; style branches filiform, obtuse, papillose outside. Achenes 5-angled; pappus of numerous bristles in 1–3 series.

About 1200 species mostly from the Americas, a few in Asia and Europe; 3 species naturalized Australia, all occurring in south-eastern Queensland.

- 1. Stems, leaves and inflorescence branches glandular hairy . . . . . 1. *E. adenophorum*  
    Stems, leaves and inflorescence branches hairy but not glandular  
    hairy . . . . . 2
- 2. Non rhizomatous, straggling shrub with purplish stems; stems,  
    leaves and inflorescences not glandular punctate; achenes  
    ciliate on ribs . . . . . 2. *E. riparium*  
    Rhizomatous shrub forming clumps; stems, leaves and  
    inflorescences glandular punctate (sometimes inconspicuously  
    so); achenes glabrous . . . . . 3. *E. serotinum*

**1. \**Eupatorium adenophorum* Sprengel** **CROFTON WEED**

*Eupatorium glandulosum* Kunth non Michaux; *Ageratina adenophora* (Sprengel) R. M. King & H. Robinson

Shrubby perennial up to *ca* 2 m tall, stems leaves and inflorescence branches glandular pubescent. Leaves with petioles up to *ca* 4 cm long; blades ± rhombic, apex acute to acuminate, base broadly cuneate, margin crenate, 4–10 cm × 3–6 cm, triplinerved from base. Heads corymbose, *ca* 5 mm long; florets white. Achenes smoothly 5-angled, 1–2 mm long, glabrous; pappus of numerous scabrid bristles 3–4 mm long. **Fig. 70E.**

Native of Central America; naturalized and widespread in the Moreton and Wide Bay districts, and is common in the vicinity of the McPherson Ra. as a weed of pastures, roadsides etc. Flowers spring. It is a declared noxious weed under the Stock Routes and Rural Lands Protection Acts, 1944–1967. It is suspected of poisoning horses.

**2. \**Eupatorium riparium* Regel** **MIST FLOWER; CREEPING CROFTON WEED**

*Ageratina riparia* (Regel) R. M. King & H. Robinson

Perennial herb up to *ca* 1 m tall; stems purplish, spreading prostrate in lower parts, rooting at nodes, usually thinly hairy. Leaves with petioles up to 1.5 cm long; blades narrowly ovate, apex acuminate, base cuneate, margin serrate, 3–11 cm × 0.8–3 cm, triplinerved, main pair of ascending lateral veins arising distinctly above base. Heads

crowded in corymbs; heads *ca* 5 mm long; florets white. Achenes 5-angled, 1–2 mm long, ciliate on angles; pappus of numerous scabrid bristles *ca* 3–4 mm long. **Fig. 70G.**

Native of Central America; widespread in the Moreton and Wide Bay districts as a weed of damp areas on hillsides, creekbanks and other sheltered places. Flowers late winter–mid spring. It is a declared noxious weed under the Stock Routes and Rural Lands Protection Acts, 1944–1967.

### 3. \**Eupatorium serotinum* Michaux

Rhizomatous perennial forming clumps up to *ca* 2 m tall; stems erect, densely pubescent, at least at top, glandular punctate though sometimes inconspicuously so. Leaves with petioles 1–3.5 cm long; blades narrowly ovate, apex acuminate, base rounded, broadly cuneate or  $\pm$  truncate, margin serrate, 5–14 cm  $\times$  2–3.8 cm, triplinerved. Heads in corymbs up to *ca* 50 cm across; heads *ca* 5 mm long; florets white. Achenes 5-angled, *ca* 1.5 mm long, glabrous; pappus of numerous scabrid bristles *ca* 3 mm long. **Fig. 70F.**

Native of the southern United States of America and Mexico; recorded from near Nerang in the southern Moreton district.

## 6. SOLIDAGO L.

Rhizomatous perennials. Leaves alternate. Heads arranged variously but in Australian species in dense terminal panicles; involucre narrowly campanulate, involucre bracts in few rows, pale coloured; receptacle scales absent; ray florets female; disc florets bisexual. Achenes many-ribbed; pappus of bristles.

100 species North America and 1 in Europe; 1 species naturalized Australia, occurring in south-eastern Queensland.

### 1. \**Solidago altissima* L.

### GOLDENROD

Perennial up to 2 m tall. Leaves with petioles 0–6 mm long; blades narrowly ovate to elliptic, apex acute to acuminate, base attenuate-cuneate, margin serrate to subentire, 4–12 cm  $\times$  0.4–1.2 cm, scabrous above, sparsely pubescent below. Heads in dense terminal panicles, heads borne on upper side of branches; involucre 3–5 mm long, 2–3 mm wide, involucre bracts linear; ray florets in 1 row, rays yellow, 1–2 mm long; disc florets yellow. Achenes *ca* 1 mm long; pappus *ca* 2.5 mm long. **Fig. 70H.**

Native of North America; occasional in the region, probably a garden escape. Flowers summer–autumn.

## 7. DICHROCEPHALA L'Hérit. ex DC.

Annual herbs. Leaves alternate. Heads small, subglobose, grouped in terminal panicles; ray florets absent; outer florets female, corolla tubular, shorter than ovary, minutely 3-lobed; inner florets bisexual, few, campanulate, 4–5-lobed; anthers with minute apical appendage; style branches short. Achenes compressed, glabrous; pappus absent or rarely of 2 minute bristles.

13 species, Africa, Madagascar, tropical and subtropical Asia and Australia; 1 species Australia, occurring in south-eastern Queensland.

### 1. *Dichrocephala integrifolia* (L. f.) Kuntze

*Hippia integrifolia* L. f.; *Dichrocephala latifolia* (Desf.) DC.

Erect or ascending herb 0.5–1.5 m tall, glabrous or sparsely pilose. Leaves with petioles up to *ca* 3 cm long; blades lyrate-pinnatifid, lobes serrate, sometimes lateral lobes absent, 2–6 cm  $\times$  1–4 cm. Heads subglobose, 3–4 mm across, in lax terminal panicles; involucre bracts *ca* 1.5 mm long. Achenes *ca* 1.25 mm long; pappus of 2 minute scales, soon deciduous.

Known in the region only from rainforest margins in the vicinity of Maleny in the southern Wide Bay district. Flowers mid summer.



Fig. 70 ASTERACEAE — A<sub>1</sub>–A<sub>3</sub> *Vernonia cinerea*, A<sub>1</sub> portion of flowering stem x1, A<sub>2</sub> flowering head x3, A<sub>3</sub> achene with pappus x6; B<sub>1</sub>–B<sub>2</sub> *Adenostemma* spp. — B<sub>1</sub>–B<sub>2</sub> *A. lavenia*, B<sub>1</sub> portion of flowering stem x1, B<sub>2</sub> achene with pappus x12; C *A. macrophyllum*, achene with pappus x12; D<sub>1</sub>–D<sub>3</sub> *Ageratum houstonianum*, D<sub>1</sub> portion of flowering stem x1, D<sub>2</sub> floret x6, D<sub>3</sub> involucral bract x12; E–G *Eupatorium* spp. — E<sub>1</sub>–E<sub>2</sub> *E. adenophorum*, E<sub>1</sub> leaf x<sup>2</sup>/<sub>3</sub>, E<sub>2</sub> achene x12; F *E. serotinum*, leaf x<sup>2</sup>/<sub>3</sub>; G<sub>1</sub>–G<sub>2</sub> *E. riparium*, G<sub>1</sub> leaf x<sup>2</sup>/<sub>3</sub>, G<sub>2</sub> achene x12; H *Solidago altissima*, portion of inflorescence and leaf x1; I *Lagenifera gracilis*, achene x12; J *Solenogyne bellioides*, achene x12.

**8. LAGENIFERA** Cass.(Previously incorrectly spelt *Lagenophora*)

Perennial stoloniferous herbs; stems scapiform. Leaves mostly radical. Heads usually solitary; involucre campanulate or hemispherical, involucre bracts in 2–4 rows; receptacle scales absent; ray florets in 1–several rows, female; disc florets male or bisexual, tubular, 5-lobed; anther bases obtuse; style branches slender, papillose on outer surface. Achenes compressed, with thickened margins, produced into short glandular beak surmounted by paler thickened rim; pappus absent.

15 species south-eastern Asia, Australia, New Zealand and Central and South America; 3 species Australia; 1 species south-eastern Queensland.

**1. *Lagenifera gracilis*** Steetz

*Lagenifera billardieri* Cass. var. *microcephala* Benth.; *L. stipitata* auct. Qld. non (Labill.) Druce

Herb with slender rhizome and fleshy roots. Leaves radical; ± sessile or petioles up to ca 1 cm long; blades obovate-spathulate, apex ± obtuse, base attenuate, margin sinuate-dentate with acute or obtuse teeth, 1–6 cm × 0.5–2 cm, glabrous to hirsute. Heads 3–4 mm wide in flower, wider in fruit; rays white, pink or bluish, 1.5–2 mm long. Achenes 2–3.5 mm long, beak 0.2–0.5 mm long, glandular. **Fig. 70I.**

Recorded from the Darling Downs, Wide Bay and Moreton districts, often in eucalypt or brigalow communities. Flowers spring to autumn.

**9. SOLENOGYNE** Cass.

Perennial stoloniferous herbs; stems scapiform. Leaves radical. Heads solitary; involucre campanulate-hemispherical, involucre bracts in 3–4 rows; receptacle scales absent; ray florets female, in 3–4 rows; disc florets male, tubular, 5-lobed; anther bases obtuse; style branches slender, papillose on outer surface. Achenes compressed, not beaked, not glandular, without thickened rim; pappus absent.

3 species all endemic in Australia; 1 species south-eastern Queensland.

**1. *Solenogyne bellioides*** Cass.

*Lagenifera solenogyne* F. Muell.; *L. bellioides* (Cass.) Druce

Herbs with slender rhizome and fleshy roots. Leaves radical; petioles up to 2 cm long; blades obovate, apex acute, base attenuate, margin minutely to coarsely toothed, 1.5–6 cm × 0.5–1.5 cm, ± glabrous to hirsute. Involucre 3–4 mm wide in flower, wider in fruit; rays white to bluish, minute. Achenes 2–2.5 mm long, margin thickened. **Fig. 70J.**

Known from the Moreton, Burnett and Darling Downs districts. Flowers spring–summer.

**10. BRACHYSCOME** Cass.(Sometimes spelt *Brachycome*)

Annual or perennial herbs. Leaves radical and/or alternate cauline, entire or variously dissected. Heads terminal; involucre usually hemispherical, involucre bracts usually in 2–3 rows, with scarious or torn margin; receptacle scales absent; ray florets female, in a single row; disc florets bisexual, 5-toothed; anther bases obtuse, connective sometimes produced into narrow appendage; style branches narrowly ovate, papillose on outer side. Achenes flattened or terete, sometimes winged; pappus present or absent, if present then of free or united, minute or large bristles.

About 75 species Australia, New Zealand, North America and Africa; 59 species Australia; 17 species south-eastern Queensland.

It is necessary to have mature fruits for the identification of **Brachyscome** species as mature and immature fruits may vary considerably in shape and size from each other.

- |   |   |    |
|---|---|----|
| 1. Fruits of two types, those of ray florets wingless and tuberculate, those of disc florets winged and not tuberculate . . . . .   | 1. <i>B. ciliaris</i>                           | 2  |
| Fruits not of two types, those of ray and disc florets similar . . . . .  |   |    |
| 2. Fruits winged . . . . .  |   | 3  |
| Fruits wingless . . . . .   |   | 8  |
| 3. Fruits curved . . . . .  |   | 4  |
| Fruits flat . . . . .   |   | 5  |
| 4. Wings not infolded, with long marginal glandular hairs . . . . .   | 2. <i>B. campylocarpa</i>                       |    |
| Wings infolded, margin without long glandular hairs . . . . .   | 3. <i>B. curvicarpa</i>                         |    |
| 5. Wing margins entire; sides of fruit with bladder-like swellings . . . . .  | 4. <i>B. whitei</i>                             |    |
| Wing margins irregularly incised; sides of fruit often tuberculate but without bladder-like swellings . . . . .   |   | 6  |
| 6. Involucres 10 mm or more in diameter; fruits 3–4 mm long without tubercles on faces . . . . .  | 5. <i>B. aculeata</i>                           |    |
| Involucres less than 10 mm diameter; fruits 2–3 mm long, often with tubercles on faces . . . . .  |   | 7  |
| 7. Plants with woolly hairs in leaf axils or on whole plant; rays 5–9 mm long . . . . .   | 6. <i>B. dentata</i>                            |    |
| Plants without woolly hairs; rays <i>ca</i> 4 mm long . . . . .   | 7. <i>B. ascendens</i>                          |    |
| 8. Fruits turgid at maturity . . . . .  |   | 9  |
| Fruits flat at maturity . . . . .   |   | 13 |
| 9. Leaves entire . . . . .  | 8. <i>B. basaltica</i>                          |    |
| At least some leaves toothed or variously dissected . . . . .   |   | 10 |
| 10. Leaves toothed or lobed, often some entire; fruits conspicuously densely tuberculate on each face . . . . .   | 9. <i>B. melanocarpa</i>                        |    |
| Leaves 1–2-pinnatisect or 1-pinnate; fruits usually with some tubercles but not densely tuberculate . . . . .   |   | 11 |
| 11. Pappus not obliquely placed . . . . .   | 10. <i>B. multifida</i>                         |    |
| Pappus obliquely placed . . . . .   |   | 12 |
| 12. Fruits with inconspicuous longitudinal folds not broken into large tubercles . . . . .  | 11. <i>B. diversifolia</i> var. <i>dissecta</i> |    |
| Fruits with conspicuous longitudinal folds broken up into large tubercles . . . . .   | 12. <i>B. goniocarpa</i>                        |    |
| 13. Plants glabrous . . . . .   |   | 14 |
| Plants glandular and/or septate hairy . . . . .   |   | 15 |
| 14. Leaves entire . . . . .   | 13. <i>B. scapigera</i>                         |    |
| Leaves pinnatisect . . . . .  | 14. <i>B. stuartii</i>                          |    |
| 15. Faces of fruit smooth . . . . .   | 15. <i>B. tenuiscapa</i> var. <i>pubescens</i>  |    |
| Faces of fruit tuberculate . . . . .  |   | 16 |
| 16. Margins of achenes with irregular tubercle-like lobes . . . . .   | 7. <i>B. ascendens</i>                          |    |
| Margins of achenes smooth . . . . .   |   | 17 |
| 17. Ascending or weakly erect; leaf blades narrowly cuneate to ovate-cuneate or obicular in outline, crenate to pinnatifid or pinnatisect, lobes up to <i>ca</i> 0.8 cm × 0.25 cm . . . . . | 16. <i>B. microcarpa</i>                        |    |
| Erect; leaf blades entire and linear or pinnatisect with linear lobes up to <i>ca</i> 0.8 cm × 0.1 cm . . . . .   | 17. <i>B. trachycarpa</i>                       |    |

### 1. *Brachyscome ciliaris* (Labill.) Less.

*Bellis ciliaris* Labill.

Erect or ascending perennial up to *ca* 45 cm tall. Leaves cauline, linear to lyrate, margin entire or pinnatisect. Involucres 4–10 mm diameter, involucral bracts 2–4.5 mm long, with lacerate-ciliate margin; ray florets white to purple, rays 2–7 mm long; disc florets yellow. Achenes of ray and disc florets of different types; ray achenes

dark brown to black, oblong-cuneate, flattened, margin smooth, not winged, 1.3–1.8 mm long, with few glandular hairs; disc achenes brown to black, elliptic, flattened, 1.5–2.5 mm long, glabrous or with few curled glandular hairs, marginal wings whitish or creamish, entire or irregularly and shallowly lobed, with long curled glandular hairs on margin; pappus of both fruit types small but relatively conspicuous, larger in disc fruit than ray fruit of same head.

Two varieties occur in the region:

- |  |  |
|--|--|
| 1. Leaves pinnatisect, lobes occasionally reduced to teeth, rarely<br>2-pinnatisect, lobes 3–9, narrowly to broadly linear, up to <i>ca</i><br>1.6 cm × 0.2 cm | <i>B. ciliaris</i> var. <i>ciliaris</i>        |
| Leaves linear, entire or some with 1–3 segments or teeth, whole<br>leaf up to 3.2 cm × 0.1 cm  | <i>B. ciliaris</i> var. <i>subintegrifolia</i> |

Both *B. ciliaris* var. *ciliaris* (Fig. 71A.) and *B. ciliaris* var. *subintegrifolia* G. L. Davis are well known from the central and western Darling Downs districts. Flowers mostly spring.

## 2. *Brachyscome campylocarpa* J. M. Black

Many-stemmed erect or ascending annual up to *ca* 30 cm tall, hairy in axils, otherwise ± glabrous. Leaves radical and cauline; blades 1–2-pinnatisect with sheathing base, rarely radical leaves entire, whole leaf up to 11.2 cm long, leaf segments 3–5, up to 2 cm × 0.2 cm. Involucres 6–9 mm diameter, involucre bracts 3.5–5 mm long; ray florets white, rays up to 1 cm long; disc florets yellow. Achenes black when mature, oblong-cuneate, strongly curved, 2–3 mm long, body terete, wings thick and distally expanded, with long marginal glandular hairs Fig. 71B.

Rarely collected; the Queensland Herbarium has two specimens of this species from Queensland, one from Yelarbon in the western Darling Downs district and one from Birdsville in the Gregory South district.

## 3. *Brachyscome curvicarpa* G. L. Davis

Erect or ascending perennial up to *ca* 45 cm tall, stems woolly hairy or glandular, or sometimes ± glabrous. Upper leaves sessile, lower with petioles up to *ca* 3 cm long; blades broadly to narrowly cuneate, base tapering, pinnatisect or toothed, rarely ± entire, up to 5 cm × 1.5 cm. Involucres 4–8 mm diameter, involucre bracts 3.5–4.5 mm long; ray florets white or lavender, rays 5–7 mm long; disc florets yellow. Achenes brown to dark brown, obovate, curved, *ca* 2 mm long, margin wings infolded and glandular hairy on edges; pappus conspicuous, whitish. Fig. 71C.

Known from the Darling Downs district. Flowers found most of the year.

## 4. *Brachyscome whitei* G. L. Davis

Ascending annual up to *ca* 20 cm tall, minutely glandular pubescent to conspicuously septate hairy. Leaves radical and cauline; petioles up to *ca* 2 cm long, reducing upwards, upper leaves ± sessile; blades broadly ovate to broadly elliptic to elliptic or cuneate, pinnatifid or toothed in upper part, up to *ca* 4 cm × 2 cm, reducing upwards. Involucres *ca* 4–5 mm diameter, involucre bracts 2–4 mm long; ray florets pink to purplish to bluish, rays 5–6 mm long. Achenes dark brown to black, obovate, flattened, *ca* 1.5–1.8 mm long, each face with numerous confluent tubercles giving an inflated appearance, margin winged, wavy, glandular on edges; pappus whitish, relatively conspicuous. Fig. 71D.

Known from sandy soils of the western Darling Downs district. Flowers late winter–spring.

## 5. *Brachyscome aculeata* (Labill.) Less.

*Bellis aculeata* Labill.; *Brachyscome scapiformis* DC.

Erect or ascending perennial with 1–several stems up to 62 cm tall. Basal rosette and lower cauline leaves ± sessile or petioles up to *ca* 4 cm long, blades narrowly obovate to spatulate, apex rounded, base tapered, margin crenate or toothed, up to *ca* 10 cm × 2 cm; upper cauline leaves sessile, blades linear to cuneate, margin acutely and irregularly toothed, occasionally more deeply divided, rarely entire, smaller than basal leaves and reducing upwards. Heads on leafy peduncles; involucres up to 1.8 cm

across, involucre bracts up to 8 mm × 2 mm; ray florets white, lilac or blue, rays *ca* 5–8 mm long; disc florets yellow. Achenes broad, flat, 3–4 mm × 1.5–3 mm, winged, wing ± entire to irregularly and incompletely dissected; pappus less than 0.5 mm long. **Fig. 71G.**

Rare in the region, known only from extreme southern parts of the Moreton and Darling Downs district.

#### 6. *Brachyscome dentata* Gaudich.

*Brachyscome heterodonta* DC.; *B. marginata* Benth.

Erect perennial, branching from base, up to *ca* 45 cm tall, woolly hairs in leaf axils or on whole plant. Radical leaves present in young plants, cauline leaves numerous; petioles of lower leaves up to *ca* 3 cm long, upper leaves ± sessile; blades linear-cuneate to cuneate, entire except for 3 acute terminal teeth, occasionally pinnatisect, lobes few, whole blade up to *ca* 8.5 cm × 0.8 cm. Involucres *ca* 5–8 mm diameter, involucre bracts 3–5 mm long; ray florets white, rays 5–9 mm long; disc florets yellow. Achenes broadly cuneate, flat, 2–3 mm long, body frequently with long tubercles at maturity, wings broad, irregularly and deeply dissected; pappus whitish, conspicuous. **Fig. 71E.**

Widespread in the Darling Downs district. Flowers mostly spring.

#### 7. *Brachyscome ascendens* G. L. Davis

Ascending perennial up to *ca* 30 cm tall, glandular and septate hairy. Cauline leaves ± sessile; blades cuneate, dentate to pinnatifid with 2–8 acute lobes or teeth, up to *ca* 2.8 cm × 0.8 cm. Involucres *ca* 5–9 mm wide, involucre bracts *ca* 4.5 mm × 1.5 mm; ray florets lavender, rays *ca* 4 mm long; disc florets yellow. Achenes broad, oblong, flat, *ca* 2 mm × 1.3 mm, body tuberculate in centre, laterally expanded into irregular thickened lobes, appearing wing-like; pappus less than 0.5 mm long but relatively conspicuous. **Fig. 71N.**

Rare, known only from the Roberts Plateau area of the southern Moreton district.

#### 8. *Brachyscome basaltica* F. Muell.

Glabrous perennial up to *ca* 60 cm tall. Leaves radical and cauline or cauline only; sessile; apex ± acute, margin entire. Involucres *ca* 5–8 mm diameter, involucre bracts 2.5–4 mm long; ray florets whitish, rays 3.5–8 mm long; disc florets yellow. Achenes flattened at first, becoming ± turgid at maturity, 1.5–2 mm long, conspicuously tuberculate, margin smooth but becoming obscured at maturity; pappus a terminal rim which may be irregularly divided.

Two varieties occur in the region:

- |  |   |
|--|---|
| 1. Lower leaves narrowly ovate, 3.2–5.5 cm × 0.6–1.4 cm broad,<br>prominently 3-veined, upper leaves smaller . . . . . | <i>B. basaltica</i> var. <i>basaltica</i> |
| Lower leaves linear-ovate to linear, 3–9.5 cm × <i>ca</i> 0.25 cm,<br>1-veined, upper leaves ± filiform . . . . .      | <i>B. basaltica</i> var. <i>gracilis</i>  |

*Brachyscome basaltica* var. *basaltica* (**Fig. 71F.**) is known from the Moreton and Darling Downs districts and is probably found elsewhere in the region. Flowers most of the year. G. L. Davis, *Blumea* 73:174 (1948) gives the range of *B. basaltica* var. *gracilis* Benth. as "Southern coast of Qld . . ." The Queensland Herbarium has specimens from the Leichhardt and Port Curtis districts but none from south-eastern Queensland. However as the variety is found in New South Wales and Victoria it has been included here as its range may extend into the area covered by this Flora.

#### 9. *Brachyscome melanocarpa* Sonder & F. Muell. ex Sonder

Perennial, ± erect, up to *ca* 45 cm tall. Leaves radical and cauline, on young plants radical leaves only present; lower leaves with petioles up to *ca* 5 cm long, upper ones sessile; lower leaf blades oblong-cuneate, with broad acute to rounded lobes, up to *ca* 4 cm × 2.5 cm, blades gradually becoming narrower upwards; upper sessile ones ± linear or linear-ovate, entire or with few teeth, up to 6 cm × 0.8 cm. Involucres 0.7–1.2 cm diameter, involucre bracts 3–5 mm long; ray florets white to bluish purple, rays 6–10 mm long; disc florets yellow. Achenes black or dark brown, turgid

and subcylindrical at maturity, 2–2.5 mm long, densely tuberculate on each face, margin smooth or  $\pm$  tuberculate; pappus white, conspicuous. **Fig. 71K.**

Known from the south-western Darling Downs district. Flowers mostly spring.

**10. *Brachyscome multifida* DC.**

Glabrous, probably perennial, branching from base, up to *ca* 45 cm tall. Leaves cauline;  $\pm$  sessile or petioles up to 1.2 cm long to first leaf division; blades 1–2-pinnatisect, segments 5–10,  $\pm$  linear, 0.5–2 cm  $\times$  0.05–0.1 cm. Involucres 5–7 mm diameter, involucre bracts 2–3.5 mm long; ray florets white to pink to bluish, rays 4–10 mm long; disc florets yellow. Achenes brown to black,  $\pm$  cuneate, turgid and slightly flattened, 1.8–2.5 mm long, tuberculate, margin smooth; pappus white, short, of unequal bristles grouped in bundles. **Fig. 71H.**

Widespread in the Darling Downs district on well drained soils. Flowers late autumn to spring. Cultivated as an ornamental. Usually sold at nurseries as HAWKESBURY RIVER DAISY.

**11. *Brachyscome diversifolia* (Graham) Fischer & C. A. Meyer var. *dissecta* G. L. Davis**

Erect perennial branching from base, up to *ca* 40 cm tall, stems glandular and  $\pm$  septate pubescent. Leaves radical and cauline; petioles up to *ca* 5.5 cm long, up to first division of blade, expanded at base; blades 1–2-pinnatisect, ultimate segments linear to linear-oblong, apex acute, up to *ca* 1.2 cm  $\times$  0.15 cm. Involucres *ca* 0.8–1 cm diameter, involucre bracts *ca* 6–6.5 mm long; ray florets white, rays *ca* 0.8–1 cm long; disc florets yellow. Achenes light to dark brown, narrowly cuneate, quadrangular, laterally compressed, with two longitudinal folds on each side, sometimes with fine tubercles, *ca* 1.8–2.8 cm long; pappus bristles white, *ca* 0.5 mm long. **Fig. 71J.**

Known from the Darling Downs district between Inglewood and Millmerran. Flowers spring.

**12. *Brachyscome gonicarpa* Sonder & F. Muell. ex Sonder**

Annual,  $\pm$  erect, up to *ca* 22 cm tall, with sparse glandular and septate hairs. Leaves radical and cauline; petioles up to *ca* 2 cm long, expanded at base; blades pinnatisect or 1-pinnate, up to *ca* 3 cm long, segments linear to elliptic, apex obtuse to acute, margin sometimes toothed, *ca* 4–7 mm  $\times$  0.7–2 mm. Involucres 4–7 mm diameter, involucre bracts 2.5–6 mm long; ray florets white, rays 4–8 mm long; disc florets yellow. Achenes black or brown, cuneate, quadrangular with the lateral longitudinal folds broken up into tubercles, 1.2–2.4 mm long, margin smooth or dorsal one produced into a crest; pappus white, obliquely placed. **Fig. 71I.**

Known from the central Darling Downs district between Inglewood and Millmerran. Flowers spring.

**13. *Brachyscome scapigera* (Sieber ex Sprengel) DC.**

*Senecio scapigera* Sieber ex Sprengel

Glabrous tufted perennial up to *ca* 40 cm tall. Leaves radical; petioles mostly 0.5–5 cm long, often winged; blades linear to narrowly obovate, apex acute or rounded, base tapering, margin entire, 2–10 cm  $\times$  0.4–1.5 cm. Involucres 0.7–1 cm diameter, involucre bracts 0.3–5 mm long; ray florets white or mauve, rays 0.5–0.9 mm long; disc florets yellow. Achenes brown,  $\pm$  cuneate, flattened, 2–3 mm long, margins thickened, smooth; pappus minute. **Fig. 71L.**

Rare in the region, collected once from Stanthorpe in the southern Darling Downs district.

**14. *Brachyscome stuartii* Benth.**

Glabrous tufted perennial up to *ca* 20 cm tall. Leaves radical; petioles 0.5–2 cm to first leaf division; blades pinnatisect, up to *ca* 5 cm long, segments up to *ca* 13, entire or irregularly toothed or lobed, up to *ca* 9 mm long, largest toward top of leaf. Involucres 0.5–0.8 mm diameter, involucre bracts 2.5–3.5 mm long; ray florets white to mauve to bluish, rays 5–8 mm long; disc florets yellow. Achenes dark brown to black, cuneate, laterally flattened, with two conspicuous folds on each edge, 0.9–1.7 mm long, with few tubercles in central region of sides; pappus white, short, bristles unequal. **Fig. 71M.**

Stanthorpe-Wallangarra area of the southern Darling Downs district. Flowers spring to autumn but mostly spring.



Fig. 71 ASTERACEAE — A–Q *Brachyscome* spp. — A–K achenes, all x12 — A<sub>1</sub>–A<sub>2</sub> *B. ciliaris* var. *ciliaris*, A<sub>1</sub> disc achene, A<sub>2</sub> ray achene; B *B. campylocarpa*; C *B. curvicarpa*; D *B. whitei*; E *B. dentata*; F *B. basaltica* var. *basaltica*; G *B. aculeata*; H *B. multifida*; I *B. goniocarpa*; J, *B. diversifolia* var. *dissecta*, K *B. melanocarpa*; L<sub>1</sub>–L<sub>2</sub> *B. scapigera*, L<sub>1</sub> flowering plant x1, L<sub>2</sub> achene x12; M<sub>1</sub>–M<sub>2</sub> *B. stuartii*, M<sub>1</sub> flowering plant x1, M<sub>2</sub> achene x12; N *B. ascendens*, achene x12; O<sub>1</sub>–O<sub>2</sub> *B. trachycarpa*, O<sub>1</sub> flowering stem x1, O<sub>2</sub> achene x12; P<sub>1</sub>–P<sub>2</sub> *B. microcarpa*, P<sub>1</sub> flowering plant x1, P<sub>2</sub> achene x12; Q *B. tenuiscapa* var. *pubescens*, achene x12.

**15. *Brachyscome tenuiscapa* J. D. Hook. var *pubescens* (Benth.) G. L. Davis***Brachyscome decipiens* J. D. Hook. var. *pubescens* Benth.

Stoloniferous perennial up to *ca* 26 cm tall, pubescent with glandular septate hairs. Leaves radical; sessile or with  $\pm$  winged petioles up to *ca* 4 cm long, bases sheathing; blades narrowly obovate or almost spatulate, apex  $\pm$  rounded, base tapering, margin entire below, toothed towards apex, 2–4 cm  $\times$  0.4–1.5 cm. Involucres *ca* 5–7 mm diameter, involucre bracts *ca* 3–5 mm long; ray florets mauve, rays *ca* 6–7 mm long; disc florets yellow. Achenes dark brown to black, cuneate, flattened, 1.2–1.8 mm long, margin thickened, faces smooth. **Fig. 71Q.**

Stanthorpe-Wallangarra area of the southern Darling Downs district. Flowers spring.

**16. *Brachyscome microcarpa* F. Muell.***Brachyscome discolor* C. Stuart ex Benth.

Ascending or weakly erect perennial, frequently with no main stem, mostly less than 45 cm tall, usually  $\pm$  glandular pubescent, rarely glabrous. Leaves radical and cauline; lower leaves with petioles up to *ca* 5 cm long, upper ones  $\pm$  sessile; blades narrowly cuneate to ovate-cuneate or  $\pm$  orbicular, pinnatifid to pinnatisect or crenate, rarely almost entire, up to *ca* 4 cm  $\times$  2 cm, reducing upwards. Involucres 3–6 mm diameter, involucre bracts 2–3 mm long; ray florets white to bluish, rays 4–6 mm long; disc florets yellow. Achenes brown to black, obovate-cuneate, flattened, 1–1.8 mm long, tuberculate on central area of each face, margin smooth; pappus white, short. **Fig. 71P.**

Widespread in the region, in well drained areas. Flowers spring to autumn.

**17. *Brachyscome trachycarpa* F. Muell.**

Erect perennial up to *ca* 40 cm tall, stems glandular scabrid. Leaves sessile or petioles up to *ca* 1 cm long to first division, difficult to distinguish from blades; blades either entire and linear, 0.5–3.5 cm  $\times$  0.08–0.2 cm, or pinnatisect and up to *ca* 3.5 cm long, lobes 1–6,  $\pm$  linear, up to 8 mm  $\times$  1 mm. Involucres 2–3.5 mm diameter, involucre bracts 1.5–2.5 mm long; ray florets white to purplish to bluish, rays 3–5 mm long. Achenes brown, oblong-cuneate, flattened, 1.5–1.8 mm long, minutely tuberculate on sides, each tubercle with moderately conspicuous glandular hairs, margin  $\pm$  thickened, smooth; pappus minute, crown shaped. **Fig. 71O.**

Western Darling Downs district. Flowers found most of the year.

**11. MINURIA DC.**

Annual or perennial herbs, erect or prostrate. Leaves alternate, sometimes clustered, sessile. Heads pedunculate, solitary; involucres ovoid or hemispherical, involucre bracts in 3–4 rows; receptacle scales absent; ray florets female, in 2 or more rows; disc florets sterile or male, tubular, 5-toothed, rarely 4-toothed; anther bases obtuse; stigma lobes pointed with papillose stigmatic lines. Achenes of ray florets  $\pm$  flattened,  $\pm$  prominently ribbed, pappus of several-many bristles free or united in clumps; achenes of disc florets sterile, flattened; pappus very variable, of dimorphic hairs, long and short,  $\pm$  free or of a cup of connate scales.

9 species all endemic in Australia; 1 species south-eastern Queensland.

**1. *Minuria integerrima* (DC.) Benth.****SMOOTH MINURIA***Therogeron integerrimum* DC.; *Minuria candollei* F. Muell.

Spreading perennial herb up to 60 cm tall, woody at base; stems glabrous. Leaves narrowly ovate, apex acute-acuminate, margin entire or  $\pm$  denticulate, 1–5 cm  $\times$  0.1–0.5(–0.9) cm, glabrous, midrib conspicuous. Heads *ca* 1.2 cm across expanded rays; involucre bracts in 4 rows, narrow, 2–4 mm long, glabrous; ray florets in several rows, ray purple or bluish, 3–4.5 mm long; disc florets yellow. Achenes of ray florets brown, 0.5–1.1 mm long; pappus of many free barbellate bristles 1.5–2 mm long; sterile disc achenes translucent, flattened, 0.4–1 mm long; pappus of 8–10 barbellate bristles, 1.5–2 mm long. **Fig. 74A.**

Darling Downs district, usually on heavy soils. Flowers spring to autumn.

## 12. CALOTIS R. Br.

Perennial or annual herbs or occasionally subshrubs. Leaves radical and/or cauline, petiolate or sessile; blades entire or variously dissected. Heads solitary, axillary or forming cymose or racemose panicles; involucre bracts in 3–4 whorls; receptacle scales absent; ray florets female, in 1-several series; disc florets usually male, rarely bisexual, 5-toothed; anthers obtuse at base with connective extended to form narrow terminal appendage; style branches linear. Achenes flattened; pappus represented by awns which are usually rigid and armed with recurved barbs, occasionally plumose, rarely absent, scales alternating with awns sometimes present.

About 23 species endemic in Australia; 8 species south-eastern Queensland.

1. Bodies of fruits hairy all over . . . . .	1. <i>C. hispidula</i>	2
Bodies of fruits glabrous or with few hairs on sides and at apex . . . . .	. . . . .	
2. Pappus represented by rigid awns alternating with an equal number of scales . . . . .	. . . . .	3
Pappus represented by awns only, scales absent . . . . .	. . . . .	5
3. Heads on extremely short peduncles so as to appear sessile . . . . .	2. <i>C. squamigera</i>	4
Heads on long peduncles, not appearing sessile . . . . .	. . . . .	
4. Scales infolded at top so as to appear entire; awns barbed along upper part . . . . .	3. <i>C. cuneifolia</i>	
Scales not infolded, fringed at top; awns with barbs in form of terminal arrow head . . . . .	4. <i>C. dentex</i>	
5. Major awns 2 or rarely 3 . . . . .	5. <i>C. lappulacea</i>	6
Major awns 4–6 . . . . .	. . . . .	
6. Major awns ± equal in length; rays 0.25–0.5 cm long . . . . .	6. <i>C. scapigera</i>	7
Major awns very unequal in length; rays 0.5–1.2 cm long . . . . .	. . . . .	
7. Awns in a single ring . . . . .	7. <i>C. scabiosifolia</i>	
Second ring of plumose awns present within first . . . . .	8. <i>C. cuneata</i>	

1. *Calotis hispidula* (F. Muell.) F. Muell.

BOGAN FLEA; BINDY EYE

*Cheiriloma hispidulum* F. Muell.

Prostrate or ascending annual up to *ca* 30 cm tall, ± pubescent with septate hairs. Leaves with petioles up to *ca* 1 cm long or absent on upper leaves; blades ± cuneate or narrowly obovate, apex rounded to acute, base tapering to petiole, margin 3–5-toothed or occasionally entire, up to 2.5 cm × 0.8 cm, becoming smaller upwards. Involucres 0.3–0.5 mm across, involucre bracts 2–4 mm long; ray florets yellow, rays *ca* 1 mm long; disc florets yellow. Achenes cuneate, flattened, body 1.5–2.5 mm long, ± densely white hairy; awns 5–6, 1.5–2.5 mm long, barbed in upper part, woolly in lower part, awns alternating with scales which are dissected into 2–8 hairy processes usually resembling secondary awns. **Fig. 72A.**

Widespread in western parts of the region, on sandy soils in cleared brigalow country. Flowers spring.

2. *Calotis squamigera* C. T. White

Procumbent annual up to *ca* 15 cm tall but often less than 5 cm tall, septate hairy. Radical leaves with petioles up to *ca* 2.5 cm long, blades narrowly obovate, apex ± rounded, base narrowed to petiole, margin entire or sparsely toothed, 1.5–3 cm × 0.2–0.6 cm; cauline leaves similar to radical leaves but smaller. Heads on very short peduncles so as to appear sessile; involucres 4–6 mm across, involucre bracts 3–3.5 mm long; ray florets with minute rays; disc florets yellow. Fruiting heads 6–8 mm diameter; achenes cuneate, flattened, body 1.7–2.2 mm long, minutely tuberculate, sometimes with few hairs along margin and at apex; awns 4–5, vertical or slightly divaricate, 1.7–2.5 mm long, minutely barbed along entire length, alternating with short scales with ciliolate margins. **Fig. 72B.**

Western Darling Downs district. Flowers winter–spring.

**3. *Calotis cuneifolia* R. Br.**

*Calotis cuneifolia* R. Br. var. *biaristata* Domin; *C. cuneifolia* R. Br. var. *glabrescens* C. T. White; *C. scabriuscula* C. T. White var. *lobata* C. T. White

Erect ascending or sometimes prostrate perennial up to ca 60 cm tall, septate hairy. Cauline leaves with petioles up to ca 1.5 cm long, usually winged, abruptly expanded at base, blades cuneate, with 3–6 distal lobes each usually entire or occasionally toothed, up to 4 cm × 2 cm, becoming smaller upwards; radical leaves similar but only present on young plants. Heads terminal and axillary; involucre 4–6 mm across, involucre bracts 2–3.5 mm long; ray florets white or lilac, rays 3–6 mm long; disc florets yellow. Fruiting heads 0.8–1.2 cm diameter; achenes cuneate, flattened, body 0.8–1.8 mm long, tuberculate, ± glabrous; awns usually 2, occasionally 3–4, 1–3.5 mm long, barbed in upper half, awns alternating with equal number of smooth infolded scales which are broader than long. **Fig. 72C.**

Widespread in the region and moderately common in the Darling Downs district. Flowers found most of the year.

**4. *Calotis dentex* R. Br.**

WHITE BURR DAISY; WHITE DAISY BURR

*Calotis scabriuscula* C. T. White

Erect branching perennial up to ca 80 cm tall, septate hairy. Leaves sessile, ± stem clasping, oblong to narrowly obovate, apex ± acute, base narrowing but expanding suddenly at extreme base, margin of lower leaves serrate or dentate or occasionally pinnatifid, upper leaves usually entire, up to ca 8 cm × 2 cm, becoming smaller upwards. Involucre 0.7–1.5 cm across, involucre bracts 5–10 mm long; ray florets white, rays 5–10 mm long; disc florets yellow. Fruiting heads 1–2 cm diameter; achenes cuneate, flattened, body 1.7–2.2 mm long, smooth or minutely papillose on faces, glabrous; awns 2, occasionally 1 or 3, 4–6.5 mm long, barbed with barbs in form of terminal arrow head, awns alternating with fringed scales which are broader than long. **Fig. 72D.**

Widespread throughout the region on well drained often sandy soils. Flowers found throughout the year.

**5. *Calotis lappulacea* Benth.**

YELLOW BURR DAISY; YELLOW DAISY BURR

*Calotis suffruticosa* Domin; *Calotis glabrescens* C. T. White

Perennial, ± erect, up to ca 50 cm tall, ± septate hairy, woody at base. Radical leaves present only on young plants, cuneate, toothed or pinnatifid, up to 6 cm × 0.8 cm; cauline leaves sessile or broader ones sometimes with petioles up to ca 1 cm long, blades mostly linear or narrowly obovate and entire, sometimes acutely toothed, occasionally broader and pinnatifid, up to 2.5 cm × 0.5 cm, becoming smaller upwards. Involucre 3–5 mm across, involucre bracts 2–3 mm long; ray florets yellow, rays 2.5–3.5 mm long; disc florets yellow. Fruiting heads 5–7 mm diameter; achenes cuneate, flattened, body 1.2–1.6 mm long, tuberculate, glabrous; major awns 2, rarely 3, erect or slightly divergent, usually arising from centre of top of flattened faces, about as long as body, secondary awns ± horizontal, much shorter than major ones, 3–6 clustered together on one side, 1 or rarely more on other, awns barbed in upper part, usually with septate hairs in lower part, rarely with septate hairs only. **Fig. 72E.**

Widespread in the region, usually on heavy soils. Flowers found most of the year but mainly spring and autumn.

**6. *Calotis scapigera* Hook.**

TUFTED BURR DAISY

Stoloniferous perennial mostly less than 20 cm tall, with basal cluster of leaves. Radical leaves with petioles up to ca 1.5 cm long; blades linear to linear-obovate, apex acute, base narrowed, margin entire or sparsely toothed, occasionally with few linear lobes, 2–4 cm × 0.2–0.6 cm, glabrous or almost so. Involucre 4–7 mm across, involucre bracts 3–4 mm long; ray florets white or purplish, rays 2.5–5 mm long; disc florets yellow. Fruiting heads 6–10 mm diameter; achenes cuneate, flattened, body 1.7–2.5 mm long, glabrous; awns 4–6, diverging, 1–4 mm long, minutely barbed in upper part, woolly hairy in lower part. **Fig. 72F.**

Darling Downs district, rare.

7. *Calotis scabiosifolia* Sonder & F. Muell.

## ROUGH BURR DAISY

Erect stoloniferous perennial up to 45 cm tall, from glabrous to moderately densely septate hairy. Radical leaves with petioles up to *ca* 6 cm long, blades elliptic to narrowly obovate or obovate, apex rounded, base narrowed to petiole, margin serrate, pinnatifid or pinnatipartite, segments entire or serrate, 1.5–11 cm × 0.7–4 cm; cauline leaves sessile, narrowly ovate to oblong to linear, margin entire or serrate, up to *ca* 6 cm × 0.8 cm, becoming smaller upwards. Involucres 6–10 mm across, involucre bracts 3.5–9 mm long; ray florets white or purplish, rays 0.5–1.2 cm long; disc florets yellow. Fruiting heads 0.8–1.5 cm diameter; achenes cuneate, flattened, body 2.5–4 mm long, usually with at least few hairs along margins; major awns 5–6, 0.8–4 mm long, barbed in upper part, hairy in lower part, secondary awns when present 0.5–1 mm long, hairy, without barbs. **Fig. 72G.**

Western Darling Downs district, on heavy soils. Flowers spring to autumn, but mostly spring.

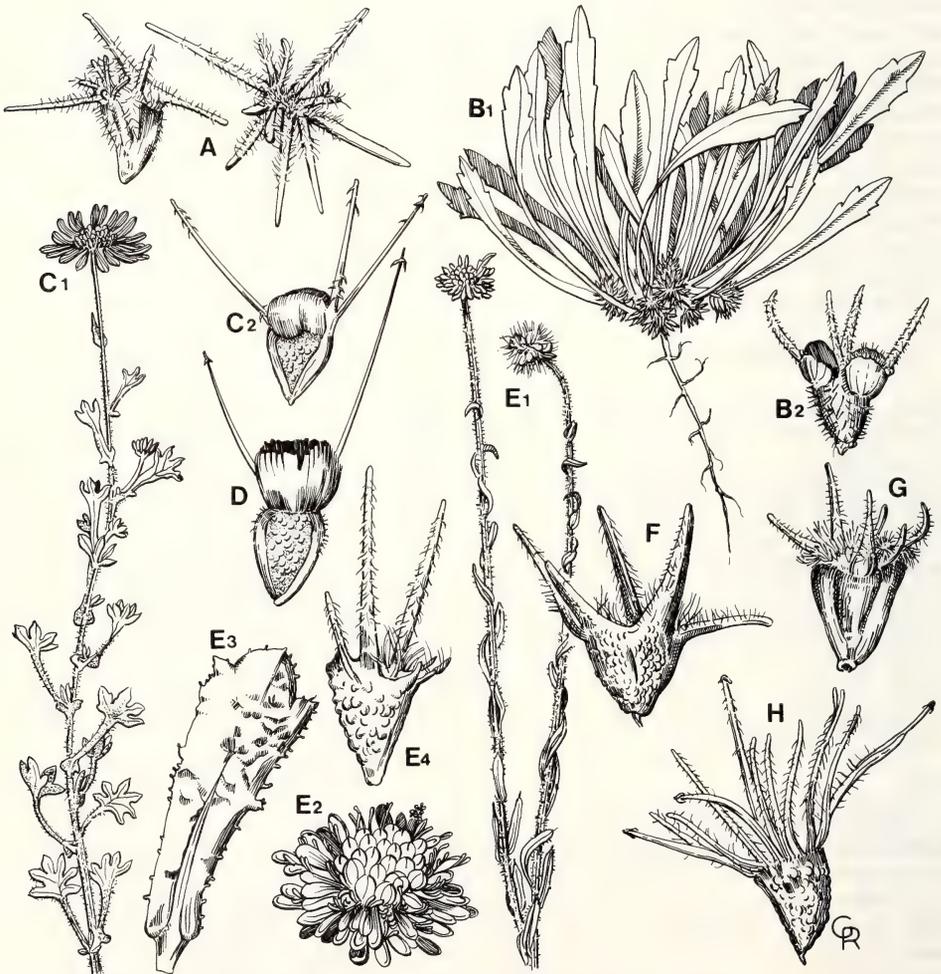


Fig. 72 ASTERACEAE — A–H *Calotis* spp. — A *C. hispidula*, top and side views of achene x6; B<sub>1</sub>–B<sub>2</sub> *C. squamigera*, B<sub>1</sub> fruiting plant x1, B<sub>2</sub> achene x6; C<sub>1</sub>–C<sub>2</sub> *C. cuneifolia*, C<sub>1</sub> portion of flowering stem x1, C<sub>2</sub> achene x6; D *C. dentex*, achene x6; E<sub>1</sub>–E<sub>4</sub> *C. lappulacea*, E<sub>1</sub> portion of flowering stem x1, E<sub>2</sub> flowering head x3, E<sub>3</sub> leaf x3, E<sub>4</sub> achene x12; F *C. scapigera*, achene x6; G *C. scabiosifolia*, achene x6; H *C. cuneata*, achene x6.



- |   |                                      |    |
|---|--------------------------------------|----|
| 3. Achenes 3–4 mm long; pappus <i>ca</i> 8 mm long . . . . .  | 2. <i>O. pimeleoides</i>             | 4  |
| Achenes 1.5–2 mm long; pappus 3–4 mm long . . . . .   |                                      |    |
| 4. Achenes glabrous . . . . .   | 3. <i>O. microphylla</i>             |    |
| Achenes pubescent . . . . .   | 4. <i>O. ramulosa</i> sens. lat.     |    |
| 5. Leaves glabrous, but often glutinous . . . . .   | 5. <i>O. elliptica</i>               | 6  |
| Leaves hairy, at least below . . . . .  |                                      |    |
| 6. Hairs medifixed or basifixed-multicellular . . . . .   |                                      | 7  |
| Hairs stellate . . . . .  |                                      | 10 |
| 7. Leaves 1.5–4 cm broad . . . . .  |                                      | 8  |
| Leaves up to <i>ca</i> 0.5 cm broad . . . . .   |                                      | 9  |
| 8. Leaf margins not toothed . . . . .   | 6. <i>O. cydoniifolia</i>            |    |
| Leaf margins toothed . . . . .  | 7. <i>O. chrysophylla</i> sens. lat. |    |
| 9. Leaves narrowly elliptic, margins toothed, 3–5 mm broad . . . . .                                    | 8. <i>O. sp. 1.</i>                  |    |
| Leaves $\pm$ linear, margins entire, 1–3 mm broad . . . . .   | 9. <i>O. sp. 2.</i>                  |    |
| 10. Involucres 0.4–0.5 cm broad in flower; rays 3–4 mm long . . . . .                                   |                                      | 11 |
| Involucres 0.6–1.4 cm broad . . . . .   |                                      | 12 |
| 11. Leaf margins sinuate-serrate; shrubs up to 5 m tall; restricted to the McPherson Ra. area . . . . . | 10. <i>O. heterocarpa</i>            |    |
| Leaf margins $\pm$ entire; shrubs up to 2 m tall; widespread in the region . . . . .                    | 11. <i>O. canescens</i>              |    |
| 12. Leaves 0.15–0.6 cm broad, restricted to Stradbroke I. . . . .                                       | 12. <i>O. hygrophila</i>             | 13 |
| Leaves 0.7–2.8 cm broad; not restricted to Stradbroke I. . . . .  |                                      |    |
| 13. Involucres 7–9 mm long; known from granite areas of the southern Darling Downs district . . . . .   | 13. <i>O. gravis</i>                 |    |
| Involucres 4–7 mm long; known from eastern parts of the Moreton and Wide Bay districts . . . . .        | 14. <i>O. nernstii</i>               |    |

### 1. *Olearia ramosissima* (DC.) Benth.

*Eurybia ramosissima* DC.

Shrub up to *ca* 1 m tall. Leaves sessile, reflexed, clustered, narrowly ovate or linear, margin revolute, 0.5–2 mm long, glabrous or scabrous above, woolly hairy below. Heads solitary at ends of lateral branches; involucre broadly turbinate, 6–9 mm broad; rays blue, 8–10 mm long; disc florets yellow and blue. Achenes *ca* 2 mm long, pubescent; pappus *ca* 5 mm long.

Granite areas of the southern Darling Downs district. Flowers spring and autumn.

### 2. *Olearia pimeleoides* (DC.) Benth.

*Eurybia pimeleoides* DC.

Shrub up to *ca* 1.5 m tall. Leaves alternate; sessile or petioles up to 3 mm long; blades oblong-cuneate to obovate, apex obtuse, base narrowed, margin recurved, 0.4–1.2 cm  $\times$  0.15–0.3 cm, glabrous to tomentose above, tomentose below. Heads solitary, terminal on branches; involucre turbinate, mostly 8–10 mm broad; rays white, 8–10 mm long; disc florets yellow. Achenes 3–4 mm long, silky hairy; pappus *ca* 8 mm long. **Fig. 74B.**

South-western Darling Downs district in sandy soil, not common. Flowers mostly spring.

### 3. *Olearia microphylla* (Vent.) Maiden & Betche

*Aster microphyllus* Vent.; *Olearia ramulosa* Benth. var. *microphylla* (Vent.) Benth.

Shrub up to 1.5 m tall; stems with simple hairs and glandular granules. Leaves alternate; petioles 0.5–1.5 mm long, distinct; blades obovate to  $\pm$  orbicular, apex rounded, base cuneate, margin recurved, 1.5–5 mm  $\times$  1.5–2.5 mm,  $\pm$  scabrous above, woolly hairy and glandular below. Heads terminal on short lateral branches;

involucres broadly turbinate, *ca* 5 mm broad; rays white, *ca* 5–6 mm long; disc florets yellow. Achenes *ca* 2 mm long, glabrous, sometimes glutinous; pappus *ca* 3 mm long.

Known from the granite areas of the southern Darling Downs district, also from mountains of the southern Moreton district, recorded once from the central Burnett district. Flowers spring.

**4. *Olearia ramulosa* (Labill.) Benth. sens. lat.**

*Aster ramulosus* Labill.

Shrub up to *ca* 60 cm tall; stems  $\pm$  pubescent, often glutinous. Leaves  $\pm$  sessile, crowded, linear, margin recurved, 2–4 mm long, glabrous or pubescent above, tomentose below. Heads sessile at ends of short lateral branches, often forming what appears as leafy racemes; involucres turbinate, 3–5 mm broad; rays white to blue, *ca* 5 mm long; disc florets yellow. Achenes 1.5–2 mm long, pubescent; pappus *ca* 3–4 mm long.

Darling Downs district, usually in sandy soils. Flowers winter–spring.

**5. *Olearia elliptica* DC.**

STICKY DAISY BUSH

Shrub up to 2 m tall, glabrous and usually glutinous. Leaves alternate; petioles 1–2 cm long; blades elliptic to oblong to ovate, apex acute, base cuneate, margin  $\pm$  entire, 4–12 cm  $\times$  1–4 cm. Heads in terminal leafless corymbose panicle; involucres broadly turbinate, *ca* 5–6 mm broad; rays white, *ca* 5–6 mm long; disc florets yellow. Achenes 2–3 mm long, sparsely hairy; pappus *ca* 4 mm long.

Southern Moreton and Darling Downs districts, usually on rocky hillsides or cliff edges, also known from the Bunya Mts. Flowers late spring to autumn.

The above description may cover more than one taxon. Specimens from the Darling Downs district with smaller shiny leaves may belong to a distinct taxon but further material is needed to be sure.

**6. *Olearia cydoniifolia* (DC.) Benth.**

*Eurybia cydoniaefolia* DC.

Shrub up to 4 m tall, with close white or rusty coloured hairs, hairs medifixed. Leaves alternate; petioles 0.5–1.5 cm long; blades ovate or elliptic, apex obtuse to acute, base cuneate, margin  $\pm$  entire, 4–10 cm  $\times$  1.5–4 cm, upper surface  $\pm$  glabrous, finely reticulate, lower surface closely white or ferruginous tomentose. Heads in terminal corymbose panicles; involucres broadly turbinate, *ca* 6–8 mm broad; rays white, 6–8 mm long; disc florets yellow. Achenes *ca* 5 mm long, sparingly hairy; pappus *ca* 6 mm long.

Known from along the McPherson Ra. and in the extreme south-eastern Darling Downs district, usually in tall eucalypt forest. Flowers spring.

**7. *Olearia chrysophylla* (DC.) Benth. sens. lat.**

*Eurybia chrysophylla* DC.

Shrub, indumentum of medifixed hairs. Leaves with petioles *ca* 0.5–1 cm long; blades oblong or elliptic, apex  $\pm$  obtuse to acute, mucronulate, base narrowed, margin denticulate, or entire in some specimens from New South Wales, 6–15 cm  $\times$  1.2–2.5 cm, glabrous above, with dense appressed hairs below, venation conspicuous above. Heads in terminal corymbose panicles; involucres turbinate, *ca* 5 mm broad; rays white, *ca* 8 mm long; disc florets yellow. Achenes *ca* 3 mm long; pappus *ca* 5 mm long.

Known from Northbrook Mt., near Brisbane. Flowers spring.

Queensland material differs from some material from southern parts of Australia and may belong to a distinct species. Further research in this group is needed.

**8. *Olearia* sp. 1.**

Shrub less than 1 m tall; young stems with minute glandular hairs and sparse longer multicellular non glandular ones. Leaves alternate; petioles up to *ca* 1 cm long; blades narrowly elliptic, apex acute, base narrowed, margin toothed, 2–3 cm  $\times$  0.3–0.5 cm,

both surfaces with sparse multicellular hairs and minute glandular ones. Heads few in loose corymbs; involucre broadly turbinate, *ca* 7–9 mm broad; rays blue, 5–8 mm long; disc florets yellow. Achenes *ca* 2.5 mm long, silky hairy; pappus *ca* 4 mm long.

Known from near Glenmorgan in the western Darling Downs district, usually in shallow stony soils. Flowers apparently summer–autumn.

### 9. *Olearia* sp. 2.

Shrub less than 1 m tall; stems with dense appressed hairs, hairs on very young parts often purplish red. Leaves with petioles up to *ca* 2 mm long; blades linear or linear-oblong, margin recurved or revolute, 3–7 cm × 0.1–0.3 cm, densely appressed hairy when young, becoming ± glabrous with age, densely appressed hairy below. Heads in terminal corymbose panicles; involucre turbinate, *ca* 5 mm broad; rays white, *ca* 1 cm long; disc florets yellow. Achenes 2.5–3 cm long, longitudinally ribbed, with short sparse hairs at least in upper half.

Known from the Dawes Ra. in the extreme north of the Burnett district. Flowers spring–summer.

### 10. *Olearia heterocarpa* S. T. Blake

Shrub up to 5 m tall. Leaves alternate; petioles 0.3–1 cm long; blades narrowly ovate, apex acuminate, base cuneate, margin sinuate-serrate, 5–11 cm × 0.7–1.8 cm, densely white or yellowish stellate tomentose below, glabrous or with sparse stellate hairs above. Heads in corymbose panicles; involucre broadly turbinate, *ca* 4–5 mm broad; rays white, 3–4 mm long; disc florets yellow. Achenes *ca* 1.5 mm long, appressed pubescent; pappus 3–4 mm long.

Known from the McPherson Ra. in the southern Moreton district. Flowers spring–summer.

### 11. *Olearia canescens* (Benth.) Hutch.

*Olearia stellulata* (Labill.) DC. var. *canescens* Benth.

Shrub up to 2 m tall. Leaves alternate; petioles 3–6 mm long; blades narrowly ovate or narrowly elliptic, apex obtuse to acuminate, base rounded to acuminate, margin ± entire, 2.5–7 cm × 0.5–2.5 cm, lower surface with dense whitish stellate tomentum, upper surface with dense white stellate tomentum when young, becoming sparser with age at length often ± glabrous. Heads in upper axils forming leafy corymbose panicles; involucre broadly turbinate, 4–5 mm broad; rays white, 3–4 mm long; disc florets yellow. Achenes *ca* 1.5 mm long, hirsute; pappus 3–4 mm long.

Widespread in the region, moderately common. Flowers mainly spring but some found in autumn.

### 12. *Olearia hygrophila* (DC.) Benth.

*Eurybia hygrophila* DC.

Shrub up to *ca* 2 m tall with slender stems, sparsely stellate tomentose. Leaves alternate; petioles 2–5 mm long; blades linear-elliptic, apex acuminate, base attenuate, margin entire or with few teeth, recurved, 1.5–7 cm × 0.15–0.6 cm, glabrous or almost so above, stellate tomentose below. Heads in large corymbose panicles; involucre broadly turbinate, *ca* 1 cm broad; rays white, 8–10 mm long; disc florets yellow. Achenes *ca* 3 mm long, glabrous; pappus *ca* 5 mm long.

Known only from swampy ground on Stradbroke I., possibly in danger of extinction by development of the island. Flowers spring.

### 13. *Olearia gravis* F. Muell.

Shrub up to 2 m tall. Leaves alternate; petioles 4–8 mm long; blades narrowly ovate, apex acute, base cuneate to rounded, margin coarsely toothed, 2–7.5 cm × 0.7–2.5 cm, whitish stellate tomentose below, less densely hairy above or almost glabrous, rugose. Heads in terminal corymbose panicles; involucre broadly turbinate, 1–1.4 cm broad, 7–9 mm long; rays white, 6–10 mm long; disc florets yellow. Achenes 2.5–3.5 mm long, glabrous; pappus *ca* 5 mm long.

Known from granite areas of the southern Darling Downs district. Flowers mostly spring.

**14. *Olearia nernstii* F. Muell.**

Shrub up to 1.5 m tall; stems loosely ferruginous or whitish stellate tomentose. Leaves alternate; petioles 0.5–1 cm long; blades narrowly ovate, apex acute to acuminate, base cuneate, margin remotely toothed, rarely ± entire, 3–10 cm × 1–2.8 cm, loosely stellate tomentose below, sparsely so above or ± glabrous or scabrous. Heads in terminal corymbose panicles; involucre broadly turbinate, 0.7–1.2 cm broad, 4–7 mm long; rays white, 5–10 mm long; disc florets yellow. Achenes 2.5–3.5 mm long, glabrous; pappus 4–5 mm long.

Widespread in the eastern Moreton district, also recorded from the Wide Bay district. Flowers mostly spring, occasionally autumn.

**15. VITTADINIA A. Rich.**

Perennial herbs or undershrubs, at length woody at base. Leaves alternate. Heads terminal, solitary or forming loose terminal corymbs; involucre hemispherical or campanulate, involucre bracts in 2–several rows with dry or scarious margins; receptacle scales absent; ray florets in 2 or more rows, female, rays spreading; disc florets numerous, bisexual, tubular, usually 5-lobed; anthers obtuse at base; style lobes somewhat flattened. Achenes ± obovate, flattened or rarely turgid, with or without ribs on faces; pappus of numerous bristles.

29 species Australia, New Caledonia and New Zealand; 27 species Australia, all endemic; 10 species south-eastern Queensland.

- 1. Achenes flat, with 2–several longitudinal ribs on each face (sometimes ribs obscured by hairs in *V. dissecta*) . . . . . 2  
 Achenes not or scarcely flattened, or if flat then faces not ribbed . . . . . 6
- 2. Leaves filiform, less than 1 mm broad, not lobed or toothed, glabrous or almost so . . . . . 1. *V. tenuissima*  
 Leaves 1 mm or more broad, often lobed or toothed, woolly or scabrous or with long spreading hairs and short glandular ones . . . . . 3
- 3. Achenes glabrous in lower half except sometimes for ring of appressed hairs at very base, with spreading hairs in upper half . . . . . 2. *V. sulcata*  
 Achenes with appressed hairs in lower part, spreading hairy in upper part, or all hairs appressed . . . . . 4
- 4. Achenes with all hairs ± appressed . . . . . 3. *V. dissecta*  
 Achenes appressed hairy in basal part, upper part with ± spreading hairs . . . . . 5
- 5. Leaves spatulate or cuneate with obtuse apex and recurved tip, sometimes with two lateral lobes; involucre bracts with long spreading hairs and shorter glandular ones . . . . . 4. *V. cuneata* var. *hirsuta*  
 Leaves linear or narrowly obovate or narrowly elliptic, apex acute, sometimes with two or rarely more lateral lobes; involucre bracts glabrous or with few appressed hairs . . . . . 5. *V. muelleri*
- 6. Achenes flat, with thickened margins . . . . . 7  
 Achenes not or scarcely flattened, without thickened margins . . . . . 9
- 7. Pappus 3–4.5 mm long . . . . . 6. *V. diffusa*  
 Pappus 5–6.5 mm long . . . . . 8
- 8. Achenes less than 1.25 mm broad; pappus 5–6 mm long . . . . . 7. *V. hispidula*  
 Achenes more than 1.25 mm broad; pappus 6–6.5 mm long . . . . . 8. *V. bicolor*
- 9. Pappus bristles plumose . . . . . 9. *V. pterochaeta*  
 Pappus bristles barbellate . . . . . 10. *V. pustulata*

**1. *Vittadinia tenuissima* (Benth.) J. M. Black**

*Vittadinia australis* A. Rich. var. *tenuissima* Benth.

Herb up to ca 45 cm tall. Leaves ± filiform, 1–3 cm long, less than 1 mm wide, glabrous or almost so. Involucre campanulate when flowering, 4–5 mm long,

involucral bracts acute, glabrous except for few cilia towards tips; rays purple or whitish, *ca* 5 mm long. Achenes flattened, longitudinally ribbed on faces, 3.5–4.5 mm long, glabrous in lower part, upper part with sparse  $\pm$  spreading hairs; pappus of barbellate bristles, 5–8 mm long.

Known from a few scattered localities in the Moreton, Darling Downs and Burnett districts. Flowers autumn.

## 2. *Vittadinia sulcata* N. T. Burbidge

Erect herb up to *ca* 40 cm tall. Leaves sessile,  $\pm$  spatulate, apex rounded, margin often with two acute lateral lobes, otherwise entire, base narrowed, often petiole-like, 0.8–2.5(–5) cm  $\times$  0.15–0.6(–2.5) cm, both surfaces with long spreading hairs and minute glandular ones. Involucres campanulate, 5–6(–9) mm long, involucral bracts acuminate, with long spreading tubercular-based hairs and shorter glandular ones; rays purplish blue, *ca* 5 mm long. Achenes longitudinally ribbed on faces, 4.5–7.5 mm long, glabrous in lower part, with spreading hairs in upper part; pappus bristles barbellate, 6–8 mm long. **Fig. 73A.**

Widespread in the region, except for coastal areas. Flowers spring to autumn.

## 3. *Vittadinia dissecta* N. T. Burbidge

Erect herb up to 45 cm tall. Leaves sessile or petiole-like section up to *ca* 1 cm long; blades spatulate or broadly obovate in outline, 3-lobed, each lobe often again 3-lobed, rarely more divided, lobe apices  $\pm$  rounded, rarely blade entire, 1–2(–4) cm  $\times$  0.1–1 cm, both surfaces with long spreading hairs and minute glandular ones. Involucres campanulate, 3.5–5.8 mm long, involucral bracts acute, with long spreading tubercular-based hairs and shorter glandular ones; rays white to blue, *ca* 4 mm long. Achenes flattened, longitudinally ribbed, 2.5–4.5 mm long,  $\pm$  appressed hairy; pappus bristles barbellate, 5–6 mm long. **Fig. 73B.**

Two varieties occur in the region:

- |   |   |
|---|---|
| 1. Involucral bracts glandular pubescent, septate hairs sparse or absent; hairs of stems strigose, mostly less than 1 mm long | <i>V. dissecta</i> var. <i>dissecta</i> |
| Involucral bracts with both glandular and septate hairs; hairs of stems hispid to hirsute, up to 2 mm long                    | <i>V. dissecta</i> var. <i>hirta</i>    |

Both *V. dissecta* var. *dissecta* and *V. dissecta* var. *hirta* N. T. Burbidge are widespread in the region. Both varieties flower spring to autumn.

## 4. *Vittadinia cuneata* DC. var. *hirsuta* N. T. Burbidge

Erect herb up to *ca* 30 cm tall. Leaves  $\pm$  sessile, spatulate, apex  $\pm$  rounded, tip recurved, margin often with 2 lateral acute lobes or entire, 0.8–1.5 cm  $\times$  0.3–0.6 cm, with long soft hairs and minute glandular ones. Involucres campanulate, 5–8 mm long, involucral bracts acute, with long spreading tubercular-based hairs and shorter glandular ones; rays blue, *ca* 5 mm long. Achenes flattened, longitudinally ribbed, (3–)5–7 mm long, basal part with appressed hairs, upper part with spreading hairs; pappus bristles barbellate, 6–8 mm long.

Southern Moreton and Darling Downs districts. Flowers spring to autumn.

## 5. *Vittadinia muelleri* N. T. Burbidge

Diffuse or erect herb up to *ca* 20 cm tall. Leaves sessile, linear or linear-obovate or narrowly elliptic, apex acute, margin often with 2, rarely more, narrow lateral lobes 1–3(–4.5) cm  $\times$  0.15–0.7 cm, usually with few hairs on margin and on midrib below. Involucres campanulate, 6–8 mm long, involucral bracts obtuse, glabrous or with few appressed hairs; rays bluish or mauve, *ca* 3 mm long. Achenes flattened, longitudinally ribbed, 4–5 mm long, appressed hairy in lower part, upper part with spreading hairs; pappus bristles barbellate, 5–8 mm long. **Fig. 73C.**

Known from the south-eastern Darling Downs district and also from the Bunya Mts. in the northern Darling Downs district. Flowers spring.

**6. *Vittadinia diffusa*** N. T. Burbidge*Vittadinia macrorhiza* auct. non (DC.) A. Gray, Benth.

Erect or procumbent herb up to 30 cm tall. Leaves linear, up to *ca* 2 cm long, less than 1.5 mm broad, hispid hairy on margin and midrib. Involucres campanulate, 4–5.5 mm long, involucre bracts acuminate, glabrous or with few glandular hairs; rays white or blue, *ca* 4 mm long. Achenes flat, not longitudinally ribbed, margin thickened, 2.5–3 mm long, appressed hairy; pappus bristles barbellate, 3–4.5 mm long.

Known from the Moreton district but probably also occurs in the Wide Bay district. Flowers probably spring to autumn.

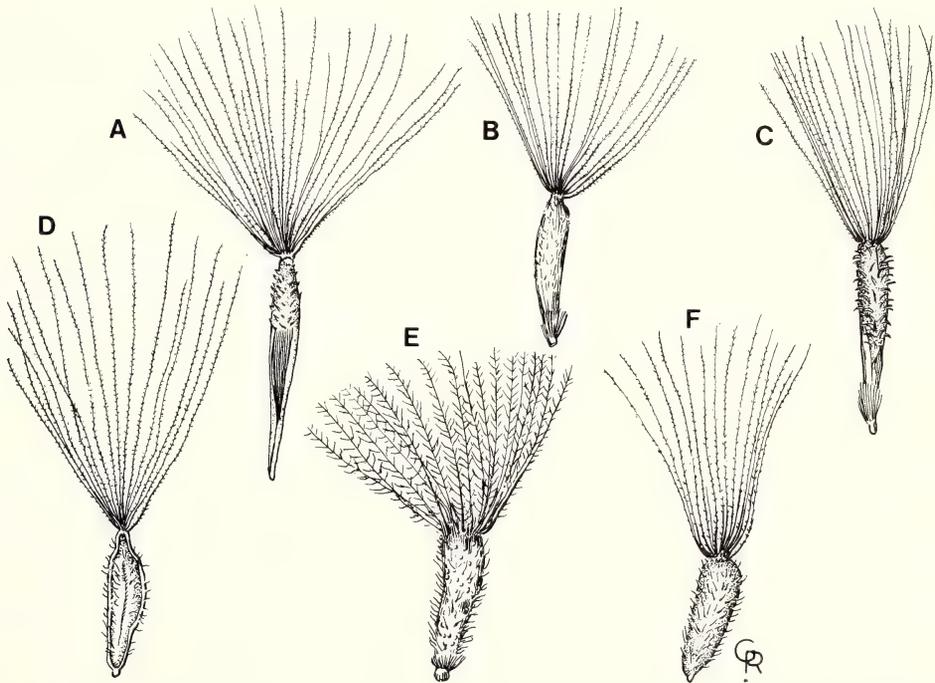
**7. *Vittadinia hispidula*** F. Muell. ex A. Gray*Vittadinia scabra* auct. non DC., Benth.

Erect herb up to *ca* 45 cm tall. Leaves sessile, linear-oblong to oblong or oblong-obovate, apex obtuse, apiculate, base rounded, semi-amplexicaule, occasionally narrowed, margin entire or coarsely toothed or lobed, 1–4(–6) cm × 0.15–0.5(–2) cm, scabrous, rarely ± glabrous. Involucres campanulate, 5–6 mm long, involucre bracts acuminate, ± glabrous or with short glandular hairs or sometimes with short glandular hairs and longer stiff spreading hairs; rays blue, *ca* 4 mm long. Achenes flat, not ribbed, margin thickened, 2.5–3 mm long, ± appressed hairy; pappus barbellate, 5–6 mm long. **Fig. 73D.**

Two varieties occur in the region:

- |  |   |
|--|---|
| 1. Involucre bracts with gland tipped hairs only . . . . .                                 | <i>V. hispidula</i> var. <i>hispidula</i> |
| Involucre bracts with coarse septate hairs and often a few gland<br>tipped hairs . . . . . | <i>V. hispidula</i> var. <i>setosa</i>    |

**V. hispidula** var. **hispidula** is known from the Moreton district but may also be found in the Wide Bay district. **V. hispidula** var. **setosa** N. T. Burbidge is known from the Burnett, Wide Bay and Moreton districts. Both varieties flower spring to autumn.



**Fig. 73** ASTERACEAE — A–F *Vittadinia* spp., achenes with pappus, all x6 — A *V. sulcata*; B *V. dissecta*; C *V. muelleri*; D *V. hispidula*; E *V. pterochaeta*; F *V. pustulata*.

**8. *Vittadinia bicolor* N. T. Burbidge**

Erect herb up to *ca* 60 cm tall. Leaves  $\pm$  sessile, linear or linear-elliptic, margin recurved, 1–3.5 cm  $\times$  0.05–0.2 cm, with tubercular-based septate hairs. Involucres campanulate, 5.5–6 mm long, involucral bracts  $\pm$  glabrous or with few hairs towards apex. Achenes flattened, not longitudinally ribbed, margin thickened, 3–3.5 mm long; pappus 6–6.5 mm long.

Known from Mt. Walsh in the western Wide Bay district. Flowers probably summer–autumn.

**9. *Vittadinia pterochaeta* (F. Muell. ex Benth.) J. M. Black**

*Vittadinia australis* A. Rich. var. *pterochaeta* F. Muell. ex Benth.

Herb up to *ca* 30 cm tall. Leaves  $\pm$  spatulate, apex rounded, tip recurved, base narrowed, margin entire or occasionally with 2 lateral teeth, 1–3.5 cm  $\times$  0.15–0.6(–0.8) cm, both surfaces with long stiff hairs and few shorter glandular ones. Involucres campanulate, 4–6 mm long, involucral bracts acute, with long  $\pm$  spreading hairs and short glandular ones; rays blue, *ca* 3 mm long. Achenes turgid, not ribbed, 4–5 mm long, silky appressed hairy at base, with more spreading hairs in upper part; pappus bristles plumose, 3.5–5 mm long. **Fig. 73E.**

Known from the western Darling Downs district. Flowers spring–summer.

**10. *Vittadinia pustulata* N. T. Burbidge**

Erect herb up to *ca* 30 cm tall. Leaves spatulate to almost linear, apex with recurved tip, base long attenuate, margin entire or occasionally with 2 lateral lobes, 1–2 cm  $\times$  0.15–0.5 cm, with long spreading hairs and short glandular ones. Involucres campanulate, 5–6 mm long, involucral bracts acute, with long  $\pm$  spreading hairs and short glandular ones; rays blue, *ca* 3 mm long. Achenes scarcely flattened or sometimes  $\pm$  flattened but not longitudinally ribbed, margin not thickened, 3–4 mm long, appressed hairy; pappus bristles barbellate, 6–8 mm long. **Fig. 73F.**

Known from the Darling Downs, Burnett and Moreton districts and probably also occurs in the Wide Bay district. Flowers spring to autumn.

**16. CAMPTACRA N. T. Burbidge**

Stems annual arising from perennial rootstock. Heads solitary, terminal on peduncles usually longer than upper leaves, involucral bracts imbricate in several rows, with or without membranous margin; receptacle scales absent; ray florets in 1–2 rows, female; disc florets numerous, bisexual, narrowly funnellform, anthers obtuse at base; style lobes linear-elliptic. Achenes becoming purplish when mature,  $\pm$  linear-terete or compressed linear-terete, striate; pappus of 1–2 rows of barbellate bristles.

2 species Australia and New Guinea; 2 species Australia, 1 endemic; 1 species south-eastern Queensland.

**1. *Camptacra barbata* N. T. Burbidge**

*Vittadinia brachycomoides* auct. Aust. non (F. Muell.) Benth.

Erect or decumbent herb up to *ca* 45 cm tall. Leaves sessile, linear, oblong, elliptic or narrowly obovate, apex acute or 3-toothed, base narrowed, margin entire or coarsely toothed, 1–4 cm  $\times$  0.15–0.6 cm, glabrous or woolly hairy below, rarely also above on young leaves. Peduncles up to *ca* 35 cm long, woolly hairy at least at apex; involucres  $\pm$  campanulate, 5–8 mm long, involucral bracts rounded to acute, sparsely hairy, ciliate at tip, with woolly hairs on back or margin; rays white or mauve, *ca* 5 mm long. Achenes slightly flattened or subterete, longitudinally ribbed on faces, 3.5–4 mm long, glabrous or with few appressed hairs; pappus bristles barbellate, 4.5–5.5 mm long.

Known from Moreton, Darling Downs and Burnett districts but not common. Flowers spring to autumn.

## 17. CONYZA Less.

Annual or perennial herbs, rarely shrubby. Leaves alternate. Heads in loose corymbs or panicles, florets usually hidden by pappus bristles; involucre bracts in 2-many series; receptacle scales absent; outer florets female, in 2 or more series, corolla filiform, truncate or minutely toothed, or occasionally with short ligule; disc florets bisexual, corolla tubular, expanded above, 5-toothed; anther bases obtuse; style branches flattened with hairs on outside. Achenes compressed, smooth or 1-nerved on each face; pappus bristles usually in 1 series,  $\pm$  concealing florets.

60 species from temperate and subtropical regions of the world; *ca* 6 species Australia; 5 species south-eastern Queensland.

- |   |                          |   |
|---|--------------------------|---|
| 1. Leaves with minute glandular granules; at least some of hairs of stems and leaves glandular  | 1. <i>C. leucantha</i>   | 2 |
| Leaves without glandular granules; hairs not glandular  |                          |   |
| 2. Mature heads 0.8–1.2 cm long   | 2. <i>C. chilensis</i>   | 3 |
| Mature heads less than 0.8 cm long  |                          |   |
| 3. Mature heads 3–4 mm long; leaves $\pm$ glabrous or with $\pm$ spreading hairs along margin and midrib  | 3. <i>C. canadensis</i>  | 4 |
| Mature heads 4–6 mm long; leaves with appressed hairs over whole surface  |                          |   |
| 4. Newly exposed receptacles of old heads (2–)2.5–4.5 mm across, not angular pitted or rarely with 2–3 pits in centre; mature heads 5–6 mm long   | 4. <i>C. bonariensis</i> |   |
| Newly exposed receptacles of old heads usually 1.5–2.5(–3) mm across, angular pitted with projecting points at the angles, sometimes pits and pit margins eroded with age; mature heads 4–5 mm long | 5. <i>C. sumatrensis</i> |   |

1. *Conyza leucantha* (D. Don) Ludlow & Raven

*Erigeron leucanthus* D. Don; *Conyza viscidula* Wall. ex DC.

Viscid herb up to *ca* 2 m tall. Leaves sessile or with petioles up to 1 cm long; blades oblong or narrowly elliptic, apex acuminate, base narrowed, margin entire or minutely dentate, 3–15 cm  $\times$  0.8–4 cm, finely glandular punctate, minutely hairy, some hairs glandular. Heads in panicles, heads 5–6 mm long; marginal florets minute; disc florets *ca* 2, 3–4 mm long. Achenes *ca* 0.5 mm long; pappus 3–3.5 mm long.

Known from coastal parts of the region, rare. Flowers spring to autumn.

2. \**Conyza chilensis* Sprengel

## CHILEAN FLEABANE

Perennial herb up to 1 m tall. Rosette leaves elliptic, tapering to petiole-like base, apex  $\pm$  rounded, margin crenate or crenate-sinuate, sometimes pinnatifid, up to 20 cm  $\times$  7 cm, scabrous; stem leaves similar but smaller, diminishing upwards. Heads in corymbs, up to 2 cm across, 0.8–1.2 cm long. Achenes *ca* 1.75 mm long; pappus *ca* 5 mm long.

Native of South America; occasionally found in the Moreton and eastern Darling Downs district. Flowers spring to autumn.

3. \**Conyza canadensis* (L.) Cronq.

## CANADIAN FLEABANE

*Erigeron canadensis* L.

Robust erect annual up to 2 m tall; stems usually branched only in upper fertile part. Leaves  $\pm$  sessile, linear-obovate, narrowed to base, margin entire or sparsely toothed, larger leaves 4–10 cm  $\times$  0.3–0.6 cm but mostly smaller, especially at base and top of plant, glabrous or with spreading hairs along margin and midrib. Head bearing region up to *ca* 50 cm long; mature heads 3–4 mm long. Achenes *ca* 1 mm long; pappus 2–2.5 mm long.

Two varieties occur in the region:

- |   |   |
|---|---|
| 1. Involucral bracts without purplish red tips; stems pubescent with long spreading hairs | <i>C. canadensis</i> var. <i>canadensis</i> |
| Involucral bracts with purplish red tips; stems glabrous or with few hairs                | <i>C. canadensis</i> var. <i>pusilla</i>    |

Both varieties are natives of North America. *C. canadensis* var. *canadensis* is known from a few places in the south-eastern Moreton district. *C. canadensis* var. *pusilla* (Nutt.) Cronq. (*Erigeron pusilla* Nutt.; *Conyza parva* Cronq.) is common in eastern parts of the region. Both flower spring to autumn.

4. \**Conyza bonariensis* (L.) Cronq. FLAXLEAF FLEABANE

*Erigeron bonariensis* L.; *E. linifolium* Willd.

Robust erect annual up to *ca* 1 m tall with long soft hairs and/or short scabrous ones; stems usually simple below, branching in fertile part. Radical leaves with petioles up to 4 cm long, blades narrowly ovate to elliptic, base narrowed, margin toothed or pinnatifid, up to *ca* 10 cm × 1.5 cm; stem leaves petiolate at base of plant, ± sessile above, blades narrowly ovate to linear, smaller than radical leaves, reducing upwards. Head bearing region up to *ca* 50 cm long; heads 5–6 mm long; newly exposed receptacle of mature heads (2–)2.5–4.5 mm across, not angular pitted or rarely with 2–3 pits in centre. Achenes 1.5–2 mm long; pappus *ca* 3 mm long.

Native of South America; widespread weed of the region, in disturbed sites, gardens and lawns. Flowers spring to autumn.

5. \**Conyza sumatrensis* (Retz.) E. H. Walker TALL FLEABANE

*Erigeron sumatrensis* Retz.; *Conyza floribunda* Kunth; *Erigeron floribundus* (Kunth) Schultz Bip.

Robust erect annual up to 2 m tall with long soft hairs and/or short scabrous ones; stems usually simple below, branching in fertile part. Radical leaves with petioles up to 4 cm long, blades narrowly ovate to elliptic, base narrowed, margin toothed or pinnatifid, up to *ca* 10 cm × 1.5 cm; stem leaves petiolate at base of plant, ± sessile above, blades similar to radical ones or linear at top of stem, smaller than radical leaves. Head bearing region up to 70 cm long; heads 4–5 mm long; newly exposed receptacle of mature heads 1.5–2.5 mm across, angular pitted with projecting points at angles, sometimes pits or margins eroded with age.

Native of south-eastern Asia and South America; widespread and common weed in the region, in disturbed sites, gardens and lawns. Flowers spring to autumn.

## 18. BACCHARIS L.

Unisexual shrubs or trees. Leaves alternate. Male and female heads on separate plants; heads in panicle, corymbiform or racemose inflorescences; involucre bracts usually narrow, usually scarious margined; receptacle scales present or absent; ray florets absent; disc florets 5-lobed; anthers usually obtuse at base; style clavate or bifurcate, branches hispid. Achenes ribbed; pappus of numerous bristles, that of male flowers ± plumose tipped.

About 400 species from the Americas; 1 species naturalized Australia, occurring in south-eastern Queensland.

1. \**Baccharis halimifolia* L. GROUNDSEL BUSH

Shrub mostly 1–2 m tall, but up to 6 m tall; branchlets striate-angled, glabrous. Leaves with petioles up to *ca* 1.5 cm long; blades elliptic to rhombic to obovate, apex acute to obtuse, base cuneate or attenuate, lower half of blade entire, upper half entire or with few-several teeth, larger ones 3–7 cm × 2–3 cm, gradually reducing upwards and becoming entire, glabrous, prominently 3-nerved from near base. Inflorescences widely panicle; heads with *ca* 20 flowers; female involucre campanulate, 4–6 mm long, florets yellowish, 2.5–3.5 mm long, style exerted, pappus cream, mostly 1–1.2 cm long at maturity; male involucre ± hemispherical, *ca* 4 mm long, florets

yellowish, *ca* 3–3.5 mm long; pappus 3–4 mm long. Achenes 8–10-ribbed, 1–1.7 mm long, glabrous. **Fig. 74C.**

Native of eastern North America; naturalized and widespread in eastern parts of the region and particularly common in the north-eastern Moreton district, a pest of low lying pasture and disturbed sites. Flowers autumn. It is a declared noxious weed under the Stock Routes and Rural Lands Protection Acts, 1944–1967.

## 19. BLUMEA DC.

Annual or perennial herbs or shrubs. Leaves alternate, simple, margin variously lobed, dentate or serrate. Flower heads in terminal panicles, sometimes contracted into spikes or clusters, rarely heads solitary; involucre cylindrical to hemispherical, involucre bracts numerous, in several rows, with scarious margins; receptacle scales absent; ray florets absent; outer disc florets female, inner ones bisexual or sometimes functionally female; corollas tubular, 4–5-lobed; anthers with fine tails, connective prolonged into an apical appendage; style branches filiform, papillose at end. Achenes small, ribbed, terete or angled; pappus 1-seriate, of numerous slender barbed hairs.

50 species Africa, Madagascar, India and eastern Asia to northern Australia and Micronesia; *ca* 8 species Australia; 4 species south-eastern Queensland.

- |   |                        |   |
|---|------------------------|---|
| 1. Leaf bases cordate, $\pm$ stem clasping . . . . .  | 1. <i>B. tenella</i>   | 2 |
| Leaf bases tapering, not or scarcely stem clasping . . . . .  |                        |   |
| 2. Peduncles of heads up to <i>ca</i> 1.8 cm long, not or sparsely shortly hairy; involucre bracts sparsely hairy or glabrous . . . . . | 2. <i>B. saxatilis</i> | 3 |
| Peduncles of heads up to <i>ca</i> 1 cm long, with long dense silky hairs; involucre bracts silky hairy . . . . .                       |                        |   |
| 3. Corollas yellow; leaves often lyrate-lyobed . . . . .  | 3. <i>B. lacera</i>    |   |
| Corollas purple to lilac; leaves not lobed . . . . .  | 4. <i>B. mollis</i>    |   |

### 1. *Blumea tenella* DC.

Annual herbs up to *ca* 50 cm tall. Leaves sessile, oblong to elliptic-ovate, apex acute to acuminate, apiculate, base cordate,  $\pm$  stem clasping, lower leaves with large distant teeth, upper leaves becoming subentire, lower leaves 1.5–5.5 cm  $\times$  0.3–2 cm, becoming smaller upwards, scabrous on both surfaces. Heads solitary, axillary and terminal, peduncles up to *ca* 10 cm long, involucre bracts up to *ca* 6 mm long; corolla yellow, 3–4.5 mm long. Achenes *ca* 1 mm long; pappus 3–4 mm long.

Known in the region only from the northern Wide Bay district, rare.

### 2. *Blumea saxatilis* Zoll. & Mor.

Annual herb up to 50 cm tall. Leaves sessile or petioles less than 1 cm long; blades radical and cauline, narrowly ovate or narrowly obovate or ovate-spathulate, apex acute, apiculate, base tapering, margin distinctly serrate with rigid teeth, lower leaves 3–13 cm  $\times$  0.3–2.5 cm, upper ones smaller, pilose on both surfaces. Heads in terminal panicles up to *ca* 40 cm long, peduncles of heads up to *ca* 1.8 cm long; involucre bracts up to *ca* 7.5 mm long; corolla yellow, 3–4 mm long. Achenes *ca* 1 mm long; pappus 3–4 mm long.

Occasional in the Moreton and Wide Bay districts. Flowers most of the year.

### 3. *Blumea lacera* (N. L. Burm.) DC.

*Conyza lacera* N. L. Burm.; *Blumea glandulosa* DC.; *Blumea hieraciifolia* auct. Aust. non (D. Don) DC.

Annual herbs up to 1 m tall. Leaves sessile or petiolate, petioles when present up to 3 cm long; blades elliptic-oblong to obovate-oblong, lyrate-lyobed to non lobed, apex acute, obtuse or apiculate, base acute or tapering, margin irregularly serrate, larger blades 3–15 cm  $\times$  1.2–5.4 cm, upper leaves often smaller, sparsely to densely hairy above, tomentose to velutinous below. Heads in axillary and terminal dense to lax panicles, peduncles of heads up to *ca* 1 cm long, densely silky hairy; involucre bracts up to *ca* 7 mm long; corolla yellow, 3–4.5 mm long. Achenes *ca* 1 mm long; pappus 3–4 mm long.

Occasional in eastern parts of the region. Flowers most of the year.

**4. *Blumea mollis* (D. Don) Merr.***Erigeron molle* D. Don; *Blumea cunninghamii* DC.

Annual herb up to *ca* 1 m tall. Upper leaves sessile, lower petiolate, petioles up to *ca* 2 cm long; blades ovate-oblong, apex acute to apiculate, base tapering in lower leaves, acute in upper, margin closely serrate, 1–9.5 cm × 0.6–5 cm, densely silky hairy on both surfaces. Heads in dense terminal panicles, peduncles of heads up to *ca* 7 mm long, densely silky hairy; involucre bracts up to *ca* 5 mm long; corolla purple to lilac, 2.5–4.5 mm long. Achenes *ca* 1 mm long; pappus 2–4 mm long.

The Queensland Herbarium has one inadequate specimen from near Yandina in the northern Moreton district which is apparently of this species. The species is moderately common in northern Queensland.

**20. EPALTES Cass.**

Herbs. Leaves alternate. Heads in cymes, or lateral and sessile; involucre ovoid-globular or hemispherical; receptacle scales absent; ray florets absent; florets all tubular, outer ones numerous, female, minutely toothed, inner ones bisexual but often sterile, 3–5-toothed; anthers with minute tails at base; style of female flowers filiform, glabrous, style of bisexual flowers undivided or minutely notched, with tuberculate hairs. Achenes subterete, 5–10-ribbed; pappus of achenes of female flowers absent, pappus of achenes of bisexual flowers of 2–3 bristles or absent.

About 17 species from tropical parts of the world; 5 species Australia, all endemic; 1 species south-eastern Queensland.

**1. *Epaltes australis* Less.****EPALTES**

Diffuse or prostrate perennial up to *ca* 25 cm tall, glabrous or hirsute. Leaves with petioles 0.5–2.5 cm long; blades ovate or oblong, apex rounded, base cuneate, margin entire or toothed, 1–4 cm × 0.3–1.3 cm. Heads lateral, sessile or peduncles less than 5 mm long; involucre depressed hemispherical, 4–6 mm diameter, involucre bracts obtuse; florets yellow. Achenes *ca* 1 mm long; pappus absent. **Fig. 74D.**

Widespread in the Moreton and Wide Bay districts and probably occurs elsewhere in the region, in damp places. Flowers found most of the year.

**21. PTEROCAULON Elliott**

Perennial herbs. Leaves alternate, entire or toothed. Compound heads lacking a general involucre; partial heads ovoid, sessile, involucre bracts narrow, in 2 series, outer ones ± woolly, inner ones glabrous or ciliate; receptacle scales absent; florets all tubular, outer ones female, filiform, minutely toothed, inner ones few, bisexual or male, tubular, 4–5-toothed; anthers tailed; styles of outer florets filiform, of inner florets flattened or subulate. Achenes terete or compressed, sparsely hairy; pappus of bristles.

18 species America, Asia and Australia; 6 species Australia, 2 endemic; 3 species south-eastern Queensland.

- |  |                          |   |
|--|--------------------------|---|
| 1. Compound heads sessile, globular, 0.6–0.8 cm diameter, many together forming terminal dense or interrupted spike 2–6 cm long; decurrent wings of stems entire | 1. <i>P. redolens</i>    |   |
| Compound heads globular, ovoid or oblongoid, 0.8–4 cm long, solitary; decurrent wings entire or serrate  |                          | 2 |
| 2. Compound heads ovoid or globular, 0.8–2 cm long; decurrent wings of stems entire; outer bracts of partial involucre densely woolly                            | 2. <i>P. sphacelatum</i> |   |
| Compound heads ovoid or oblongoid, 2–4 cm long; decurrent wings of stems usually serrate; outer bracts of partial involucre woolly ciliate towards apex          | 3. <i>P. serrulatum</i>  |   |

**1. *Pterocaulon redolens* (Willd.) F. Vill.**

*Conyza redolens* Willd.; *Pterocaulon cylindrostachyum* C. B. Clarke; *Pterocaulon spicatum* Domin

Herb up to 1 m tall, softly tomentose or woolly all over. Leaves decurrent into narrow entire wings; blades obovate or oblong, apex obtuse, margin crenate-dentate, 2.5–5 cm × 0.7–2 cm, upper surface less densely hairy than lower. Compound heads sessile, globular, mostly 6–8 mm diameter, many together forming terminal dense or interrupted spike 2–6 cm long; outer bracts of partial involucre woolly, inner bracts glabrous; disc florets solitary. Achenes *ca* 0.8 mm long, with few hairs; pappus *ca* 4 mm long. **Fig. 74E.**

Widespread but not common in most parts of the region but not yet recorded from the Burnett district, usually in well drained areas. Flowers found most of the year but mainly spring and autumn.

**2. *Pterocaulon sphacelatum* (Labill.) F. Muell.**

*Monenteles sphacelatus* Labill.

Erect herbs up to 1.2 m tall, woolly to tomentose. Leaves decurrent into entire wings; blades obovate to oblong, apex obtuse or occasionally acute, margin crenate-dentate or entire, 1–5 cm × 0.3–1.5 cm, upper surface less densely hairy than below. Compound heads terminal or apparently lateral, sessile or pedunculate, ovoid or globular, 0.8–2 cm long; outer bracts of partial involucre densely woolly, inner bracts glabrous or with few hairs; disc florets solitary. Achenes *ca* 0.7 mm long, ± glabrous; pappus *ca* 3 mm long. **Fig. 74F.**

Rare in the region, recorded from the drier parts of the Moreton and Burnett districts. Flowers found most of the year but mainly spring and autumn, probably in response to rain.

**3. *Pterocaulon serrulatum* (Montrouz.) Guillaumin**

*Monenteles serrulatus* Montrouz.; *Pterocaulon glandulosum* (F. Muell. ex Benth.) Benth. & Hook.

Erect herbs up to *ca* 90 cm tall, glandular hairy in south-eastern Queensland, or woolly elsewhere. Leaves decurrent into usually serrate wings; blades ovate, apex mostly acute, margin serrate, 1.5–5(–8) cm × 0.5–2(–3) cm. Compound heads terminal, solitary, ovoid to oblongoid, 2–4 cm long; outer bracts of partial involucre woolly ciliate towards apex only, inner bracts glabrous or with few short hairs on margin; disc floret 1. Achenes *ca* 1 mm long, hairy; pappus 3–4 mm long. **Fig. 74G.**

Rare in the region, known from the northern Burnett district and adjacent parts of the Wide Bay district. Flowers mostly spring and autumn but some occur all year, probably after rain.

**22. GNAPHALIUM L.**

Herbs. Leaves radical and/or alternate cauline, entire. Heads small, usually in clusters which are variously arranged, solitary, or in spiciform, corymbose or paniculate inflorescences; involucre ovoid to campanulate, involucre bracts multiseriate, scarious at least in upper part; receptacle scales absent; outer florets in 2–many rows, female, filiform, minutely toothed, inner florets usually few, bisexual, tubular below, usually expanded above, 5-toothed; anther bases sagittate, ± tailed; style branches of female florets filiform, of bisexual florets short, truncate, penicillate. Achenes ± terete; pappus of 1 row of bristles, occasionally absent in female florets.

About 200 species, worldwide, but mainly the Americas; *ca* 15 species Australia, *ca* 7 introduced; 8 species south-eastern Queensland.

1. Clusters of heads not subtended by leaves, arranged in corymbs, sometimes branches of corymbs much reduced giving inflorescence the appearance of an irregularly lobed globular cluster
- Clusters of heads subtended by leaves, not arranged in corymbs

1. *G. luteo-album*

2

- |   |                            |
|---|----------------------------|
| 2. Clusters of heads $\pm$ globular, terminal, sometimes also in axils of leaves but then leaves well separated from each other . . . . . | 3                          |
| Clusters of heads arranged in elongate spike-like leafy inflorescences, terminal, sometimes also in axils of lower leaves . . . . .       | 5                          |
| 3. Individual heads usually 1–1.5 mm across in flower; bisexual campanulate florets 1 per head . . . . .                                  | 2. <i>G. sphaericum</i>    |
| Individual heads usually 2–4 mm across in flower; bisexual campanulate florets 3 or more per head . . . . .                               | 4                          |
| 4. Basal rosette of leaves alive at time of flowering; terminal cluster of heads with 1 or 2 subtending leaves . . . . .                  | 3. <i>G. gymnocephalum</i> |
| Basal rosette of leaves dead at time of flowering; terminal cluster of heads with 3–5 subtending leaves . . . . .                         | 4. <i>G. involucratum</i>  |
| 5. Upper leaves folded lengthwise, sickle shaped upwards . . . . .  | 5. <i>G. subfalcatum</i>   |
| Leaves not folded lengthwise . . . . .  | 6                          |
| 6. Outer involucre bracts glabrous . . . . .  | 6. <i>G. americanum</i>    |
| Outer involucre bracts with long crisped hairs . . . . .  | 7                          |
| 7. Heads less than 3 mm long; leaves up to 4 mm wide . . . . .  | 7. <i>G. polycaulon</i>    |
| Heads more than 3 mm long; most leaves more than 4 mm wide . . . . .  | 8. <i>G. pensylvanicum</i> |

All the species are known as CUDWEEDS.

### 1. *Gnaphalium luteo-album* L.

### JERSEY CUDWEED

Annual or biennial herb up to *ca* 50 cm tall, whitish woolly; stems usually several from base, erect to decumbent. Radical leaves  $\pm$  sessile, narrowly obovate to obovate-spathulate, up to 7 cm  $\times$  1 cm; upper cauline leaves becoming linear or narrowly ovate, reducing in size upwards. Heads ovoid, *ca* 4 mm long, not subtended by leaves, arranged in corymbs, sometimes branches of corymbs reduced, giving inflorescence appearance of an irregularly lobed globular cluster. Achenes *ca* 0.5 mm long; pappus 3–4 mm long.

Widespread in the region, particularly common in the Moreton district, often found as a weed in shaded damp disturbed areas. Flowers found all year but mostly spring–summer.

### 2. *Gnaphalium sphaericum* Willd.

Annual or biennial herb up to *ca* 40 cm tall, rarely taller; stems  $\pm$  erect, white tomentose. Radical leaves and lower cauline leaves dead at time of flowering; cauline leaves sessile or with petioles up to *ca* 2 cm long, blades narrowly elliptic to elliptic-spathulate, or narrowly obovate, apex acute, margin often revolute and wavy towards apex, mostly 1–7 cm  $\times$  0.2–1.5 cm, becoming  $\pm$  hairless above, closely whitish tomentose below. Heads usually 1–1.5 mm across, arranged in globular clusters 0.8–2.5 cm diameter, subtending leaves 5–8; bisexual campanulate florets 1 per head. Achenes *ca* 0.5 mm long; pappus *ca* 3 mm long.

Widespread in the region, often as a weed of disturbed areas. Flowers mostly spring–summer.

### 3. *Gnaphalium gymnocephalum* DC.

*Gnaphalium collinum* Labill.; *G. japonicum* Thunb. var. *collinum* (Labill.) Maiden & Betche.

Stoloniferous perennial up to *ca* 40 cm tall; stems decumbent to  $\pm$  erect, white tomentose. Rosette leaves alive at time of flowering, petioles 1–3.5 cm long, blades narrowly elliptic, apex acute, base attenuate, margin flat, 4–18 cm  $\times$  0.4–1 cm,  $\pm$  glabrous above, closely whitish tomentose below, obscurely 3-nerved above; cauline leaves sessile, much shorter than basal ones. Heads 2–3 mm across, arranged in usually terminal globular clusters 0.8–1.5 cm diameter, subtending leaves 1–2; bisexual campanulate florets 3–6 per head. Achenes *ca* 0.5 mm long; pappus *ca* 3 mm long.

Moreton district and possibly also Wide Bay district, not common, found in damp areas. Flowers spring–summer.

**4. *Gnaphalium involucratum* G. Forster**

Stoloniferous perennial up to *ca* 50 cm tall; stems erect, white tomentose. Rosette leaves dead at time of flowering; cauline leaves  $\pm$  sessile, linear to narrowly oblong, apex acuminate, margin usually flat, largest leaves 5–18 cm  $\times$  0.4–1 cm, reducing upwards, glabrous above, closely whitish tomentose below, 1-nerved. Flowering heads 3–4 mm across, arranged in usually terminal  $\pm$  globular clusters 0.8–1.5 cm diameter, subtending leaves 3–5; bisexual campanulate florets mostly 5–6 per head. Achenes *ca* 0.5 mm long; pappus *ca* 3 mm long.

Moreton and Wide Bay districts, not common, in damp or swampy places. Flowers spring to autumn.

**5. \**Gnaphalium subfalcatum* Cabrera**

Annual up to *ca* 35 cm tall; stems  $\pm$  erect, grey tomentose. Rosette and lower cauline leaves spatulate, mostly 1–5 cm  $\times$  0.3–1.2 cm; upper cauline leaves smaller, linear-ovate, folded lengthwise, usually sickle shaped at tips, both surfaces with greyish tomentum, but more dense below. Heads *ca* 3 mm across, in woolly clusters arranged in spikes on branch tips, sometimes interrupted below. Achenes *ca* 0.5 mm long; pappus *ca* 3 mm long.

Native of South America; rare in south-eastern Queensland, found in a few places in the southern Moreton district and south-eastern Darling Downs district. Flowers spring–summer.

**6. \**Gnaphalium americanum* Miller**

Annual or biennial herb up to *ca* 25 cm tall; stems decumbent to erect, densely white tomentose. Rosette leaves  $\pm$  sessile, oblong-spathulate, apex rounded, shortly apiculate, margin entire, 3–10 cm  $\times$  0.8–2 cm, upper surface  $\pm$  glabrous, midrib sunken, lower surface densely white tomentose; cauline leaves reducing upwards. Heads *ca* 3 mm across, glabrous, in clusters arranged in spikes, interrupted below. Achenes *ca* 0.5 mm long; pappus *ca* 3 mm long. **Fig. 74H.**

Native of Central and South America; known from the Moreton and eastern Darling Downs districts, possibly occurs elsewhere in the region, not common. Flowers spring–summer.

**7. *Gnaphalium polycaulon* Pers.**

*Gnaphalium indicum* auct. non L.

Annual herb up to *ca* 20 cm tall; stems decumbent, white woolly. Radical leaves absent at time of flowering; cauline leaves sessile or petioles up to *ca* 0.5 cm long,  $\pm$  spatulate, 0.8–2.5 cm  $\times$  0.25–0.5 cm, both surfaces thinly grey woolly. Heads 2.5 mm across in small clusters arranged in spikes, interrupted below. Achenes *ca* 0.5 mm long; pappus *ca* 2 mm long.

Rare in the region, recorded from the northern Darling Downs district and eastern Moreton district.

**8. \**Gnaphalium pensylvanicum* Willd.**

*Gnaphalium purpureum* auct. non L.

Annual herb up to 50 cm tall, loosely whitish woolly; stems decumbent or erect. Leaves with petioles up to *ca* 2 cm long; blades narrowly spatulate or spatulate, up to *ca* 8 cm  $\times$  2 cm, reducing upwards, loosely whitish woolly above and below. Heads *ca* 3 mm across, in clusters arranged in spikes, interrupted below. Achenes *ca* 0.5 mm long; pappus *ca* 2 mm long. **Fig. 74I.**

Native of North America; widespread in eastern parts of the region, often as a weed in disturbed ground in shaded areas. Flowers late winter to summer.

**23. LEPTORHYNCHOS Less.**

Annual or perennial herbs or undershrubs. Leaves alternate, entire. Flower heads pedunculate, often with scarious bracts along peduncle; involucre turbinate, campanulate or hemispherical, involucre bracts in several rows, scarious; receptacle scales absent; ray florets absent; florets all tubular, outer ones female, inner bisexual; anthers with fine tails; style branches nearly terete. Achenes somewhat compressed, glabrous or papillose, contracted at top; pappus of several bristles.

8 species endemic in Australia; 1 species south-eastern Queensland.



Fig. 74 **ASTERACEAE** — A *Minuria integririma*, portion of flowering plant x1; B *Olearia pimeleoides*, flowering stems x1; C *Baccharis halimifolia*, portion of flowering stem x1; D *Epaltes australis*, portion of flowering plant x1; E-G *Pterocaulon* spp. — E *P. redolens*, portion of flowering stem x1; F *P. sphacelatum*, portion of flowering stem x1; G *P. serrulatum*, portion of flowering stem x1; H-I *Gnaphalium* spp. — H<sub>1</sub>-H<sub>2</sub> *G. americanum*, H<sub>1</sub> portion of flowering stem x1, H<sub>2</sub> head x3; I<sub>1</sub>-I<sub>2</sub> *G. pensylvanicum*, I<sub>1</sub> portion of flowering stem x1, I<sub>2</sub> head x3; J *Leptorhynchus squamatus*, flowering stem x1; K *Helipterum albicans*, achene with pappus x6.

**1. *Leptorhynchos squamatus* Less.**

Perennial herb up to *ca* 25 cm tall, with caducous woolly hairs on young parts and undersides of leaves. Leaves  $\pm$  sessile, narrowly obovate to linear, apex acute, base narrowed, margin recurved, 1–4 cm  $\times$  0.15–0.3 cm. Peduncles up to *ca* 20 cm long, with scarious bracts; heads broadly turbinate, *ca* 1 cm across in flower; involucre bracts scarious with woolly ciliate margins and glabrous tips; florets yellow. Achenes *ca* 2 mm long; pappus *ca* 4–5 mm long. **Fig. 74J.**

Known from the Stanthorpe-Wallangarra area of the Darling Downs district. Flowers spring–summer.

**24. HELIPTERUM DC.**

Annual or perennial herbs. Leaves alternate or lower ones rarely opposite, entire. Heads solitary or in corymbs; involucre hemispherical to campanulate or cylindrical, involucre bracts in several rows, often petaloid; receptacle scales absent; florets of Australian species bisexual, tubular, 5-, rarely 4-toothed; anthers with fine tails; style branches nearly terete, truncate. Achenes angular, terete or somewhat flattened, glabrous or hairy; pappus of bristles finely plumose from base.

About 90 species Africa and Australia; 60 species Australia, all endemic; 4 species south-eastern Queensland.

- |  |                          |   |
|--|--------------------------|---|
| 1. Heads with yellow petaloid involucre bracts . . . . .         | 1. <i>H. albicans</i>    |   |
| Heads without yellow involucre bracts . . . . .                  |                          | 2 |
| 2. Involucre bracts without spreading petaloid laminae . . . . . | 2. <i>H. australe</i>    |   |
| Involucre bracts with white spreading laminae . . . . .          |                          | 3 |
| 3. Heads terminal, solitary, 1.5–3 cm across . . . . .           | 3. <i>H. anthemoides</i> |   |
| Heads in terminal corymbs, less than 1 cm across . . . . .       | 4. <i>H. polyphyllum</i> |   |

**1. *Helipterum albicans* (Cunn.) DC.**

COMMON SUNRAY

*Elichrysum albicans* Cunn.

Perennial herb up to 4.5 cm tall, base often woody. Leaves often congested on younger stems; blades linear to linear-oblong, apex acuminate, margin recurved to revolute, 2–10 cm  $\times$  0.15–0.3 cm, woolly hairy. Heads solitary on terminal peduncles; involucre hemispherical, 2–3 cm wide, outer involucre bracts petaloid, pale to dark brown, inner ones yellow; florets yellow. Achenes 2–3 mm long, glabrous, smooth to verruculose; pappus *ca* 5 mm long, pale yellow. **Fig. 74K.**

South-eastern Darling Downs district in well drained soils. Flowers spring to autumn.

**2. *Helipterum australe* (A. Gray) Druce**

*Dimorpholepis australis* A. Gray

Annual up to 15 cm tall but mostly less than 10 cm tall. Leaves linear, linear-elliptic or linear-oblong, 1–2 cm  $\times$  0.1–0.2 cm, glabrous or with few hairs. Heads sessile, terminal or lateral; involucre broadly campanulate, 4–5 mm long; involucre bracts not radiating, not petaloid, outer bracts whitish, fringed with long cilia, inner bracts green, glandular; florets yellow. Achenes *ca* 1 mm long, glabrous; pappus of 3–4 plumose bristles *ca* 2 mm long.

Southern Darling Downs district, not common. Flowers spring.

**3. *Helipterum anthemoides* (Sieber ex Sprengel) DC.**

*Helichrysum anthemoides* Sieber ex Sprengel

Herb up to 40 cm tall with perennial rootstock. Leaves  $\pm$  linear, 0.5–2 cm  $\times$  0.1–0.2 cm, glabrous. Heads solitary, terminal; involucre hemispherical, 1.5–3 cm across, outer involucre bracts scarious, brownish, inner ones petaloid, white; florets yellow. Achenes *ca* 2 mm long, silky hairy; pappus 3–4 mm long.

Widespread in the Moreton and Darling Downs district, possibly also elsewhere in the region. Flowers mostly spring, occasionally also autumn.

**4. *Helipterum polyphyllum* F. Muell.**

Erect annual up to ca 45 cm tall. Leaves linear, 2.5–4 cm × 0.1–0.25 cm, with sparse woolly hairs or ± glabrous. Heads in terminal corymbs; involucre narrowly campanulate, 6–8 mm long, outer involucre bracts appressed, without lamina, with sparse woolly hairs, inner bracts with broad claw and white petal-like spreading lamina; florets yellow. Achenes ca 2.5 mm long, shortly silky hairy; pappus 4–5 mm long.

Widespread in the Darling Downs district, also known from other districts in the region, usually in drier areas. Flowers mostly spring, occasionally also summer and autumn.

**25. HELICHRYSUM Miller**

Herbs or shrubs. Leaves usually alternate. Heads solitary or variously collected; involucre various, involucre bracts imbricate in several rows, often papery; receptacle scales absent; ray florets absent; disc florets all bisexual or few outer ones female, tubular, 5-, rarely 4-toothed, rarely few inner florets sterile; anthers with fine tails; style branches nearly terete, truncate or rarely with conical tips. Achenes angular, terete or slightly compressed; pappus of capillary bristles, simple or ± barbellate or plumose at end, not distinctly plumose from base.

About 500 species Europe, Africa, southern Asia and Australia; ca 100 species Australia, all endemic; 21 species south-eastern Queensland.

- |   |   |    |
|---|---|----|
| 1. Involucre less than 8 mm wide, bracts not ciliate on margins, not golden yellow                        |   | 2  |
| Involucre greater than 8 mm wide or if less than 8 mm wide then bracts golden yellow with ciliate margins |   | 9  |
| 2. Petioles 0.4–1.5 cm long   |   | 3  |
| Petioles absent or up to 0.15 cm long   |   | 4  |
| 3. Leaves not triplinerved; outer involucre bracts webby hairy but not densely so                         | 1. <i>H. bidwillii</i>                      |    |
| Leaves conspicuously triplinerved; outer involucre bracts densely white tomentose                         | 2. <i>H. whitei</i>                         |    |
| 4. Branchlets conspicuously longitudinally ridged   | 3. <i>H. vagans</i>                         | 5  |
| Branchlets not ridged   |   |    |
| 5. Leaves ± appressed to stem, often scale-like, expanded at base into thick rounded auricles             | 4. <i>H. diotophyllum</i>                   | 6  |
| Leaves not appressed to stem, not scale-like, not expanded at base  |   |    |
| 6. Leaves linear or linear-elliptic   |   | 7  |
| Leaves oblong to ovate or cuneate to obovate  |   | 8  |
| 7. Involucre bracts straw coloured  | 5. <i>H. cassinioides</i>                   |    |
| Involucre bracts white or pink  | 6. <i>H. diosmifolium</i>                   |    |
| 8. Leaves oblong to ovate, apex obtuse to acute, apiculate, tip not reflexed                              | 7. <i>H. rufescens</i>                      |    |
| Leaves cuneate to obovate, apiculate tip reflexed   | 8. <i>H. obcordatum</i> subsp. <i>major</i> |    |
| 9. Involucre bracts golden yellow with ciliate margins  |   | 10 |
| Involucre bracts white or if golden yellow then margins not ciliate                                       |   | 11 |
| 10. Inner involucre bracts less than 5 mm long  | 9. <i>H. ramosissimum</i>                   |    |
| Inner involucre bracts 5–7 mm long  | 10. <i>H. apiculatum</i> sens. lat.         |    |
| 11. Involucre bracts white or pink  |   | 12 |
| Involucre bracts yellow   |   | 17 |
| 12. Majority of leaves less than 3 mm broad   | 11. <i>H. glutinosum</i>                    |    |
| All leaves 4 mm or more broad   |   | 13 |

13. Leaves distinctly petiolate, petioles more than 5 mm long; blades mostly greater than 1.5 cm broad		14
Leaves sessile or petioles up to 5 mm long; blades mostly less than 1.5 cm broad		15
14. Leaves mostly more than 3 times as long as broad; achenes pitted	12. <i>H. elatum</i>	
Leaves 2–3 times as long as broad; achenes not pitted	13. <i>H. sp. 1.</i>	
15. Leaf margins recurved; woody subshrubs growing in rock crevices on mountains of the southern Moreton district	14. <i>H. lindsayanum</i>	
Leaf margins flat; shrubs usually in poor soils in northern parts of the region		16
16. Peduncles woolly hairy	15. <i>H. lanuginosum</i>	
Peduncles glandular hairy	16. <i>H. boormanii</i>	
17. Involucral bracts subulate pointed		18
Involucral bracts obtuse or in heads 4–6 cm across, sometimes acuminate		19
18. Leaf apices rounded, apiculate; plants of coastal sand dunes	17. <i>H. oxylepis</i>	
Leaf apices acute-acuminate; not sand dune plants	18. <i>H. collinum</i>	
19. Outer bracts 2–3 mm broad, pappus white	19. <i>H. scorpioides</i>	
Outer bracts 4 mm or more broad, pappus yellow		20
20. Leaves viscid	20. <i>H. viscosum</i>	
Leaves not viscid	21. <i>H. bracteatum</i>	

**1. *Helichrysum bidwillii* Benth.**

Shrub with climbing or straggling stems. Leaves with petioles 4–10 mm long; blades ovate or ovate-elliptic, apex acute-acuminate, base cuneate, 1–4 cm × 0.3–1.8 cm, with white woolly hairs above and below, becoming sparse with age, especially above. Heads in small compact corymbose panicles, terminating leafy branches; involucre broadly campanulate, 3–4 mm long, involucral bracts scarious, inner ones with slightly spreading tips. Achenes less than 1 mm long; pappus *ca* 3 mm long. **Fig. 75A.**

Found on the edge of rainforest and depauperate rainforest in the Moreton, Darling Downs and Burnett districts. Flowers spring to autumn.

**2. *Helichrysum whitei* N. T. Burbidge**

*Helichrysum obovatum* DC. var. *longifolium* C. T. White & Francis

Straggling shrub up to 1 m tall. Leaves with petioles 0.4–1.5 cm long; blades linear-ovate to narrowly ovate or narrowly elliptic, apex acute-acuminate, base cuneate, 3–9 cm × 0.3–1.5 cm, triplinerved, upper surface glabrous, lower surface white woolly. Heads in open ± leafless corymbose panicles; involucre campanulate, 3–4 mm long, outer involucral bracts densely white tomentose, inner bracts with scarious tips, at length recurved. Achenes less than 1 mm long; pappus *ca* 3 mm long. **Fig. 75B.**

Known from the McPherson Ra. along the border with New South Wales. Flowers spring to autumn.

**3. *Helichrysum vagans* C. T. White**

Straggling shrub up to 2 m tall; branchlets conspicuously ridged, at first tomentose but soon glabrous. Leaves with petioles 1–1.5 mm long; blades linear-ovate or narrowly ovate, apex acute-acuminate, base cuneate, margin ± recurved, 1.5–5.5(–10) cm × 0.3–0.5(–1.5) cm, ± inconspicuously triplinerved, glabrous above, sparsely woolly below. Heads in dense terminal corymbose clusters; involucre campanulate, 2–3 mm long, involucral bracts brownish. Achenes less than 1 mm long; pappus *ca* 2 mm long.

Known from the McPherson Ra. along the border with New South Wales, around the edges of rainforest. Flowers spring to autumn.

**4. *Helichrysum diotophyllum* F. Muell.**

Shrub with slender woolly virgate branches up to *ca* 1 m tall. Leaves sessile, linear, ± scale-like, 2.5–6 mm long, with expanded rounded auricles at base up to 1 mm broad.

Heads in compact terminal corymbose panicles terminating leafy branches; involucre broadly campanulate or almost globular, 3–4 mm long, involucre bracts straw coloured, without spreading tips; florets yellow. Achenes less than 1 mm long; pappus *ca* 2 mm long. **Fig. 75C.**

Found in sandy soils of the Darling Downs district. Flowers spring to autumn.

### 5. *Helichrysum cassinioides* Benth.

Erect branching shrub up to *ca* 3 m tall, young branches tomentose; bark or old stems papery. Leaves sessile or petioles less than 1 mm long; blades linear or linear-elliptic, apex obtuse or with minute  $\pm$  recurved mucros, margin recurved to revolute, 0.9–3 cm  $\times$  0.1–0.25 cm,  $\pm$  glabrous above, tomentose below. Heads dense terminal corymbs; involucre  $\pm$  cylindrical in flower, broader in fruit, 5–7 mm long, involucre bracts scarios, straw coloured, without spreading tips; florets white. Achenes *ca* 1 mm long; pappus *ca* 4 mm long.

Moreton, Burnett and Darling Downs districts, usually in rocky or stony sites. Flowers spring.

### 6. *Helichrysum diosmifolium* (Vent.) Sweet

SAGO FLOWER

*Gnaphalium diosmaefolium* Vent.

Erect shrub up to *ca* 5 m tall, young branches tomentose. Leaves sessile, linear, channelled below, apex obtuse-mucronate, margin revolute to midrib, occasionally recurved only, 1–2.5 cm  $\times$  0.1–0.25 cm, scabrous above, tomentose below. Heads in dense terminal corymbs; involucre nearly globular or broadly campanulate, 3–4 mm long, involucre bracts white or pinkish, without spreading tips; florets cream. Achenes less than 1 mm long; pappus *ca* 2 mm long.

Widespread in the region except northern Wide Bay district. Flowers mainly late winter–spring, occasionally also autumn.

### 7. *Helichrysum rufescens* (DC.) N. T. Burbidge

*Ozothamnus rufescens* DC.; *Helichrysum beckleri* F. Muell. ex Benth.; *Cassinia denticulata* auct. non R. Br., F. M. Bailey

Shrub up to *ca* 4 m tall, young branches tomentose. Leaves with minute petioles; blades oblong to ovate, apex obtuse, apiculate, tip not reflexed, base obtuse, margin flat or recurved, 0.4–1.7 cm  $\times$  0.15–0.3(–0.5) cm, glabrous above or with few soft hairs along midline, grey or white tomentose below. Heads in small compact corymbose panicles terminating leafy branches; involucre broadly campanulate, *ca* 4 mm long, involucre bracts scarios, creamy or brownish, without spreading tips; florets white. Achenes less than 1 mm long; pappus *ca* 3 mm long. **Fig. 75D.**

Edge of rainforests of the McPherson Ra. and in the south-eastern Darling Downs district. Flowers spring.

### 8. *Helichrysum obcordatum* (DC.) F. Muell. ex Benth. subsp. **major** (Benth.) N. T. Burbidge

*Helichrysum obcordatum* var. *major* Benth.

Shrub up to 1.5 m tall, young branches greyish woolly. Leaves with petioles up to 1 mm long, linked to decurrent lines on stem; blades cuneate to obovate, tip reflexed, margin flat, 0.6–1.5 cm  $\times$  0.3–0.6 cm, glabrous above, grey tomentose below. Heads in corymbose panicles terminating leafy branches; involucre cylindrical-turbinate, 3–4 mm long, involucre bracts straw coloured, without spreading tips. Achenes less than 1 mm long; pappus *ca* 3 mm long.

Widespread and common in the Stanthorpe-Wallangarra region of the southern Darling Downs district. Flowers spring–early summer.

### 9. *Helichrysum ramosissimum* Hook. sens. lat.

YELLOW BUTTONS

Erect or ascending perennial herb up to 40 cm tall, with woody rootstock. Leaves  $\pm$  sessile, narrowly obovate to narrowly oblong to linear, apex obtuse to acute, mucronulate, base narrowed and often petiole-like but then somewhat dilated at very base, 1–4.5 cm  $\times$  0.2–0.8(–1) cm, woolly hairy below, woolly hairy to glabrous above. Heads in terminal corymbs, becoming racemose with age; involucre turbinate, *ca*

5–6 mm long in flower, involucre bracts golden yellow, inner bracts of fruiting head less than 5 mm long; florets yellowish. Achenes *ca* 1 mm long; pappus yellow, *ca* 4–5 mm long. **Fig. 75E.**

Widespread and common in the region. Flowers mostly late winter–spring.

Plants with  $\pm$  glabrous upper leaf surfaces may belong to the taxon described by K. Domin, *Bibliotheca Botanica* 89:1228 (1929) as *Helichrysum semiamplexicaule* var. *simpliciusculum* Domin; however they do not appear to be closely related to *H. semiamplexicaule*. They are best included under *H. ramosissimum* pending a revision of the group. See also note under *H. apiculatum* sens. lat.

**10. *Helichrysum apiculatum* (Labill.) DC. sens. lat.** YELLOW BUTTONS  
Erect or ascending perennial herb up to 30 cm tall with woody rootstock. Leaves sessile, narrowly obovate or narrowly oblong, apex obtuse to acute, mucronulate, base narrowed and often petiole-like but then dilated at very base, or broad and amplexicaule, 1.5–7 cm  $\times$  0.2–1.5 cm, woolly hairy below, with or without woolly hairs above. Heads in terminal corymbs; involucre turbinate, *ca* 7 mm long in flower; involucre bracts pale yellow to yellow, inner bracts of fruiting head *ca* 5–7 mm long; florets yellow. Achenes *ca* 1 mm long, pappus pale yellow to yellow, *ca* 5–6 mm long.

Widespread in the region. Flowers mostly late winter to autumn.

The circumscriptions of both *Helichrysum ramosissimum* and *H. apiculatum* have been accepted as covering a wide range of material. The names *H. semiamplexicaule* Domin var. *semiamplexicaule*, *H. odorum* DC. and *H. odorum* var. *arachnoideum* Domin have been applied to some of the material here included under *H. apiculatum*. A critical revision may show that these represent taxa worth recognizing as distinct.

**11. *Helichrysum glutinosum* (Hook.) Benth.**

*Helipterum glutinosum* Hook.

Erect herb or subshrub up to *ca* 1 m tall, lower stems sometimes woolly hairy, upper stems glandular hairy, glutinous. Leaves sessile, very narrowly ovate to linear, margin flat on lower leaves, recurved on upper leaves, 2–6 cm  $\times$  0.15–0.3(–0.6) cm, lower leaves usually broader than upper leaves and sometimes conspicuously white woolly hairy on both surfaces, upper leaves glandular hairy above, glandular or woolly hairy below. Flower heads solitary, 2.5–4 cm across; involucre bracts petal-like, white to reddish pink, up to *ca* 1.5 cm long. Achenes *ca* 1.5 mm long, glabrous; pappus 4–5 mm long.

Recorded from the Burnett district, in sandy or stony soils. Flowers mostly late winter–spring, sometimes also autumn.

**12. *Helichrysum elatum* Cunn. ex DC.**

*Helichrysum albicans* Sieber ex Sprengel, non Cunn.

Perennial herb or shrub up to 2 m tall. Leaves with petioles distinct, 0.5–2 cm long; blades narrowly ovate to oblong, apex acute to acuminate, base narrowed to petiole, 5–10 cm  $\times$  1.3–4 cm, cottony hairy above becoming glabrous with age, densely cottony hairy below. Heads loosely paniculate, 2.5–4.5 cm across; involucre bracts petal-like, white, up to *ca* 1.5 cm long. Achenes *ca* 2–2.5 mm long, glabrous, pitted; pappus *ca* 5 mm long.

Known from the southern Moreton district, mostly in rich soils of the mountains and ranges near the New South Wales border, also recorded from Fraser I. Flowers winter to summer, but mostly early spring.

**13. *Helichrysum* sp. 1.**

Perennial herb up to *ca* 40 cm tall. Leaves with petioles 0.5–1 cm long; blades ovate or elliptic, apex obtuse, mucronulate, base cuneate, 3–6 cm  $\times$  1.5–2.5 cm, sparsely woolly hairy above when young, at length glabrous, densely woolly hairy below. Heads solitary, terminal or few in upper axils; involucre bracts petal-like, white, *ca* 1–1.5 cm long. Achenes *ca* 2 mm long; pappus *ca* 5 mm long.

Known from cliff edges near ANTARCTIC BEECH (*Nothofagus moorei* (F. Muell.) Krasser) forests of the extreme southern Moreton district. Flowers spring–summer.

This taxon has in the past been included in *Helichrysum elatum* but does not appear to be closely related to that species.

**14. *Helichrysum lindsayanum* Domin**

Subshrub up to *ca* 30 cm tall, base woody. Leaves crowded along stem; petioles up to 5 mm long; blades narrowly elliptic, occasionally elliptic, apex acute, base narrowed, margin recurved, 2–4.5 cm × 0.4–1.2 cm, glabrous above, densely woolly hairy below. Heads solitary, terminal or few in upper axils, 3–5 cm across; involucre bracts petal-like, white or pink, up to *ca* 1.5 cm long. Achenes *ca* 2 mm long, glabrous; pappus *ca* 5 mm long.

Crevices in rocky cliff faces of mountains of the southern Moreton district usually at altitudes above 500 m. Flowers late winter–spring.

**15. *Helichrysum lanuginosum* Cunn. ex DC.**

*Helichrysum albicans* Sieber ex Sprengel var. *lanuginosum* (Cunn. ex DC.) Domin  
Herb or undershrub up to *ca* 60 cm tall; stems woolly hairy. Leaves sessile or subsessile, narrowly elliptic to obovate, apex rounded to acute to acuminate, apiculate, base narrowed, 3–9 cm × 1–2 cm, minutely glandular hairy above and occasionally with some woolly hairs, densely woolly hairy below. Heads solitary, pedunculate, 2.5–4.5 cm across; involucre bracts white, up to 1.5 cm long. Achenes *ca* 1.5–2 mm long, glabrous; pappus *ca* 5 mm long.

Known from the northern Wide Bay and Burnett districts, usually in stony soils. Flowers autumn and spring.

**16. *Helichrysum boormanii* Maiden & Betche**

Perennial herb. Leaves ± sessile, elliptic to oblong or narrowly obovate, apex acute or acuminate, base narrowed, margin usually recurved at apex, 3.5–7 cm × 1–1.8 cm, viscid, glandular hairy, sometimes also with woolly hairs. Heads solitary, terminal or few in upper axils, peduncles usually viscid glandular hairy though sometimes woolly hairs also present; heads 3–5 cm across; involucre bracts petal-like, white, up to *ca* 1.5 cm long. Achenes *ca* 1.5 mm long, longitudinally ribbed; pappus *ca* 5–6 mm long.

Known from the central Burnett district. Flowers summer.

Specimens intermediate between *Helichrysum boormanii* and *H. lanuginosum* have been found and a revision of the group is needed.

**17. *Helichrysum oxylepis* F. Muell.**

Perennial herb; stems prostrate or ascending up to 50 cm tall. Leaves oblong to elliptic to obovate, apex rounded, apiculate, base narrowed, sometimes petiole-like, margin recurved, 3–5.5 cm × 0.3–1.5 cm, ± glabrous. Involucre hemispherical, 2–3 cm across, laminae of involucre bracts yellow, subulate pointed, claws ± glabrous. Achenes *ca* 1.5 mm long; pappus white, 4–5 mm long.

Coastal sand dunes and cliffs of the Wide Bay and northern Moreton districts. Flowers spring to autumn.

**18. *Helichrysum collinum* DC.**

Perennial herb up to 1 m tall but mostly much shorter; stems ± woolly at least when young, arising from woody rootstock. Leaves narrowly ovate or linear-ovate, apex acute-acuminate, base narrowed, margin recurved at least at tip, 3–10 cm × 0.2–1.3 cm, woolly hairy above and below, becoming ± glabrous above, sometimes also becoming sparser below. Involucre hemispherical, 2–3.5 cm across, laminae of involucre bracts yellow, subulate pointed, claws nearly glabrous or with few woolly hairs. Achenes *ca* 1.2 mm long; pappus white, *ca* 5–6 mm long.

Stanthorpe-Wallangarra and Chinchilla areas of the Darling Downs district and also a few scattered sites in the Moreton district, possibly also elsewhere in the region. Flowers spring to autumn.



Fig. 75 ASTERACEAE — A–F *Helichrysum* spp. — A<sub>1</sub>–A<sub>2</sub> *H. bidwillii*, A<sub>1</sub> portion of flowering stem x1, A<sub>2</sub> achene with pappus x12; B *H. whitei*, portion of flowering stem x1; C<sub>1</sub>–C<sub>2</sub> *H. diotophyllum*, C<sub>1</sub> portion of flowering stem x1, C<sub>2</sub> leaf showing basal auricles x6; D *H. rufescens*, portion of flowering stem x1; E<sub>1</sub>–E<sub>3</sub> *H. ramosissimum*, E<sub>1</sub> flowering stems x1, E<sub>2</sub> flowering heads x6, E<sub>3</sub> achene with pappus x25; F *H. viscosum*, flowering head x1.

**19. *Helichrysum scorpioides* (Poiret) Labill.**

*Gnaphalium scorpioides* Poiret

Perennial up to 50 cm tall; stems simple or branched at base. Leaves oblong-spathulate to linear, apex acute, base narrowed, 2–6 cm × 0.3–1 cm, glabrous to woolly above, woolly or sparsely woolly below. Involucres hemispherical, 2–3 cm across, involucre bracts yellow often tinged with brown, apex obtuse. Achenes ca 2 mm long; pappus white, ca 5 mm long.

The Queensland Herbarium has only two specimens from the region. They were collected at Stanthorpe in 1889 and 1913.

**20. *Helichrysum viscosum* Sieber ex Sprengel**

Perennial up to 50 cm tall. Leaves linear to elliptic, apex acute to acuminate, base narrowed, margin recurved, 3–9 cm × 0.2–1 cm, viscid and minutely scabrous. Involucres hemispherical, 2–4 cm across, involucre bracts papery, yellow often marked with brown, apex ± rounded, apiculate, outer ones more than 4 mm wide. Achenes ca 2 mm long; pappus yellow, 6–8 mm long. **Fig. 75F.**

Known from the Stanthorpe-Wallangarra area in the southern Darling Downs district. Flowers spring to autumn.

**21. *Helichrysum bracteatum* (Vent.) Andr. sens. lat. GOLDEN EVERLASTING**

*Xeranthemum bracteatum* Vent.

Perennial, flowering in first year, up to 1 m tall. Leaves radical and/or cauline, very variable, obovate-oblong to oblong-ovate to linear, apex acute to acuminate, base narrowed, up to 10 cm × 1.5 cm, glabrous or scabrous, rarely with woolly hairs. Involucres hemispherical, 2–6 cm across, involucre bracts papery, yellow often marked with brown, apex rounded, apiculate or sometimes acuminate in some heads 4–6 cm diameter, outer ones 4 mm or more wide. Achenes 2–3 mm long; pappus yellow, 6–8 mm long.

Widespread and common throughout the region. Flowers spring to autumn. Cultivated as an ornamental.

The species as described under **H. bracteatum** includes a number of taxa. However an Australia wide revision is needed before the status of these taxa can be ascertained.

**26. CASSINIA R. Br.**

Shrubs or rarely herbs. Leaves alternate, entire. Flower heads small, numerous, in terminal corymbs or panicles; involucres narrowly ovoid to ovoid to oblong, involucre bracts usually imbricate, scarious or coloured; receptacles with scarious chaffy scales between florets; ray florets absent; disc florets bisexual, tubular, 5-toothed; anthers shortly or obscurely tailed; style branches nearly terete, truncate. Achenes angular or nearly terete; pappus of several simple entire or denticulate capillary bristles in single row and slightly connate at base.

28 species Africa, Australia and New Zealand; ca 20 species Australia, all endemic; 6 species south-eastern Queensland.

1. Majority of leaves 1.5 mm or more wide . . . . .	2
Majority of leaves less than 1.5 mm wide . . . . .	4
2. Leaves obovate to oblong to elliptic, 1–4 cm × 0.3–1 cm . . . . .	1. <i>C. subtropica</i>
Leaves linear or narrowly elliptic, 2–8 cm × 0.15–0.4(–1.5) cm . . . . .	3
3. Inflorescences paniculate . . . . .	2. <i>C. collina</i>
Inflorescences corymbose . . . . .	3. <i>C. compacta</i>
4. Inflorescences corymbose . . . . .	4. <i>C. uncata</i>
Inflorescences paniculate . . . . .	5
5. Young stems and branches of inflorescences with dense white cottony hairs . . . . .	5. <i>C. laevis</i>
Young stems and branches of inflorescences with short spreading hairs, often glandular . . . . .	6. <i>C. quinquefaria</i>

**1. *Cassinia subtropica* F. Muell.**

Shrub up to *ca* 2.5 m tall, branches tomentose-pubescent. Leaves with petioles 1–1.5 mm long; blades obovate to oblong to elliptic, apex obtuse or acute, mucronulate, base narrowed or rounded, margin scarcely recurved, 1–4 cm × 0.3–1 cm, glabrous and smooth above, white or ferruginous tomentose underneath. Inflorescences loose panicles up to *ca* 15 cm long; involucre straw coloured or pinkish brown, 3–4 mm long; florets usually 3. Achenes *ca* 0.75 mm long; pappus *ca* 2 mm long.

Found in eastern parts of the region, in eucalypt open forest, often on soils of basaltic origin. Flowers autumn and spring.

**2. *Cassinia collina* C. T. White**

Shrub up to *ca* 2 m tall, branches brownish hispidulous. Leaves with petioles *ca* 1 mm long; blades linear or narrowly ovate, apex apiculate, base narrowed, margin recurved or revolute almost to midrib, 3–7 cm × 0.15–0.4 cm, with minute rough hairs above, white tomentose below. Inflorescences panicles up to *ca* 16 cm long; involucre straw coloured, *ca* 4 mm long; florets 7. Achenes *ca* 0.75 mm long, pubescent; pappus *ca* 2 mm long.

Known only from near Biggenden in the Wide Bay district. Flowers autumn.

**3. *Cassinia compacta* F. Muell.**

*Cassinia longifolia* R. Br. var. *straminea* Benth; *C. longifolia* auct. non R. Br., F. M. Bailey

Shrub up to *ca* 3 m tall, branches shortly closely tomentose. Leaves with petioles up to *ca* 2 mm long in Queensland, up to *ca* 10 mm long elsewhere; blades narrowly ovate or almost linear, apex ± acute, apiculate, base narrowed, margin recurved to revolute, 3–7 cm × 0.15–0.4 cm in Queensland, up to 10 cm × 1.5 cm elsewhere, white tomentose below. Inflorescences corymbs mostly 4–8 cm broad; involucre straw coloured, *ca* 4 mm long; florets 4, rarely 5–6. Achenes *ca* 1 mm long, hairy; pappus *ca* 2.5 mm long.

Known from the edge of rainforest of southern parts of the region, mainly along the border with New South Wales. Flowers spring–summer.

**4. *Cassinia uncatata* Cunn. ex DC.**

Shrub up to *ca* 2 m tall, branches with stiff usually glandular hairs. Leaves ± sessile, linear, apex reflexed, margin revolute, 1–3 cm × 0.05–0.1 cm, glabrous above, thinly tomentose below. Inflorescences corymbs 3–8 cm broad; involucre straw coloured or whitish, *ca* 4 mm long. Achenes *ca* 0.75 mm long, glabrous; pappus *ca* 2.5–3 mm long.

Known from the Stanthorpe-Wallangarra area of the Darling Downs district. Flowers spring–summer.

**5. *Cassinia laevis* R. Br.**

COUGHBUSH

Shrub up to *ca* 2.5 m tall, branches with dense cottony hairs. Leaves ± sessile, linear, margin revolute to midrib, 1–3 cm × up to *ca* 0.1 cm, smooth above, underside white tomentose. Inflorescences panicles 3–6 cm long; involucre whitish or straw coloured, 3–4 mm long; florets usually 4–5. Achenes *ca* 0.75 mm long, minutely hairy; pappus *ca* 2 mm long.

Widespread throughout the region in eucalypt open woodland. Flowers mostly spring to autumn.

**6. *Cassinia quinquefaria* R. Br.**

Shrub up to *ca* 3 m tall, young branches with short spreading hairs, often glandular. Leaves with petioles up to *ca* 1 mm long; blades linear, margin revolute to midrib, 1.5–4 cm × *ca* 1 mm, glabrous above, tomentose below. Inflorescences panicles 4–12 cm long; involucre straw coloured, *ca* 3–4 mm long; florets *ca* 5. Achenes *ca* 0.75 mm long, hairy; pappus *ca* 2 mm long.

Widespread in region except Wide Bay district, usually in eucalypt open forest. Flowers summer to early winter.

F. M. Bailey, "Qd. Fl." 6:2007 (1901) recorded a specimen from Killarney as *Cassinia denticulata* R. Br. This was a misidentification; the specimen is *Helichrysum rufescens* (DC.) N. T. Burbidge. *C. denticulata* does not occur in Queensland.

## 27. IXIOLAENA Benth.

Herbs, annual or with perennial base. Leaves alternate, entire. Heads on terminal peduncles; involucre campanulate or hemispherical, involucre bracts numerous; receptacle scales absent; ray florets absent; disc florets bisexual, or rarely few outer ones female, tubular, 5-toothed; anthers with long tails; style branches slender, capitate or truncate at end. Achenes angular or terete, not beaked; pappus of fine bristles.

About 6 species, all endemic in Australia; 4 species south-eastern Queensland.

- |   |                          |   |
|---|--------------------------|---|
| 1. Involucres hemispherical; scarios upper part of inner involucre bracts attenuate, $\pm$ entire                             | 1. <i>I. brevicompta</i> |   |
| Involucres campanulate; scarios upper part of inner involucre bracts broad, often dilated, often lacerate, apex $\pm$ rounded |                          | 2 |
| 2. Leaves with dense conspicuous white woolly hairs on both leaf surfaces   | 2. <i>I. tomentosa</i>   |   |
| Leaves green and without woolly hairs above   |                          | 3 |
| 3. Leaves with dense white woolly hairs below, green above  | 3. <i>I. sp. 1.</i>      |   |
| Leaves green on both surfaces   | 4. <i>I. leptolepis</i>  |   |

1. *Ixiolaena brevicompta* F. Muell.

Erect herb up to 45 cm tall, eventually developing perennial woody base usually covered with loose woolly hairs, rarely almost glabrous and then glandular scabrous. Leaves sessile, linear-oblong to narrowly obovate, apex acute, base attenuate, 1.5–3.5 cm  $\times$  0.15–0.7 cm. Heads hemispherical, 1–1.5 cm broad; involucre bracts glandular scabrous or with few woolly hairs, scarios upper part of inner bracts attenuate,  $\pm$  entire; florets yellow. Achenes *ca* 2.5 mm long; pappus much shorter than corolla. **Fig. 76B.**

Western Darling Downs district, usually in clay soils. Flowers found most of the year, probably induced by rain.

2. *Ixiolaena tomentosa* Sonder & F. Muell.

## WOOLLY IXIOLAENA

Erect or ascending perennial often with woody base, up to 35 cm tall, woolly. Leaves sessile, linear-oblong to narrowly obovate, apex acuminate, base long attenuate, 1–5 cm  $\times$  0.15–0.4 cm,  $\pm$  white woolly on both surfaces. Heads campanulate, 6–10 mm broad; involucre bracts woolly hairy, scarios upper part of inner bracts broad, often dilated, often lacerate; florets yellow. Achenes *ca* 2.5 mm long; pappus  $\pm$  as long as corolla.

Western Darling Downs district, usually on brown clay soils. Flowers found most of the year, probably induced by rain.

3. *Ixiolaena sp. 1.*

Erect perennial up to *ca* 45 cm tall; stems woolly hairy. Leaves sessile, narrowly oblong to linear-oblong, apex acuminate, base narrowed, margin recurved, 1–5 cm  $\times$  0.15–0.6 cm, lower surface densely white woolly, upper surface green, scabrous hairy often with few woolly hairs. Heads campanulate, 6–10 mm broad; involucre bracts woolly hairy, scarios upper part of inner bracts broad, often dilated, often lacerate; florets yellow. Achenes *ca* 2–2.5 mm long; pappus  $\pm$  as long as corolla.

Western Darling Downs district, usually in red sandy loams. Flowers found most of the year, probably after rain.

The above species is related to *Ixiolaena tomentosa*.

4. *Ixiolaena leptolepis* (DC.) Benth.

## STALKED IXIOLAENA

*Helichrysum leptolepis* DC.

Erect perennial with woody base, usually glandular scabrid, occasionally glabrous or with woolly hairs. Leaves sessile, linear-oblong to narrowly obovate, apex acuminate, base narrowed, 1–5 cm  $\times$  0.15–0.7 cm, green above and below, often 3-nerved at base.

Heads campanulate, *ca* 1–1.5 cm across; involucre bracts glandular scarious; florets yellow. Achenes *ca* 2–2.5 mm long; pappus  $\pm$  as long as corolla. **Fig. 76A.**

Western Darling Downs district, usually in grasslands. Flowers found most of the year, probably induced by rain.

## 28. RUTIDOSUS DC.

Perennial herbs. Leaves alternate, entire. Heads solitary, terminal or paniculate; involucre hemispherical or ovoid, involucre bracts in several rows, unequal, scarious; receptacle scales absent; ray florets absent; all florets bisexual, tubular, 4–5-toothed; anthers shortly or not tailed; style branches truncate. Achenes obconical, papillose; pappus of scales, entire or jagged or with long cilia on margin.

10 species all endemic in Australia; 2 species south-eastern Queensland.

- |   |                          |
|---|--------------------------|
| 1. Outer involucre bracts glabrous; pappus scales with long cilia on margins                    | 1. <i>R. murchisonii</i> |
| Outer involucre bracts woolly hairy; pappus scales often denticulate but not ciliate on margins | 2. <i>R. leucantha</i>   |

### 1. *Rutidosus murchisonii* F. Muell.

Erect up to 40 cm tall. Radical leaves persisting for some time on young plants, petioles winged, up to 3 cm long, blades narrowly elliptic, apex mucronate, up to *ca* 6 cm  $\times$  0.8 cm, white woolly below, less densely so above; cauline leaves sessile, linear or linear-elliptic, 1–6 cm  $\times$  0.1–0.3 cm, woolly below, sparsely woolly or  $\pm$  glabrous above. Heads terminal; involucre  $\pm$  hemispherical, 8–10 mm diameter, involucre bracts glabrous; florets yellow. Achenes *ca* 1 mm long; pappus of 8–12 narrow acute scales with long cilia on margin. **Fig. 76C.**

Known from sandy soils of the eastern Wide Bay district and northern Moreton district, also from sandy areas in the northern Darling Downs district, not common. Flowers mainly spring but some found most of the year.

The Queensland Herbarium has a few specimens from the Darling Downs and Leichhardt districts of a form of this species in which the leaves have recurved margins and moderately dense short glandular hairs. Further study may show this to represent an undescribed species.

### 2. *Rutidosus leucantha* F. Muell.

Erect or ascending herb up to 20 cm tall. Leaves sessile, elliptic or narrowly elliptic, apex mucronate, 1.5–3 cm  $\times$  0.3–0.6(–0.9) cm, woolly hairy below, upper surface with minute  $\pm$  scabrous hairs and occasionally few woolly hairs. Heads pedunculate, peduncles arising in leaf axils; involucre  $\pm$  hemispherical, 8–10 mm diameter, outer involucre bracts woolly hairy; florets white or yellow. Achenes *ca* 1 mm long; pappus of *ca* 10  $\pm$  spatulate acute scales, margin entire or  $\pm$  denticulate. **Fig. 76D.**

Rare, known from a few places in the western Darling Downs district in red soils. Flowers spring to autumn.

## 29. AMMOBIUM R. Br.

Herbs,  $\pm$  white tomentose. Leaves radical and cauline, entire. Flower heads solitary, terminal; involucre hemispherical, involucre bracts either petal-like and spreading or scarious and more appressed; receptacle scales present; ray florets absent; disc florets bisexual, 5-toothed; anthers with fine tails; style lobes truncate. Achenes 4-angled; pappus a membranous cup, either truncate or  $\pm$  produced into 2 or 4 unequal teeth or short awns.

2 species, both endemic in eastern Australia; 1 species south-eastern Queensland.

**1. *Ammobium alatum* R. Br.**

Erect herb up to *ca* 1 m tall, white tomentose; stems with 4 wings 1–3 mm wide. Radical leaves with winged petioles up to *ca* 10 cm long, blades narrowly ovate, apex acute to acuminate, base narrowed, margin entire, up to *ca* 2–10 cm × 0.5–1 cm, glaucous above, silvery hairy below; stem leaves sessile, narrowly ovate, apex acuminate, smaller than radical leaves, reducing upwards. Heads *ca* 1–2 cm diameter, terminating branches which are arranged in a terminal corymb; involucre bracts white, papery, in many rows, each *ca* 5 mm long; disc florets yellow, numerous, *ca* 3–4 mm long, each floret subtended by a receptacle scale. Achenes 4-angled, winged on 2 angles, *ca* 4 mm × 1 mm; pappus a membranous cup *ca* 0.5–1 mm long. **Fig. 76E.**

Rare in south-eastern Queensland, known from a few areas in the south-eastern Darling Downs district and the southern Moreton district.

**30. *ACOMIS* F. Muell.**

Erect slender herbs. Leaves alternate, entire. Flower heads on slender terminal peduncles; involucre broadly hemispherical, involucre bracts scarious, slightly thickened at base; receptacle convex, scales absent; ray florets absent; disc florets numerous, bisexual, tubular, 5-toothed; anthers with fine tails; style branches long, truncate. Achenes without pappus.

3 species, all endemic in Australia; 1 species south-eastern Queensland.

**1. *Acomis acoma* (F. Muell.) Druce**

*Rutidosus acoma* F. Muell.; *Acomis rutidosus* F. Muell.

Annual or possibly perennial herb up to *ca* 60 cm tall; stems branching at base, erect or ascending, ± woolly. Leaves with petioles 0.4–1 cm long; blades narrowly ovate, apex acute-acuminate, base cuneate to attenuate, 0.3–8.5 cm × 1–2.4 cm, discolourous, densely woolly hairy below, less densely so above. Heads 6–10 mm wide; outer involucre bracts ovate, 1–2 mm long, inner bracts obovate-oblong, *ca* 3 mm long; florets yellow, *ca* 4 mm long. Achenes ovoid or ellipsoid, *ca* 2.5 mm long, tuberculate. **Fig. 76F.**

Recorded from the Moreton, Burnett and Wide Bay districts, not common, mostly in open forest, occasionally on edge of rainforest. Flowers summer–autumn.

**31. *MYRIOCEPHALUS* Benth.**

Annual herbs. Leaves basal or alternate, sessile, entire. Heads compound, with general involucre of scarious or coloured bracts; partial heads with involucre of few scarious bracts; receptacle scales absent; florets 1 or few per partial head, bisexual, tubular, 3- or 5-toothed; anthers tailed; style branches truncate. Achenes ± obovoid, sparsely to densely hairy; pappus none or of 1 or more awns or bristle-like scales, simple or ± plumose.

10 species, all endemic in Australia; 1 species south-eastern Queensland.

**1. *Myriocephalus rhizocephalus* (DC.) Benth.**

*Hyalolepis rhizocephala* DC.

Tufted, ± prostrate annual; stems up to *ca* 5 cm long. Leaves ± linear, 1–7 cm × *ca* 0.1 cm, glabrous or sparsely woolly. Compound heads depressed ovoid, 0.5–1.2 cm across; bracts of general involucre hyaline, colourless with green midrib, woolly ciliate; partial heads 1–5-flowered; florets 3–4-toothed. Pappus of a single bristle or occasionally absent. **Fig. 76G.**

Rare in the region, known from drier areas of the western Darling Downs district. Flowers spring.

## 32. ANGIANTHUS Wendl.

Herbs. Leaves alternate, entire. Partial flower heads numerous, few-flowered, crowded into dense compound head; each partial head with 1–4 subtending involucre bracts which are morphologically  $\pm$  similar to 2–4 inner bracts which surround the partial head; receptacle scales absent; ray florets absent; disc florets bisexual, 3–5-toothed; anthers  $\pm$  distinctly pointed or tailed at base; style branches  $\pm$  terete, truncate. Achenes usually compressed, brownish; pappus none or of 1 or more bristles or scales, often united in ring or cup at base.

15 species, all endemic in Australia; 1 species south-eastern Queensland.

1. *Angianthus brachypappus* F. Muell.

Annual, usually white tomentose, occasionally glabrous at base; stems procumbent, up to *ca* 15 cm long, arising from central taproot. Leaves sessile, linear or linear-cuneate, 0.5–2 cm  $\times$  *ca* 0.1 cm. Compound heads numerous, pale yellow or brownish, cylindrical, 0.8–1.5 cm  $\times$  0.4–0.5 cm; partial involucre of 2 hyaline conduplicate bracts and 2 clawed hyaline bracts enclosing 2 florets. Achenes papillose, *ca* 0.5 mm long; pappus minute jagged crown falling off with corolla.

Rare in the region, known only from the south-western Darling Downs district. Flowers spring–summer.

See note after *Chrysocoryne pusilla* (Benth.) Endl.

## 33. CHRYSOCORYNE Endl.

Annual herbs. Leaves alternate, entire. Partial flower heads numerous, few-flowered, crowded into dense compound head, each partial head with 1 subtending involucre bract very unlike the 2–10 inner bracts which surround each partial head; receptacle scales absent; ray florets absent; disc florets bisexual, 3–5-toothed; anthers  $\pm$  distinctly pointed or tailed at base; style branches  $\pm$  terete, truncate. Achenes pink or purple, obconical; pappus absent or small jagged ring or ring of bristles.

6 species, all endemic in Australia, 1 species south-eastern Queensland.

1. *Chrysocoryne pusilla* (Benth.) Endl.

*Crossolepis pusilla* Benth.; *Angianthus pusillus* (Benth.) Benth.; *Siloxerus pusillus* (Benth.) Ising

Ascending annual; stems reddish, filiform, 3–15 cm long, usually with white scale-like hairs, becoming glabrous with age. Leaves oblong-linear below, becoming ovate or broadly ovate above, lower leaves 5–10 mm  $\times$  0.5–1 mm, upper leaves 0.5–3 mm  $\times$  0.5–2 mm, usually with at least a few scale-like hairs. Compound heads numerous, golden, cylindrical or narrowly obconical, 0.7–1.2 cm  $\times$  0.3–0.4 cm; partial involucre of 4 hyaline concave enclosing bracts and 4–8 hyaline flat bracts enclosing 2–7 florets. Achenes papillose, *ca* 0.5 mm long; pappus minute jagged crown falling off with corolla.

Rare in the region, known only from the western Darling Downs district. Flowers collected spring.

The above species is similar in appearance to *Angianthus brachypappus* F. Muell. but can be distinguished by its glabrous branches or branches with white scale-like hairs.

**A. brachypappus** has white woolly hairs at least just below the compound heads.

## 34. CALOCEPHALUS R. Br.

Annual or perennial herbs or small shrubs. Leaves sessile, opposite or alternate, entire. Partial heads numerous, clustered together to form globose or conical terminal sessile or pedunculate compound heads; general involucre absent or consisting of a few leafy or scarious bracts, rarely exceeding florets; partial heads 2- or more-flowered;

involucres of several bracts, outer ones narrow,  $\pm$  persistent, inner ones broader, transparent, deciduous; receptacle scales absent; ray florets absent; disc florets bisexual, 5-toothed; anthers  $\pm$  distinctly tailed; style branches nearly terete, truncate. Achenes usually compressed; pappus of several narrow-linear scales or bristles,  $\pm$  plumose ciliate, free or united in ring at base.

15 species, all endemic in Australia; 2 species south-eastern Queensland.

- |  |                      |
|--|----------------------|
| 1. Leaves alternate, at least upper ones decurrent . . . . . | 1. <i>C. sonderi</i> |
| Leaves mostly opposite, not decurrent . . . . .              | 2. <i>C. citreus</i> |

### 1. *Calocephalus sonderi* F. Muell.

PALE BEAUTY HEADS; YELLOW  
POVERTY WEED

Erect branching woolly annual up to 30 cm tall. Leaves alternate, linear-ovate to linear, apex acute, base tapering or in upper ones decurrent, up to 3 cm  $\times$  0.15 cm, becoming smaller upwards. Compound heads globular, 6–9 mm diameter; partial heads 2–3-flowered, stipitate; involucre bracts 5–7, broad, scariosus with pale yellow laminae usually also with at least a few woolly hairs below lamina; florets yellow. Achenes less than 1 mm long; pappus *ca* 1–1.2 mm long, of 6–10 bristles, plumose towards summit, united in ring at base.

Known from the western Darling Downs district, rare.

### 2. *Calocephalus citreus* Less.

Perennial with woody base, up to *ca* 40 cm tall, hairy. Leaves mostly opposite, linear, apex  $\pm$  acute, up to 8 cm  $\times$  0.1–0.2 cm, becoming shorter upwards. Compound heads ovoid to oblongoid, 0.6–1.4 cm long; partial heads 3-flowered; involucre bracts *ca* 10, scariosus, with broad yellow lamina, outer ones woolly on back; florets yellow. Achenes less than 1 mm long; pappus *ca* 1 mm long of 4–5 bristles, plumose at apex, united in ring at base.

Known from the south-eastern Darling Downs district, rare.

## 35. ACTINOBOLE Fenzl ex Endl.

Dwarf annuals,  $\pm$  white tomentose. Leaves alternate, entire. Flower heads several, sessile in dense terminal clusters or compound heads, surrounded by few leafy bracts, each head many-flowered; involucre ovoid, involucre bracts scariosus, woolly hairy; receptacle without scales; ray florets absent; disc florets bisexual, tubular, 5-toothed; anthers with five tails; style branches truncate. Achenes with pappus of *ca* 5 spreading plumose bristles.

3 species all endemic in Australia; 1 species south-eastern Queensland.

### 1. *Actinobole uliginosum* (A. Gray) Eichler

*Gnaphalodes uliginosum* A. Gray

Stems prostrate, 0.5–6 cm long, densely grey woolly. Leaves with petioles up to 2 mm long; blades obovate, apex acute, base narrowed to petiole, up to *ca* 10 mm long, woolly hairy. Heads 3–12, sessile in broad terminal cluster, *ca* 1 cm diameter, surrounded by ovate or oblong floral leaves 4–8 mm long, acting as general involucre, not or scarcely exceeding heads; involucre *ca* 5 mm long, outer involucre bracts woolly, inner ones  $\pm$  glabrous; disc florets numerous, shorter than involucre. Achenes obovoid, papillose; pappus of 5, rarely 4 bristles, united at base, *ca* 2 mm long, falling off with corolla.

Found in the western Darling Downs district. Flowers early spring.

## 36. CRASPEDIA G. Forster

Herbs. Leaves radical or radical and alternate, entire. Flower heads compound, terminal, consisting of numerous partial heads clustered together into an ovoid or globular compound head surrounded by several  $\pm$  scariosus bracts forming a general

involucre; partial heads 3–8-flowered; involucre of several scarious bracts; florets bisexual, tubular, 5-toothed; anthers  $\pm$  distinctly tailed; style branches  $\pm$  terete, truncate. Achenes usually compressed, silky hairy; pappus of several narrow-linear scales or bristles, plumose-ciliate from base or towards end only, free or slightly united at base.

7 species, temperate Australia and New Zealand; 4 species Australia; 3 species south-eastern Queensland.

- |   |                         |
|---|-------------------------|
| 1. Bracts of general involucre green and conspicuous in young non expanded heads; involucre bracts brown, hyaline; pappus whitish | 1. <i>C. uniflora</i>   |
| Bracts of general involucre inconspicuous or absent, involucre bracts and tips of pappus golden                                   | 2                       |
| 2. Older leaves $\pm$ glabrous above, silvery hairy below; mature heads 0.8–1.2 cm diameter                                       | 2. <i>C. chrysantha</i> |
| All leaves silvery hairy above and below; mature heads usually 1.5–3 cm diameter  | 3. <i>C. globosa</i>    |

### 1. *Craspedia uniflora* G. Forster

*Craspedia glauca* (Labill.) Sprengel; *C. richia* Cass.

Perennial herb with tufted stock and fleshy fibrous roots and simple erect stems up to *ca* 60 cm tall,  $\pm$  glabrous to moderately densely woolly. Radical leaves with petioles 1–15 cm long, blades elliptic or obovate-oblong to narrowly ovate to linear-elliptic, 2–15 cm  $\times$  0.4–1.2 cm, broader in southern Australia; cauline leaves sessile, stem clasping, reducing in size upwards. Compound heads usually pale yellow, sometimes orange, usually somewhat depressed globular, flowering heads 1.2–2.5 cm across; bracts of general involucre green, *ca* 3–4 mm long, becoming hidden as partial heads expand; partial heads 5–10-flowered; involucre bracts hyaline, brownish. Pappus whitish, of 12–18 bristles, plumose from base, shortly united at base, as long as florets.

Known from the southern Darling Downs district and the Burnett district. Flowers spring.

### 2. *Craspedia chrysantha* (Schlechtendal) Benth. GOLDEN BILLY BUTTONS; YELLOW DRUMSTICKS

*Calocephalus chrysanthus* Schlechtendal

Perennial herb; stems ascending or erect, branching at base, up to *ca* 30 cm tall, grey woolly. Leaves  $\pm$  sessile, linear or linear-ovate or linear-elliptic, up to 7 cm  $\times$  0.7 cm, reducing upwards, lower surface grey woolly, upper surface at length  $\pm$  glabrous. Compound heads bright yellow, globular or ovoid, usually 0.8–1.2 cm wide at maturity; general involucre inconspicuous; partial heads 4–7-flowered; involucre bracts hyaline, tips yellow. Pappus of 9–16 bristles, plumose and golden towards summit, united in narrow ring at base.

Western Darling Downs district, usually on clay soils. Flowers spring. It can be poisonous to hungry animals under stress.

### 3. *Craspedia globosa* Benth.

Perennial herb; stems simple, erect. Leaves mostly radical, linear or linear-ovate, up to *ca* 20 cm  $\times$  0.4 cm, occasionally up to *ca* 1 cm broad, reducing upwards, grey woolly on both sides. Compound heads bright yellow, globular, usually 1.5–3 cm diameter at maturity; general involucre absent; partial heads 4–6-flowered; involucre bracts hyaline, tips yellow. Pappus of 12–15 bristles, plumose and golden tipped, united in ring at base.

Western Darling Downs district. Flowers spring.

## 37. *PODOLEPIS* Labill.

Annual or perennial herbs. Radical leaves petiolate, entire, forming conspicuous basal cluster or present only on young plants; cauline leaves alternate, sessile. Heads solitary and terminal on main stem or few together on short peduncles; involucre ovoid to hemispherical, involucre bracts in several rows, with scarious entire erect laminae,

outer bracts sessile, inner ones usually with herbaceous claws; receptacle scales absent; outer florets usually female, with rays or tubular; disc florets bisexual, tubular, 5-toothed; anthers with fine tails; style branches filiform in female florets, truncate in bisexual florets. Achenes  $\pm$  terete, minutely papillose, rarely tuberculate; pappus of fine bristles, barbellate or  $\pm$  plumose, often united at base.

19 species all endemic in Australia; 5 species south-eastern Queensland.

- |  |                          |   |
|--|--------------------------|---|
| 1. Outer florets with inconspicuous ligules less than 0.3 cm long                              | 1. <i>P. arachnoidea</i> | 2 |
| Outer florets with conspicuous ligules greater than 1 cm long                                  |                          |   |
| 2. Intermediate involucrel bracts $\pm$ sessile  | 2. <i>P. neglecta</i>    | 3 |
| Intermediate involucrel bracts with distinct claws 3 mm or more long                           |                          |   |
| 3. Lamina of intermediate involucrel bracts shorter than their claws                           | 3. <i>P. longipedata</i> | 4 |
| Lamina of intermediate involucrel bracts as long as or longer than their claws                 |                          |   |
| 4. Rosette leaves up to 2 cm broad; lamina of intermediate involucrel bracts acute             | 4. <i>P. jaceoides</i>   |   |
| Rosette leaves 3.5–6.5 cm broad; lamina of intermediate involucrel bracts obtuse or emarginate | 5. <i>P. monticola</i>   |   |

### 1. *Podolepis arachnoidea* (Hook.) Druce

*Rutidosus arachnoidea* Hook.; *Podolepis rhytidochlamys* F. Muell.

Perennial up to 80 cm tall, many-stemmed, forming large clumps; young stems white woolly. Radical leaves with petioles up to 3 cm long, expanded at base, blades obovate-elliptic, apex acute, up to 13.5 cm  $\times$  2.2 cm, woolly on both surfaces or only below; cauline leaves stem clasping, ovate, apex acute, up to 13 cm  $\times$  4 cm, woolly on both surfaces or only below. Heads in clusters of 2–10 at ends of branches; involucre *ca* 10 mm  $\times$  5–7 mm, involucrel bracts scarcely clawed; ray florets *ca* 5–7, rays yellow, *ca* 2.5 mm long. Achenes *ca* 2 mm long, shortly beaked, minutely papillose; pappus *ca* 6–7 mm long, barbellate. **Fig. 76J.**

Widespread in the region, usually on sandy soils. Flowers mostly spring with a few in summer and autumn.

### 2. *Podolepis neglecta* G. L. Davis

Perennial up to 65 cm tall; stems glabrous or sparsely woolly. Radical leaves present only on young plants; cauline leaves oblong to narrowly ovate, apex acute to acuminate, up to 10(–15) cm  $\times$  2(–4) cm. Heads solitary or few together; involucre 1–1.5 cm  $\times$  1–2 cm; involucrel bracts sessile; ray florets *ca* 30–50, rays yellow, 0.8–2 cm long, 3-lobed. Achenes *ca* 2.5–3 mm long, minutely papillose; pappus *ca* 8 mm long, barbellate, united at base. **Fig. 76I.**

Eastern parts of the region as far north as Noosa Heads, also known from the Stanthorpe-Wallangarra area of the Darling Downs district. Flowers mostly spring, with some summer–autumn.

### 3. *Podolepis longipedata* Cunn. ex DC.

Perennial up to *ca* 95 cm tall but mostly less than 60 cm tall; stems with loose woolly indumentum. Radical leaves with petioles up to 5 cm long, expanded at base, blades linear-oblong to narrowly ovate, apex acute, up to 20 cm  $\times$  3.5 cm, glabrous or with scattered septate hairs; cauline leaves  $\pm$  stem clasping, otherwise similar to radical leaves, slightly smaller and reducing upwards. Heads 1-several together; involucre 1–1.5 cm  $\times$  1–2.2 cm, intermediate involucrel bracts with claws longer than their laminae; ray florets *ca* 40, rays yellow, 1.5–2 cm long, 3-lobed. Achenes *ca* 2 mm long, minutely papillose; pappus *ca* 6 mm long, finely barbellate, united at base.

Widespread in the region, usually on sandy soil. Flowers mainly spring but some summer and autumn.

### 4. *Podolepis jaceoides* (Sims) Voss

*Scalia jaceoides* Sims; *Podolepis acuminata* R. Br.

Stems annual from perennial stock, up to 80 cm tall. Radical and lower cauline leaves with petioles up to 4 cm long, enlarged at base, blades linear-oblong to obovate, apex

acute, up to 20 cm × 2 cm, sparsely woolly below and sometimes above, sometimes hispid above; upper leaves ± stem clasping, linear or narrowly ovate, smaller than lower leaves, reducing upwards. Heads solitary, sometimes few together; involucre 1.5–2 cm × 1.5–3 cm, lamina of intermediate involucre bracts as long as or longer than claws; ray florets *ca* 30–40, rays yellow, up to 2.5 cm long, 3–5-lobed. Achenes *ca* 2–3 mm long, minutely papillose; pappus *ca* 6 mm long, finely barbellate, united at base.

Known from the south-eastern Darling Downs district. Flowers spring with a few in summer.

### 5. *Podolepis monticola* R. Henderson

Perennial up to 50 cm tall; stems woolly. Rosette leaves with petioles up to 3 cm long expanded at base, blades ovate to obovate, apex obtuse to acuminate, up to 21 cm × 6.5 cm, lower surface woolly, upper surface ± scabrous; upper leaves linear or narrowly ovate, smaller than radical leaves, reducing upwards. Heads 1 or few together; involucre *ca* 1.5–2 cm × *ca* 2.5 cm, lamina of intermediate involucre bracts as long as or longer than claws; ray florets *ca* 30, rays yellow, *ca* 1.5 cm long, 2–4-lobed. Achenes 2.5–3 mm long, smooth or minutely papillose; pappus *ca* 6 mm long, finely barbellate. **Fig. 76H.**

Known only from the McPherson Ra. at high altitudes, usually in rock crevices. Flowers spring–summer.

## 38. DITTRICHIA Greuter

Annual, biennial or perennial herbs or subshrubs; stems erect or ascending. Leaves mostly alternate. Heads solitary or several together; involucre hemispherical or campanulate, involucre bracts multiseriate; receptacle scales absent; ray florets present or absent, female; disc florets bisexual, 5-lobed; anther bases tailed; style branches acute, rounded or truncate. Achenes cylindrical, abruptly contracted below pappus; pappus hairs united at base, persistent.

2 species from Mediterranean region to northern India; 1 species naturalized Australia, occurring in south-eastern Queensland.

### 1. \**Dittrichia graveolens* (L.) Greuter

STINKWORT

*Erigeron graveolens* L.; *Inula graveolens* (L.) Desf.

Erect strong smelling bushy annual up to *ca* 1 m tall, ± covered with minute glandular hairs. Leaves ± sessile, linear-ovate, apex acute, base narrowed, margin entire or denticulate, 1–5 cm × 0.1–0.6 cm, occasionally larger at base. Heads *ca* 1 cm across; ray florets yellow, 6–8, rays 2–2.5 mm long. Achenes *ca* 2 mm long, finely pubescent; pappus *ca* 4 mm long.

Native of the Mediterranean region to north-western India; naturalized in the southern Darling Downs district around Wallangarra, rarely collected. It is reported to be a cause of dermatitis in humans and stock.

## 39. CARPESIMUM L.

Erect, annual, biennial or perennial herbs. Leaves alternate, simple. Heads terminal or axillary, sessile or pedunculate, usually drooping; involucre campanulate or hemispherical, involucre bracts in 3–4 series, outer ones herbaceous, inner ones subscariosus; receptacles flat, scales absent; ray florets absent; outer florets female, tubular, 3–5-toothed, inner florets bisexual, more widely tubular, 5-toothed. Achenes elongate, finely ribbed, tapering to short beak surmounted by minute crown; pappus absent.

10 species from Europe to China and Japan and southern Asia; 1 species apparently native in Australia, occurring in south-eastern Queensland.

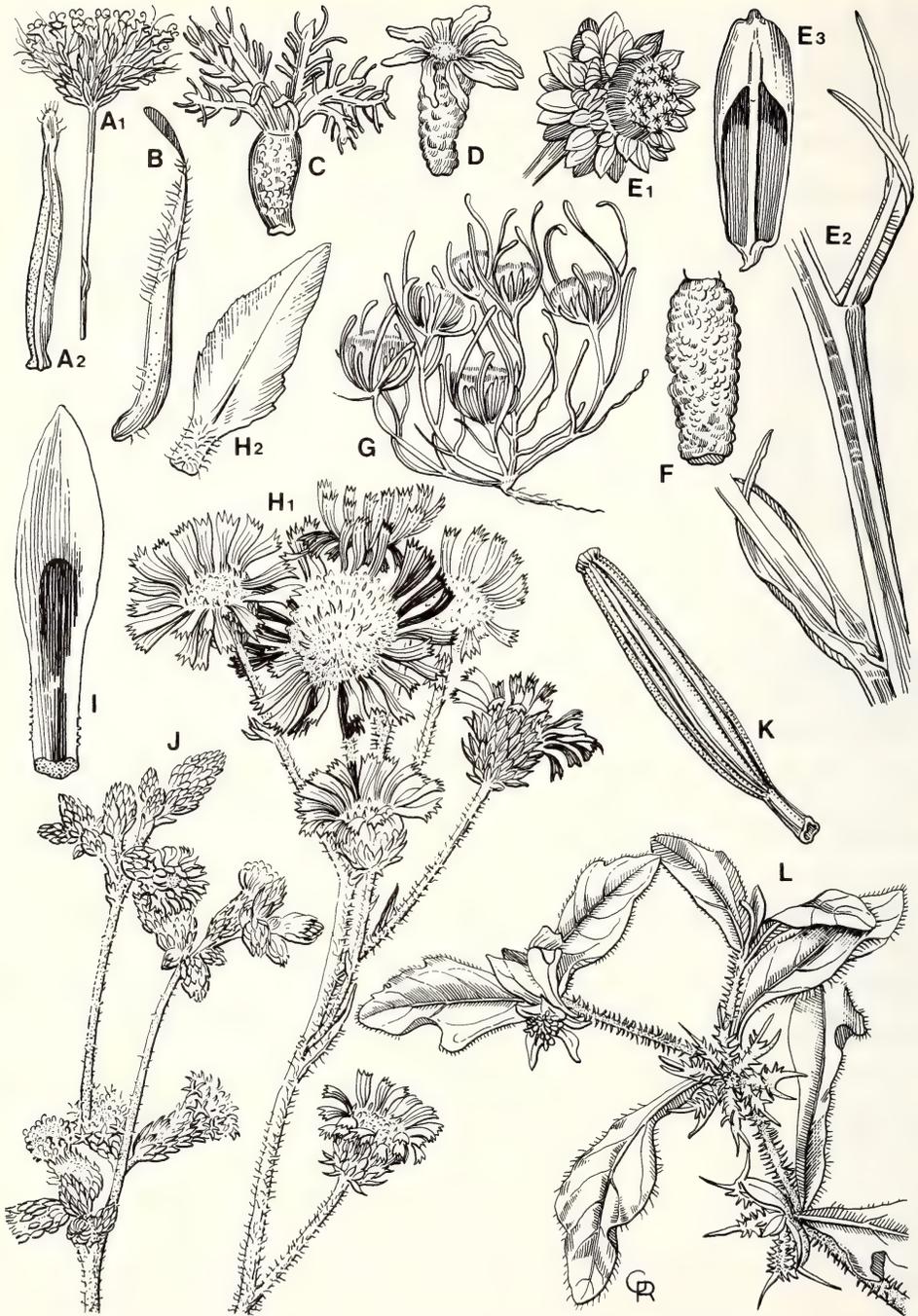


Fig. 76 ASTERACEAE — A–B *Ixiolaena* spp. — A<sub>1</sub>–A<sub>2</sub> *I. leptolepis*, A<sub>1</sub> flowering head x1, A<sub>2</sub> inner involucre bract x6; B *I. brevicompta*, inner involucre bract x6; C–D *Rutidosus* spp., achenes with pappus, both x12 — C *R. murchisonii*; D *R. leucantha*; E<sub>1</sub>–E<sub>3</sub> *Ammobium alatum*, E<sub>1</sub> flowering head x1, E<sub>2</sub> portion of winged stem x1, E<sub>3</sub> achene x6; F *Acomis acoma*, achene x12; G *Myriocephalus rhizocephalus*, habit x1; H–J *Podolepis* spp. — H<sub>1</sub>–H<sub>2</sub> *P. monticola*, H<sub>1</sub> flowering heads x1, H<sub>2</sub> intermediate involucre bract x4; I *P. neglecta*, intermediate involucre bract x4; J. *P. arachnoidea*, portion of inflorescence x5/6; K *Carpesium cernuum*, achene x12; L *Acanthospermum hispidum*, portion of stem with flowering and fruiting heads.

**1. *Carpesium cernuum* L.**

Apparently annual herb 30–60 cm tall, with fine pale  $\pm$  appressed hairs, sometimes almost cottony. Leaves with petioles 0.2–2 cm long; blades elliptic to obovate, apex obtuse, base cuneate to long tapering, margin sinuate-dentate, lower ones 10–18 cm  $\times$  3–5.5 cm, upper ones smaller. Heads solitary, 1–1.5 cm broad; outer involucre bracts 3–6 mm long, spreading or reflexed, inner ones 7–8 mm  $\times$  2–2.5 mm, erect; florets yellow, *ca* 2–2.5 mm long. Achenes *ca* 4 mm long. **Fig. 76K.**

Known from eucalypt forest of the mountains and ranges of south-eastern parts of the region. Flowers summer-autumn.

**40. ACANTHOSPERMUM Schrank**

Annual herbs; stems dichotomously branched, pubescent. Leaves opposite, subentire to pinnatifid. Inflorescences heads, solitary in axils, sessile or shortly peduncled, heads radiate; involucre biseriate, outer involucre bracts 4–6, inner bracts same number as ray achenes and closely enveloping them; receptacles small, convex scales present; ray florets female, fertile, uniseriate, 5–8, corolla yellow, tube as long as or shorter than limb, ligule apex emarginate or tridentate; disc florets bisexual, corollas yellow, tube short, 5-lobed. Fruits strongly or weakly compressed,  $\pm$  densely echinate on whole surface; pappus absent.

6 species from warm temperate to tropical North and South America and West Indies and Galapagos Is.; 2 species naturalized Australia; 1 species south-eastern Queensland.

**1. \**Acanthospermum hispidum* DC.****STAR BURR**

Erect up to *ca* 55 cm tall, stems with long spreading multicelled hairs with shorter  $\pm$  appressed ones between them. Leaves sessile or with winged petiole-like base up to *ca* 1 cm long; blades elliptic, ovate or deltoid-ovate, apex acute-obtuse, base gradually narrowed below middle, margin serrulate or doubly repand-serrate to subentire,  $\pm$  pilose on both sides, gland dotted beneath. Heads solitary in leaf axils and in forks of stem, 4–5 mm wide in flower, 1–1.8 cm wide in fruit, peduncles mostly 1–4 mm long in Queensland, up to 1.5 cm long elsewhere; outer involucre bracts 3–4 mm long,  $\pm$  pilose, especially on margin; ray florets 5–8, limb elliptic, apex tridentate, sparsely hairy, usually sparsely glandular; disc florets *ca* 7, *ca* 1.5–1.8 mm long, usually sparsely glandular; receptacle scales *ca* 2 mm long. Fruits cuneate, strongly compressed, 4–7 mm long, gland dotted, with hooked prickles on body and 2 terminal strongly divergent prickles 3–4 mm long. **Fig. 76L.**

Native of America; naturalized throughout the region as a weed of disturbed land and often on alluvial flats. The burrs are troublesome in wool. Flowers summer–autumn. It is a declared noxious weed under the Stock Routes and Rural Lands Protection Acts, 1944–1967.

**41. PARTHENIUM L.**

Aromatic herbs or shrubs. Leaves alternate, entire or much divided. Heads solitary or in terminal corymbs or panicles; involucre bracts in 2 series; receptacle scales present; ray florets 5, bisexual, fertile; disc florets sterile or fertile. Achenes  $\pm$  compressed, pubescent, margin thickened into rib-like structure, attached to adjacent pair of disc florets and a subtending inner involucre bract; pappus of 2–3 awns or scales or absent.

16 species Americas and West Indies; 1 species naturalized Australia, occurring in south-eastern Queensland.

**1. \**Parthenium hysterophorus* L.****PARTHENIUM WEED**

Annual herb up to 2 m tall, much-branched above. Leaves with petioles up to 2 cm long; lower leaves deeply pinnately dissected, up to 20 cm  $\times$  12 cm, upper leaves less divided and smaller, strigose above and below. Heads in large terminal paniculate inflorescences; involucre cupular, *ca* 2 mm  $\times$  4–5 mm; rays white, *ca* 0.7 mm long; disc florets yellow. Achenes *ca* 2 mm long; pappus of two broad awns, *ca* 0.5 mm long. **Fig. 77A.**

Occasionally reported in the region. Flowers spring to autumn. It is a declared noxious weed throughout the state under the Stock Routes and Rural Lands Protection Acts, 1944–1967, but appears to be aggressive only in the 500–800 mm rainfall belt. It is a pest in the central highlands of Queensland. The Queensland Herbarium's first record of the species from Queensland was from Toogoolawah in the Moreton district in 1955 and the first report from the central highlands was in 1964. The species did not begin to spread rapidly until 1973–1974.

**42. AMBROSIA L.**

Perennial shrubs or herbs. Leaves mostly alternate. Florets in unisexual heads, male heads in long terminal panicle spike-like racemes, female heads immediately below males in axils of uppermost bracts; male heads hemispherical, involucre bracts few, united, receptacles with capillary scales, corolla tubular, 5-toothed, anthers without tails; female heads with 1 floret borne in sessile or stalked clusters sometimes solitary, axillary in floral axils, involucre bracts connate, tips often forming ± spiny processes, receptacle scales absent, perianth absent, stigmatic branches elongate, linear. Fruiting heads obovoid, consisting of hardened beaked involucre composed of connate bracts and single enclosed achene.

35–40 species, tropics and temperate areas, but mostly tropical America; 4 species naturalized Australia; 3 species south-eastern Queensland.

- |   |                             |   |
|---|-----------------------------|---|
| 1. Spines scattered over the whole of the fruiting involucre                                      | 1. <i>A. confertiflora</i>  |   |
| Spines or tubercles in one row towards top of the fruiting involucre                              |                             | 2 |
| 2. Perennials with creeping rhizomes; leaves of middle parts of stem subsessile                   | 2. <i>A. psilostachya</i>   |   |
| Annuals without creeping rhizomes; leaves of middle parts of stem with petioles 1 cm or more long | 3. <i>A. artemisiifolia</i> |   |

**1. \*Ambrosia confertiflora DC. BARR RAGWEED**

*Franseria confertiflora* (DC.) Rydb.; *F. tenuifolia* Harvey & Gray  
Erect perennial up to ca 75 cm tall with underground rhizomes sending up shoots at various intervals. Leaves alternate; petioles up to ca 10 cm long, reducing upwards; blades pinnately to tetrapinnately lobed, up to ca 15 cm × 15 cm, sparsely to densely pubescent. Inflorescences up to ca 15 cm long; male heads drooping. Fruiting involucre up to 5 mm × 4 mm, often much smaller; spines mostly 10–20, 0.5–2 mm long. **Fig. 77B.**

Native of North America; reported naturalized from a few widely scattered localities in the Moreton, Darling Downs and Burnett districts. Flowers autumn–early winter. It is a declared noxious weed under the Stock Routes and Rural Lands Protection Acts, 1944–1967.

**2. \*Ambrosia psilostachya DC. PERENNIAL RAGWEED**

Perennial up to ca 75 cm tall with underground rhizomes sending up shoots at various intervals. Leaves mostly opposite or subopposite, subsessile, pinnatifid, divisions mostly toothed or lobed, up to ca 10 cm × 6 cm, scabrous or hirsute, with glandular crystals. Inflorescences up to ca 15 cm long; male heads drooping. Fruiting involucre ca 2.5 mm long, beak ca 1 mm long with 4–6 tubercles towards apex.

Native of North America; naturalized but seldom met with in the Moreton and Burnett districts. Flowers autumn–early winter. It is a declared noxious weed under the Stock Routes and Rural Lands Protection Acts, 1944–1967.

**3. \*Ambrosia artemisiifolia L. ANNUAL RAGWEED**

Erect annual with taproot; stems up to ca 2 m tall. Leaves opposite below, alternate above; petioles up to ca 10 cm long but mostly 1–3 cm long, becoming subsessile under inflorescences; blades pinnatifid or bipinnatifid, up to 10 cm × 7 cm, ± hirsute-pubescent. Inflorescences up to ca 15 cm or more long, often nearly or wholly male; male heads drooping. Fruiting involucre up to ca 3 mm long with 5–7 short spines towards apex.

Native of north America; naturalized in the Moreton, Wide Bay and Darling Downs districts, common in the Moreton district, as a weed of roadsides, creek banks and cultivation. Flowers autumn–early winter. It is a declared noxious weed under the Stock Routes and Rural Land Protection Acts, 1944–1967.

## 43. XANTHIUM L.

Annual monoecious herbs. Leaves alternate. Heads solitary or in axillary clusters; male heads terminal and in upper leaf axils, globose, many-flowered, deciduous after anthesis, involucre bracts numerous, corollas 5-toothed, filaments connate, anthers free, obtuse at base; female heads in axils of leaves below male heads, sessile, ovoid, florets 2, outer involucre bracts *ca* 5, connate at base, inner bracts connate into ellipsoid burr with tip of bracts becoming hooked spines. Achenes completely enclosed in burr, 2 per burr.

About 70 species North and South America, Europe, Asia, Africa; 4–5 species naturalized Australia; 2 species south-eastern Queensland.

- |  |                       |
|--|-----------------------|
| 1. Plants with 3-branched spines arising at base of petioles . . . . . | 1. <i>X. spinosum</i> |
| Plants without spines at base of petioles . . . . .                    | 2. <i>X. pungens</i>  |

1. \**Xanthium spinosum* L.

## BATHURST BURR

Erect up to *ca* 1 m tall with 1 or 2, 3-branched spines at base of each petiole. Leaves with petioles up to 3 cm long; blades narrowly ovate, apex acuminate, base cuneate, margin entire or with 2–4 lateral lobes, 2.5–7.5 cm × 0.6–2.5 cm, sparsely hairy above, white tomentose below. Male heads borne in clusters at end of branches; female heads solitary in axils. Fruiting burrs ovoid-oblongoid, body 0.9–1.2 cm long, beset with numerous yellow hooked spines *ca* 3 mm long, and with 2 inconspicuous beaks at summit, body pubescent. **Fig. 77D.**

Native of South America; naturalized and widespread in the region, usually as a weed of creek flats, run-down pastures or old cultivation areas. Flowers summer–autumn. It is a declared noxious weed under the Stock Routes and Rural Lands Protection Acts, 1944–1967.

2. \**Xanthium pungens* Wallr.

## NOOGOORA BURR

*Xanthium strumarium* auct. non L.

Erect, up to *ca* 2 m tall but mostly less than 1 m tall. Leaves with petioles up to 15 cm long; blades ovate-triangular, 3–5-lobed, base cordate, margin coarsely irregularly toothed, 4–20 cm × 3–15 cm, scabrous pubescent. Male heads in clusters arranged in panicles at ends of branches usually with few female heads at base of inflorescence, female heads also clustered in leaf axils. Fruiting burrs ovoid-oblongoid, body *ca* 1.5 cm long, beset with numerous hooked spines 3–4 mm long, and with 2 apical beaks *ca* 4 mm long, body pubescent and glandular. **Fig. 77C.**

Native of North America; naturalized throughout the region, as a common weed of river and creek flats, old cultivation paddocks or in some pasture land. Flowers summer–autumn. Young plants are poisonous to stock and the burrs can become entangled in the wool of sheep reducing its value. It is a declared noxious weed under the Stock Routes and Rural Lands Protection Acts, 1944–1967.

Some authors consider Australian material to belong to *Xanthium chinense* Miller or *X. occidentale* Bertol.

## 44. ZINNIA L.

Annual or perennial herbs or subshrubs. Leaves opposite, entire. Heads solitary, peduncles hollow; involucre cylindrical to hemispherical, involucre bracts in several rows; receptacle scales present; ray florets female, ray persistent on top of mature achene; disc florets bisexual, 5-lobed, sometimes zygomorphic; style branches filiform; anther bases truncate to sagittate, apex with acute appendage. Achenes compressed or 3-angular; pappus absent or of awns or horned.

About 20 species southern United States of America, Central and South America; *ca* 2 species naturalized Australia; 1 species south-eastern Queensland.

1. \**Zinnia peruviana* (L.) L.

## WILD ZINNIA

*Chrysogonum peruvianum* L.; *Zinnia multiflora* L.; *Zinnia pauciflora* L.

Erect annual up to *ca* 60 cm tall. Leaves sessile, narrowly ovate, apex narrowed, obtuse or acute, base rounded to cordate, 2–6 cm × 0.5–2 cm, scabrous, 3-nerved.

Peduncles swollen, striate, up to *ca* 7 cm long; heads 3–5 cm across expanded rays; involucre campanulate, *ca* 1.3 cm × *ca* 1 cm, involucre bracts rounded at apex; rays dull red above, whitish below, 1–1.5 cm long. Achenes *ca* 10 mm long, those of ray florets without pappus, those of disc florets with pappus of single awn *ca* 5 mm long. **Fig. 77E.**

Native of the southern United States of America and Central and South America; garden ornamental, naturalized and widespread in the region, usually as a weed of disturbed sites, not common. Flowers summer–autumn.

#### 45. SIGESBECKIA L.

Annual herbs. Leaves opposite, ± petiolate, simple. Heads in lax leafy panicles; involucre campanulate or hemispherical, involucre bracts few, herbaceous; receptacle scales present, embracing disc florets; ray florets female, inconspicuous; disc florets bisexual or functionally male, tubular, 3–5-toothed; anther bases obtuse; style branches of ray florets linear, obtuse, of disc florets deltoid at apex. Achenes incurved; pappus absent.

6 species tropical and temperate parts of the world; 1 species Australia, occurring in south-eastern Queensland.

##### 1. *Sigesbeckia orientalis* L.

##### INDIAN WEED

Erect up to 1 m tall. Leaves subsessile or petioles up to *ca* 4 cm long, winged when large; blades ovate-triangular to ovate, apex acute to acuminate, base ± truncate to cuneate, often narrowed abruptly to winged petiole, margin coarsely irregularly toothed or smaller leaves sometimes ± entire, 4–15 cm × 0.7–9 cm, shortly pubescent. Heads in dichotomous leafy panicles; involucre *ca* 1 cm across outer expanded bracts, involucre bracts in 2 rows, outer row of 5 spreading linear-spathulate bracts 5–10 mm long, covered with glandular hairs, inner ones clasping ray achenes, glandular hairy; rays yellow, up to *ca* 1 mm long, persistent; disc florets yellow. Achenes *ca* 2–3 mm long, ray achenes clasped by persistent glandular hairy inner bracts. **Fig. 77F.**

Widespread in the region, except western parts, usually in fertile soils, often in shaded areas. Flowers spring to autumn.

#### 46. GUIZOTIA Cass.

Annual or perennial herbs. Leaves opposite, simple. Heads solitary or in corymbose panicles; involucre hemispherical-campanulate, involucre bracts in 2 series, outer bracts 5–8, green with ciliate margin, inner bracts scarious-membranous, keeled; receptacle scales present; ray florets yellow, 6–18, female; disc florets yellow, bisexual, 5-lobed; anther bases ± sagittate; styles with short hairy appendages. Achenes ± laterally compressed; pappus none.

6 species Africa; 1 species occasionally found apparently naturalized Australia, occurring in south-eastern Queensland.

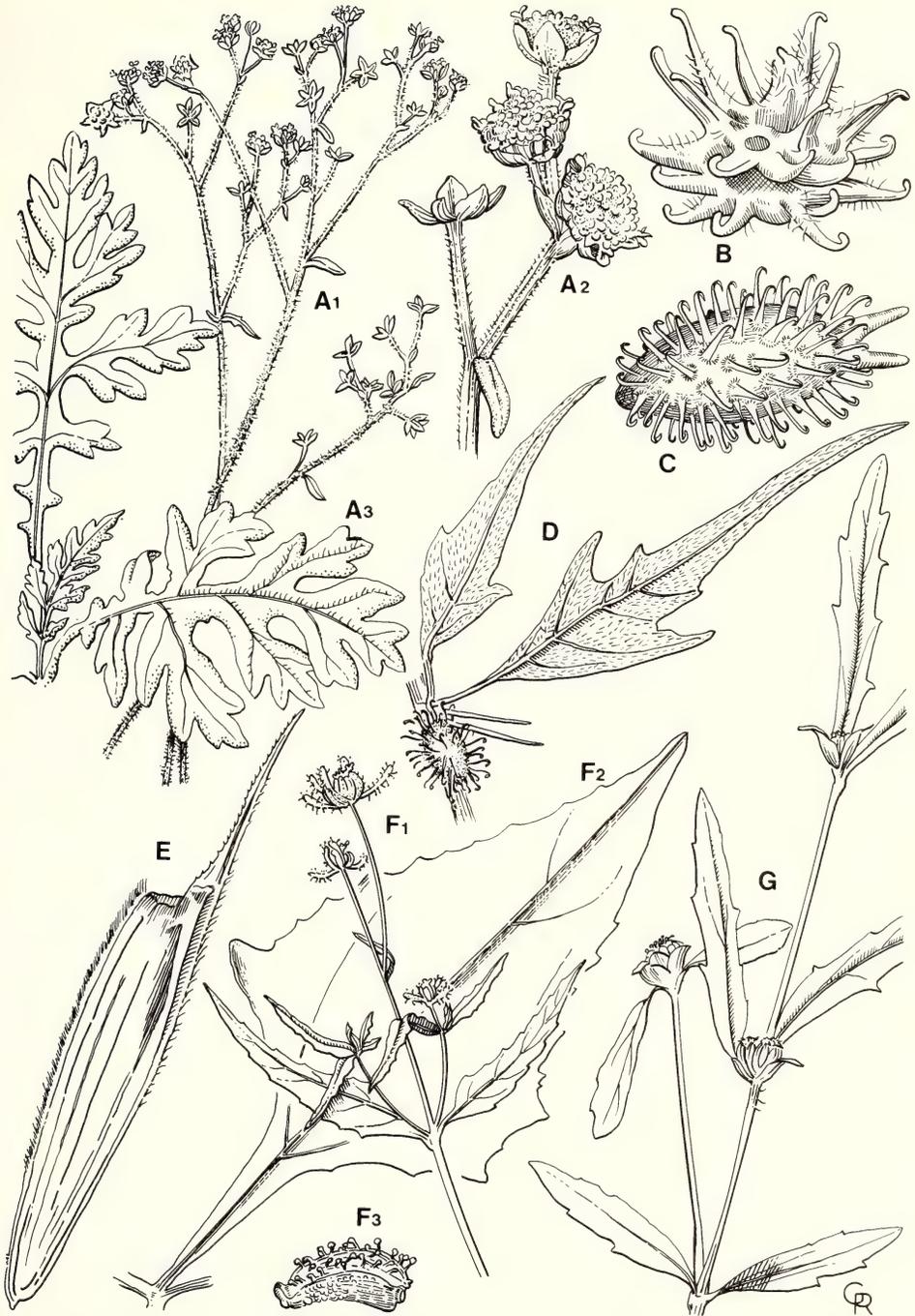
##### 1. \**Guizotia abyssinica* (L. f.) Cass.

##### NIGER SEED

*Polymnia abyssinica* L. f.

Erect annual herb up to 2 m tall. Leaves sessile, narrowly ovate to ovate to obovate, apex acute, base cordate, somewhat stem clasping, margin entire to serrate, up to 15 cm × 6 cm, scabrous above and below. Heads 1.5–3 cm across rays, in leafy corymbose panicles; ray florets 6–8, rarely –15, rays mostly 0.8–1.5 cm long. Achenes 3.5–5 mm long.

Native of Ethiopia; occasionally found in southern parts of the region but it may not be naturalized. Flowers apparently autumn.



**Fig. 77** ASTERACEAE — A<sub>1</sub>–A<sub>3</sub> *Parthenium hysterophorus*, A<sub>1</sub> portion of inflorescence x1, A<sub>2</sub> flowering heads x3, A<sub>3</sub> leaves x1; B *Ambrosia confertiflora*, fruiting involucre x12; C–D *Xanthium* spp. — C *X. pungens*, burr x2; D *X. spinosum*, portion of stem with leaf, spines and burr x1; E *Zinnia peruviana*, achene x6; F<sub>1</sub>–F<sub>3</sub> *Sigesbeckia orientalis*, F<sub>1</sub> portion of flowering stem x1, F<sub>2</sub> leaf x1, F<sub>3</sub> achene x6; G *Enydra fluctuans*, portion of flowering stem x1.

47. **ENYDRA** Lour.

Herbs. Leaves opposite. Flower heads sessile in axils; involucre of 4 leafy bracts, 2 outer ones larger than inner ones; receptacle scales enclosing florets and achenes; ray florets female, in several rows, rays short, 3-toothed; disc florets bisexual but usually sterile, tubular, 5-toothed; anthers obtuse at base; style branches flattened. Achenes flattened; pappus absent.

About 10 species, widespread in tropical regions; 1 species Australia, occurring in south-eastern Queensland.

1. ***Enydra fluctuans* DC.**

*Enydra paludosa* DC.

Perennial herb often growing in water, glabrous or thinly pilose; stems creeping, rooting at nodes, flowering branches ascending. Leaves subsessile or petioles up to *ca* 1 cm long; blades narrowly ovate or narrowly elliptic, margin entire or toothed, 2–7 cm × 0.5–1.5 cm. Heads solitary, axillary, 8–10 mm across; outer involucre bracts 0.6–1.2 cm long, inner ones 4–5 mm long; florets yellowish or greenish. Achenes 2.5–3.5 mm long. **Fig. 77G.**

Known from marshy areas of the Moreton and Wide Bay districts, not common. Flowers spring–summer.

48. **ECLIPTA** L.

Annual or perennial herbs. Leaves opposite, entire or toothed. Heads campanulate or hemispherical, pedunculate, solitary or in pairs in upper leaf axils; involucre bracts 2-seriate, longer than disc florets; receptacle scales present; ray florets female or sterile, ray strap shaped; disc florets bisexual, campanulate, 4–5-lobed; anthers with rounded apical appendage, base obtuse; style of ray florets shortly bifid, of disc florets oblong, apex deltoid. Achenes oblong, ± compressed; pappus absent or a lacerated rim or 2 short awns.

3 or 4 species, tropical parts of the world; 2 species Australia, 1 endemic; both occurring in south-eastern Queensland.

- |   |                          |
|---|--------------------------|
| 1. Rays white; flowering involucre hemispherical, <i>ca</i> 6 mm diameter | 1. <i>E. prostrata</i>   |
| Rays yellow; flowering involucre campanulate, <i>ca</i> 3–4 mm diameter   | 2. <i>E. platyglossa</i> |

1. ***Eclipta prostrata* (L.) L.**

## WHITE ECLIPTA

*Verbesina prostrata* L.; *Eclipta alba* (L.) Hassk.

Erect or decumbent annual herb up to 1 m tall, scabrous pubescent. Leaves ± sessile or petioles up to *ca* 3 mm long; blades narrowly ovate to elliptic, apex acute to acuminate, base narrowed, margin irregularly toothed or ± entire, mostly 3–10 cm × 0.5–1 cm. Peduncles up to *ca* 6 cm long, solitary or paired; heads hemispherical, *ca* 6 mm diameter in flower, up to *ca* 1.5 cm diameter in fruit; rays white. Achenes compressed, *ca* 3 mm long, strongly tuberculate; pappus absent or a minute ring of teeth. **Fig. 78A.**

Common on wet ground in eastern parts of the region. When growing in disturbed areas it is often considered a weed. Flowers spring to autumn.

2. ***Eclipta platyglossa* F. Muell.**

## YELLOW ECLIPTA

Prostrate or ascending annual herb, scabrous pubescent. Leaves with petioles up to *ca* 4 mm long; blades narrowly ovate or linear-ovate, apex acute, base narrowed or ± rounded, margin entire, mostly 1.5–7 cm × 0.15–0.7 cm. Peduncles 0.5–3 cm long, solitary or paired; heads 3–4 mm diameter in flower, up to *ca* 7 mm diameter in fruit; rays yellow. Achenes ± compressed, *ca* 3 mm long, smooth or tuberculate; pappus a minute rim.

Widespread throughout the region, in damp areas. Flowers mostly spring–summer.

**49. WEDELIA** Jacq.

Herbs. Leaves opposite, rarely highest ones alternate. Heads pedunculate, terminal and upper axillary, solitary or 2–4 together; involucre hemispherical or campanulate, involucral bracts in 2–3 rows; ray florets female, in 1 row; disc florets bisexual or rarely male, tubular, 5-lobed, yellow; anthers with obtuse or sagittate base; style arms broad, acute or obtuse. Achenes obovoid,  $\pm$  laterally compressed, 3–4-angular; pappus absent, cup shaped or of 1–2 bristles.

About 100 species Americas, Africa, south-eastern Asia, New Guinea, Solomon Is., Australia; *ca* 5 species Australia; 2 species south-eastern Queensland.

- |   |                            |
|---|----------------------------|
| 1. Pappus a minute denticulate cup, sometimes with a deciduous bristle; petioles 0–0.8 cm long; leaves with scabrous hairs; widespread, not confined to coastal sandy soils | 1. <i>W. spilanthoides</i> |
| Pappus absent or consisting of 1 short curved needle; petioles 0.5–6.5 cm long; leaves with sparse to dense appressed hairs, not scabrous; confined to coastal sandy soils  | 2. <i>W. biflora</i>       |

**1. *Wedelia spilanthoides*** F. Muell.

Perennial herb up to *ca* 1 m tall. Leaves sessile or with petioles up to *ca* 8 mm long; blades linear, oblong, linear-ovate or ovate, apex subobtuse and mucronate or acute, base rounded to  $\pm$  truncate, margin repand-dentate, sometimes lobed at base, 2.5–10 cm  $\times$  0.2–1 cm, scabrous above and below. Heads solitary or 2 together, peduncles 0.5–12 cm long; involucre *ca* 6–8 mm wide; ray florets *ca* 11, rays yellow, 0.9–1.3 cm long. Achenes obconical, triquetrous, truncate at apex, 2.5–3 mm long, glabrous or with few hairs; pappus a minute denticulate cup sometimes with 1 short bristle. **Fig. 78C.**

Widespread in the region, usually in grasslands or eucalypt communities on sandy soils. Flowers spring to autumn.

**2. *Wedelia biflora*** (L.) DC.

*Verbesina biflora* L.; *Melanthera biflora* (L.) Willd.

Straggling perennial herb up to *ca* 1.5 m tall but mostly less than 1 m tall. Leaves with petioles 0.5–6.5 cm long; blades ovate or broadly ovate, apex acuminate, acute or subobtuse, base cuneate, rounded or almost truncate, margin serrate-dentate or rarely almost entire, 2.5–15 cm  $\times$  1–10 cm, with sparse to dense appressed hairs on both surfaces. Heads solitary or few together, peduncles 0.5–9 cm long; involucre *ca* 8–10 mm wide; ray florets *ca* 8, rays yellow, 4–10 mm long. Achenes obovoid,  $\pm$  truncate, triquetrous, *ca* 2.5–3 mm long, glabrous or minutely pilose with minute tubercles; pappus absent or of 1 short bristle. **Fig. 78B.**

Coastal sands of the region. Flowers spring to autumn.

**50. TITHONIA** Desf. ex Juss.

Coarse annual or sometimes perennial herbs or shrubs. Leaves mostly alternate. Heads showy on peduncles thickened at top; involucre hemispherical or broadly campanulate, involucral bracts in 2–5 series; receptacle scales embracing disc florets, persistent; ray florets present, rays conspicuous; disc florets tubular, 5-toothed; anthers obtuse at base or shortly sagittate, apex with short appendage; style branches narrow with triangular tips. Achenes oblong, 4-angled; pappus a crown of short free or connate scales, 1–2 awns often also present.

10 species Central America and West Indies; 2 species naturalized Australia, occurring in south-eastern Queensland.

- |  |                           |
|--|---------------------------|
| 1. Involucral bracts in 2 rows, all bracts green, acute                | 1. <i>T. rotundifolia</i> |
| Involucral bracts in about 4 rows, inner ones papery with rounded tips | 2. <i>T. diversifolia</i> |

1. \**Tithonia rotundifolia* (Miller) Blake MEXICAN SUNFLOWER

*Tagetes rotundifolia* Miller

Annual herb up to *ca* 2 m tall. Leaves with petioles up to *ca* 7 cm long; blades  $\pm$  ovate in outline, apex acute or acuminate, entire or 3–5-lobed, margin mostly crenate, 5–15 cm  $\times$  5–10 cm, scabrous. Peduncles up to *ca* 30 cm long; heads showy, up to *ca* 9 cm across expanded rays; involucre 2–3 cm across in flower, involucre bracts in 2 rows, herbaceous, acute, 1–1.5 cm long; rays orange above, yellow below, 2–3 cm long; disc florets numerous. Achenes *ca* 6–8 mm long, appressed hairy; pappus of a ring of short scales and 2 persistent awns 3–5 mm long. **Fig. 78D.**

Native of Central America; naturalized, widespread mostly in eastern parts of the region but not common, often as a weed of roadsides, embankments etc. Flowers autumn.

2. \**Tithonia diversifolia* (Hemsley) A. Gray MEXICAN SUNFLOWER

*Mirasolia diversifolia* Hemsley

Perennial up to 3 m tall. Leaves with petioles up to *ca* 10 cm long; blades  $\pm$  ovate in outline, deeply 3–5-lobed, margin mostly crenate, 6–15 cm  $\times$  5–12 cm, pubescent on both surfaces. Peduncles up to 15 cm long, often several together in panicles; heads showy, up to *ca* 10 cm across expanded rays; involucre 2–3 cm across in flower, involucre bracts in *ca* 4 rows, inner ones with broad rounded papery tips; rays yellow above and below, 4–5 cm long; disc florets numerous. Achenes 5–8 mm long, appressed hairy; pappus of a ring of short scales and 2 persistent awns *ca* 5 mm long.

Native of Central America; naturalized, widespread in eastern parts of the region, moderately common, often as a weed of roadsides, embankments etc. Flowers spring and autumn.

The above species has also been known as JAPANESE SUNFLOWER but it is not native to Japan.

## 51. HELIANTHUS L.

Annual or perennial herbs. Lower leaves usually opposite, upper alternate. Heads usually large, solitary, pedunculate; involucre hemispherical, involucre bracts in 2-many series; receptacle scales present, enfolding disc florets; ray florets sterile, rays usually yellow, conspicuous; disc florets purplish or blackish, bisexual, 5-toothed; anthers with narrow deltoid apical appendages, base obtuse; style arms narrow, tips hairy on outer face. Achenes obovate,  $\pm$  compressed; pappus of 2 awns or narrow scales, soon caducous, rarely absent.

About 110 species mostly North America, a few South America; 4 species introduced Australia; 2 species south-eastern Queensland.

- |  |           |                       |
|--|-----------|-----------------------|
| 1. Leaves 2–6 cm wide, green, not glaucous | . . . . . | 1. <i>H. annuus</i>   |
| Leaves 0.5–1.5 cm wide, blue-glaucous      | . . . . . | 2. <i>H. ciliaris</i> |

1. \**Helianthus annuus* L. SUNFLOWER

Annual herb up to 4 m tall, naturalized specimens mostly less than 2 m tall. Leaves with petioles up to 10 cm long; blades ovate to triangular, apex acuminate, base cordate to truncate, margin toothed or  $\pm$  entire, 5–10 cm  $\times$  2–6 cm, scabrid-pubescent. Heads mostly 8–10 cm across in naturalized plants, often much larger in cultivated plants; rays yellow; disc florets brownish or purplish black. Achenes narrowly obovate, somewhat compressed, *ca* 5 mm long, larger in cultivated plants; pappus of 2 narrow scales, *ca* 1 mm long, very caducous.

Native of North America, now widely cultivated throughout the world; cultivated as both a garden and crop plant in Australia, naturalized in southern and eastern parts of south-eastern Queensland, often as a weed of roadsides. Flowers spring to autumn.

2. \**Helianthus ciliaris* DC. TEXAS BLUEWEED

Perennial from slender rhizomes; stems glaucous, up to *ca* 50 cm tall. Leaves opposite, sessile, linear-ovate or narrowly ovate, 3–8 cm  $\times$  0.5–1.5 cm, blue-glaucous, glabrous except for stiff hairs on margin, 3-nerved. Involucre *ca* 1–2.5 cm across; rays yellow,

*ca* 1 cm long; disc florets yellow or reddish. Achenes *ca* 3 mm long; pappus absent or of 1–3 scales.

Native of the southern United States; recorded once from the southern Moreton district as a weed of cultivation.

## 52. VERBESINA L.

Perennial herbs or shrubs. Leaves alternate or opposite. Heads solitary or corymbose-paniculate; involucre hemispherical or campanulate, involucre bracts in 2-many rows; receptacle scales present; ray florets female; disc florets bisexual, 5-toothed; anther bases obtuse or auriculate; style branches acute or alternate. Achenes flattened, each edge with well developed wing; pappus of 2 bristles.

About 150 species, warm parts of the Americas; 1 species naturalized Australia, occurring in south-eastern Queensland.

### 1. \**Verbesina encelioides* (Cav.) A. Gray

CROWNBEARD; WILD  
SUNFLOWER

*Ximenesia encelioides* Cav.

Annual herb up to *ca* 1.5 m tall. Leaves opposite in lower part, alternate above; petioles winged, up to *ca* 4.5 cm long with stem clasping auricles at base; blades ovate, apex acute to acuminate, base broadly cuneate, margin toothed or lobed, 4–10(–15) cm × 1.5–6(–10) cm, dense white appressed hairs below, less densely hairy above. Heads solitary or few together, 3–5 cm across expanded rays, peduncles up to *ca* 25 cm long; involucre broadly hemispherical, *ca* 2 cm broad, involucre bracts in 2 rows, outer green, 1–1.5 cm long; rays yellow, 1–2 cm long, trilobed; disc florets yellow. Achenes dark, 5–7 mm long, wings pale, *ca* 1.5 mm wide, the whole with sparse fine hairs; pappus of 2 fine bristles 1–2 mm long. **Fig. 78E.**

Native of the southern United States of America; naturalized and widespread in the area often as a weed of disturbed sites. Flowers found most of the year except mid winter. It is poisonous to stock though it is seldom eaten unless the stock are travelling or hungry.

## 53. SPILANTHES Jacq.

Herbs. Leaves opposite, simple. Heads solitary on peduncles in upper axils, fruiting heads conical or ovoid; involucre ± campanulate, involucre bracts in 1–3 rows, outer ones foliaceous; receptacles conical, scales folded around florets; ray florets present or absent, if present then 1-seriate, female; disc florets yellow, bisexual, tubular, 5-lobed; anthers not or scarcely lobed at base; style arms acute in ray florets, truncate in disc florets. Achenes oblong, those of ray florets triquetrous, those of disc laterally compressed, often ciliate along margins; pappus absent or of 1–3 short fine bristles.

About 75 species Americas, southern Asia, New Guinea and Australia; *ca* 2 species Australia; 1 species south-eastern Queensland.

### 1. *Spilanthes grandiflora* Turcz.

Herb up to *ca* 60 cm tall. Leaves sessile or petioles up to 1 cm long; blades linear to narrowly ovate, apex subobtusely to acute, base cuneate to attenuate, margin ± entire or repand-dentate, 3–7(–14) cm × 0.2–1.5(–3) cm, 3-nerved, glabrous or with a few soft hairs. Peduncles up to 35 cm long; heads at first ± globose, *ca* 8 mm long, later ovoid and rounded at apex, 1–1.5 cm long; involucre cup shaped, involucre bracts in 3 rows, up to *ca* 4 mm long; ray florets 5–15, rays yellow, 5–10 mm long. Achenes of ray florets 2–2.5 mm long, of disc florets flattened, faces smooth, ciliate along margin, 2–3 mm long; pappus absent or on disc achenes often of 2 short hairs. **Fig. 78F.**

Not common, recorded from eastern parts of the region. Flowers summer–autumn.

### 54. CALYPTOCARPUS Less.

Erect annual herbs. Leaves opposite. Heads  $\pm$  peduncled, terminal but appearing axillary by growth of lateral shoots; involucre of 3–4 herbaceous outer bracts and several thin  $\pm$  colourless inner ones; receptacle scales present; ray florets female; disc florets bisexual; anther bases not tailed; style branches with pubescent appendages. Achenes obconical, compressed; pappus of 2 short ascending awns, with ascending barbs, 2 or 3 short scales also usually present.

1 species, southern United States of America and Mexico, naturalized in Australia, occurring in south-eastern Queensland.

#### 1. \**Calyptocarpus vialis* Less.

#### CREEPING CINDERELLA WEED

*Synedrella vialis* A. Gray

Scabrous herb with weak often sprawling stems up to 60 cm long. Leaves with petioles 0.5–1.1 cm long; blades ovate-triangular, apex acute, base tapering abruptly to petiole, margin serrate, 1.5–4 cm  $\times$  0.8–2.5 cm. Heads 5–10 mm long; outer involucre bracts 4–9 mm long; ray florets 4–8, rays yellow, *ca* 3 mm long; disc florets yellow. Achenes obconical, slightly 3–4-angled, verrucose to muricate, body 3–4 mm long; awns 1.5–2 mm long. **Fig. 78G.**

Native of the southern United States of America and Mexico; naturalized and moderately common in eastern parts of the region, occasional in the Burnett district, as a weed of gardens, footpaths etc. Flowers found most of the year.

### 55. COREOPSIS L.

Annual or perennial herbs or shrubs. Leaves opposite or rarely alternate, entire to pinnately divided. Heads solitary or in loose corymbose-paniculate inflorescences; involucre bracts in few series,  $\pm$  connate at base; receptacle scales present; ray florets sterile or rarely female and fertile; disc florets bisexual; anthers entire or minutely auriculate at base; style branches apically truncate or conical or shortly caudate-appendaged. Achenes compressed, mostly 2-winged; pappus absent or of bristle or of 2 teeth or 2 scales.

About 120 species from Americas and tropical Africa; 1 species naturalized Australia, occurring in south-eastern Queensland.

#### 1. \**Coreopsis lanceolata* L.

#### COREOPSIS

Erect annual or short lived perennial up to *ca* 1 m tall, stems and leaves sparsely hairy. Radical leaves with petioles up to *ca* 15 cm long, blades spatulate, up to *ca* 20 cm  $\times$  3 cm; lower cauline leaves petiolate, pinnate or pinnatisect, leaflets *ca* 3–7; upper cauline leaves becoming sessile, entire, narrowly obovate to linear-obovate, up to *ca* 10 cm long. Peduncles up to *ca* 30 cm long; involucre 1–2 cm diameter, involucre bracts in 3 rows, *ca* 1 cm long; ray florets usually *ca* 8, bright yellow, rays 1–3 cm long; disc florets yellow. Achenes *ca* 2–3 mm long, wings each *ca* 1.5–2 mm wide, bidentate at apex with small fimbriate teeth. **Fig. 78H.**

Native of eastern United States; naturalized in the region and particularly common in a few places in the Moreton and eastern Darling Downs districts. Flowers spring to autumn, but mostly spring.

### 56. COSMOS Cav.

Annual or perennial herbs. Leaves opposite, entire, lobed or pinnatisect. Heads solitary or in corymbose-paniculate inflorescences; involucre  $\pm$  hemispherical, involucre bracts mostly in 2 series, connate at base; receptacle scales present; ray florets sterile; disc florets bisexual, 5-lobed; anthers not or scarcely tailed at base; style branches slender with short acute appendages. Achenes linear,  $\pm$  4-angled, tip usually attenuate into beak; pappus usually of 2–8 bristles.

About 25 species from tropical and subtropical America; 2 species naturalized Australia; 1 species south-eastern Queensland.

**1. \*Cosmos bipinnatus** Cav.

COSMOS

Robust annual up to *ca* 2 m tall. Leaves with petioles up to *ca* 7 mm long; blades bipinnately divided into linear-filiform segments, whole leaf up to *ca* 10 cm long, segments 0.5–3 cm × 0.04–0.12 cm. Peduncles up to *ca* 20 cm long; outer involucre bracts *ca* 8, 6–9 mm long with subulate tip up to *ca* 1.2 cm long; ray florets usually *ca* 8, white, pink or purple, rays 2–4 cm long; disc florets yellow. Achenes 8–10 mm long, beak up to *ca* 6 mm long; pappus of 2, rarely 3 retrorsely barbed awns. **Fig. 78I.**

Native of the southern United States of America and Mexico; naturalized in southern parts of the region, an escape from garden cultivation. Flowers autumn.

**57. BIDENS** L.

Erect annual herbs. Leaves opposite, simple or pinnatisect. Heads solitary or in corymbose or paniculate inflorescences on straight rigid peduncles; involucre bracts few, in 2–3 series, outer ones herbaceous, inner ones usually bordered with whitish membranous margin; receptacle scales present; ray florets sterile or sometimes absent; disc florets bisexual, 5-lobed; anthers obtuse at base; style branches with acute or subulate point. Achenes broad and flattened or slender and 4-angled; pappus of 2–4 rigid barbed awns.

About 230 species cosmopolitan; 4 species, 2 naturalized, Australia; 2 species south-eastern Queensland.

1. Lower leaves usually simple, middle leaves usually pinnate with 3–7 leaflets, upper leaves often single or pinnately 3-foliolate; achenes 0.4–1.6 cm long; rays if present white or cream
- Lower leaves 2–3-pinnate or 2–3-pinnatisect, upper leaves sometimes 1-pinnate or 1-pinnatisect; achenes 1–1.8 cm long; rays yellowish

1. *B. pilosa*2. *B. bipinnata***1. Bidens pilosa** L.

COBBLER'S PEGS

Annual erect herb up to *ca* 1 m tall; stems ± quadrangular, glabrate or sparsely pilose, green or purplish. Leaves with petioles 1–6.5 cm long; lowermost blades often simple, ovate or narrowly ovate, apex acute to acuminate, base cuneate, margin serrate, 1.5–7 cm × 0.5–3.5 cm; median ones mostly pinnate with 3–7 leaflets, petiolules 0–10 mm long, blades similar to lower simple ones; upper leaves simple or pinnately 3-foliolate, blades similar to lower ones but reduced in size. Heads mostly in corymbose terminal inflorescences, peduncles up to *ca* 9 cm long; heads 7–8 mm across at anthesis; involucre basally hispid, outer involucre bracts 7–9, linear and linear-spathulate, 3.5–5 mm long, shorter than inner ones, ± ciliate or hispid, inner bracts narrowly ovate with membranous margin; ray florets present or absent, if present rays white or cream, up to *ca* 1.5 cm long; disc florets yellow. Achenes linear, flattened, 4-angled, 0.4–1.6 cm long; pappus of 2–3 yellowish retrorsely barbed awns 2–4 mm long. **Fig. 78J.**

Cosmopolitan in warm areas, found in eastern parts of the region, common weed of disturbed areas especially in coastal districts. Flowers most of the year.

**2. Bidens bipinnata** L.

BIPINNATE BEGGAR'S TICKS

Annual; stems quadrangular, mostly glabrous. Leaves with petioles 1.5–5 cm long; blades mostly 2–3-pinnate or 2–3-pinnatisect, ultimate segments usually narrow, 2–18 cm × 1–18 cm, reducing upwards. Heads in terminal corymbose inflorescences, peduncles up to *ca* 9 cm long; outer involucre bracts 7–10, linear, 3–5 mm long, inner bracts broader, 4–8 mm long; ray florets yellowish, not or scarcely exceeding disc florets; disc florets yellow. Achenes linear, flattened, 4-angled, inner ones 1–1.8 cm long, outer ones often 0.7–1.2 cm long; pappus of 2–4 yellowish retrorsely barbed awns 2–4 mm long, in Queensland pappus mostly of 2 awns.

Rare in the region. Flowers most of the year.

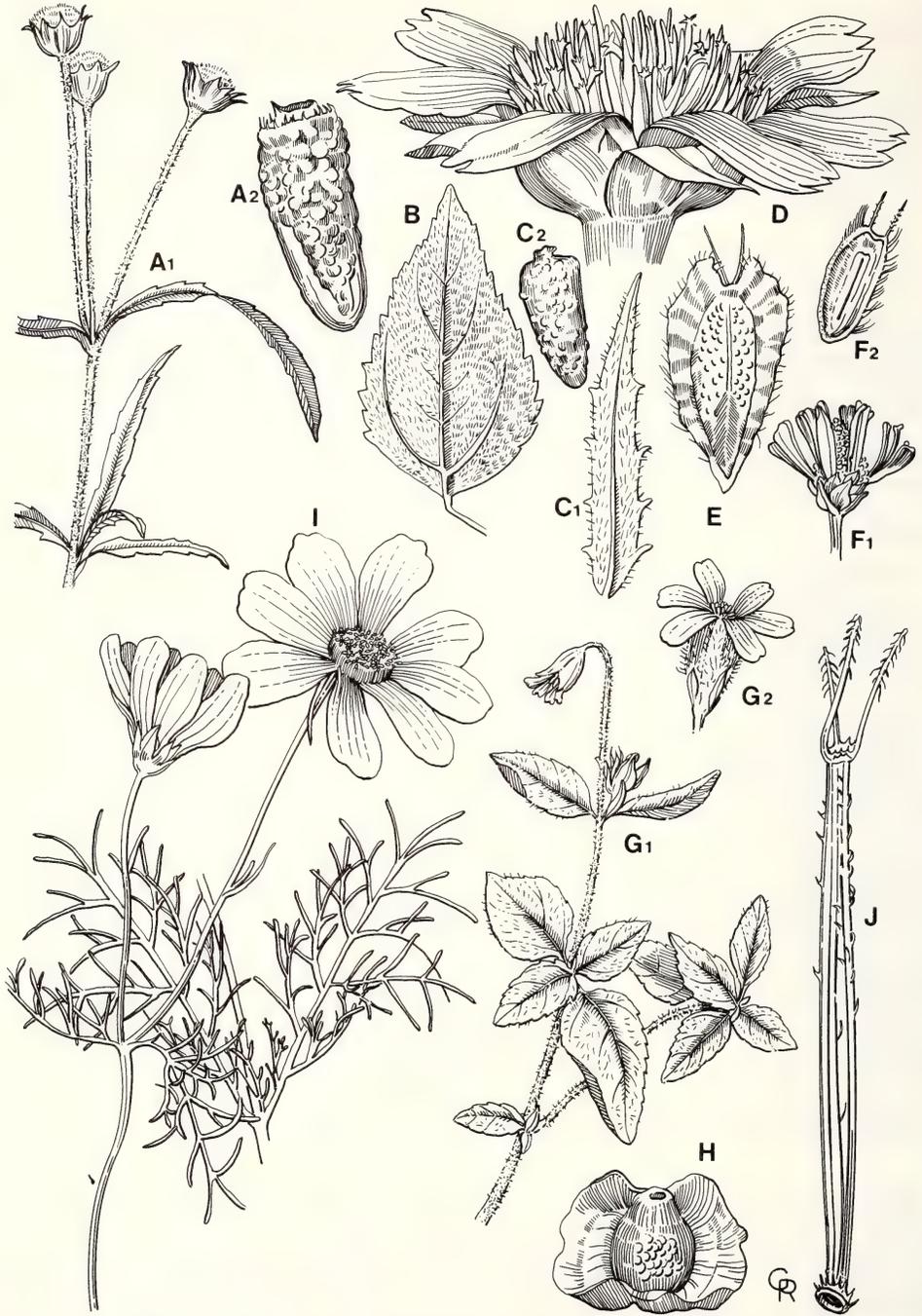


Fig. 78 ASTERACEAE — A<sub>1</sub>–A<sub>2</sub> *Eclipta prostrata*, A<sub>1</sub> portion of flowering stem x1, A<sub>2</sub> achene x12; B–C *Wedelia* spp. — B *W. biflora*, leaf x1; C<sub>1</sub>–C<sub>2</sub> *W. spilanthoides*, C<sub>1</sub> leaf x1, C<sub>2</sub> achene x6; D *Tithonia rotundifolia*, flowering head x1; E *Verbesina encelioides*, achene with pappus x6; F<sub>1</sub>–F<sub>2</sub> *Spilanthes grandiflora*, F<sub>1</sub> flowering head x1, F<sub>2</sub> disk achene with pappus x6; G<sub>1</sub>–G<sub>2</sub> *Calyptocarpus vialis*, G<sub>1</sub> portion of flowering stem x1, G<sub>2</sub> flowering head x2; H *Coreopsis lanceolata*, achene x6; I *Cosmos bipinnatus*, portion of flowering plant x1/2; J *Bidens pilosa*, achene x6.

**58. GLOSSOGYNE** Cass.

Glabrous perennials. Leaves radical, and alternate or opposite cauline. Heads on long terminal peduncles; involucre bracts few, in 2 series, narrow; receptacle scales present; ray florets female; disc florets bisexual, tubular, 4–5-toothed; anther bases obtuse; style branches ending in subulate points. Achenes narrow, usually flattened; pappus of 2–4 rigid persistent awns.

8 species from southern China, south-eastern Asia, New Guinea to Australia; 3 species, 2 endemic, Australia; 1 species south-eastern Queensland.

**1. *Glossogyne tenuifolia*** (Labill.) Cass.

NATIVE COBBLER'S PEGS

*Bidens tenuifolia* Labill.

Erect up to *ca* 30 cm tall; rootstock perennial, sometimes ± woody; stems often almost leafless. Leaves chiefly radical or nearly so; petioles up to *ca* 4 cm long; blades of lowest sometimes cuneate and 3-lobed, others pinnately divided into 5 or 7 stiff linear segments, segments entire or 2–3-lobed, whole leaf 1.5–6 cm × 1–4 cm. Heads on peduncles up to *ca* 8 cm long; involucre campanulate, 3–4 mm long; ray florets yellow, rays up to *ca* 1 cm long, occasionally much reduced; disc florets yellow. Achenes linear, flattened, striate, *ca* 8 mm long; pappus of 2 erect or spreading barbellate awns 3–4 mm long. **Fig. 79A.**

Widespread in the region but not common. Flowers spring to autumn.

**59. GALINSOGA** Ruiz & Pavon

Annual herbs. Leaves opposite, entire or toothed. Heads small in small cymes, terminal or in upper leaf axils; involucre broadly campanulate or hemispherical, involucre bracts in 1 or 2 series; receptacle scales flat, often conspicuous; ray florets female; disc florets bisexual, cylindrical or ± campanulate, 5-toothed; anthers with suborbicular apical appendages, base sagittate; style branches linear-ovate. Achenes dimorphic, those of ray florets slightly compressed, those of disc florets angled; pappus of fimbriate scales.

4 species from Mexico to Argentina; 1 species naturalized Australia, occurring in south-eastern Queensland.

**1. \**Galinsoga parviflora*** Cav.YELLOW WEED; POTATO WEED;  
GALINSOGA

Ascending annual up to *ca* 50 cm tall. Leaves with petioles up to *ca* 1.5 cm long; blades ovate, apex acute or acuminate, base broadly cuneate, margin ± entire to serrate-crenate, 2.5–6 cm × 1.5–4 cm, hispidulous to ± glabrous. Heads hemispherical, *ca* 4 mm × 5 mm; ray florets 5, white; disc florets yellow. Achenes dimorphic, ray achenes *ca* 2.25 mm long, disc achenes *ca* 1.75 mm long; pappus of several fimbriate scales, about as long as achene. **Fig. 79B.**

Native of South America; widespread in the region and common in coastal areas as a weed of disturbed ground and gardens. Flowers spring–summer. The leaves can be cooked and eaten as a green vegetable.

**60. TRIDAX** L.

Annual or perennial prostrate or decumbent herbs. Leaves opposite. Heads on long peduncles; involucre ovoid, campanulate or hemispherical, involucre bracts in 2 rows; receptacle scales present, persistent; ray florets female; disc florets bisexual, tubular, 5-lobed; anther bases sagittate, apex with small appendages; style branches of ray florets narrow, short, those of disc florets longer, acuminate. Achenes turbinate; pappus of numerous plumose bristles.

About 26 species, Mexico to tropical South America; 1 species naturalized Australia, occurring in south-eastern Queensland.

1. \**Tridax procumbens* L.

TRIDAX; TRIDAX DAISY

Perennial decumbent herb, sometimes rooting at nodes. Leaves with petioles up to *ca* 1 cm long; blades ovate-elliptic to rhomboid-ovate, apex acute to acuminate, base cuneate, margin coarsely and irregularly toothed, 2–5 cm × 0.5–3 cm, hispid. Peduncles up to *ca* 30 cm long; involucre campanulate, 1–1.5 cm across, involucre bracts 5–7 mm long, hispid; ray florets 5–6, rays whitish or creamy yellow, 4–5 mm long. Achenes 2–2.5 mm long, densely hairy; pappus of long plumose bristles 4–6 mm long. **Fig. 79C.**

Native of Central America; widely naturalized and a common weed of disturbed sites. Flowers found most of the year.

## 61. SCHKUHRIA Roth

Bushy erect annual herbs. Leaves alternate, dissected, segments narrow. Heads small, pedunculate, terminal and axillary, sometimes arranged in corymbs; involucre campanulate or turbinate, involucre bracts 5–8; receptacle scales absent; ray florets female or sometimes ray florets absent; disc florets bisexual, tubular below, campanulate above, 5-toothed; anthers with obtuse apical appendage, base obtuse or minutely sagittate; style branches obtuse or shortly appendaged. Achenes narrow, 4–5-ribbed; pappus of 8–10 hyaline scales.

10 species tropical and subtropical America; 1 species naturalized Australia, occurring in south-eastern Queensland.

1. \**Schkuhria pinnata* (Lam.) Cabrera var. *abrotanoides* (Roth) Cabrera

CURIOUS WEED

*Schkuhria abrotanoides* Roth

Herb up to 40 cm tall. Leaves up to 4 cm long, deeply pinnately dissected, lobes filiform, up to 2 cm long, glabrous, glandular dotted. Heads on filiform peduncles up to 2.5 cm long; involucre turbinate, *ca* 5 mm long; ray floret solitary, ray yellow, *ca* 1.5–2 mm long; disc florets yellow. Achenes narrowly turbinate, 4-angled, *ca* 4 mm long; pappus scales 8, 4–6 of the scales with aristate tips. **Fig. 79D.**

Native of South America; widely naturalized in the region and moderately common in the Darling Downs district, as a weed of roadsides, cultivation and native pasture. Flowers mainly autumn but a few most times of the year.

## 62. FLAVERIA Juss.

Herbs. Leaves opposite. Flower heads collected in dense clusters or compound heads surrounded by few leafy bracts or floral leaves, clusters terminal or sessile in forks; involucre cylindrical or compressed with few bracts; florets few, outer ones often female, ligulate, often solitary in involucre, bisexual ones tubular, 5-toothed; anthers obtuse at base; style branches truncate. Achenes somewhat compressed, pappus absent.

14 species, mainly Americas; 1 endemic species Australia, occurring in south-eastern Queensland.

1. *Flaveria australasica* Hook.

SPEEDY WEED

Erect rigid annual up to *ca* 90 cm tall but usually smaller, glabrous. Leaves ± sessile or petioles up to *ca* 1.5 cm long, petioles dilated at base; blades linear or linear-ovate, apex acute, base usually narrowed, margin entire or remotely toothed, 2–8 cm × 0.3–1.2 cm. Flower heads numerous in dense globular or hemispherical clusters, *ca* 1 cm across, floral leaves longer than clusters; involucre 4–6 mm long, outer ones of each cluster usually consisting of 2–3 narrow bracts with single ligulate floret, inner ones containing 2–6 tubular disc florets; florets yellow-green. Achenes prominently ribbed, *ca* 1 mm long. **Fig. 79E.**

Widespread in the region, usually on grey or black clay soils, sometimes as a weed in pastures. Flowers spring to autumn.



Fig. 79 ASTERACEAE — A<sub>1</sub>–A<sub>2</sub> *Glossogyne tenuifolia*, A<sub>1</sub> portion of flowering stem x1, A<sub>2</sub> achene with pappus x3; B *Galinsoga parviflora*, portion of flowering stem x1; C<sub>1</sub>–C<sub>3</sub> *Tridax procumbens*, C<sub>1</sub> flowering stem x1, C<sub>2</sub> flowering head x1, C<sub>3</sub> achene with pappus x6; D<sub>1</sub>–D<sub>3</sub> *Schkuhria pinnata* var. *abrotanoides*, D<sub>1</sub> portion of inflorescence x1, D<sub>2</sub> flowering head x6, D<sub>3</sub> achene with pappus x6; E *Flaveria australasica*, portion of flowering stem x1; F *Tagetes minuta*, portion of flowering stem x1.

**63. TAGETES L.**

Annual or perennial herbs. Leaves alternate or opposite, pinnate or rarely simple, strongly scented. Heads solitary or corymbosely arranged; involucre cylindrical, involucre bracts in 1 row, connate; receptacle scales absent; ray florets female, sometimes minute, rarely absent; disc florets tubular, 5-lobed; anther bases obtuse, apex appendaged; style arms of ray florets narrow, of disc florets truncate and hairy or with deltoid appendage. Achenes linear; pappus of few scales or bristles.

About 50 species tropical and subtropical Americas; 1 species naturalized Australia, occurring in south-eastern Queensland.

**1. \**Tagetes minuta* L.****STINKING ROGER**

Glabrous annual 0.1–3 m tall, strongly scented. Leaves with petioles up to *ca* 3 cm long, base with filiform  $\pm$  stem clasping segments; blades pinnately dissected, whole leaf up to *ca* 15 cm long; leaflets sessile,  $\pm$  elliptic, margin dentate, 1–7 cm  $\times$  0.2–1.1 cm. Heads in congested terminal cymose panicles; involucre narrowly cylindrical, *ca* 10 mm  $\times$  2 mm, involucre bracts 3, connate almost to top, dull yellow, streaked with oil sacs; ray florets 1–3, creamy white, rays 1–2 mm long; disc florets creamy white. Achenes black, *ca* 7–8 mm long; pappus of 4–6 bristles. **Fig. 79F.**

Native of South America; naturalized in eastern parts of the region, often as a weed of disturbed damp sites. Flowers summer–autumn.

**64. HELENIUM L.**

Annual or perennial herbs; stems usually simple below, branching above. Leaves alternate, lowest ones usually pinnately lobed, upper ones usually entire. Heads on terminal peduncles, usually globose; involucre flat or saucer shaped, involucre bracts in 2 series; ray florets present or absent, female, sterile or fertile; disc florets bisexual, numerous, 5-lobed; anther bases not tailed; style branches truncate, penicillate. Achenes 4–5-angled; pappus of 5 translucent scales each usually with an awn-like tip.

About 40 species, North America; 1 species recorded Australia, occurring in south-eastern Queensland.

**1. \**Helenium amarum* (Raf.) H. L. Rock****BITTER SNEEZEWEED;  
AMERICAN SNEEZEWEED**

*Gaillardia amara* Raf.; *Helenium tenuifolium* Nutt.

Annual herb up to 30 cm tall. Leaves yellowish green, linear, 1–5 cm long. Peduncles up to *ca* 5 cm long; rays 7–10, yellow, *ca* 1 cm long; disc florets yellow. Achenes *ca* 1–1.5 mm long; pappus *ca* 1 mm long.

Native of the southern United States of America; recorded once in the Lowood district from a paddock used as an aerodrome by the United States Air Force during World War II. It is known to be poisonous to sheep.

**65. GAILLARDIA Foug.**

Annual or perennial herbs. Leaves alternate. Heads large, showy, solitary on long peduncles terminating branches; involucre broad, involucre bracts in *ca* 3 series; receptacle scales setiform; ray florets sterile, rarely female and fertile; disc florets bisexual, campanulate, 5-toothed; anthers with acuminate apical appendage, base eared or minutely sagittate; style of disc florets linear, truncate, penicillate, usually long or short hairy. Achenes villous; pappus of achenes of disc florets of 6–10 hyaline scales, awned, pappus of ray florets smaller.

28 species Americas; 1 species cultivated as a garden annual in Australia, apparently naturalized in south-eastern Queensland.

1. \**Gaillardia pulchella* Foug.

GAILLARDIA

Erect annual up to *ca* 50 cm tall, pubescent. Leaves sessile or with petioles up to *ca* 2 cm long; blades oblong or narrowly obovate, apex acute or rounded, base narrowed, margin entire, obscurely toothed or variously lobed, 2–9 cm × 0.3–3 cm. Heads with expanded rays up to 6 cm across, peduncles up to 12 cm long; rays yellow in upper part, purple-red or occasionally yellow in lower part; disc florets yellow. Achenes turbinate, *ca* 2.5 mm long, villous with upward pointing hairs; pappus of 5 awned scales, *ca* 5 mm long.

Native of the southern United States of America and Mexico, widely cultivated as an ornamental; apparently naturalized in a few places, usually on sand dunes, occasionally seen as a garden escape in some places. Flowers autumn–winter.

66. *ACHILLEA* L.

Perennial herbs, often with thick woody rootstocks. Leaves alternate, entire to 3–4-pinnatifid. Heads radiate, usually small, pedunculate, rarely shortly so, usually arranged in terminal corymbs, more rarely solitary; involucre bracts in many series; receptacles ± flat or convex, scales present; florets white or yellow; ray florets female, ligules ± 3-dentate or 3-lobed; disc florets bisexual, tube ± compressed, 5-toothed, base pouched and enveloping top of achene, style branches truncate. Achenes smooth, compressed, oblong or obovate, glabrous, not winged; pappus absent.

About 200 species from the northern temperate region; 2–3 species naturalized Australia; 2 species south-eastern Queensland.

- |  |                          |
|--|--------------------------|
| 1. Leaves 2–3 times pinnately divided, rachis not winged or toothed<br>between primary pinnae                | 1. <i>A. millefolium</i> |
| Leaves deeply pinnately lobed, rachis winged and usually with<br>small teeth or lobes between primary pinnae | 2. <i>A. distans</i>     |

1. \**Achillea millefolium* L.

MILFOIL; YARROW

Stoloniferous; stems erect, 10–100 cm tall, ± woolly hairy. Leaves narrowly ovate in outline, 3-pinnatisect, rarely 2-pinnatisect, rachis narrow without small pinnae or teeth between larger pinnae, mostly 4–10 cm × 0.8–2 cm, with long fine hairs. Heads in dense broad corymbs up to 10 cm across, peduncles 1–5 mm long; involucre ovoid, 3–4 mm long, outer involucre bracts with scarious margin, 2–2.5 mm long, pilose; ray florets 5–6, rays white to pink-red, 1–2.5 mm long, 3-lobed; disc florets 10–20, yellow, *ca* 2 mm long. Achenes *ca* 1.5 mm long. **Fig. 80A.**

Native of Europe and Western Asia; recorded from around Stanthorpe in the Darling Downs district. Flowers spring.

2. \**Achillea distans* Waldst. & Kit. ex Willd.

TANSYLEAF MILFOIL

*Achillea tanacetifolia* All., non Miller

Stoloniferous; stems up to 100 cm tall, woolly hairy. Leaves ovate or narrowly ovate in outline, deeply compoundly pinnately lobed, rachis winged and usually with teeth or small lobes between primary pinnae, 4–15 cm × 1–3 cm, with long fine hairs. Heads in dense broad corymbs up to *ca* 10 cm across; involucre ovoid, mostly 5–6 mm long, outer involucre bracts with scarious margin, 2–3 mm long, pilose; ray florets 5, rays red, pink-red or whitish, 2–3 mm long, 3-lobed; disc florets *ca* 10–20, yellow, *ca* 2.5 mm long. Achenes *ca* 1.5–2 mm long. **Fig. 80B.**

Native of Europe; probably introduced as an ornamental, naturalized in a few places in the Moreton and eastern Darling Downs districts. Flowers spring–summer.

67. *ANTHEMIS* L.

Annual biennial or perennial herbs. Leaves alternate, 1–3-pinnate. Heads solitary on terminal peduncles; involucre hemispherical, involucre bracts in several rows; receptacle scales usually present; ray florets usually female, in one row, rays usually 2–3-dentate; disc florets numerous, tubular, bisexual; anthers usually obtuse at base;

style branches truncate and papillose at apex. Achenes usually angled or ribbed; pappus a short crown or absent.

About 200 species from southern Europe to western Asia; 3 species naturalized in temperate Australia; 1 species south-eastern Queensland.

### 1. \**Anthemis cotula* L.

### STINKING MAYWEED

Erect annual up to *ca* 40 cm tall with an unpleasant odour; stems sparsely hairy. Leaves subsessile, 2–3-pinnate, 1.5–6.5 cm × 0.5–3 cm. Heads on peduncles up to *ca* 15 cm long; involucre 6–10 mm diameter, involucre bracts *ca* 3–5 mm × *ca* 1 mm; receptacle scales present; ray florets white, rays 0.8–1.2 cm long; disc florets *ca* 2–3 mm long, arranged on conical receptacle. Achenes turbinate, *ca* 1.8 mm long with 8–11 tuberculate ribs; pappus absent.

Native of Europe; naturalized but seldom met with in the Moreton district. Flowers early summer.

## 68. COTULA L.

Herbs, usually decumbent. Leaves alternate, entire, lobed or dissected. Heads solitary, pedunculate; involucre hemispherical or campanulate, involucre bracts in 2 rows; ray florets absent; marginal florets female, often without corollas; inner disc florets bisexual, rarely sterile, tubular, 4–5-toothed; anthers obtuse at base; style branches obtuse or truncate or sometimes undivided. Achenes flattened, sometimes winged; pappus absent.

About 80 species, cosmopolitan; *ca* 10 species Australia, 6 endemic; 3 species south-eastern Queensland.

- |  |                            |   |
|--|----------------------------|---|
| 1. Heads less than 6 mm diameter . . . . .             | 1. <i>C. australis</i>     |   |
| Heads 6–9 mm diameter . . . . .                        |                            | 2 |
| 2. Leaves usually bipinnate . . . . .                  | 2. <i>C. longipes</i>      |   |
| Leaves entire, coarsely lobed or pinnatisect . . . . . | 3. <i>C. coronopifolia</i> |   |

### 1. *Cotula australis* (Sieber ex Sprengel) J. D. Hook. COMMON COTULA; CARROT WEED

*Anacyclus australis* Sieber ex Sprengel

Annual or perennial, usually prostrate, ± pubescent or villous. Leaves with petioles 0–10 mm long; blades 1–2-pinnate, up to *ca* 2 cm × 1 cm, individual leaf segments mostly 1 mm or less wide. Peduncles slender, 1–6 cm long, much longer than leaves; involucre 3–6 mm diameter; outer florets in 3–4 rows, corollas absent; inner florets bisexual, corolla 4-lobed. Achenes of outer florets flattened, pedicellate, narrowly winged; achenes of inner florets very shortly pedicellate, not winged; all achenes *ca* 1 mm long. **Fig. 80C.**

Widespread in the region in damp shady places, found as a weed in shaded garden beds and lawns. Flowers late autumn to spring.

### 2. *Cotula longipes* (J. D. Hook.) W. M. Curtis

*Leptinella longipes* J. D. Hook.; *Cotula reptans* Benth. var. *major* Benth.

Perennial herb with creeping stems, ± glabrous. Leaves with petioles up to *ca* 10 mm long; blades 2-pinnate, up to 4 cm × 3 cm, segments mostly more than 1 mm wide. Peduncles about as long as leaves; involucre 6–9 mm diameter. Achenes slightly flattened, *ca* 2.5 mm long.

The Queensland Herbarium has a single specimen from the region, collected at Currumbin in the southern Moreton district in 1932.

### 3. *Cotula coronopifolia* L.

Glabrous perennial; stems weak, succulent. Leaves stem clasping, blades entire, coarsely lobed to pinnatisect, 1.5–6 cm × 0.2–2 cm. Peduncles 1–3.5 cm long; involucre 6–9 mm diameter; outer florets in 1 row, corollas absent; inner florets

yellow, numerous. Achenes 1–2 mm long; outer achenes broadly winged, pedicellate; inner achenes with shorter pedicels and narrower wings than outer ones.

Known from a few places in the vicinity of Brisbane, usually along creeks. Flowers spring.

F. M. Bailey "Qd. Fl." 3:868 (1900) recorded *Cotula alpina* J. D. Hook. from Queensland. This was evidently a mistake as *C. alpina* is not known from Queensland.

## 69. CENTIPEDA Lour.

Annual or perennial herbs. Leaves alternate, usually toothed. Flower heads sessile or shortly stalked, solitary, lateral or in terminal racemes; involucre bracts in 2 rows, margin scarious; receptacle scales absent; ray florets absent; florets all tubular, outer female with short tubular corollas, inner ones bisexual, campanulate, 4-lobed; anthers obtuse at base; style lobes very short, obtuse or truncate. Achenes with 3–5 very prominent ribs or angles; pappus absent.

6 species Madagascar, Asia, Australia, New Zealand, Polynesia and Chile; 4 species Australia, 3 endemic; 3 species south-eastern Queensland.

- |   |                           |   |
|---|---------------------------|---|
| 1. Heads in terminal racemes . . . . .                                | 1. <i>C. racemosa</i>     |   |
| Heads not in racemes, mostly solitary, axillary . . . . .             |                           | 2 |
| 2. Heads less than 4 mm wide; achenes less than 1.5 mm long . . . . . | 2. <i>C. minima</i>       |   |
| Heads 4–9 mm wide; achenes 1.5–2.5 mm long . . . . .                  | 3. <i>C. cunninghamii</i> |   |

### 1. *Centipeda racemosa* (J. D. Hook.) F. Muell.

SNUFFWEED

*Myriogyne racemosa* J. D. Hook.

Erect perennial herb up to ca 20 cm tall, ± glabrous. Leaves sessile, linear to narrowly obovate, apex acute, margin acutely toothed, 0.5–1.5 cm × 0.15–0.3 cm. Heads globular, 2–4 mm diameter, in terminal leafless racemes up to 2 cm long, sometimes almost paniculate or corymbose. Achenes 4–5-angled, 1–1.5 mm long.

Rare in the region, recorded from the Moreton and Burnett districts.

### 2. *Centipeda minima* (L.) A. Braun & Aschers.

SPREADING SNEEZEWEED

*Artemisia minima* L.; *Centipeda orbicularis* Lour.; *C. orbicularis* Lour. var. *minuta* (Forster) F. M. Bailey; *C. orbicularis* Lour. var. *sternutatoria* (Roxb.) F. M. Bailey

Annual herb, prostrate or occasionally erect, up to ca 15 cm tall, with sparse to dense white woolly hairs. Leaves sessile, obovate or narrowly obovate or oblong or narrowly oblong, apex obtuse to ± acute, base narrowed and sometimes appearing petiolate, margin toothed, 0.8–2.5 cm × 0.25–1 cm. Heads solitary, leaf-opposed or sometimes accompanied by one or more pedunculate heads; heads 2–4 mm wide; florets greenish. Achenes 4-angled, angles reaching end of achene, 1–1.5 mm long.

Widespread in the region but not common. Flowers spring to autumn.

### 3. *Centipeda cunninghamii* (DC.) A. Braun & Aschers.

A SNEEZEWEED

*Myriogyne cunninghamii* DC.

Erect or ascending perennial 5–15 cm tall, flowering in the first year, glabrous or woolly on young shoots. Leaves sessile, narrowly obovate or oblong-cuneate, apex acute or obtuse, base narrowed and sometimes appearing petiolate, margin toothed, 0.8–2.5 cm × 0.25–1 cm. Heads solitary, sessile, leaf-opposed, 4–9 mm wide. Achenes 4-angled, angles not reaching end of achene, 1.5–2.5 mm long. **Fig. 80D.**

The Queensland Herbarium has a single specimen from the region, collected in the Burnett district.

## 70. SOLIVA Ruiz & Pavon

Low growing annual herbs. Leaves radical or alternate cauline, petiolate; blades deeply tripinnately or bipinnately dissected. Heads terminal but sessile in clusters of leaves; involucre hemispherical, involucre bracts numerous, in 2 rows; receptacle

scales absent; outer florets female, without corollas; inner florets tubular; anther bases obtuse; style lobes truncate. Achenes of female florets with thick wings, tapering to rigid persistent style, sometimes spine-like, pappus absent; achenes of inner florets infertile though often seemingly perfect.

About 8 species South America; 2 species naturalized Australia, occurring in south-eastern Queensland.

- |   |                           |
|---|---------------------------|
| <p>1. Fruiting heads <i>ca</i> 10 mm diameter; achenes with thick wings as wide as or narrower than body of achene, wings often with transverse corrugations, persistent spine-like style not sharp pointed</p>   | 1. <i>S. anthemifolia</i> |
| <p>Fruiting heads 3–5 mm diameter; achenes with thin wings which are much wider than body of achene, wings on each side divided into smaller lower lobe and larger upper lobe, upper lobe with erect spinose projection near style, persistent spine-like style sharp pointed</p> | 2. <i>S. pterosperma</i>  |

1. \**Soliva anthemifolia* (Juss.) R. Br. ex Less.      DWARF JO JO WEED; HAIRY JO JO WEED

*Gymnostyles anthemifolia* Juss.

Herb, at first acaulescent but eventually with  $\pm$  prostrate stems up to 5 cm long. Leaves with petioles up to 5 cm long; blades 2–3-pinnately dissected, 4–10 cm  $\times$  1–4 cm, softly hairy. Heads hemispherical, *ca* 10 mm across in fruit. Achenes 2.5–3 mm long excluding spine, with thick wings as wide as or narrower than body of achene, wings often with transverse corrugations, persistent spine-like style not sharp pointed. **Fig. 80E.**

Native of South America; widespread in the region, often as a weed of pasture and lawns. Flowers autumn.

2. \**Soliva pterosperma* (Juss.) Less.      BINDY EYE; JO JO WEED

*Gymnostyles pterosperma* Juss.; *Soliva sessilis* auct. Aust. non Ruiz & Pavon

Herb; stems prostrate, up to 8 cm long. Leaves with petioles up to 2 cm long; blades 2–3-pinnately divided, 1–2 cm  $\times$  0.6–1 cm,  $\pm$  softly hairy. Heads  $\pm$  hemispherical, 3–5 mm across in fruit. Achenes *ca* 3 mm long, excluding spine, with thin wings which are much wider than body of achene, wings on each side divided into smaller lower lobe and larger upper lobe with erect spinose projection near and  $\pm$  parallel to persistent sharp pointed spinose style. **Fig. 80F.**

Native of South America; widespread weed of lawns and pastures. Flowers autumn–winter, fruits spring–summer.

*Soliva pterosperma* is the common weed of lawns usually known as BINDY EYE. In western parts of the region the common name BINDY EYE is also applied to *Calotis hispidula* (F. Muell.) F. Muell.

## 71. TANACETUM L.

Perennial herbs. Leaves alternate, often pinnatifid or 1–3-pinnatisect. Heads solitary or in sparse or dense corymbs; involucre hemispherical, involucre bracts in 3–4 rows; receptacle scales absent; marginal flowers female, rays scarcely developed in Australian species, conspicuous or absent elsewhere; disc florets bisexual, tubular, 5-lobed; anther bases obtuse; style branches  $\pm$  truncate. Achenes  $\pm$  cylindrical or  $\pm$  clavate, 5–10-ribbed; pappus a short membranous crown or absent.

50–60 species temperate Northern Hemisphere; *ca* 3 species possibly naturalized Australia; 1 species south-eastern Queensland.

**1. \**Tanacetum vulgare* L.**

TANSY

Plants 0.6–1.2 m tall, glandular, strongly scented. Leaves with petioles up to *ca* 5 cm long; blades 1–2-pinnatisect, segments often toothed or lobed, whole leaf up to 18 cm × 10 cm, glabrous or sparsely pubescent, glandular-punctate. Heads in terminal and axillary corymbs; involucre 5–10 mm broad; ray florets *ca* 20, rays reduced, inconspicuous, *ca* 1.5 mm long. Achenes 5-ribbed, *ca* 2 mm long; pappus a minute crown *ca* 0.3 mm long.

Native of Europe and temperate Asia; probably introduced as a garden plant, occasionally found as a garden escape. Flowers spring to autumn.

**72. ARTEMISIA L.**

Herbs or subshrubs. Leaves alternate, entire or variously dissected. Heads small, in racemose panicles or solitary; involucre ovoid or campanulate; receptacle scales absent; ray florets absent; disc florets with outer series female, inner series bisexual or functionally male, occasionally whole head male; corolla of outer female florets 2–3-toothed, others 5-lobed; anthers with apical appendage, base obtuse or minutely pointed; style of female florets linear, truncate, penicillate, style of bisexual florets linear or linear-spathulate, usually penicillate. Achenes subglobose, smooth, 2-ribbed or multi-striate; pappus absent.

About 400 species from the Northern Temperate region, southern Africa and South America; *ca* 5 species naturalized Australia; 2 species south-eastern Queensland.

- |   |                         |
|---|-------------------------|
| 1. Leaves of mid-stem deeply 1–2-pinnatisect, segments filiform | 1. <i>A. scoparia</i>   |
| Leaves of mid-stem 1-pinnatisect, segments broad                | 2. <i>A. verlotorum</i> |

**1. \**Artemisia scoparia* Waldst. & Kit.**

Biennial; flowering stem single, up to *ca* 6 cm tall, usually reddish, glabrous to sparsely spreading pilose. Leaves deeply 1–2-pinnatisect with filiform segments, whole leaf up to *ca* 4 cm long, most of lower ones withered at flowering. Inflorescences terminal panicles, up to *ca* 30 cm long; heads nodding, *ca* 2 mm long; florets yellowish or reddish. Achenes *ca* 0.7 mm long, striate.

Native of Europe and temperate Asia; probably introduced as a garden plant, reported early this century as a roadside weed from around Montville in the Moreton district but the Queensland Herbarium has no recent records from the region.

**2. \**Artemisia verlotorum* Lamotte**

*Artemisia vulgaris* auct. non L.

Perennial, rhizomatous, up to *ca* 1 m tall, stems ± pilose. Leaves 1-pinnatisect, those of upper part of plant ± entire, lowest pair of segments often stipule-like, other segments ± entire, whole leaf up to *ca* 10 cm × 6 cm, glabrous or sparsely hairy above, densely white cottony hairy below. Inflorescences terminal panicles up to *ca* 20 cm long; heads *ca* 2–3 mm long; florets brownish. Achenes *ca* 0.7 mm long.

Native of south-western China; naturalized but seldom met with in southern parts of the region. Flowers summer–autumn.

**73. ERECHTITES Raf.**

Annuals or short lived perennial herbs. Leaves alternate. Heads solitary or collected into cymes or corymbs, usually ± cylindrical; involucre bracts in two series, outer series minute, inner series large and conspicuous; receptacle scales absent; ray florets absent; outer florets female or bisexual, inner florets bisexual; anthers scarcely tailed; style branches with terminal appendage of fused papillose hairs. Achenes ± terete; pappus of copious hairs.

About 15 species North and South America; 1 species naturalized Australia, occurring in south-eastern Queensland.

**1. \**Erechtites valerianifolia* (Wolf) DC.****BRAZILIAN FIREWEED***Senecio valerianifolius* Wolf

Erect annual up to *ca* 2 m tall, usually glabrous. Lower leaves with petioles 0.8–1.5 cm long, blades ovate, margins subentire or variously serrate-dentate, 3–6 cm × 2–3 cm; upper leaves with petioles up to *ca* 2 cm long, occasionally subsessile, blades pinnately lobed or pinnatisect, 6–25 cm × 3–14 cm. Inflorescences ± corymbose, terminal and axillary, pedicels 0–1.5 cm long; involucre cylindrical, 0.8–1.2 cm long, inner involucre bracts 12–14; florets white. Achenes 2.5–3.5 mm long, ribbed; pappus purplish at least when mature, 7–8 mm long. **Fig. 80G.**

Native of South America; naturalized in eastern parts of the region, usually in places of high rainfall, often as a weed of roadsides and gullies. Flowers summer–autumn.

**74. GYNURA Cass.**

Herbs, often somewhat succulent. Leaves alternate. Heads terminal, solitary or loosely corymbose; involucre cylindrical at anthesis, involucre bracts in 1 series; receptacle scales absent; ray florets absent; disc florets bisexual, tubular, 5-toothed; anthers obtuse at base; style bulbous at base, branches ending in hairy points. Achenes ± linear; pappus of numerous fine bristles.

About 100 species tropical Africa and Madagascar to Asia and Australia; 1 species Australia, occurring in south-eastern Queensland.

**1. *Gynura drymophila* (F. Muell.) F. G. Davies***Senecio drymophilus* F. Muell.; *Gynura pseudochina* auct. non (L.) DC.

Erect herb up to *ca* 50 cm tall; rootstock thick, perennial. Leaves usually crowded on short stem, sessile and stem clasping or petioles up to *ca* 3 cm long, ± winged; blades obovate, ovate-oblong or narrowly ovate, apex ± acute, base narrowed, margins coarsely toothed or sometimes ± entire, 4–14 cm × 1.5–4.5 cm, pubescent or ± glabrous. Heads usually in long peduncled corymbs; involucre *ca* 1.2–1.4 cm long, bracts 12–14; florets yellow, *ca* 1–1.2 cm long. Achenes *ca* 6 mm long; pappus *ca* 10 mm long. **Fig. 80H.**

Known from the Moreton, Wide Bay and Burnett districts, not common. Flowers mostly summer–autumn.

**75. CRASSOCEPHALUM Moench**

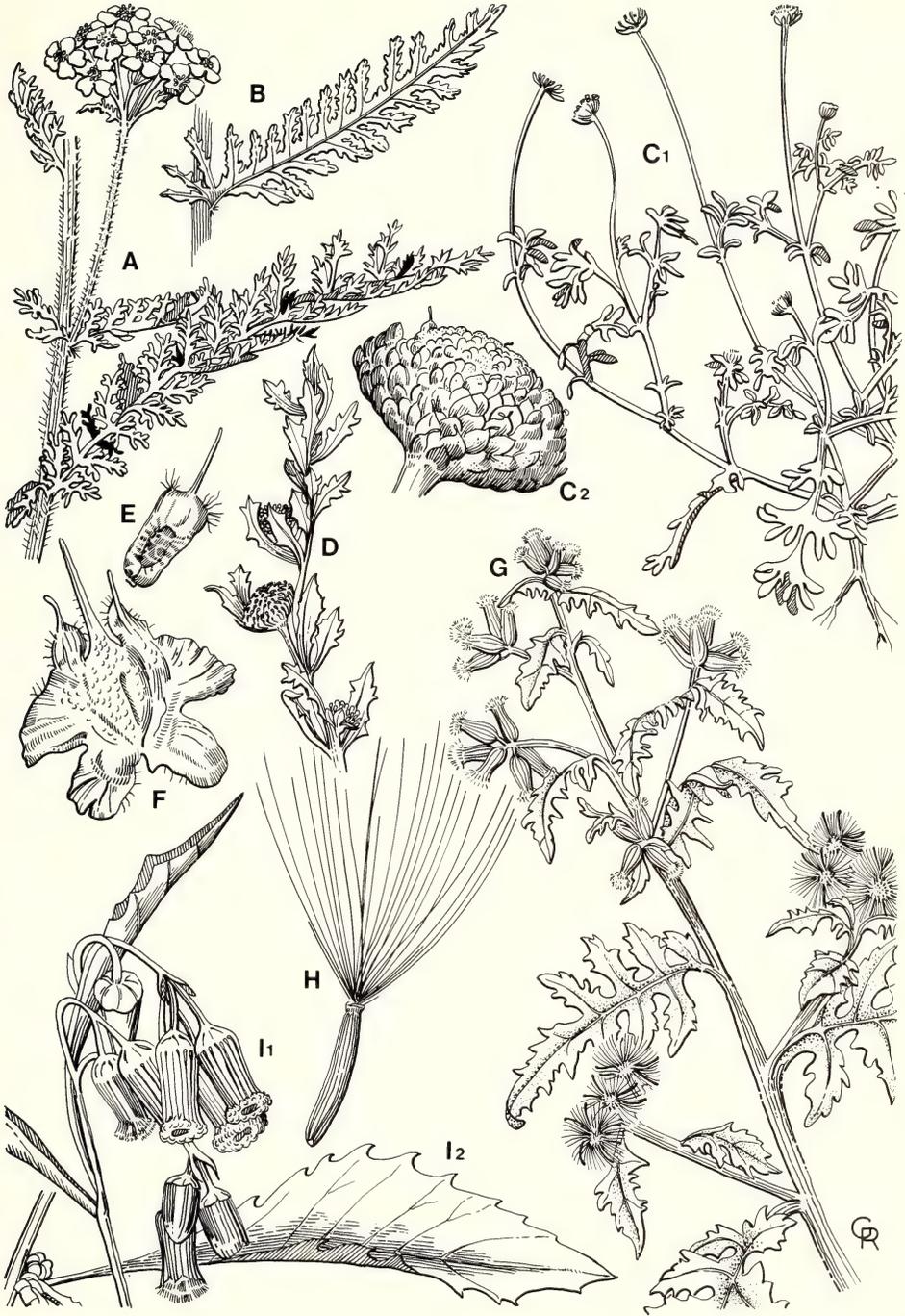
Erect or straggling herbs. Leaves alternate. Heads solitary or corymbosely arranged on leafy or bracteate peduncles; involucre bracts in two series, outer series much reduced and inconspicuous, inner series large and conspicuous; receptacle scales absent; ray florets absent; disc florets bisexual, tubular, 5-lobed; anthers with an apical appendage, base obtuse; style branches linear, truncate, penicillate, with subulate tip of fused papillae. Achenes cylindrical, ribbed; pappus of many fine white hairs.

About 30 species, warm parts of Africa and Madagascar; 1 species naturalized Australia, occurring in south-eastern Queensland.

**1. \**Crassocephalum crepidioides* (Benth.) S. Moore****THICKHEAD***Gynura crepidioides* Benth.

Erect annual herb up to 1.2 m tall, thinly hairy. Leaves with petioles up to *ca* 4 cm long often with pair of stipule-like lobes at base; blades elliptic to ovate in outline, lower leaves lyrate-pinnatifid, margin coarsely serrate, up to 20 cm × 10 cm, upper leaves not lobed or with single lobe on either side at base, margin serrate, smaller than lower leaves. Heads few to many, cymosely arranged, each head *ca* 1 cm long, nodding at first, later erect; inner involucre bracts *ca* 16, 8–9 mm long; florets with purplish lobes. Achenes *ca* 2 mm long; pappus *ca* 9 mm long. **Fig. 80I.**

Native of Africa and Madagascar; first recorded in Queensland in the mid 1950s and now a widespread weed in coastal parts of the state; it is widespread and common in eastern parts of south-eastern Queensland as a weed of roadsides, disturbed ground, waste places, etc. Flowers found most of the year.



**Fig. 80** ASTERACEAE — A–B *Achillea* spp. — A *A. millefolium*, portion of flowering stem x1; B *A. distans*, leaf x1; C<sub>1</sub>–C<sub>2</sub> *Cotula australis*, C<sub>1</sub> portion of flowering plant x1, C<sub>2</sub> flowering head x12; D *Centipeda cunninghamii*, portion of fertile stem x1; E–F *Soliva* spp., achenes, both x6 — E *S. anthemifolia*; F *S. pterosperma*; G *Erechites valerianifolia*, portion of flowering stem x1/2; H *Gynura drymophila*, achene with pappus x3; I<sub>1</sub>–I<sub>2</sub> *Crassocephalum crepidioides*, I<sub>1</sub> portion of flowering plant x1, I<sub>2</sub> leaf x1.

## 76. EMILIA Cass.

Herbs. Leaves radical or alternate cauline. Heads combined into cymose or corymbose inflorescences; involucre cylindrical or campanulate, involucre bracts in 1 series; receptacle scales absent; ray florets absent; disc florets bisexual, 5-lobed; anther bases without appendage; style branches with triangular subulate hairy tips. Achenes 5-angled; pappus of many fine soft bristles.

30 species tropical parts of the world; 1 species Australia, occurring in south-eastern Queensland.

1. *Emilia sonchifolia* (L.) DC.

EMILIA

*Cacalia sonchifolia* L.

Annual, erect, 15–90 cm tall, ± glabrous, ± glaucous. Leaves sessile and stem clasping or lower ones with petioles up to ca 3 cm long; blades variable, lyrate-pinnatisect, ovate or broadly ovate, apex rounded to acuminate, base rounded or cordate-amplexicaul, margin ± irregularly toothed, 1.5–13 cm × 0.8–6 cm. Heads in lax cymes on peduncles up to 1.5 cm long, pedicels 0.5–4 cm long; heads 0.8–1.2 cm long; florets purple or sometimes orange-purple. Achenes ca 5 mm long, with 5 shortly hairy ribs; pappus white, ca 5 mm long. **Fig. 81A.**

Widespread in eastern parts of the region, often as a weed of disturbed areas, roadsides, and cultivation. Flowers autumn to spring. The leaves are edible to humans.

## 77. SENECIO L.

Annual or perennial herbs or shrubs. Leaves alternate. Heads simple, terminal, solitary or corymbose or paniculate; involucre cylindrical to campanulate, involucre bracts in single row, usually with a few scale bracts at base; receptacle scales absent; ray florets sometimes present, female or sterile; disc florets bisexual, tubular; anthers obtuse or acute at base; style branches truncate. Achenes terete, striate; pappus of free capillary bristles.

About 2 000 species cosmopolitan; 38–40 species Australia; 11 species south-eastern Queensland.

- |  |                              |
|--|------------------------------|
| 1. Heads without ray florets, all florets tubular . . . . .  | 2                            |
| Heads with ray florets and tubular disc florets . . . . .  | 7                            |
| 2. Involucre bracts ca 20 per head . . . . .   | 1. <i>S. vulgaris</i>        |
| Involucre bracts fewer than 15 per head . . . . .  | 3                            |
| 3. At least some leaves bipinnatisect . . . . .  | 2. <i>S. bipinnatisectus</i> |
| Leaves never bipinnatisect . . . . .   | 4                            |
| 4. Involucre bracts 8–9 per head, rarely few with 10 or 6 . . . . .  | 5                            |
| Involucre bracts 10 or more per head . . . . .   | 6                            |
| 5. Achenes with several ridges, each ridge with subappressed coarse hairs; leaves with fine serrations . . . . .                       | 3. <i>S. minimus</i>         |
| Achenes with ca 10 narrow longitudinal furrows, each furrow with subappressed hairs; leaves with coarse irregular serrations . . . . . | 4. <i>S. cahillii</i>        |
| 6. Involucre bracts 3.5–5 mm long . . . . .  | 5. <i>S. hispidulus</i>      |
| Involucre bracts 6–8 mm long . . . . .   | 6. <i>S. quadridentatus</i>  |
| 7. Involucre bracts 8–10 per head; rays ca 0.2 cm long . . . . .   | 7. <i>S. glossanthus</i>     |
| Involucre bracts 12–20 per head; rays 0.6–1.3 cm long . . . . .  | 8                            |
| 8. Achenes tuberculate; involucre bracts ca 0.5 cm long . . . . .  | 8. <i>S. tuberculatus</i>    |
| Achenes glabrous or pubescent but not tuberculate; involucre bracts 0.6–1.5 cm long . . . . .  | 9                            |
| 9. Pappus 1.2–1.4 cm long; involucre ca 1.5 cm broad in flower . . . . .   | 9. <i>S. daltonii</i>        |
| Pappus 0.5–0.8 cm long; involucre ca 1 cm or less broad in flower . . . . .  | 10                           |

10. Achenes *ca* 4.5 mm long; pappus *ca* 8 mm long; involucre *ca* 10 mm broad in flower  
 Achenes *ca* 3 mm long; pappus *ca* 5 mm long; involucre *ca* 3–5 mm broad in flower
10. *S. amygdalifolius*  
 11. *S. lautus* sens. lat.

### 1. \**Senecio vulgaris* L.

### COMMON GROUNDSEL

Erect annual up to 50 cm tall. Lower leaves with petioles up to 2 cm long, upper sessile with stem clasping auricles; blades pinnatifid, lobes dentate, 3–7 cm × 0.7–3 cm, ± glabrous or sparsely hairy. Heads in corymbs; involucre cylindrical-campanulate, 4–5 mm broad, involucre bracts *ca* 20, 5–7 mm long; ray florets absent. Achenes 1.5–2.5 mm long, pubescent between ridges; pappus 5–7 mm long.

Native of Europe, northern Africa and Asia; naturalized, an occasional weed in the Moreton district. Flowers spring–summer.

### 2. *Senecio bipinnatisectus* Belcher

### COMMONWEALTH WEED

*Erechtites atkinsoniae* F. Muell.

Erect, up to 2 m tall; stems striate. Leaves sessile; blades bipinnatisect or bipinnatisect, base with pinnatisect auricles, margin recurved, whole blade up to 12 cm × 7 cm, reducing upwards, young leaves with few hairs, at length ± glabrous. Heads in corymbs; involucre ± cylindrical, 2–3 mm broad in flower, involucre bracts 8–11, 5–7 mm long; ray florets absent. Achenes *ca* 2–2.5 mm long, glabrous or with few hairs; pappus 5–6 mm long.

Known from the edges of rainforest or in rainforest regrowth of the Moreton and Wide Bay districts as far west as the Bunya Mts. Flowers spring to autumn.

### 3. *Senecio minimus* Poiret

*Erechtites prenanthoides* DC.

Erect herb up to 1 m tall. Leaves sessile or subpetiolate; blades ovate or elliptic, apex narrowed-obtuse to acute, base slightly to conspicuously expanded into stem clasping auricles, margin denticulate, up to 13 cm × 3 cm, reducing upwards, young leaves hairy, at least below, becoming ± glabrous with age. Heads in corymbose panicles; involucre cylindrical-campanulate in flower, 2–4 mm broad, involucre bracts 8, rarely 6–10, 6–7 mm long; ray florets absent. Achenes *ca* 2 mm long, with ± appressed hairs on ribs; pappus *ca* 6 mm long.

Known from the McPherson Ra. and Mt. Glorious in the southern Moreton district. Flowers spring–summer.

### 4. *Senecio cahillii* Belcher

Erect herb up to 1.2 m tall. Leaves sessile or subpetiolate, auricles absent or simple or dentate; blades obovate to linear, margin dentate, up to 13 cm × 2.5 cm, reducing upwards. Heads in corymbs; involucre cylindrical-campanulate, 3–5 mm broad, involucre bracts 8–9, rarely up to 11, 4.5–5 mm long; ray florets absent. Achenes 2.5 mm long, sparsely hairy; pappus 3–4 mm long.

Eastern parts of the region. Flowers spring–summer.

### 5. *Senecio hispidulus* A. Rich.

### HISPID FIREWEED

*Erechtites arguta* auct. non (A. Rich.) DC.

Erect annual up to 50 cm tall. Leaves sessile or petioles up to *ca* 1 cm long, auriculate with dentate auricles; blades variable, mostly 3–7(–11) cm × 0.5–2.5 cm, scabrid or hispid. Heads in corymbs; involucre ± cylindrical in flower, *ca* 2–3 mm broad, involucre bracts *ca* 12–13, 3.5–5 mm long; ray florets absent. Achenes *ca* 2 mm long, glabrous; pappus 4–5 mm long.

Two varieties occur in the region:

1. Leaves denticulate or coarsely toothed, not pinnatifid . . . . . *S. hispidulus* var. *hispidulus*  
 Leaves pinnatifid lobed . . . . . *S. hispidulus* var. *dissectus*

*Senecio hispidulus* var. *hispidulus* has been recorded once from the region, from Stradbroke I. *S. hispidulus* var. *dissectus* (Benth.) Belcher (*Erechtites arguta* var. *dissecta* Benth.) is known from a few places in the southern Moreton district and has also been collected at the Bunya Mts. Flowers most of the year.

**6. *Senecio quadridentatus* Labill.**

COTTON FIREWEED

*Erechtites quadridentata* (Labill.) DC.

Perennial herb up to *ca* 60 cm tall. Leaves sessile, linear or linear-ovate, apex acuminate, base attenuate and sometimes auriculate, margin usually revolute, entire or denticulate, occasionally coarsely toothed, 3–13 cm × 0.2–0.5(–3) cm, with soft matted hairs at least below, sometimes glabrous or scabrous above. Heads in cymose corymbs; involucre ± cylindrical, *ca* 3 mm broad in flower, involucre bracts 11–13, 6–8 mm long; ray florets absent. Achenes *ca* 3 mm long, ridges hairy; pappus 5–6 mm long. **Fig. 81B.**

Widespread in open eucalypt communities of the Moreton and Darling Downs districts, also recorded from the Burnett district. Flowers mostly spring–summer.

**7. *Senecio glossanthus* (Sonder) Belcher**

SLENDER GROUNDSEL

*Erechtites glossantha* Sonder; *Senecio brachyglossus* F. Muell. ex Benth., non Turcz.

Erect annual up to *ca* 40 cm tall. Leaves sessile, broad-linear, ± entire, toothed or with few lobes 1–5 cm × 0.15–0.3(–1) cm, ± glabrous, lower leaves without auricles, upper leaves auriculate and stem clasping. Heads in corymbs; involucre cylindrical-campanulate, 2–4 mm broad, involucre bracts 8–10, 4–7 mm long; ray florets 3–8, rays yellow, *ca* 2 mm long. Achenes 2–2.5 mm long, pubescent; pappus 3–4 mm long.

Recorded once from the western Darling Downs district in cleared brigalow country. Flowers spring and autumn, probably induced by rain.

**8. *Senecio tuberculatus* Ali**

Annual herb up to *ca* 50 cm tall. Leaves with petioles up to 3 cm long, upper leaves sometimes sessile but never stem clasping; blades linear-elliptic and toothed or once or twice pinnatisect, 1.5–12.5 cm × 0.2–8 cm, sparsely hairy or glabrous above. Heads in corymbs; involucre campanulate, 8–10 mm broad in flower, involucre bracts *ca* 20, *ca* 5 mm long; ray florets 8–11, rays yellow, *ca* 8 mm long. Achenes *ca* 5 mm long, tapering towards apex, tuberculate; pappus *ca* 4–5 mm long.

Western Darling Downs district usually in cleared brigalow country. Flowers mostly spring.

**9. *Senecio daltonii* F. Muell.**

DALTON WEED

Perennial herb usually under 20 cm tall, with extensive underground root system. Leaves with petioles up to *ca* 3 cm long; blades narrowly ovate or narrowly elliptic, apex acute, base attenuate, margin recurved, coarsely toothed or ± entire, 3–8 cm × 0.2–1.5 cm, glabrous or sparsely hairy especially below. Heads solitary or few together; involucre campanulate, *ca* 1.5 cm broad when flowering, involucre bracts 16–20, 0.8–1.5 cm long, ± pubescent outside; rays yellow, *ca* 1 cm long. Achenes *ca* 4 mm long, ± glabrous; pappus 1.2–1.4 cm long.

Found in heavy soils of the Darling Downs district, often considered a weed in cultivation. Flowers mainly autumn with some spring–summer.

**10. *Senecio amygdalifolius* F. Muell.**

Erect herb or shrub up to 1.5 m tall, glabrous. Leaves with petioles 0.5–2 cm long; blades narrowly ovate, apex acute to acuminate, base rounded to cuneate, often oblique, margin serrate, 5–15 cm × 1.2–4.5 cm. Heads in loose corymbs; involucre narrowly campanulate, *ca* 1 cm broad in flower, involucre bracts *ca* 13, *ca* 8–10 mm long; ray florets mostly 6–10, rays yellow, *ca* 0.8–1.3 cm long. Achenes *ca* 4.5 mm long, glabrous; pappus *ca* 8 mm long.

Moderately common in the Moreton district, often near rainforest or in rainforest regrowth, also known from near Killarney in the Darling Downs district, and the Bunya Mts. and Mt. Perry in the Burnett district. Flowers spring.

**11. *Senecio lautus* G. Forster ex Willd. sens. lat.**VARIABLE GROUNDSEL;  
FIREWEED

Prostrate to erect perennial up to *ca* 70 cm tall. Leaves very variable, sessile or base narrow and petiole-like but petiole-like section not distinctly differentiated from leaf

blade; blades very variable, linear and entire or ovate and variously toothed or pinnatisect with several linear lobes, whole leaf 1.5–10 cm × 0.2–3 cm, glabrous or with few hairs. Heads in corymbose panicles; involucre campanulate, 3–5 mm broad, involucre bracts 12–20, 6–8 mm long; ray florets 8–14, rays yellow, 0.6–1.2 mm long. Achenes *ca* 3 mm long, glabrous to pubescent; pappus *ca* 5 mm long. **Fig. 81C.**

Widespread throughout the region. Flowers found most of the year.

S. I. Ali, *Aust. J. Bot.* 17:161–176 (1969) recognized 4 subspecies in Australia. Queensland specimens were included under subsp. **dissectifolius** Ali, subsp. **maritimus** Ali and subsp. **lanceolatus** (Benth.) Ali. However these subspecies cannot always be satisfactorily distinguished. Further research including extensive field work is needed on the group.

## 78. CALENDULA L.

Annual or perennial herbs, sometimes woody at base, often glandular and aromatic. Leaves alternate, simple. Heads in branched terminal inflorescences or solitary; involucre campanulate, involucre bracts in 1–2 rows; receptacle without scales; ray florets female; disc florets functionally male; anther bases sagittate; styles undivided. Achenes large, of two types, outer curved, beaked and keeled or winged, inner strongly curved often almost into ring, transversely rugose-tuberculate on dorsal surface; pappus absent.

About 30 species from Central Europe, Mediterranean region and the Middle East; 2 species naturalized Australia; 1 species south-eastern Queensland.

### 1. \**Calendula arvensis* L.

### FIELD MARIGOLD

Erect or sprawling annual up to *ca* 25 cm tall, from almost glabrous to woolly hairy. Leaves sessile, often somewhat stem clasping, oblong or narrowly obovate, apex obtuse or acute, base ± amplexicaul to long attenuate and often appearing petiolate, margin entire to denticulate, 1–11 cm × 0.4–2 cm. Involucre 1–1.8 cm across, involucre bracts *ca* 5–7 mm long; ray florets yellow, rays *ca* 7 mm long; disc florets yellow. Outer achenes beaked, spiny on back, *ca* 1–1.5 cm long, inner achenes smaller. **Fig. 81D.**

Native of Central Europe and Mediterranean region; naturalized in the Darling Downs district, not common, sometimes as a weed of roadsides. Flowers mostly spring–summer.

## 79. CHRYSANTHEMOIDES Medik.

Shrubs. Leaves alternate. Heads in terminal corymbs or solitary; involucre campanulate or hemispherical, involucre bracts in 2–4 rows; receptacle scales absent; ray florets female with 3-toothed ray; disc florets bisexual, tubular, 5-lobed; anthers with ovate-apiculate appendage, base sagittate, lobes of adjacent anthers connate and produced into tail; style branches oblong-ovate in ray florets, shortly bilobed with ring of hairs below division in disc florets. Fruits drupes; pappus absent.

2 species southern and tropical Africa; 1 species naturalized Australia, occurring in south-eastern Queensland.

### 1. \**Chrysanthemoides monilifera* (L.) Norlindh subsp. **rotundata** (DC.) Norlindh

### BONESEED

*Osteospermum rotundatum* DC.

Shrub, young parts often white woolly. Leaves with petioles 0.8–2.5 cm long; blades elliptic to obovate to broadly obovate to ± circular, base abruptly narrowed, margin mostly subentire or obscurely dentate, 3–7 cm × 1.5–5 cm. Heads in terminal corymbs; involucre campanulate, 7–10 mm diameter; ray florets 5–13, yellow, rays 8–10 mm long; disc florets yellow. Drupes 6–8 mm long, hard stone of drupe obovoid, about twice as long as broad.

Native of southern Africa; naturalized in Moreton and Wide Bay districts usually near the sea shore where it can spread rapidly and become a pest. Flowers found most of the year. It is a declared noxious weed under the Stock Routes and Rural Lands Protection Acts, 1944–1967.

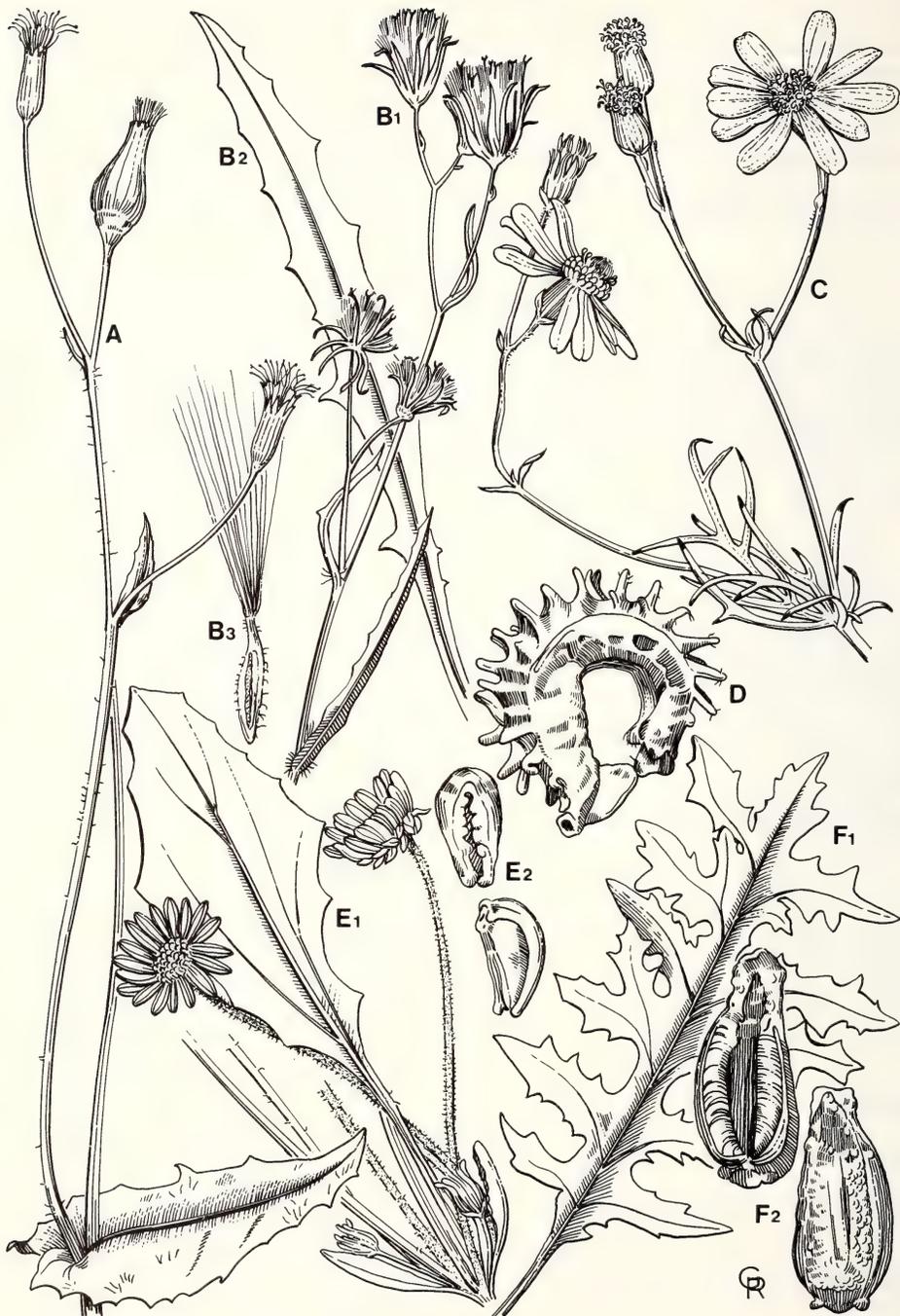


Fig. 81 ASTERACEAE — A *Emilia sonchifolia*, portion of flowering plant x1; B-C *Senecio* spp. — B<sub>1</sub>-B<sub>3</sub> *S. quadridentatus*, B<sub>1</sub> portion of inflorescence x1, B<sub>2</sub> lower leaf x1, B<sub>3</sub> achene with pappus x6; C *S. lautus*, portion of flowering stem x1; D *Calendula arvensis*, achene x6; E-F *Cymbonotus* spp. — E<sub>1</sub>-E<sub>2</sub> *C. lawsonianus*, E<sub>1</sub> portion of flowering stem x1, E<sub>2</sub> top and side view of achene x6; F<sub>1</sub>-F<sub>2</sub> *C. sp. 1.*, F<sub>1</sub> leaf x1, F<sub>2</sub> top and bottom view of achene x6.

**80. CYMBONOTUS** Cass.

Perennial herbs. Leaves alternate or radical. Heads large, solitary, pedunculate; involucre campanulate, at length hemispherical, involucre bracts in several series; receptacle pitted, margins of pits often produced into rigid points or deciduous scales; ray florets female; disc florets bisexual, rarely sterile, tubular, 5-toothed; anthers shortly sagittate but scarcely tailed; style branches broad, erect or scarcely spreading. Achenes smooth and grooved on inner face with 3 or 5 prominent ribs on back and sides; pappus absent.

About 3 species all endemic in Australia; 2 species south-eastern Queensland.

- |  |                          |
|--|--------------------------|
| 1. Leaves $\pm$ entire or sinuate-toothed or lyrate lobed; achenes <i>ca</i> 2.5 mm long . | 1. <i>C. lawsonianus</i> |
| Leaves pinnatisect; achenes 4–5 mm long . . . . .  | 2. <i>C. sp. 1.</i>      |

**1. *Cymbonotus lawsonianus*** Gaudich.

BEAR'S EAR

*Arctotis australiensis* Beauvard

Perennial herb. Leaves radical, spreading; petioles 1–4 cm long; blades ovate, apex  $\pm$  obtuse, base abruptly narrowed, margin  $\pm$  entire or sinuately toothed or lyrate lobed, 2–7 cm  $\times$  1–4 cm, minutely scabrous above, white tomentose below. Peduncles up to *ca* 3.5 cm long; heads *ca* 1–1.5 cm across; involucre white tomentose; ray florets 8–15, rays yellow, 6–10 mm long; disc florets yellow. Achenes  $\pm$  smooth on back, with deeply cavernous concave face, *ca* 2.5 mm long, glabrous. **Fig. 81E.**

Known from a few places in the south-eastern Darling Downs district, rare. Flowers mostly spring.

**2. *Cymbonotus* sp. 1.**

*Arctotheca repens* auct. non Wendl.

Perennial herb. Leaves radical, spreading; petioles up to *ca* 8 cm long; blades deeply pinnately lobed, 4–10 cm  $\times$  1–6 cm, glabrous above, sparsely to densely tomentose below. Peduncles up to *ca* 20 cm long; heads *ca* 3–4 cm across; involucre bracts sparsely hairy; ray florets yellow, rays 1–2 cm long; disc florets yellow. Achenes  $\pm$  smooth on back with deep cavernous concave face, 4–5 mm long, glabrous. **Fig. 81F.**

Known from the Darling Downs district, not common. Flowers spring.

This may be the taxon described by G. Beauvard, *Bull. Soc. Bot. Geneva* 7: 41–56 (1915) as *Arctotis maidenii*. Further research would be necessary to ascertain whether the taxon described above and that described by Beauvard are conspecific. No combination for Beauvard's name exists under ***Cymbonotus***.

**81. ARCTOTHECA** Wendl.

Perennial herbs, often white woolly, with or without stems. Leaves  $\pm$  radical or alternate, mostly pinnatifid, rarely entire. Heads large, solitary, pedunculate; involucre campanulate or hemispherical, involucre bracts in many series; receptacle scales often present; ray florets sterile, strap shaped; disc flowers bisexual, tubular, 5-lobed; anther bases sagittate; styles abruptly thickened and cylindrical above, branches connate or minutely bifid, tips rounded. Achenes linear or obovoid in outline, ribbed, tomentose, silky woolly or occasionally glabrous; pappus of small hyaline scales or a terminal crown or occasionally absent.

4 species from southern Africa; 3 species naturalized Australia; 1 species south-eastern Queensland.

**1. \**Arctotheca calendula*** (L.) Levyns

CAPE WEED

*Arctotis calendula* L.; *Cryptostemma calendulaceum* (L.) R. Br.

Sprawling herb; stems usually annual, up to *ca* 15 cm tall, rarely longer. Leaves at first in basal rosette, stem leaves similar to basal ones; petioles up to *ca* 6 cm long; blades lyrate pinnatifid, rarely sinuate, margin repand and obscurely toothed, mostly 5–15 cm  $\times$  2–5 cm, glabrous or pubescent above, with white cottony hairs below.

Peduncles axillary, up to *ca* 20 cm long; heads solitary, 2–5 cm across; ray florets yellow, in one row, rays 0.8–2.5 cm long; disc florets purple. Achenes *ca* 2 mm long, enveloped in pinkish brown silky hairs; pappus of minute pointed scales. **Fig. 82A.**

Native of southern Africa; naturalized and widespread in the region, often seen as a weed of disturbed sites and cultivation after winter rain. Flowers spring.

## 82. ARCTOTIS L.

Herbs or perennial subshrubs. Leaves alternate or radical. Heads large, solitary, pedunculate; involucre hemispherical, involucre bracts in many series; receptacle scales present; ray florets female or sterile, strap shaped; disc flowers bisexual, tubular, 5-toothed; anther bases entire or shortly auricled and sagittate; style branches connate or sometimes bifid, apex rounded, smooth or papillose. Achenes oblongoid,  $\pm$  winged and deeply grooved on inner face, convex, ribbed and tuberculate on outer face, usually villous; pappus of scales.

About 50 species, Africa; 1 species naturalized Australia, occurring in south-eastern Queensland.

### 1. \**Arctotis stoechadifolia* Bergius

*Arctotis grandis* auct. non Thunb.

Perennial, prostrate or ascending, up to *ca* 60 cm tall, softly white tomentose all over. Lower leaves with petioles up to *ca* 8 cm long, upper ones sessile; blades oblong to obovate or obovate-cuneate in outline, pinnately lobed or lyrate, entire to irregularly toothed, up to 12 cm  $\times$  4 cm, reducing upwards. Peduncles axillary, up to *ca* 12 cm long; heads solitary, 4–6 cm across; ray florets female, rays white with yellow base, *ca* 2 cm long; disc florets dark purple. Achenes 5-ribbed, 2 lateral ribs winged and incurved towards middle one, *ca* 3.5 mm long, villous and with basal ring of hairs; pappus of 7–8 scales, 3–4 mm long. **Fig. 82B.**

Apparently introduced from southern Africa as a garden plant; reported apparently naturalized from near Chinchilla in the Darling Downs district.

## 83. GAZANIA Gaertn.

Perennial, rarely annual herbs. Leaves radical or alternate cauline, usually white felted below. Heads large, solitary on long peduncles; involucre urceolate or campanulate, involucre bracts in many series, connate below to form cup; receptacle scales absent; ray florets 1-seriate, sterile, rays conspicuous; disc florets bisexual or inner ones functionally male, tubular, 5-lobed; anther bases sagittate; style branches of bisexual florets linear, obtuse to  $\pm$  acute, those of functionally male flowers connate. Achenes obovate or turbinate, silky hairy; pappus 1-seriate, of numerous narrow scales, often difficult to distinguish from ovary hairs.

40 species, Africa; 1 species or possibly a hybrid of horticultural origin naturalized Australia, occurring in south-eastern Queensland.

### 1. \**Gazania* sp. 1.

### GAZANIA

Creeping perennial herb; stems soft, leafy. Leaves of naturalized plants with petioles up to *ca* 5 cm long, larger in cultivated specimens; blades elliptic or narrowly obovate, margin revolute, entire or pinnately lobed, up to 12 cm  $\times$  1.5 cm, glabrous above, white felted below. Peduncles axillary, up to *ca* 15 cm long; heads up to *ca* 6 cm across rays; involucre *ca* 1–1.5 cm across; ray and disc florets of naturalized specimens yellow or orange with various reddish or brownish markings at base of rays. Achenes *ca* 4–5 mm long; pappus scales narrow.

Possibly a hybrid of horticultural origin, widely cultivated as an ornamental, naturalized in coastal sands in the northern Moreton district, occasionally found as a garden escape elsewhere in the region. Flowers found most of the year.

**84. CARDUUS L.**

Annual, biennial or perennial herbs; stems spiny winged. Leaves lobed to 2-pinnatisect, margin spinose-dentate. Heads solitary pedunculate to crowded and sessile; involucre depressed globose to cylindrical, involucre bracts in several rows, spine tipped; receptacles long hairy; ray florets absent; disc florets actinomorphic or zygomorphic, deeply 5-lobed, 1 lobe often longer than others; anther bases tailed; style branches narrow. Achenes compressed; pappus of many rows of scabrous or barbellate bristles, united at base into ring, deciduous.

About 100 species Europe and Asia; 3 species naturalized Australia, occurring in south-eastern Queensland.

- |   |                            |   |
|---|----------------------------|---|
| 1. Heads solitary, pedunculate, hemispherical   | 1. <i>C. thoermeri</i>     |   |
| Heads clustered, sessile, ± cylindrical   |                            | 2 |
| 2. Inner involucre bracts with minute antrorse hairs on faces; florets 1.2–1.7 cm long; pappus 1.2–1.7 cm long; achenes 4–5 mm long | 2. <i>C. pycnocephalus</i> |   |
| Inner involucre bracts without minute antrorse hairs on faces; florets 1–1.2 cm long; pappus 1–1.2 cm long; achenes 3–4 mm long     | 3. <i>C. tenuiflorus</i>   |   |

**1. \**Carduus thoermeri* J. A. Wienn.****NODDING THISTLE**

Coarse erect annual up to *ca* 2 m tall; stems with spiny wings, spines up to *ca* 1.2 cm long. Lower leaves up to 40 cm × 7.5 cm, upper leaves smaller, each leaf with 4–8 pairs of broadly triangular lobes, each with an apical spine up to *ca* 10 mm long and several lateral spines, glabrous or sparsely hairy. Heads solitary, pedunculate, hemispherical, 3–5 cm × 6–8 cm; outer involucre bracts spine tipped; florets purple, 2–3.5 cm long. Achenes 4–6 mm long; pappus 1.5–2.5 cm long.

Native of Europe; naturalized in the region in disturbed sites on the better soils of the southern Wide Bay and Burnett districts, the western Moreton district and extreme eastern Darling Downs district. Flowers spring–summer.

**2. \**Carduus pycnocephalus* L.****SLENDER THISTLE**

Erect slender annual up to 1 m tall; stems with wings up to *ca* 5 mm wide, wings with spines up to *ca* 1.2 cm long, stems and wings woolly hairy. Lower leaves up to *ca* 30 cm × 7.5 cm, upper leaves smaller, each leaf with 2–6 pairs of lobes each with an apical spine up to *ca* 10 mm long and several lateral spines, densely woolly hairy below, less densely so above. Flower heads 1–several clustered together, sessile, ± cylindrical; outer involucre bracts spine tipped, inner involucre bracts with minute antrorse hairs on faces; florets purple, 1.2–1.7 cm long. Achenes 4–5 mm long; pappus 1.2–1.7 cm long.

Native of Europe; naturalized and widespread in the region but mainly in the Moreton and Darling Downs districts, usually on sandy or loamy soils. Flowers spring.

**3. \**Carduus tenuiflorus* Curtis****SLENDER THISTLE**

Erect slender annual up to *ca* 75 cm tall; stems with wings up to *ca* 10 mm wide with spines up to *ca* 1.2 cm long, stems and wings woolly hairy. Lower leaves up to *ca* 30 cm × 7.5 cm, upper leaves smaller, each leaf with 6–8 pairs of lobes each with an apical spine up to *ca* 10 mm long and several lateral spines, densely woolly hairy below, less densely so above. Flower heads in clusters of 3 or more, sessile, ± cylindrical; outer involucre bracts spine tipped, inner involucre bracts without minute antrorse hairs on faces; florets purple, 1–1.2 cm long. Achenes 3–4 cm long; pappus 1–1.2 cm long.

Native of Europe; rare in the region, collected from a few places in the Darling Downs district. Flowers spring–early summer.

## 85. CNICUS L.

Annual herb with branched spreading habit, occasionally rosette forming. Leaves alternate. Heads with ovoid-globose involucre, involucre bracts in many series; receptacles densely long bristled; ray florets absent; all florets tubular, marginal ones sterile, inner ones obliquely 5-lobed; anthers tailed; style slightly thickened near point of bifurcation. Achenes cylindrical, prominently many-ribbed, with 10-toothed raised rim and oblique hollow at base; pappus 2-seriate, outer series of 10 long bristles surrounding 10 shorter inner ones.

Monotypic genus from southern Europe and eastern Mediterranean region to Afghanistan; naturalized Australia and occurring in south-eastern Queensland.

1. \**Cnicus benedictus* L.

## BLESSED THISTLE

Erect up to *ca* 25 cm tall or acaulous with sessile heads and rosette of leaves, cottony hairy. Lower leaves shortly petiolate, upper sessile and stem clasping; blades oblong-ovate,  $\pm$  pinnatifid, spiny-dentate, lower leaves 7–22 cm  $\times$  1.5–4 cm, upper smaller. Heads 2–3.5 cm long; florets shorter than involucre. Achenes 7–9 mm long, outer pappus *ca* 10 mm long, inner pappus *ca* 2.5 mm long.

Known from the Moreton and eastern Darling Downs districts, rare. Flowers spring.

## 86. CIRSIUM Miller

Perennial, biennial or annual herbs; stems often spiny winged. Leaves alternate or radical, spinose at margins. Heads solitary or crowded; involucre bracts in many series, often spinose; receptacles densely setose; ray florets absent; all florets tubular, 5-lobed; anther bases sagittate, adjacent auricles connate and prolonged into tail; style abruptly thickened below branches, branches often partly connate. Achenes  $\pm$  obovate, compressed, glabrous; pappus of feathery bristles in several series.

About 150 species from the northern hemisphere; *ca* 4 species naturalized Australia; 1 species south-eastern Queensland.

1. \**Cirsium vulgare* (Savi) Ten.

## SPEAR THISTLE

*Carduus vulgaris* Savi; *Cnicus lanceolatus* (L.) Scop.

Robust annual or biennial herb up to 1.5 m tall; stems furrowed, cottony hairy or  $\pm$  glabrous, with interrupted spiny wings from decurrent leaf bases. Basal leaves rosulate, ovate or narrowly ovate in outline, pinnatifid with spinose lobes, whole leaf up to 45 cm  $\times$  10 cm; upper leaves pinnatifid, up to 15 cm  $\times$  4 cm, segments each with erect and deflexed lobes, each lobe acuminate with an apical spine up to *ca* 1.5 cm long, upper surface strigose with spiny hairs, lower surface cottony hairy. Heads terminal; involucre ovoid, 3–5 cm long, involucre bracts with spinose tips; florets purplish, exceeding involucre. Achenes *ca* 2.5–4 mm long; pappus of plumose bristles, 0.8–1.1 cm long, soon caducous. **Fig. 82C.**

Native of Europe, western Asia and northern Africa; naturalized and widespread in the region, often as a weed of old cultivation. Flowers found most of the year but mainly spring and autumn.

This plant is often called SCOTCH THISTLE in Queensland but the name is more widely applied to another plant not found in this State.

## 87. CYNARA L.

Perennial herbs. Leaves in basal rosette or alternate, usually deeply divided, with spiny segments. Heads solitary or in sparingly branched cymes; involucre ovoid or globose, outer and inner involucre bracts with a stout spine on ovate appendage at apex; receptacle scales setaceous; ray florets absent; disc florets bisexual, tubular, 5-lobed; anthers tailed; styles thickened below branches. Achenes glabrous; pappus of many plumose hairs, connate at base.

14 species Mediterranean region and western Asia; 1 species naturalized Australia, occurring in south-eastern Queensland.

**1. \**Cynara cardunculus* L.**

ARTICHOKE THISTLE; CARDOON

Erect perennial up to 1.5 m tall. Leaves pinnatisect with narrowly ovate pinnatifid lobes, secondary lobes terminating in spine, whole leaf up to *ca* 50 cm × 35 cm, reducing upwards, shortly tomentose above, white tomentose below. Involucres subglobular, 5–6 cm long; florets blue. Pappus straw coloured.

Native of the Mediterranean region; recorded once from near Toowoomba in the Darling Downs district. It is a declared noxious weed under the Stock Routes and Rural Lands Protection Acts, 1944–1967.

**88. SILYBUM Adans.**

Erect glabrous herbs. Leaves alternate, toothed or pinnatifid, margin spiny. Heads large, solitary, terminal; involucre subglobose, involucre bracts in many rows, spiny; receptacle densely setose; ray florets absent; disc florets 5-lobed; anthers with narrow apical appendage, base sagittate; style with ring of hairs below branches, branches narrow, connate, minutely papillose. Achenes compressed; pappus of many bristles in many rows, connate at base, deciduous.

2 species from the Mediterranean region; 1 species naturalized Australia, occurring in south-eastern Queensland.

**1. \**Silybum marianum* (L.) Gaertn.**

VARIEGATED THISTLE

*Carduus marianus* L.

Annual or biennial up to 2 m tall. Leaves oblong in outline, sinuate-lobed or pinnatifid, margin undulate, spiny, up to 45 cm × 18 cm, becoming smaller upwards, glabrous, mottled with white along veins. Involucres up to 12 cm across spreading outer bracts, inner urceolate part of involucre 3–6 cm across, involucre bracts up to 4 cm long, terminating in a rigid spine; florets purple. Achenes black, 5–7 mm long, glabrous; pappus 1.2–2 cm long. **Fig. 82D.**

Native of the Mediterranean region; naturalized and widespread in the eastern Darling Downs district and also known from the Moreton and Wide Bay districts. Flowers spring–summer. The species can be poisonous to hungry stock. It is a declared noxious weed under the Stock Routes and Rural Lands Protection Acts, 1944–1967.

**89. SAUSSUREA DC.**

Erect annual or perennial herbs. Leaves alternate, toothed or lobed or pinnately divided. Heads solitary or in panicles; involucre ovoid or campanulate, involucre bracts numerous, imbricate, inner ones longest; receptacles bearing bristles between florets; florets all tubular, 5-lobed; anthers tailed; style branches linear, slightly thickened at base. Achenes glabrous; pappus of several plumose bristles united in a ring at base.

About 400 species, mainly temperate Asia but also Europe, Australia and North America; 1 species Australia, occurring in south-eastern Queensland.

**1. *Saussurea carthamoides* (Buch.-Ham. ex Roxb.) Benth.***Serratula carthamoides* Buch.-Ham. ex Roxb.

Annual up to 60 cm tall; stems longitudinally ribbed. Leaves with petioles up to 6 cm long; blades deeply pinnatifid, up to 10 cm × 6 cm, becoming smaller upwards, glabrous above, white cottony woolly below. Heads in loose terminal panicles; involucre campanulate, 0.8–1 cm long; florets purple. Achenes 1.5–2 mm long; pappus *ca* 7 mm long. **Fig. 82E.**

Rare, known from a few places in the Moreton and Burnett districts. Flowers apparently spring.

90. CENTAUREA L.

Erect annual or perennial herbs, usually rigid. Leaves radical and alternate, entire or pinnatifid. Flower heads solitary or clustered; involucre globular or ovoid, involucre bracts numerous, usually ending in spine or in fringed or toothed appendage; receptacles with numerous bristles; ray florets absent; disc florets bisexual, tubular, 5-lobed, outer row often larger and sterile; anthers tailed; style branches linear, often cohering, thickened at base. Achenes glabrous, usually obliquely or laterally attached at base; pappus of short simple bristles or scales or sometimes absent.

About 600 species from Europe and northern Africa to India and China and temperate North and South America; 6 species naturalized Australia; 5 species south-eastern Queensland.

- |   |                           |
|---|---------------------------|
| 1. Florets purple . . . . .   | 2                         |
| Florets yellow . . . . .  | 4                         |
| 2. Involucre bracts with a spreading spine . . . . .                              | 1. <i>C. calcitrapa</i>   |
| Involucre bracts without spines . . . . .   | 3                         |
| 3. Involucre bracts with long brown fimbriae along edges . . . . .                | 2. <i>C. nigra</i>        |
| Involucre bracts lacerate at apex but not fimbriate . . . . .                     | 3. <i>C. jacea</i>        |
| 4. Involucre bracts with most spines 1 cm or more long; heads solitary . . . . .  | 4. <i>C. solstitialis</i> |
| Involucre bracts with spines less than 1 cm long; heads often clustered . . . . . | 5. <i>C. melitensis</i>   |

1. \**Centaurea calcitrapa* L.

STAR THISTLE

Annual or biennial up to ca 60 cm tall, stems with sparse crisped hairs. Lower leaves with petioles up to ca 6 cm long, upper ones ± sessile; lower blades pinnatifid with narrow lobes with acute-mucronulate apices, whole blades up to ca 15 cm × 4 cm, becoming smaller upwards; uppermost blades linear or narrowly ovate, entire. Heads sessile or shortly pedunculate in axils of upper leaves or in forks in branches; involucre ca 1–1.5 cm × 0.7–1 cm, outer involucre bracts topped with spines up to 3 cm long, spines often pinnately spinose at base; florets purple. Achenes flattened-obovoid, ca 3 mm long; pappus absent. **Fig. 82H.**

Native of Europe, western Asia and northern Africa; widespread but not common in the region. Flowers summer–autumn.

2. \**Centaurea nigra* L.

BLACK KNAPWEED

Perennial up to ca 60 cm tall, scabrous. Lower leaves with petioles up to ca 3 cm long, blades narrowly ovate, usually entire, rarely dentate or lobed, up to ca 10 cm × 2 cm; upper leaves sessile, narrowly oblong, apex acute, smaller than lower leaves. Heads terminal on branches; involucre ovoid, ca 1–1.5 cm long, involucre bracts with fimbriae 2–2.5 mm long along edge; florets purple. Achenes flattened-obovoid, ca 3 mm long; pappus of hairs shorter than achene. **Fig. 82G.**

Native of Europe; recorded once from the region, from Gympie. Flowers spring–summer.

3. \**Centaurea jacea* L.

Perennial up to ca 1 m tall, scabrous. Lower leaves with petioles up to ca 18 cm long, blades narrowly ovate to narrowly obovate, margin entire or toothed, up to ca 8 cm × 3 cm; upper leaves sessile, narrowly ovate to oblong to linear, up to ca 8 cm × 0.8 cm. Heads terminal on branches, often ± corymbose; involucre ovoid or oblongoid, 1.3–1.8 cm long, outer involucre bracts lacerate along upper margin; florets purple. Achenes flattened-obovoid, ca 3 mm long; pappus absent. **Fig. 82F.**

Native of Europe and Western Asia; naturalized in the Redbank Plains area near Ipswich in the Moreton district. Flowers summer.

**4. \**Centaurea solstitialis* L.****ST. BARNABY'S THISTLE**

Annual up to *ca* 60 cm tall; stems conspicuously winged, scabrous along edge, woolly hairy. Lower leaves soon withering, lyrate or pinnatifid; upper leaves sessile, decurrent into stem wings, linear-ovate, apex acute or acuminate, margin entire or with few teeth, mostly 1–5 cm × 0.2–0.5 cm, woolly hairy, scabrous along margin. Heads terminal on branches; involucre ovoid, 1–1.5 cm long, involucre bracts with spine 0.8–2.5 cm long with 2–3 digitately arranged spinules on either side of spine; florets yellow. Achenes flattened-obovoid, 2–3 mm long, marginal ones dull, blackish, without pappus, outer ones glossy, greyish or brownish, with pappus of bristles 3–5 mm long.

Native of southern Europe and western Asia; naturalized in the Moreton and Darling Downs district, usually on disturbed ground, but is not particularly common. Flowers summer.

**5. \**Centaurea melitensis* L.****MALTESE COCKSPUR; COCKSPUR THISTLE**

Annual up to *ca* 60 cm tall, sparsely woolly. Lower leaves with petioles up to 6 cm long, blades pinnatifid, up to *ca* 10 cm × 4 cm; upper leaves decurrent but wings not continuous from node to node, blades oblong-linear, entire, uppermost 1–1.5 cm long. Heads terminal and on short branches from upper axils or apical ones paired or clustered; involucre ovoid, *ca* 0.8–1 cm long, involucre bracts with spines mostly 4–8 mm long, spines pinnately spinulose at base; florets yellow. Achenes flattened-obovoid, *ca* 2.5–4 mm long; pappus of bristles 3–5 mm long.

Native of the Mediterranean region; widespread in the region as a weed of heavy soils in disturbed areas. Flowers spring–summer.

**91. LEUZEIA DC.**

Perennial herbs with underground rootstock. Leaves alternate, entire to pinnatifid. Heads solitary, large; involucre hemispherical to ovoid, involucre bracts in several series, each with rigid herbaceous basal part and membranous to scarious appendage; receptacles with numerous bristles; ray florets absent; disc florets bisexual, tubular; anthers with short appendages; style long with relatively short arms. Achenes usually glabrous; pappus of several rows of denticulate to ciliate bristles, longer than achene.

About 30 species from Mediterranean region to eastern Asia and Australia; 1 species endemic in Australia, occurring in south-eastern Queensland.

**1. *Leuzea australis* Gaudich.**

*Centaurea australis* (Gaudich.) Benth. & Hook.

Herb up to *ca* 60 cm tall, branches usually with a little cottony wool. Leaves with petioles 0–15 cm long; blades oblong-ovate, toothed or pinnatifid or pinnately divided, lower ones up to 18 cm × 6 cm, blades and petioles reducing upwards, often with a little cottony wool. Heads solitary, 3–6 cm across; florets purplish. Achenes striate, 7–8 mm long; pappus *ca* 2 cm long. **Fig. 82I.**

Widespread in the region, usually on heavy soils. Flowers spring to autumn.

**92. ACROPTILON Cass.**

Rhizomatous perennials. Leaves alternate. Heads solitary on branches; involucre oblong-ovoid or cylindrical, involucre bracts in many series with broad entire cuspidate scarious appendages; receptacles bristly; ray florets absent; disc florets bisexual, tubular, anthers tailed; style thickened or hairy below branches. Achenes obovoid, compressed, apex truncate at maturity; pappus caducous, multi-seriate, of flattened barbellate hairs often becoming shortly plumose at distal end.

2 species from Western Europe and Asia; 1 species naturalized Australia, occurring in south-eastern Queensland.

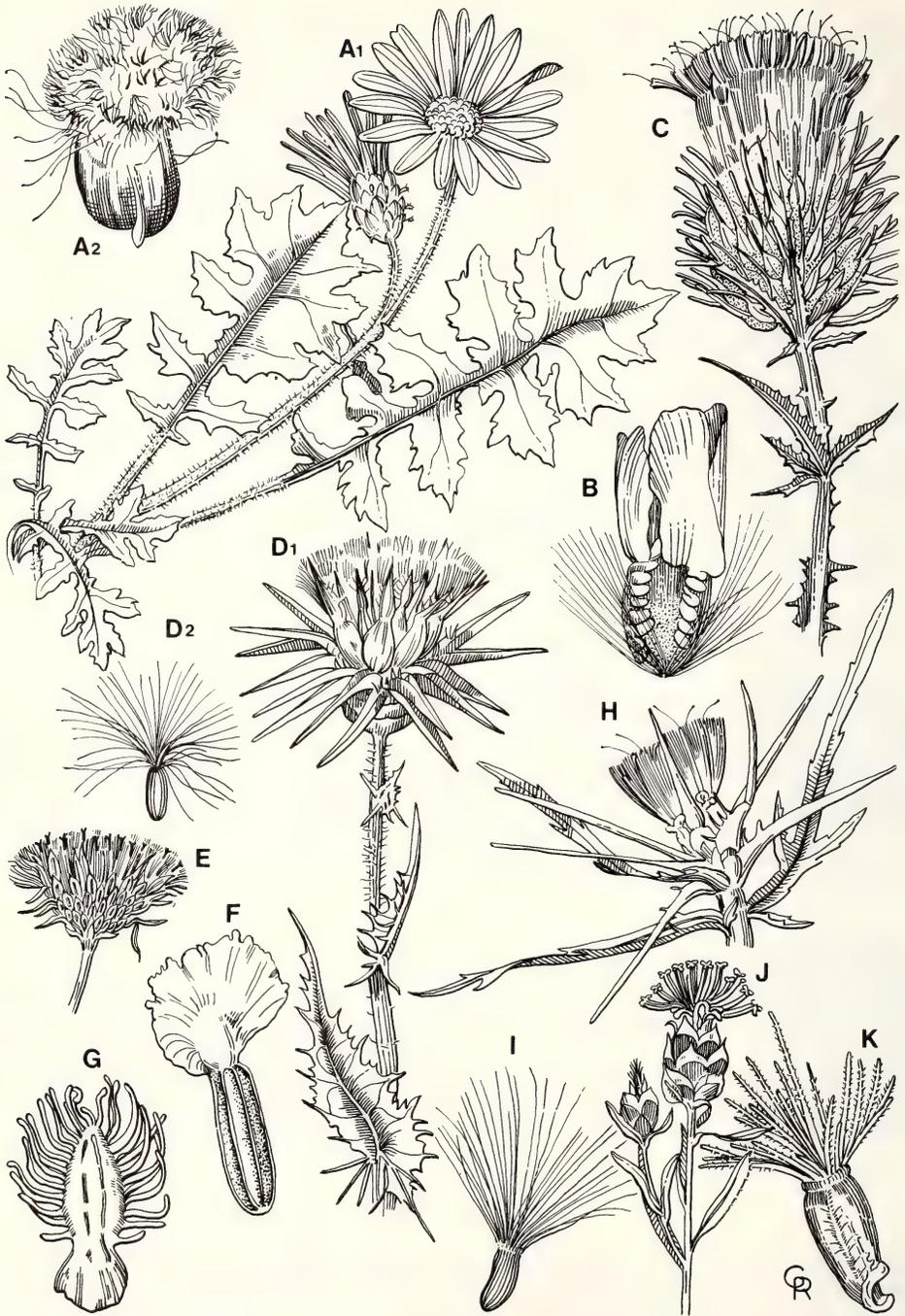


Fig. 82 ASTERACEAE — A<sub>1</sub>–A<sub>2</sub> *Arctotheca calendula*, A<sub>1</sub> portion of flowering plant x1, A<sub>2</sub> achene x6; B *Arctotis stoechadiifolia*, achene x6; C *Cirsium vulgare*, portion of flowering stem x1; D<sub>1</sub>–D<sub>2</sub> *Silybum marianum*, D<sub>1</sub> portion of flowering stem x1/2, D<sub>2</sub> achene with pappus x1; E *Saussurea carthamoides*, flowering head x1; F–H *Centaurea* spp. — F *C. jacea*, involucral bract x3; G *C. nigra*, involucral bract x6; H *C. calcitrapa*, head x1; I *Leuzea australis*, achene with pappus x1; J *Acroptilon repens*, portion of flowering stem x1; K *Mantiscalca salmantica*, achene with pappus x6.

**1. \*Acroptilon repens (L.) DC.**CREEPING KNAPWEED; RUSSIAN  
KNAPWEED*Centaurea repens* L.

Erect up to *ca* 50 cm tall. Rosette leaves petiolate and deeply divided, up to 9 cm × 2 cm; stem leaves simple, subsessile, elliptic to linear or sometimes obovate, apex obtuse to acute, base cuneate or long attenuate, margin coarsely and distinctly toothed, 1–5 cm × 0.2–1 cm, sparsely to moderately densely hairy, ± glandular punctate. Heads terminating short leafy branches; involucre 0.9–1.2 cm × 0.7–0.8 cm, involucre bracts in 4 unequal rows, spineless, orbicular, rigid, scarious, hairy on upper margins; florets purple, or occasionally white or pink, *ca* 1–1.5 cm long. Achenes *ca* 3–4 mm × 2 mm; pappus *ca* 6–10 mm long. **Fig. 82J.**

Native of western Europe and central Asia; naturalized in the Moreton and Darling Downs districts, usually on clay or clay loam soils; it can be a nuisance in pastures. Flowers summer–autumn.

**93. MANTISALCA Cass.**

Biennials or perennials. Leaves alternate, often pinnately lobed. Heads solitary; involucre ovoid-globose, involucre bracts in several series ending in short deciduous spine; receptacle scales present; ray florets absent; disc florets bisexual; anther bases caudate. Achenes slightly compressed, ribbed and transversely rugulose, hilum lateral; pappus of several series of scabrous bristles, innermost series a ring bearing 1 long bristle.

5 species Mediterranean region; 1 species apparently naturalized Australia, occurring in south-eastern Queensland.

**1. \*Mantiscalca salmantica (L.) Briq. & Cavillier***Centaurea salmantica* L.

Erect up to 60 cm tall. Basal leaves in rosette, pinnatifid to sublyrate, up to 20 cm long, scabrous; upper leaves linear, denticulate to subentire, 1–3 cm long. Involucre 1–2 cm long, 1–1.3 cm broad, involucre bracts straw coloured with a black spot at apex, spine 0.5–1 mm long; florets purple. Achenes *ca* 4 mm long; pappus 2–3 mm long. **Fig. 82K.**

Native of the Mediterranean region; occasionally recorded from the Darling Downs district. Flowers spring–summer.

**94. CARTHAMUS L.**

Annuals. Leaves radical and cauline, alternate, entire to pinnatifid or pinnatisect, usually with spiny margin. Involucre subglobose to ovoid, involucre bracts many-seriate, outer ones herbaceous, often spreading, inner ones spiny; receptacle scales numerous; ray florets absent; disc florets tubular, 5-toothed. Achenes obpyramidal, 4-angled, outer achenes coarsely rugose, without pappus, inner ones smooth with pappus of narrow scales.

About 13 species from Mediterranean region, Africa and Asia; 3–4 species naturalized Australia; 2 species south-eastern Queensland.

- |  |   |   |   |   |   |                         |
|--|---|---|---|---|---|-------------------------|
| 1. Leaves entire or finely spiny serrate | . | . | . | . | . | 1. <i>C. tinctorius</i> |
| Leaves coarsely spiny pinnatifid         | . | . | . | . | . | 2. <i>C. lanatus</i>    |

**1. \*Carthamus tinctorius L.**

SAFFLOWER

Annual up to *ca* 1 m tall. Leaves sessile, ovate, apex acute, base rounded or cuneate, upper often stem clasping, margin ± entire or finely spiny serrate, 1.5–10 cm × 0.6–4 cm. Involucre 1.5–4 cm diameter, excluding outer bracts, outer involucre bracts ovate, up to *ca* 3 cm long; florets yellow or yellow-orange, up to *ca* 1 cm longer than inner involucre bracts. Achenes *ca* 6–8 mm long; pappus absent or rarely inner achenes with short narrow scales.

Place of origin unknown but widely cultivated throughout the world for seed-oil; cultivated and naturalized in south-eastern Queensland, widespread but not common, often as a weed of roadsides, along railway lines etc. Flowers mostly spring.

**2. \**Carthamus lanatus* L.****SAFFRON THISTLE**

Annual up to *ca* 80 cm tall, glandular,  $\pm$  villous. Radical leaves with petioles up to *ca* 5 cm long, blades pinnatifid, spiny, up to *ca* 15 cm  $\times$  5 cm; cauline leaves sessile, ovate or narrowly ovate, deeply lobed or pinnatifid, lobes ending in long spines, base stem clasping, 2–11 cm  $\times$  0.8–5 cm. Involucres 2–3 cm long, excluding outer bracts, outer involucre bracts 2–4.5 cm long; florets yellow, up to 1 cm longer than inner involucre bracts. Achenes *ca* 4–5 mm long; pappus of many narrow scales, *ca* 1 cm long. **Fig. 83A.**

Native of Europe, Asia and Africa; naturalized throughout the region, but most common in the Darling Downs and Burnett districts, as a weed of cultivation, roadsides etc. Flowers spring–early summer. It is a declared noxious weed under the Stock Routes and Rural Lands Protection Acts, 1944–1967.

**95. SCOLYMUS L.**

Spiny annual, biennial or perennial herbs; stems with spiny wings. Leaves pinnatifid, rigid, spiny-dentate. Heads sessile, axillary; involucre bracts in several rows, spiny, whole involucre overtopped by spiny subtending leaves; receptacle scales present, the scales enclosing achenes; all florets with rays, yellow; anther bases sagittate; style branches slender,  $\pm$  filiform. Achenes compressed; pappus absent, or of a few stiff bristles.

3 species Mediterranean region; 1 species apparently naturalized Australia, occurring in south-eastern Queensland.

**1. \**Scolymus maculatus* L.****SPOTTED THISTLE**

Erect up to 90 cm tall. Leaves ovate to obovate, pinnatifid, margin spiny, lower ones 4–20 cm  $\times$  2–8 cm, upper ones smaller but with long stiff spines, both stem leaves and wings with white thickened margins. Involucres *ca* 1–1.5 cm broad; florets all yellow, rays *ca* 1 cm long. Achenes *ca* 2–4 mm long; pappus absent.

Native of the Mediterranean region; occasionally found in black soil areas of the Darling Downs district. Flowers spring.

**96. CICHORIUM L.**

Annual, biennial or perennial herbs. Leaves rosulate or alternate, pinnatifid or coarsely toothed. Heads solitary or few together in axillary clusters; involucre bracts in 2 series; receptacles usually without scales; florets all with rays; anthers sagittate at base; style branches long, slender, obtuse, with long hairs. Achenes obconical or obovoid, obscurely 5-angled, glabrous; pappus of 1–2 rows of minute scales.

About 10 species Europe, western Asia and northern Africa; 1 species naturalized Australia, occurring in south-eastern Queensland.

**1. \**Cichorium intybus* L.****CHICORY**

Stout divaricately branched perennial up to 1.2 m tall with thick taproot, roughly hairy or  $\pm$  glabrous. Basal leaves with petioles up to 5 cm long, blades irregularly lobed and/or toothed, 5–22 cm  $\times$  1.5–7 cm; stem leaves sessile, stem clasping, similar to basal leaves or  $\pm$  entire, reducing in size upwards. Heads measured across expanded rays 2.5–3.5 cm across, solitary or in few-headed clusters in axils of upper leaves; florets bright blue, rarely whitish. Achenes obconical, obscurely 5-angled, 2–3 mm long; pappus scales minute. **Fig. 83B.**

Native of northern Europe; naturalized and widespread in the region, usually in disturbed areas on heavy soils. Flowers spring–summer, flowers open early morning and close about midday. It is cultivated in some parts of the world for its roots which when roasted and ground are used for mixing with coffee. The leaves are edible.

**97. TOLPIS** Adans.

Annual or perennial herbs. Leaves mostly radical, dentate or lobed. Heads in lax corymbose panicles; involucre campanulate, involucre bracts in 1–2 rows; receptacle scales absent; all florets with rays; anther bases sagittate; style branches short, obtuse. Achenes obconical, ribbed, apex truncate; pappus of 2 rows of bristles.

About 20 species mainly Mediterranean region with a few in Africa and Atlantic Is.; 1 species naturalized Australia, occurring in south-eastern Queensland.

**1. \**Tolpis barbata* (L.) Gaertn.****YELLOW HAWKWEED**

*Crepis barbata* L.; *Tolpis umbellata* Bertol.

Annual up to *ca* 40 cm tall. Leaves with  $\pm$  winged petioles up to *ca* 2 cm long; blades of basal leaves oblong-obovate to narrowly ovate, apex  $\pm$  acute, base attenuate, margin dentate, 4–8 cm  $\times$  0.5–1.5 cm, sparsely hairy, upper leaves  $\pm$  linear, margin entire or dentate, smaller than lower leaves. Involucre 4–6 mm diameter, involucre bracts unequal in length, 5–9 mm long; outer rays yellow, *ca* 3 mm long, inner ones brownish, shorter than outer ones. Achenes *ca* 1–2 mm long; pappus of outer florets of several bristles less than 0.5 mm long, of inner florets of several short hairs and few barbellate hairs 2–3 mm long.

Collected once from Wallangarra in the southern Darling Downs district. Flowers apparently spring–early summer.

**98. HEDYPNOIS** Miller

Hispid annual herbs. Leaves in basal rosette and alternate cauline. Heads on long peduncles, terminal and axillary; involucre cylindrical-campanulate in flower, involucre bracts in 2 series, outer minute, inner large, hardened in fruit, incurved, tightly enfolding marginal achenes; receptacle scales absent; florets all with rays, bisexual; anther bases sagittate; style branches slender. Achenes finely ribbed, outer slightly incurved, with short crown-like pappus, inner straight with pappus of several often bristle-like scales.

3 species Canary Is., Madeira and Mediterranean region; 1 species naturalized Australia, occurring in south-eastern Queensland.

**1. \**Hedypnois rhagadioloides* (L.) F. W. Schmidt****CRETIN WEED**

*Hyoseris rhagadioloides* L.; *Hedypnois cretica* (L.) Dum.-Cours.

Procumbent or erect up to *ca* 30 cm tall. Basal leaves  $\pm$  sessile or with petioles up to *ca* 8 cm long, expanded at base, blades  $\pm$  spatulate, apex acute, base narrowed, margin toothed, up to 15 cm  $\times$  3 cm, upper leaves sessile, becoming  $\pm$  entire, smaller than lower ones. Scapes hollow, swollen towards summit, up to *ca* 10 cm long; involucre 7–9 mm long; florets yellow. Achenes 6–10 mm long, ribbed longitudinally; pappus of outer achenes *ca* 0.5 mm long, of inner achenes 2–3 mm long. **Fig. 83C.**

Native of the Mediterranean region; naturalized in the Moreton and Darling Downs districts, as a weed of cultivation. Flowers spring.

**99. PICRIS** L.

Coarse annual or perennial herbs. Leaves alternate. Heads in loose irregular corymbose inflorescences; inner involucre bracts in 1 row, narrow, outer involucre bracts smaller, in 1–3 rows, or broad and conspicuous, all enlarged in fruiting stage; receptacle scales absent; florets all with rays. Achenes transversely wrinkled and longitudinally furrowed; pappus of 1 row of plumose bristles with few shorter barbellate ones.

40–50 species Europe, northern Africa, Asia and Australia; 3 species Australia, 2 endemic, all occurring in south-eastern Queensland.

- |   |                                   |   |
|---|-----------------------------------|---|
| 1. Outer bracts large, ovate-cordate . . . . .  | 1. <i>P. echioides</i>            | 2 |
| Outer bracts linear-ovate . . . . .   |                                   |   |
| 2. Achenes 5.5–8 mm long; involucre bracts conspicuously ciliate on margins . . . . . | 1. <i>P. evae</i>                 |   |
| Achenes 4–5 mm long, involucre bracts not ciliate on margins . . . . .                | 3. <i>P. carolorum-henricorum</i> |   |

### 1. \**Picris echioides* L.

OX TONGUE

Stout erect annual or perennial herb up to 1 m tall. Lower leaves broadly ovate, irregularly toothed or entire, narrowed to petiole-like base, up to 30 cm × 3 cm; upper leaves sessile, stem clasping, narrowly ovate, smaller than lower ones, with short hairs trifid or bifid at very tip and longer simple tubercular based hairs. Heads *ca* 1.3 cm across; outer involucre bracts ovate-cordate, apex acuminate, leaf-like, *ca* 1.3 cm long, inner involucre bracts linear-ovate; florets yellow. Achenes 2.5–3 mm long; pappus 5–6 mm long.

Native of the Mediterranean region and south-western Asia; naturalized in southern states, reported once from Laidley in the Moreton district in a crop, the seed of which was imported from the United States of America.

### 2. *Picris evae* Lack

HAWK WEED

*Picris hieracioides* auct. Aust. non L.

Annual up to 1.7 m tall; stems with spreading rigid hairs trifid at very tip. Leaves sessile, narrowly ovate or oblong or narrowly elliptic, apex acute, base narrowed, margin ± entire to dentate, up to 15 cm × 3 cm, becoming smaller upwards, with sparse spreading hairs bifid at tip. Heads ± cylindrical in flower, *ca* 8 mm across; outer involucre bracts linear-ovate, margin long ciliate, 4–6 mm long, inner involucre bracts linear-ovate, margin long ciliate, *ca* 0.7 cm long in flower, *ca* 1.2 cm long in fruit; florets yellow. Achenes 5.5–8 mm long; pappus 6–8 mm long.

Darling Downs and western Moreton districts. Flowers spring–summer.

### 3. *Picris carolorum-henricorum* Lack

HAWK WEED

*Picris hieracioides* auct. Aust. non L.

Perennial herb up to 50 cm tall. Leaves sessile in upper stem, lower leaves with petioles up to 6 cm long; blades narrowly ovate to narrowly obovate, apex acute, base long attenuate, margin entire to dentate, up to 15 cm × 1.3 cm, becoming smaller upwards, glabrous or with few bifid tipped hairs. Heads ± cylindrical in flower; outer involucre bracts linear-ovate, *ca* 3 mm long, inner involucre bracts linear-ovate, *ca* 0.8 cm long in flower, *ca* 1.1 cm long in fruit. Achenes 4–5 mm long; pappus 5–7 mm long. **Fig. 83D.**

Coastal parts of the Moreton and Wide Bay districts, not common. Flowers spring.

## 100. *YOUNGIA* Cass.

Erect herbs. Leaves radical and alternate. Heads in paniculate or corymbose inflorescences; involucre cylindrical, involucre bracts in 2 rows, outer ones shorter than inner ones; receptacle scales absent; florets bisexual, all with rays; anthers with linear basal auricles; style arms obtuse. Achenes oblong, subterete or angular, ribbed; pappus of numerous fine soft white bristles.

About 40–50 species, Asia and Australia; 1 species Australia, occurring in south-eastern Queensland.

### 1. *Youngia japonica* (L.) DC.

*Prenanthes japonica* L.; *Crepis japonica* (L.) Benth.

Herb up to *ca* 60 cm tall. Leaves radical, rarely with cauline leaves in Australian specimens; petioles 0.5–6 cm long; blades oblong or obovate, usually lyrate-pinnatifid, terminal lobe much larger than lateral ones, margin finely dentate, lobed or crenate, rarely blade not pinnatifid, 1.5–12 cm × 0.9–5 cm, glabrous. Heads in corymbose panicles; involucre *ca* 2–3 mm wide, outer involucre bracts minute, inner ones 4–5 mm long; florets yellow, 10–15, rays *ca* 2 mm long, inner ones sometimes smaller. Achenes 1.5–2 mm long; pappus *ca* 3 mm long.

Found in moist shady areas of eastern parts of the region. Flowers found most of the year.



Fig. 83 ASTERACEAE — A *Carthamus lanatus*, portion of flowering stem x1; B *Cichorium intybus*, portion of flowering stem x1; C<sub>1</sub>–C<sub>3</sub> *Hedypnois rhagadioloides*, C<sub>1</sub> fruiting head x1, C<sub>2</sub> outer achene x6, C<sub>3</sub> inner achene x6; D<sub>1</sub>–D<sub>2</sub> *Picris carolorum-henricorum*, D<sub>1</sub> portion of flowering stem x1, D<sub>2</sub> achene x6; E–F *Hypochoeris* spp. — E<sub>1</sub>–E<sub>2</sub> *H. glabra*, E<sub>1</sub> outer achene x6, E<sub>2</sub> inner achene x6; F<sub>1</sub>–F<sub>2</sub> *H. radicata*, F<sub>1</sub> flowering heads x1, F<sub>2</sub> achene with pappus x6.

## 101. HYPOCHOERIS L.

Annual or perennial herbs. Leaves mostly radical, stem leaves few or absent. Heads terminal on simple or sparsely branched scapes; involucre cylindrical-campanulate, involucre bracts in 2–5 series; receptacle scales present; florets all with rays; anthers sagittate; style branches long, obtuse. Achenes cylindrical, ribbed, at least inner ones beaked; pappus of 1–2 rows of plumose bristles, sometimes also an outer row of simple bristles.

About 70 species, Europe, Mediterranean region and South America; 3 species naturalized Australia, all occurring in south-eastern Queensland.

- |   |   |   |
|---|---|---|
| 1. Pappus of 1 row, plumose; florets white . . . . .                                      | 1. <i>H. microcephala</i> var. <i>albiflora</i> |   |
| Pappus of 2 rows, inner plumose, outer shorter and simple; florets yellow . . . . .       |   | 2 |
| 2. Perennials with thick fleshy rootstock; all achenes beaked . . . . .                   | 2. <i>H. radicata</i>                           |   |
| Annuals with slender taproot; outer achenes truncate at apex, inner ones beaked . . . . . | 3. <i>H. glabra</i>                             |   |

1. \**Hypochoeris microcephalus* (Schultz Bip.) Cabrera var. *albiflora* (Kuntze) Cabrera

WHITE FLATWEED

*Hypochoeris brasiliensis* (Lessing) Grisebach var. *albiflora* Kuntze

Perennial with fleshy taproot. Basal leaves spreading, oblong in outline, apex acuminate, base narrowed to broad winged petiole-like base, margin sinuate-toothed to pinnatifid, rarely  $\pm$  entire, up to 14 cm  $\times$  3 cm, glabrous; cauline leaves few, similar to basal but sessile, reducing upwards. Heads on scapes corymbose-paniculately arranged, whole up to ca 30 cm tall; heads up to ca 1.8 cm long; involucre 1–1.7 cm long; florets white. Achenes with slender cylindrical body tapering to slender beak, whole ca 7–9 mm long; pappus 1-seriate, of plumose bristles 5–8 mm long.

Native of South America; naturalized, widespread weed in the region, often in lawns. Flowers mainly spring but also summer and autumn.

2. \**Hypochoeris radicata* L.

CATSEAR; FLATWEED

Perennial with fleshy rootstock. Basal leaves sessile or petiolate, blades obovate in outline, apex  $\pm$  acute, margin sinuate-toothed to pinnatifid, up to 20 cm  $\times$  3 cm, hispid to almost glabrous; cauline leaves few, similar to basal, reducing upwards. Heads on scapes corymbose-paniculately arranged, whole 15–60 cm tall; heads ca 2.5 cm across; involucre 1.8–2.5 cm long; florets yellow. Achenes all with long slender beaks, body of achene 4–7 mm long, finely ribbed, ribs toothed, beak 7–10 mm long; pappus up to 10 mm long, of 2 series, inner of plumose bristles, outer of shorter scabrid bristles. **Fig. 83F.**

Native of Europe; naturalized throughout the region and a weed of pasture, cultivation and lawns. Flowers spring to autumn. The young leaves can be eaten cooked or raw.

3. \**Hypochoeris glabra* L.

SMOOTH CATSEAR

Annual with slender taproot. Basal leaves sessile or petiolate, blades obovate in outline, apex  $\pm$  acute, margin sinuate-toothed to pinnatifid, up to 20 cm  $\times$  3 cm,  $\pm$  glabrous; cauline leaves few, similar to basal, reducing upwards. Heads on scapes corymbose-paniculately arranged, whole up to ca 45 cm tall; heads up to ca 2 cm across; involucre 1.2–1.5 cm long; florets yellow. Inner achenes with body 3–5 mm long, ribbed, ribs toothed, beak ca 7 mm long; outer achenes similar to inner but apex truncate, not beaked; pappus up to 10 mm long, of 2 series, inner of plumose bristles, outer of shorter scabrid bristles. **Fig. 83E.**

Native of Europe; naturalized in southern parts of the region, not common. Flowers spring to autumn. The young leaves can be eaten cooked or raw.

Each of the above species is often referred to as a DANDELION; however this name is also applied to *Taraxacum officinale* Weber. The common weed of lawns in south-eastern Queensland which is usually known as DANDELION is *Hypochoeris radicata* L.

## 102. LEONTODON L.

Perennial herbs, indumentum commonly of forked hairs; stems scapiform. Leaves mostly in basal rosettes. Heads 1–few per scape; involucre campanulate, involucre bracts in several rows; receptacles pitted, the pits often dentate or ciliate on margins, scales absent; florets all with rays, bisexual, rays 5-toothed; anthers not tailed; style branches slender. Achenes cylindrical to fusiform, longitudinally striate or ribbed, sometimes beaked; all achenes with plumose pappus or marginal ones with crown-like pappus of scales.

50 species temperate Eurasia, Mediterranean region and the Middle East; 1 species naturalized Australia, occurring in south-eastern Queensland.

### 1. \**Leontodon saxatilis* Lam.

### HAIRY HAWKBIT

*Leontodon taraxacoides* (Vill.) Mérat

Perennial with short rhizome, indumentum of forked hairs. Leaves in basal rosette; petioles up to *ca* 4 cm long; blades obovate in outline, apex obtuse, base tapering, remotely pinnate-toothed to runcinate-pinnatifid. Scapes up to 30 cm long, unbranched; involucre 7–9 mm long; florets yellow. Achenes *ca* 5 mm long, those of inner florets shortly beaked with plumose pappus *ca* 5 mm long, those of outer florets scarcely beaked with crown-like pappus of scarious scales *ca* 1 mm long. **Fig. 84A.**

Native of Europe; rare in the region, known from the Moreton and Darling Downs districts. It is very similar in appearance to *Hypochoeris* species and may have been overlooked by past collectors.

## 103. TARAXACUM Wiggers

Perennial herbs, taproot thick. Leaves all in basal rosettes. Scapes simple, hollow; heads solitary, terminal; involucre campanulate or oblong, involucre bracts multi-seriate, outer shorter and often recurved; receptacle scales absent; all florets with rays; anthers sagittate at base; style branches long, slender, obtuse, with long hairs. Achenes 4–5-angled, ribbed, beaked; pappus of many series of hairs.

About 60 species mostly temperate Northern Hemisphere with a few in South America; 2 species Australia, 1 native; 1 species south-eastern Queensland.

### 1. \**Taraxacum officinale* Weber

### DANDELION

Perennial herb. Leaves radical; petioles 0–5 cm long; blades runcinate-pinnatifid, margin  $\pm$  entire or irregularly denticulate, 6–25 cm  $\times$  1–6 cm, sparsely hispid or glabrous. Scapes up to *ca* 30 cm long; involucre 1.5–2 cm long, outer involucre bracts reflexed, inner involucre bracts erect, 1–1.3 cm long in flower, longer in fruit; florets yellow, numerous, rays 0.5–1 cm long. Achenes striate and muricate-spinulose, *ca* 4–4.5 mm long with beak 0.8–1.2 cm long bearing pappus *ca* 5–7 mm long. **Fig. 84B.**

Native of Europe; widespread in the region but not common, weed of pasture, cultivation and lawns, often in damp or shaded areas. Flowers spring–early summer. The young leaves can be eaten cooked or raw.

The common weed of lawns in south-eastern Queensland which is usually known as DANDELION is *Hypochoeris radicata* L.

104. **CHONDRILLA L.**

Biennial or perennial herbs with branched stems. Leaves mostly basal, cauline ones linear or absent. Heads terminal or axillary, sessile or pedunculate; involucre cylindrical, involucral bracts in 2–3 series; receptacle scales absent; florets all with rays; anther bases sagittate; style branches slender. Achenes beaked, beak deciduous; pappus of 1 row of white scabrous hairs or bristles.

About 25 species from Europe to central Asia; 1 species naturalized Australia, occurring in south-eastern Queensland.

1. \**Chondrilla juncea* L.

## SKELETON WEED

Erect biennial or perennial with taproot and wiry branches up to 1.2 m tall, glabrous except at base of stem and sometimes at axils of branches. Lower leaves in rosette, petioles up to ca 5 cm long, blades runcinate-pinnatifid, apex acute or obtuse, margin entire or toothed, 5–8 cm × 1–3 cm; upper leaves linear, entire, up to ca 9 cm × 0.3 cm. Heads axillary, subsessile, solitary or few together; involucre cylindrical, 0.9–1.3 cm long, inner involucral bracts ca 8, linear, outer ones much shorter; florets 9–15, yellow, exceeding involucre. Achenes 3.5–4 mm long, 5-ribbed, scaly mucronate towards tip, upper scales elongated into minute 4–5-toothed crown, beak slender, 3–5 mm long; pappus 4–5 mm long.

Native of southern Europe and central Asia; naturalized in the Moreton, Burnett and Wide Bay districts, a weed of orchards and cultivated areas. Flowers summer. It is a declared noxious weed under the Stock Routes and Rural Lands Protection Acts, 1944–1967.

105. **LACTUCA L.**

Annual or perennial herbs. Leaves radical or alternate. Heads in panicles or corymbs, sometimes solitary; involucre narrowly cylindrical, involucral bracts in few series; receptacle scales absent; all florets with rays; anther bases sagittate; style branches long hairy. Achenes ± compressed, ribbed, with ascending marginal hairs; pappus multi-seriate.

About 100 species mainly temperate Eurasia and Africa; 3 species naturalized Australia; 2 species south-eastern Queensland.

- |   |                       |
|---|-----------------------|
| 1. Leaf margins ciliate-spinulose; stems ± spinulose in lower part      | 1. <i>L. serriola</i> |
| Leaf margins not ciliate-spinulose; stems never spinulose in lower part | 2. <i>L. saligna</i>  |

1. \**Lactuca serriola* L.

## PRICKLY LETTUCE

Annual or biennial herb up to ca 1.5 m tall; stems glabrous, usually ± spinulose in lower part. Leaves held vertically in one plane, sessile, obovate-oblong, usually pinnatifid, rarely entire, margin ciliate-spinulose, up to 10 cm × 5 cm, upper leaves smaller than lower. Heads in terminal panicles; involucre 0.7–1.2 cm long, becoming longer in fruit; rays yellow. Achenes grey, ca 3 mm long, beak ca 3 mm long; pappus ca 5 mm long. **Fig. 84C.**

Native of temperate Europe, Asia and northern Africa; naturalized in the Moreton and Burnett districts, usually as a weed of disturbed sites. Flowers spring–summer. Young plants have been suspected of poisoning hungry stock.

2. \**Lactuca saligna* L.

## WILD LETTUCE; WILLOW LETTUCE

Annual or biennial herb up to ca 60 cm tall. Lower leaves pinnatisect with few lobes, up to 20 cm × 5 cm; upper leaves entire or remotely sinuate-dentate, apex acuminate, base auriculate, smaller than lower leaves. Heads in terminal spikes or racemes; involucre 0.6–1.2 cm long. Achenes dark, ca 3 mm long, beak ca 3–5 mm long; pappus ca 3–4 mm long.

Native of Europe, western Asia and the Mediterranean region; naturalized in the Moreton, Darling Downs and Burnett districts and probably also to be found in the Wide Bay district, usually a weed of cultivation or grasslands. Flowers summer.



Fig. 84 ASTERACEAE — A<sub>1</sub>–A<sub>3</sub> *Leontodon saxatilis*, A<sub>1</sub> portion of leaf showing forked hairs x6, A<sub>2</sub> outer achene x6, A<sub>3</sub> inner achene x6; B<sub>1</sub>–B<sub>2</sub> *Taraxacum officinale*, B<sub>1</sub> portion of flowering plant x1, B<sub>2</sub> achene with pappus x8; C<sub>1</sub>–C<sub>3</sub> *Lactuca serriola*, C<sub>1</sub> portion of inflorescence x1, C<sub>2</sub> leaf and portion of lower stem x1, C<sub>3</sub> achene with pappus x1; D–F *Sonchus* spp., achenes with pappus all x6 — D *S. megalocarpus*; E *S. asper*; F *S. oleraceus*; G *Tragopogon porrifolius*, achene with pappus x1.

106. **SONCHUS L.**

Annual or perennial herbs. Leaves basal or alternate cauline, entire or variously dissected. Heads in irregular corymbose panicles, sometimes subumbellate, rarely solitary; involucre ovoid or campanulate, involucre bracts in many rows; receptacle scales absent; florets all with rays; anther bases sagittate; style branches medium to long. Achenes mostly compressed, ribbed, often winged; pappus of fine hairs intermixed with bristles.

About 50 species from Europe, Africa, Asia to Australia and New Zealand; 3–5 species Australia; 3 species south-eastern Queensland.

- |   |                           |   |
|---|---------------------------|---|
| 1. Achenes 4.3–8 mm long; plants confined to coastal sand dunes . . . . .   | 1. <i>S. megalocarpus</i> |   |
| Achenes 2.8–3.1 mm long; plants not confined to coastal sand dunes . . . . .                                      |                           | 2 |
| 2. Mature achenes with flat marginal wings, longitudinally ribbed but not transversely wrinkled . . . . .         | 2. <i>S. asper</i>        |   |
| Mature achenes with thick marginal ribs, not wing-like, longitudinally ribbed and transversely wrinkled . . . . . | 3. <i>S. oleraceus</i>    |   |

**1. *Sonchus megalocarpus* (J. D. Hook.) J. M. Black**

*Sonchus asper* (L.) Hill var. *megalocarpus* J. D. Hook.; *Embergeria megalocarpus* (J. D. Hook.) Boulos; *Actites megalocarpa* (J. D. Hook.) N. Lander; *Sonchus maritimus* auct. non L., F. M. Bailey

Erect fleshy herb up to ca 30 cm tall; stems somewhat woody at base. Leaves radical and cauline, radical leaves with petioles up to ca 3 cm long, cauline leaves sessile and cordate; blades narrowly spatulate or narrowly ovate, deeply pinnatisect or lobed or entire, apex acute or obtuse, margin sinuate, irregularly prickly-dentate, 1.5–17 cm × 0.5–4.5 cm, glabrous. Peduncles up to ca 21 cm long, heads up to ca 3 cm diameter when opened; involucre bracts 0.4–2.7 cm × 0.1–0.5 cm; florets yellow, 1–2 cm long, rays 5.5–10 mm long. Achenes 4.3–8 mm long, glabrous; pappus persistent, 0.65–1.4 cm long. **Fig. 84D.**

Coastal sand dunes and cliffs of the Moreton and Wide Bay districts. Flowers spring to autumn.

**2. \**Sonchus asper* (L.) Hill**

**ROUGH SOWTHISTLE; PRICKLY SOWTHISTLE**

*Sonchus oleraceus* L. var. *asper* L.; *S. hydrophilus* Boulos

Annual herb up to 1 m tall. Leaves stiff, blades pinnatifid or undivided, apex acute-acuminate, basal auricles rounded, ± appressed to stem, margin coarsely toothed, up to 25 cm × 10 cm, becoming smaller upwards. Heads up to 2 cm diameter when open; involucre bracts up to 1.2 cm long; florets yellow. Achenes flattened, ca 3 mm long, longitudinally ribbed, faces never transversely wrinkled, glabrous, with flat marginal wings when mature; pappus 6–7 mm long. **Fig. 84E.**

Native of Europe and northern Africa; naturalized and widespread in southern parts of the region and possibly elsewhere in the region but the species is poorly collected. Flowers most of the year.

L. Boulos, *Bot. Not.* 126 (1973) recorded *Sonchus hydrophilus* Boulos from the region. However there is some doubt as to the status of the taxon and pending further research it is best considered a form of *Sonchus asper*.

**3. *Sonchus oleraceus* L.**

**COMMON SOWTHISTLE**

Annual herb up to ca 1 m tall, ± glaucous. Leaves soft, blades runcinate-pinnatifid, apex acuminate, base of lower leaves narrow and petiole-like but dilated and stem clasping at very base, upper leaves without petiole-like section, basal auricles acute, spreading, margin coarsely toothed, up to 20 cm × 10 cm, reducing upwards. Heads up to 2 cm diameter when open; involucre bracts up to 1.2 cm long; florets yellow. Achenes flattened, ca 3 mm long, longitudinally ribbed, faces transversely wrinkled, marginal ribs thick, not winged; pappus 6–7 mm long. **Fig. 84F.**

Native of Europe and northern Africa; naturalized and widespread in the region, usually as a weed of disturbed ground. Flowers most of the year. Young leaves can be cooked and eaten as a green vegetable.

**107. TRAGOPOGON L.**

Biennial or perennial herbs. Leaves alternate, grass-like, stem clasping. Heads terminal; involucre cylindrical or narrowly campanulate, involucre bracts in 1 row; receptacle scales absent; all florets with rays; anthers sagittate at base; style branches slender. Achenes fusiform, narrowed into long beak; pappus of plumose bristles and few non plumose bristles.

About 45 species from Europe and western Asia; 1–2 species naturalized Australia; 1 species south-eastern Queensland.

**1. \**Tragopogon porrifolius* L.****SALSIFY**

Glabrous biennial up to *ca* 1 m tall with long taproot, latex present. Leaves basal and cauline, linear, apex subulate, up to 30 cm × 1.5 cm, reducing upwards. Peduncles hollow, swollen towards top, up to *ca* 20 cm long; heads 2–3 cm across in flower, up to 12 cm across in fruit; involucre bracts 5–12, but mostly 8, 2–3 cm long in flower, up to 5.5 cm long in fruit; rays purple-violet. Achenes 1–1.2 cm long, strongly muricate on ribs, beak 1.2–1.5 cm long; pappus 1.5–2.5 cm long. **Fig. 84G.**

Native of southern Europe; naturalized, widespread but not common on heavy black soils of the Darling Downs district, occasional in the Moreton district. Flowers spring. The roots are edible.



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