

THE  
QUEENSLAND FLORA:

BY  
F. MANSON BAILEY, F.L.S.,

SOLO JARDINIERE OF QUEENSLAND.

WITH PLATES ILLUSTRATING SOME RARE SPECIES.

PART V.

*LORANTHACEÆ TO LEMNACEÆ*

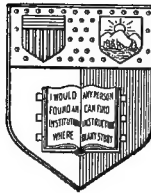


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QUEENSLAND  
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# THE QUEENSLAND FLORA.

## CLASS I. DICOTYLEDONS.

### SUBCLASS III. MONOCHLAMYDEÆ.

**SERIES VI. ACHLAMYDOSPOREÆ.**—Ovary 1-celled, 1 to 3 ovulate. Ovules without apparent coats. Seeds adnate to the walls of the pericarp.

**CXIV. LORANTHACEÆ.** Parasitical shrubs or trees. Leaves opposite or alternate, without stipules. Stamens opposite the corolla-lobes or petals or on them. Ovary inferior, 1-celled, with 1 erect ovule, not perceptible till the flowering is over. Seeds adherent to the pericarp.

**CXV. SANTALACEÆ.** Flowers usually hermaphrodite, often minute. Perianth-lobes valvate. Stamens opposite the lobes. Ovary with few pendulous ovules rarely conspicuous till after fecundation. Drupe indehiscent. Shrubs, herbs or rarely trees.

**CXVI. BALANOPHOREÆ.** Fleshy scapigerous leafless root-parasites. Flowers unisexual, small in dense terminal heads or spikes. Perianth-lobes valvate. Stamens 3. Ovary 1 or 2-celled, with 1 pendulous ovule in each cell.

**SERIES VII. UNISEXUALES.**—Flowers unisexual, very rarely polygamous. Ovary of 1 carpel or syncarpous, cells 1 or 2 ovulate; ovules if 2 collateral; styles as many as carpels.

**CXVII. EUPHORBACEÆ.** Perianth inferior, rarely none in one or both sexes, single or rarely of calyx and petals. Disk often present. Stamens 1, few or many. Ovary 1, 2 or 3-celled, cells 1 to 2-ovulate; ovules pendulous. Fruit of 2 to 3 loculicidal cocci, or a drupe or berry; cotyledons flat or folded, albumen fleshy, very rarely none. Herbs, shrubs or trees.

**CXVIII. BALANOPSEÆ.** Inflorescence, male amentaceous. Perianth none or represented by minute scales. Stamens from 2 to numerous; anthers subsessile. Ovary imperfectly 2-celled; ovules 2 in each cell, erect, anotropous. Seeds albuminous, radicle inferior.

**CXIX. URTICACEÆ.** Flowers unisexual. Perianth inferior, lobed or partite. Stamens as many as and opposite the perianth divisions or fewer, filaments erect or incurved in the bud. Ovary 1 celled, 1-ovulate; style simple or bifid, or stigma sessile, plumose. Fruit a samara, drupe, or achene, or a syncarp of confluent pericarps and perianths. Seed erect or pendulous, albumen scanty or none. Herbs, shrubs or trees, sometimes with a milky sap.

**CXX. CASUARINEÆ.** Male inflorescence spicate. Perianth segments 1 to 2, minute. Stamen 1. Female in cones. Ovary 1-celled, 2-ovulate. Seed 1. Albumen none. Radicle superior. Branches jointed, leafless except a whorl of teeth at the joints.

**CXXI. CUPULIFEREÆ.** Male inflorescence often amentaceous. Perianth small or none. Stamens various. Ovary 1 to 6-celled, with 1 or 2 ovules in each cell. Nuts seated on or enclosed in an involucre. Albumen none. Radicle superior. Leaves simple.

**SERIES VIII. Order of doubtful affinity.**

**CXXII. CERATOPHYLLEÆ.** Flowers monœcious axillary. Perianth submembranous, many-partite. Stamens numerous. Ovary 1-celled, 1-ovulate. Nuts often 2 to 4 spined. Albumen none. Radicle superior, short; plumule many-leaved. Submerged freshwater herbs; stem very slender, much-branched, fragile. Leaves whorled, cleft into filiform toothed segments.

## CLASS II. GYMNASPERMS.

Flowers strictly unisexual, without perianths. Anther-cells 2 or more sessile on the scale-like connectives or scales of a catkin or cone. Ovules in the axils or upon the scales of a cone or a fleshy cup or receptacle without any ovary. Cotyledons 2, or sometimes 3 or many.

CXXIII. CONIFERÆ. Branching trees or shrubs, with needle-like or rigid entire leaves or scales. Stamens in catkins with scale-like connectives, bearing 2 or few anther-cells.

CXXIV. CYCADACEÆ. Trunks woody, usually simple, with a palm-like crown of large pinnate leaves. Anther-cells numerous on the concealed under side of the scales of a large cone.

## CLASS III. MONOCOTYLEDONS.

Stem not distinguishable into pith, wood and bark, but when perennial, consisting of bundles of fibres irregularly imbedded in cellular tissue, with a firmly adherent rind outside. Seeds with one cotyledon, the embryo undivided, the young stems developed from a sheath-like cavity on one side. Leaves radical or alternate and parallel veined or rarely pinnate and crowning the undivided stem. Parts of the flower most frequently in threes, or in a few orders the perianth wanting, or the parts reduced in number when irregular; or in twos or fours in *Naiadaceæ*.

SERIES I. MICROSPERMÆ.—Flowers uni- or bisexual. Perianth superior, segments usually biseriate, inner or both series corolline. Ovary 1-celled, placenta parietal, rarely 3-celled, placenta axile. Seeds many-minute.

CXXV. HYDROCHARIDEE. Flowers mostly unisexual, enclosed in spathes. Sepals 3. Petals 3 or none. Stamens 3, 6, 9 rarely numerous, or fewer by abortion; anthers erect. Ovary 1 or sub-3 celled. Styles or stigmas 3 to 12. Fruit fleshy or membranous. Aquatic (fresh or salt-water) plants with undivided leaves.

CXXVI. BURMANNIACEÆ. Flowers bisexual. Perianth subsistent, lobes or segments biseriate, short, valvate. Stamens 3 or 6; anthers sessile on the perianth-tube. Ovary 3-celled with axile, or 1-celled with parietal placentas. Capsule loculicidal. Herbs with radical leaves rarely reduced to scales. Flowers in forked cymes sometimes reduced to a single flower.

CXXVII. ORCHIDEE. Flowers irregular (except *Apostasia*), bisexual. Perianth 6-partite; segments biseriate, inner or both corolline. Stamen 1, confluent with the style in a column (2 in *Apostasia*), anthers 2-celled; pollen grains cohering in waxy or powdery masses. Ovary 1-celled with 3 parietal placentas (3-celled in *Apostasia*), usually twisted. Capsules loculicidal. Seeds minute, with a homogeneous embryo. Herbs or shrubs often epiphytic. Inflorescence centripetal.

SERIES II. EPIGYNEÆ.—Flowers bisexual (except *Dioscoreaceæ*). Perianth superior (except *Ophiopogon*), biseriate, one or both series corolline. Ovary 1 to 3-celled. Albumen copious.

CXXVIII. SCITAMINEÆ. Flowers irregular, uni- or bisexual. Perianth biseriate, inner or both series petaloid, limb spreading (inner of 1 short petal in *Musa*). Stamen 1 antheriferous (5 in *Musa*). Ovary 1 to 3-celled; style long, stigma with a usually ciliate mouth.

CXXIX. HÆMODORACEÆ. Perianth superior ( $\frac{3}{4}$  inferior in *Ophiopogon*), petaloid; limb 6-lobed or partite in 2 series. Stamens 6, opposite perianth-lobes; anthers erect or versatile. Ovary 3-celled, cells 1 to 2 ovulate; style columnar, stigma simple or 3-toothed. Fruit bursting irregularly before the seeds ripen. Perennial herbs. Leaves radical, narrow; flowers in spikes or panicles.

CXXX. IRIDEE. Flowers regular or nearly so. Perianth corolline. Stamens 3 opposite the outer lobes. Ovary inferior, usually 3-celled, cells many ovulate. Embryo small in horny albumen. Inflorescence centrifugal. Leaves laterally flattened or terete.

CXXXI. AMARYLLIDEE. Flowers regular or slightly irregular. Perianth corolline. Stamens 6, filaments distinct or connate; anthers erect or versatile. Ovary 3-celled, cells many ovulate; style short or long, stigma 3-lobed or partite. Capsules loculicidal or bursting irregularly. Embryo small in fleshy albumen. Rootstock bulbous or tuberous; leaves linear or lanceolate.

CXXXII. TACCACEÆ. Perianth superior; subglobose, 6-lobed in 2 series, mouth contracted. Stamens 6, on the base of the lobes; filaments very short, hooded, anthers sessile in the hood, 2-celled. Ovary 1-celled; placentas 3, parietal, many ovulate. Styles 3, very short, stigmas broad reflexed. Fruit a many seeded berry. Scapigerous herb; rootstock tuberous. Leaves radical, limb 3-partite, segments pinnatifid. Flowers umbellate, with broad outer bracts, and very long filiform pendulous inner ones.

CXXXIII. DIOSCOREACEÆ. Flowers small, unisexual, regular. Perianth superior; limb rotate, 6-cleft in 2 series. Male flowers: Stamens 3 or 6, on the base of the segments, surrounding a pistillode; anthers oblong or globose. Female flowers: Staminodes 3 or 6; ovary 3-gonous, 3-celled; cells 2-ovulate; stigmas 3, entire or bifid. Fruit a coriaceous, 3-winged, loculicidal capsule, dehiscing through the wings, with flat broadly-winged seeds. Stems usually twining. Leaves alternate, veinlets reticulate.

SERIES III. CORONARIÆ.—Flowers bi- rarely unisexual. Perianth inferior, 4 or 6 partite in 2 series, one or both series corolline. Ovary superior, 1 to 3-celled. Albumen copious.

CXXXIV. ROXBURGHACEÆ. Perianth 4-partite in 2 series, segments elongate, lanecolate. Stamens 4, on the bases of the segments; anthers linear, erect, connective appendaged. Ovary ovoid, 1-celled; ovules few, basal. Fruit coriaceous, 2-valved. Seeds few beaked, funicle fleshy, lacerate; albumen hard, fleshy; embryo small. A slender twining perennial; rootstock tuberous. Leaves alternate or whorled; flowers few, axillary, large.

CXXXV. LILIACEÆ. Flowers bi- rarely unisexual. Perianth petaloid, 6-merous, lobes or segments free or connate below. Stamens 6, on the perianth-tube or lobes, rarely hypogynous, filaments distinct or connate. Ovary 3-celled, cells 2 or more ovulate. Fruit a 3-celled berry or capsule. Seeds globose or flattened. Albumen horny or fleshy; embryo terete. Terrestrial herbs or climbers or arborescent.

CXXXVI. PONTEDERIACEÆ. Flowers bisexual, irregular. Sepals 3. Petals large, corolline, obovate, marcescent. Stamens 6 on the bases of the segments; one longest, with the filament laterally toothed. Ovary 3-celled; cells many ovulate; style slender. Capsule membranous, loculicidally 3-valved. Seeds small. Albumen floury. Embryo cylindric. Fresh-water, erect, creeping or floating herbs. Leaves with often tumid spongy petioles. Scape erect from the sheaths of the leaves; flowers spicate or racemose, blue.

CXXXVII. PHLYDRACEÆ. Flowers bisexual. Inner perianth of 2 broad petals, outer deficient. Stamen 1 perfect, 2 staminodia. Ovary 3-celled or with 3 parietal placentas. Fruit a capsule, loculicidally 3-valved.

CXXXVIII. XYRIDÆ. Flowers sessile in the rigid bracts of a terminal head or spike, bisexual. Bracteoles (sepals?) 3, deciduous, embracing claws of petals, 2 lateral, 1 broader dorsal. Petals 3, clawed-yellow or white. Stamens 3. Anthers sagittate, staminodia 3, sometimes absent. Ovary imperfectly 3-celled; placentas 3, many ovulate; style 3-fid. Capsule loculicidally 3-valved, or with the top circumsceiss. Seeds linear or oblong. Albumen floury. Embryo minute.

CXXXIX. COMMELYNACEÆ. Flowers regular or not. Perianth marcescent, 6 partite in 2 series, sepals 3, petals 3, clawed; claws distinct or connate. Stamens 6, on the bases of the segments, perfect or 2 to 4 of them staminodia with often bearded filaments. Ovary 3-celled, cells 1 or few ovulate. Style often bearded and enlarged below the tip. Capsule loculicidal (indehiscent in *Polia*); albumen floury; embryo minute.

SERIES IV. CALYCIÆ.—Perianth inferior, rigid or herbaceous, lobes or segments biseriata, inner series rarely sub-corolline. Ovary superior 1 to 3-celled; albumen copious.

CXL. FRAGELLARIACEÆ. Flowers small, uni- or bisexual. Perianth rotund, 6-partite, segments subequal. Stamens 6, hypogynous or on the bases of the segments; filaments filiform, anthers erect. Ovary 3-celled; cells 1-ovulate, style short, 3-cleft or stigmas sessile. Fruit small, globose, indehiscent, 3-celled or with 1 to 2 pyrenes. Seeds various. Albumen floury. Embryo minute. Tall climber, leaves ending in a tendril.

CXLI. JUNCACEÆ. Perianth inferior, 6-partite in 2 series, persistent; segments narrow, thin or coriaceous. Stamens 3 or 6 on the bases of the segments; anthers erect, basifixed. Ovary 1 or 3-celled, many ovulate; stigmas 3. Capsule 1 to 3-celled, loculicidally 3-valved. Seeds many erect. Albumen hard; embryo small. Stems tufted, erect; leaves terete or compressed, sheathing or reduced to sheaths; flowers in axillary or terminal cymes, green or brown.

CXLII. PALMÆ. Flowers uni- or bisexual. Perianth inferior, 6-partite or lobed in 2 series, coriaceous, rarely herbaceous, inner series usually valvate. Stamens 3 or 6, rarely more, on the base of perianth; anthers versatile. Ovary 1 to 3-celled, or of 3 distinct or connate carpels, cells 1 to 2 ovulate. Fruit various, never capsular. Stems arborescent or climbing and woody. Young inflorescence enclosed in a spathe.

SERIES V. NUDIFLOREÆ.—Perianth none, or of scales or bristles. Ovary superior, 1-celled, or a syncarp. Seeds usually albuminous.

*Inflorescence enclosed in a (sometimes imperfect) spatha; trees, shrubs, or herbs.*

CXLIII. PANDANACEÆ. Flowers dioecious. Perianth none. Male flowers: Stamens many, fascicled or spicate on the spadix; filaments distinct or connate; anthers erect, basifixed; pistillode none or minute. Female flowers; staminodia minute or none; carpels sessile, distinct or connate in bundles. Ovules solitary, or many parietal, stigmas sessile or sub-sessile. Fruit an oblong or globose dry or fleshy syncarp. Stems arborescent with leaves in a spire, or climbing and leafy.

CXLIV. TYPHACEÆ. Perianth none. Flowers monœcious, crowded in unisexual dense catkin-like cylindric spikes, mixed with capillary hairs. Male flowers: Stamens solitary or fascicled, filaments capillary; anthers basifixed, erect, 2-celled. Female flowers: A capillary filament bearing a minute narrow 1-ovulate ovary narrowed into a capillary style with a linear stigma. Fruit a minute achene. Marsh plants with linear, erect biconvex leaves.

CXLV. AROIDEÆ. Flowers small or minute, unisexual, usually on bisexual spadix with the female flowers below, rarely bisexual. Perianth none or of scales. Male flowers: Anthers 2 to 4-celled, distinct or connate. Female flowers: Ovary sessile, 1 to 3-celled, cells 1 or more ovulate. Fruit a 1 or few-seeded berry. Seeds albuminous or in a few genera without albumen.

*Flowers solitary or binate, sunk in the sides or surface of small or minute floating lenticular or globose fronds.*

CXLVI. LEMNACEÆ. Small or minute, gregarious, floating, monœcious, scale-like plants. Flowers few, most minute, in fissures of the frond, naked or in a sheath. Perianth none. Male flowers: Stamens 1 or 2; anther 1 or 2-celled. Female flowers: Ovary 1-celled; style short, stigma truncate or infundibular, ovules 1 to 7 basal. Fruit a membranous utricle. Seeds ribbed. Albumen none; embryo cylindric.

### ORDER CXIV. LORANTHACEÆ.

Calyx-tube adnate to the ovary, the limb with as many lobes or teeth as petals, or forming an entire border, or none. Petals (or segments of the perianth when the calyx is inconspicuous) 4 to 6 or rarely more, free or united in the lobed corolla, inserted round an epigynous disk, valvate in the bud, rarely wanting. Stamens as many as petals, opposite to and usually inserted on them. Ovary inferior, 1-celled, with 1 erect ovule, usually not perceptible till the flowering is past, and adnate to the wall of the cell so as to have been described as pendulous; style or stigma simple. Fruit an indehiscent berry or drupe, with a single seed. Albumen fleshy. Embryo straight, with a superior radicle.—Shrubs usually much branched, parasitical on the branches of trees and shrubs, sometimes so near their roots as to appear terrestrial, very rarely (only in two Australian species) really terrestrial shrubs or trees. Leaves opposite or rarely alternate, usually thick and leathery or sometimes fleshy, sometimes reduced to minute scales or none. Bracts usually one under each flower or pedicel, with 2 bracteoles close under the flower, concave or united in a little cup, having the appearance of an external calyx, or the bracteoles or very rarely the bracts also wanting.

A considerable Order, chiefly abundant within or near the tropics both in the New and the Old World, with a very few species from more temperate regions in the northern as well as in the southern hemisphere.

TRIBE I. **Euloranthææ**.—Flowers hermaphrodite or dioecious by abortion. Perianth double; calyx-tube adnate; limb a more or less distinct ring or short cup.

Parasitical shrubs. Flowers elongate hermaphrodite. Fruit succulent. Seeds not furrowed . . . . . 1. LORANTHUS.

TRIBE II. **Viscææ**.—Flowers all unisexual. Perianth simple, without any conspicuous calyx margin.

- Anthers sessile on the perianth-segments, opening inwards in several pores. Plants glabrous, leafless or leafy . . . . . 2. VISCUM.
- Anthers at the bases of the perianth segments, opening transversely. Plants leafy, hoary or tomentose . . . . . 3. NOTOTHIXOS.

1. LORANTHUS, Linn.

(Referring to the long linear form of segment of perianth.)

Calyx-limb short, truncate or toothed. Petals 4 to 8, free or more or less united in a tubular corolla, spreading at the ends. Stamens inserted on the bases of the petals; filaments distinct; anthers adnate or versatile, with parallel cells opening longitudinally. Style filiform, with a terminal stigma. Fruit a berry, usually crowned by the limb of the calyx.—Parasitical shrubs. Leaves opposite or rarely alternate. Flowers hermaphrodite, axillary or terminal, in racemes or cymes or solitary, long and brightly coloured, or green at least at the tips. Bracts in all the Australian species solitary, small and concave, close under each flower, without the 2 bracteoles which are in many extra-Australian species.

A very large genus, almost wholly tropical or subtropical, in America, Africa, and Asia, with one species as far north as the south of Europe. Of the following species, one is common in Asia, another extends into Timor and perhaps over several of the islands of the Indian Archipelago; the others, as far as hitherto ascertained, are endemic.

Several of the Australian species, besides the Asiatic *L. longiflorus*, appear to have two forms of leaves, so different in aspect that it is difficult to fancy that the two belong to one species; the one sessile, broad and deeply cordate, the other petiolate, narrow, and contracted at the base. Many also, probably, vary in the colours of the flower more or less red or yellow-orange, with or without green tips or the green extending to below the middle.

Anthers versatile, oblong. Petals free. Leaves opposite. Inflorescence mostly terminal.

Leaves petiolate, thick, from short and obovate to long lanceolate and falcate. Cymes several-flowered

1. *L. celastroides*.

Leaves small, sessile or nearly so. Peduncles slender, 2-flowered.

Leaves linear, narrowed at the base

2. *L. Didwillii*.

Leaves ovate, rounded at the base

3. *L. myrtifolius*.

Anthers adnate, linear. Petals united to the middle or higher up.

Leaves alternate or opposite. Inflorescence axillary.

Flowers several, in racemes

4. *L. longiflorus*.

Flowers several, in cymes.

Flowers and inflorescence glabrous. Calyx-limb truncate, much shorter than the adnate tube.

Leaves obovate to oblong.

Cymes rather loose, shortly pedunculate

5. *L. dictyophlebus*.

Cymes reduced to a sessile cluster

6. *L. alyxifolius*.

Flowers and inflorescence hoary-tomentose. Calyx-limb 5-toothed, nearly as long as the adnate tube. Cymes sessile, few-flowered

7. *L. odontocalyx*.

Flowers solitary or in pairs.

Leaves mostly opposite, coriaceous.

Leaves terete, slender

8. *L. linearifolius*.

Leaves flat, from narrow-linear to oblong-cuneate

9. *L. Exocarpi*.

Anthers adnate, linear. Petals free. Leaves mostly opposite.

Flowers in clusters of 3, the clusters in axillary racemes

10. *L. signatus*.

Flowers in axillary cymes (or umbels), the common peduncle with 2 to 5 diverging or divaricate umbellate branches.

Branches of the peduncle (usually 3 or 4) bearing each a single flower

11. *L. sanguineus*.

Peduncle twice forked with 1 flower to each branch

12. *L. bifurcatus*.

Branches of the peduncle usually 3 or 4, each bearing 3 flowers.

Leaves terete

13. *L. ünophyllus*.

Leaves flat.

Lateral flowers of the 3, or all three, pedicellate. Plant glabrous

14. *L. pendulus*.

Flowers all 3 closely sessile. Plant more or less hoary-tomentose, at least the calyx

15. *L. Quandang*.

Flowers sessile on the dilated apex of the peduncle, between 2 large bracts or floral leaves

16. *L. grandibracteus*.

1. **L. celastroides** (Celastrus-like), *Sieb. in Roem. and Schult. Syst.* vii. 163; *Benth. Fl. Austr.* iii. 389. Glabrous. Leaves opposite, from obovate or ovate, 1 to 2in. long to cuneate-oblong lanceolate or almost linear, and 4in. long or more, and when narrow often falcate, obtuse or very rarely almost acute, narrowed into a petiole. Flowers in loose terminal trichotomous cymes, shortly pedunculate and always shorter than the last leaves, sometimes appearing axillary

from the shortness of the flowering branch. Calyx-border scarcely prominent, obscurely sinuate-toothed. Petals 5 or 6, free, about  $1\frac{1}{2}$  in. long. Anthers versatile, oblong.—DC. Prod. iv. 318; A. Gray, Bot. Amer. Expl. Exped. i. 740, t. 100; F. v. M. Rep. Burdek. Exped. 13; *L. eucalyptifolius*, Sieb. in Roem. and Schult. Syst. vii. 163, not of H. B. and K.; *L. eucalyptoides*, DC. Prod. iv. 318; A. Gray, Bot. Amer. Expl. Exped. i. 741; F. v. M. Pl. Vict. t. 80.

Hab.: Brisbane River, Moreton Bay, and other southern localities.

2. ***L. Bidwillii*** (after J. C. Bidwill), *Benth. Fl. Austr.* iii. 390. Glabrous, with slender branches. Leaves opposite, narrow-linear, obtuse, shortly contracted at the base, but scarcely petiolate, rarely exceeding 1 in. Peduncles terminal or apparently axillary from the shortness of the flowering branch, short but filiform, with 2 filiform 1-flowered branches not exceeding the last leaves. Calyx-border scarcely prominent, obscurely-toothed. Petals 5, free, very narrow, nearly 1 in. long. Anthers versatile.

Hab.: Wide Bay, *Bidwill*.

3. ***L. myrtifolius*** (Myrtle-leaved), *A. Cunn. Herb.*; *Benth. Fl. Austr.* iii. 390. Glabrous, with slender branches. Leaves opposite, some quite, others almost sessile, ovate, obtuse, rounded or almost cordate at the base, not thick,  $\frac{1}{2}$  to 1 in. long. Peduncles purple, terminal or apparently axillary from the shortness of the flowering-branch, filiform, with 2 filiform 1-flowered branches, scarcely exceeding the leaves. Flowers  $1\frac{1}{2}$  in. long. Calyx-border scarcely prominent, obscurely-toothed. Petals 5, free, very narrow, above 1 in. long. Anthers versatile, pale-yellow bordered with purple on filaments of a deep purple, very slender at the top.

Hab.: Logan, *A. Cunningham*; Killarney, *Jos. Wedd.*

4. ***L. longiflorus*** (flowers long), *Desr. in Lam. Dict.* iv. 598; *Benth. Fl. Austr.* iii. 390. Glabrous or the inflorescence slightly tomentose. Leaves alternate, in the ordinary form petiolate, from broadly ovate or ovate-lanceolate to narrow-lanceolate, obtuse, narrowed at the base, mostly 2 to 4 in. long, thick, obscurely veined. Flowers large, in short dense axillary racemes, rarely reduced to 2 or 3 flowers, all distinctly and singly pedicellate. Calyx limb-prominent, truncate, often oblique and sometimes obscurely toothed. Petals 5,  $1\frac{1}{4}$  to  $1\frac{1}{2}$  in, long, united to about two-thirds of their length into a slightly swollen tube, occasionally splitting as the corolla fades, the upper portion of the petals reflexed at the time of flowering. Anthers narrow-linear, adnate.—DC. Prod. iv. 304; W. and Arn. Prod. 334; Wight, Ic. t. 302; *L. indicus*, *Desr. in Lam. Dict.* iv. 601, not of DC.; *L. vitellinus*, F. v. M. Rep. Burdek. Exped. 12.

Hab.: Islands of the Gulf of Carpentaria, Shoalwater Passage, *R. Brown*; Port Curtis, *M'Gillivray*; Burdekin and Gilbert Rivers, *F. v. Mueller*; Port Denison, *Burdekin Expedition*; Edgecombe Bay, *Dallachy*; Gloucester Island, *Henne*; Brisbane River, Moreton Bay, *A. Cunningham*, *F. v. Mueller* and others; in the interior, *Mitchell*.

5. ***L. dictyophlebus*** (veins of leaves netted), *F. v. M. Rep. Burdek. Exped.* 14; *Benth. Fl. Austr.* iii. 391. "Durandool," Barron River, *F. Cowley*. Glabrous. Leaves mostly opposite, from broadly obovate or orbicular to oblong-elliptical, obtuse, narrowed into a distinct petiole, sometimes all under 3 in. long, broad and thick, with the veins scarcely conspicuous, sometimes 4 to 5 in. long, smooth and shining, with the reticulate veinlets as well as the primary veins prominent. Peduncles short, axillary, each with 3 or 4 short 8-flowered branches. Calyx-tube or ovary very narrow; limb small, the teeth scarcely conspicuous. Corolla  $1\frac{1}{2}$  in. long, slender, the petals united to about  $\frac{3}{4}$  their length into a slightly dilated tube, often splitting when old. Anthers narrow-linear, adnate.

Hab.: Rockhampton, *Dallachy*; Brisbane River, Moreton Bay, *A. Cunningham*; to Cairns.



F.C. Wills, Del. at Lith.

*Loranthus Bidwilli*, Benth.

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F.C. Wills, Del. et Lith.

*Loranthus myrtifolius*, A. Cronq.



6. **L. alyxifolius** (Alyxia-like), *F. v. M. Herb.*; *Benth. Fl. Austr.* iii. 391. Glabrous, or the inflorescence minutely rusty-tomentose. Leaves opposite, from broadly obovate to obovate-oblong, very obtuse, tapering into a very short petiole, mostly from 2 to 3in. long, thick and obscurely veined. Flowers long and slender, almost sessile, in dense axillary cymes or clusters. Calyx-border short, obscurely sinuate-toothed. Petals  $1\frac{1}{2}$ in. long, united to at least  $\frac{2}{3}$  of their length in a scarcely dilated tube, often split on the upper side. Anthers adnate, narrow-linear.—*L. maytenifolius*, *F. v. M. Rep. Burdek. Exped. 14*, not of A. Gray.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller, W. Hill.*

7. **L. odontocalyx** (calyx toothed), *F. v. M. Herb.*; *Benth. Fl. Austr.* iii. 391. Glabrous, except the inflorescence, or slightly hoary-tomentose. Leaves mostly alternate, oblong, cuneate-oblong or lanceolate, obtuse, narrowed into a short petiole, under 3in. long, thick and scarcely veined. Cymes axillary, sessile or very shortly pedunculate, usually 3 to 7-flowered, the short branches and pedicels hoary-tomentose as well as the buds. Calyx tomentose, the limb more prominent than in the allied species, nearly as long as the adnate tube, 5-toothed. Petals 5, not quite 1in. long, united to above the middle. Anthers adnate, linear. Young fruits crowned by a long neck formed by the calyx-limb.

Hab.: A very imperfect specimen with broader leaves, from Howick's Group, *F. v. Mueller*, appears to belong to this species.—*Benth.*

8. **L. linearifolius** (leaves linear), *Hook. in Mitch. Trop. Austr.* 102; *Benth. Fl. Austr.* iii. 391. Glabrous. Leaves mostly opposite, terete, slender, sometimes almost filiform, acute or obtuse, usually 2 to 3in. but sometimes above 4in. long. Flowers axillary, pedicellate in pairs, the pedicels sessile or borne on a common peduncle of 1 to 2 lines. Calyx-border obscurely toothed. Petals usually 6, about 1in. long, united to about the middle in a slightly dilated tube, often split on the upper side. Anthers adnate, linear.

Hab.: Narran River, *Mitchell.*

9. **L. Exocarpi** (first found on *Exocarpus*), *Behr in Linnæa*, xx. 624; *Benth. Fl. Austr.* iii. 392. "Thappin," Cloncurry, *Palmer*. Glabrous. Leaves mostly opposite, but here and there alternate, from oblong-cuneate to narrow-linear, but always flat, obtuse, narrowed into a petiole, mostly  $1\frac{1}{2}$  to  $2\frac{1}{2}$ in. long, rather thick, often triplinerved. Flowers axillary, pedicellate, solitary or in pairs, the thick pedicels sessile or more rarely borne on a very short common peduncle. Calyx-border obscurely toothed. Petals usually 6, above 1in. long, united to about  $\frac{1}{3}$  of their length. Anthers adnate, linear.—*L. subfalcatus*, *Hook. in Mitch. Trop. Austr.* 224.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown, Henne*; Keppel Bay, *R. Brown*; Port Denison, *Fitzalan*; Mount Archer, *Dallachy*; Brisbane River, Moreton Bay, *F. v. Mueller, Fitzalan*; Flinders River, *Bowen*; Lakes Salvator, *Mitchell*; Cooper's Creek, *Howitt's Expedition.*

The tropical specimens have usually broader, more cuneate leaves, the southern ones frequently but not always very narrow linear leaves.—*Benth.*

Fruit eaten raw by aboriginals.—*Palmer, l.c.*

10. **L. signatus** (signate), *F. v. M. Herb.*; *Benth. Fl. Austr.* iii. 392. Glabrous. Leaves opposite or nearly so, in the ordinary form from obovate to oval-oblong or elliptical obtuse, narrowed into a short petiole, 2 to 4in. long, rather thick, but more or less prominently veined, but in some specimens all sessile, orbicular-cordate, with large rounded auricles, and in others mostly narrow-lanceolate and 4 or 5in. long. Flowers in clusters of 3, almost sessile along the rhachis of dense axillary 1-sided racemes of 1 to 2in., with 1 bract under each flower as in all the Australian species. Calyx-border obscurely

sinuate-toothed. Petals 5 or 6, free, narrow, about 1 in. long, not dilated at the end. Anthers adnate, linear, very narrow.—*L. indicus*, DC. Prod. iv. 305, not of Desr.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Gilbert River, *F. v. Mueller*; N.E. Coast, *A. Cunningham*, *R. Brown* (both with long narrow leaves).—*Benth.*

The variations in the leaf appear to be the same as in the case of *L. longiflorus* and *L. pendulus*, but not having seen the sessile cordate and the narrow petiolate leaves on the same specimen, I am unable to say whether they represent distinct varieties or different ages or parts of the same individual. The species is also in Timor, whence De Candolle had the specimen in which he thought he had identified Desrousseaux' *L. indicus*, above referred to *L. longiflorus*. Cuming's n. 1945, from the Philippine Islands, may also be the same, and if so, the species has a wide range in the Archipelago, but is not, I believe, in Continental India.—*Benth.*

11. ***L. sanguineus*** (blood-red), *F. v. M. Fragm.* i. 177, and *Rep. Burdek. Exped.* 13; *Benth. Fl. Austr.* iii. 393. Glabrous and more or less glaucous, usually pendulous. Leaves mostly opposite, oblong-linear to linear-lanceolate and falcate, obtuse, 3 to 6 in. long, thick, obscurely veined or veinless. Flowers axillary, the common peduncle bearing 3 or 4 umbellate divaricate branches, as in *L. pendulus*, but each with only 1 flower. Calyx-border very short, truncate. Petals 5 or 6, free, narrow, about 1½ in. long, the slightly dilated apex of the bud remarkably angular. Anthers adnate, linear. Stigma capitate, much larger than in the allied species.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

12. ***L. bifurcatus*** (twice forked), *Benth. Fl. Austr.* iii. 393. Glabrous and more or less glaucous. Leaves mostly opposite, linear-lanceolate, falcate, obtuse or almost acute, 4 to 8 in. long, thick, often 3-nerved. Flowers axillary, the common peduncle twice-forked, each branch bearing a single flower, without any in the forks. Calyx-border reduced to a scarcely conspicuous line. Petals 5 or 6, free, narrow, about 1 in. long, the buds dilated at the base to a diameter greater than that of the calyx-tube, and clavate, but not angular at the end. Stigma not large.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*. Allied to *L. sanguineus* and *L. pendulus*, differing from both chiefly in the ramification of the peduncle.—*Benth.*

13. ***L. linophyllus*** (leaves at times hoary or woolly), *Fenzl in Hueg. Enum.* 56; *Benth. Fl. Austr.* iii. 393. Quite glabrous or the young shoots inflorescence and flowers, or the inflorescence only, hoary-tomentose or almost woolly. Leaves opposite, terete and usually slender, like those of *L. linearifolius*, or sometimes thicker, but never flat, mostly 2 to 3 in. long, but sometimes above 4 or under 1½ in. Flowers in axillary or lateral cymes, the common peduncle very short, bearing an umbel of 3 or 4, rarely 2 rays; each with a partial cyme of 3 or rarely 5 flowers, as in *L. pendulus*. Calyx-border scarcely prominent, truncate. Buds slender, clavate at the end. Petals free, 9 to 10 lines long. Anthers adnate, oblong-linear.—Miq. in Pl. Preiss. i. 279; *J. Preissii*, Miq. l.c. 283, Behr in Linnæa, xx. 625; *L. Casuarina*, Miq. l.c. 279; *L. scoparius*, Miq. l.c. 280.

Hab.: On the Casuarinas along the banks of the Brisbane River, Moreton Bay, Warwick, and many other localities.

14. ***L. pendulus*** (hanging), *Sieb. in DC. Prod.* iv. 294, and *Mem. Lor.* t. 1; *Benth. Fl. Austr.* iii. 394. Glabrous. Leaves mostly opposite, from obovate-oblong-cuneate and about 2 in. long, to linear-lanceolate attaining sometimes 10 in. or even more, thick and usually 3 or 5-nerved, sometimes sessile, broad and cordate. Flowers in axillary cymes, the common peduncle short, bearing an umbel of 3 or 4 rarely 2 rays, each with a partial cyme of 3 rarely 5 flowers, the central one sessile, or rarely all pedicellate. Calyx-border





*Loranthus grandibracteus*, F. v. M.

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shortly cup-shaped, truncate. Buds slender, clavate at the tips. Petals free, 1 to  $1\frac{1}{2}$  in. long. Anthers adnate, from oblong-linear to narrow-linear.—*L. congener*, Sieb. in DC. Prod. iv, 295, and Mem. Lor. t. 2 (leaves short, central flowers sessile); *L. longifolius*, Hook. Ic. Pl. t. 880 (leaves very long, central flowers sessile); *L. aurantiacus*, A. Cunn.; Hook. in Mitch. Trop. Austr. 101 (flowers all pedicellate); *L. Miquelii*, Lehm. in Pl. Preiss. i. 280 (flowers all pedicellate).

Hab.: Gilbert River, *F. v. Mueller*; Wide Bay, *Bidwill*; Rockingham Bay and Rockhampton, *Dallachy*; Brisbane River, Moreton Bay, *F. v. Mueller* and others.

Vari. *parviflorus*. Leaves small and narrow; flowers small, often 4-merous, the central ones sessile.—*L. Melaleuca*, Lehm. in Pl. Preiss. i. 281, Miq. in Ned. Kruidk. Arch. iv. 107; *L. miraculosus*, Miq. in Pl. Preiss. i. 281, and in Ned. Kruidk. Arch. iv. 106.—New England, *C. Stuart*; (therefore probably on the border line between N.S.W. and Queensland).

15. **L. Quandang** (first found on Quandang), *Lindl. in Mitch. Thrice Exped.* ii. 69; *Benth. Fl. Austr.* iii. 395. Foliage and inflorescence more or less hoary-tomentose, or rarely glabrous except the calyx. Leaves opposite, from obovate or oblong-cuneate and 1 to 2 in. long to lanceolate and 3 or 4 in. long, thick, veinless or obscurely 3-nerved. Flowers in axillary cymes, the common peduncle bearing an umbel of 2 or 3 rarely 4 rays, each with 3 closely sessile flowers. Calyx-tube tomentose, more contracted under the limb than in *L. pendulus*; limb tomentose or very rarely glabrous. Flowers otherwise of *L. pendulus*; petals free, under 1 in. long. Anthers adnate, oblong-linear.—*L. nutans*, A. Cunn.; Hook. in Mitch. Trop. Austr. 158; *L. canus*, *F. v. M.* in Hook. Kew Journ. viii. 145, and in Trans. Vict. Inst. 1855, 128; Miq. in Ned. Kruidk. Arch. iv. 107.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*, *Henne*, *Bowman*; Keppel Bay, *R. Brown*; Suttor Desert, Islands of Howick's Group, and Moreton Bay, *F. v. Mueller*; Belyando River and Fitzroy Downs, *Mitchell*.

16. **L. grandibracteus** (leafy-bracts large), *F. v. M. Rep. Burck. Exped.* 14; *Benth. Fl. Austr.* iii. 395. Glabrous. Leaves opposite, from oblong-cuneate to linear-lanceolate, obtuse, narrowed into a petiole, 2 to 4 in. long or more when narrow, thick, veinless or obscurely 3-nerved. Peduncles at the forks of the branches, each about 1 in. long, very much flattened and dilated at the end into a truncate receptacle, bearing 4 to 6 closely sessile flowers between 2 broadly ovate or ovate-lanceolate obtuse floral leaves or leafy bracts, 1 to  $1\frac{1}{2}$  in. long, and obscurely several-nerved. Bracts under each flower minute or none. Calyx nearly 2 lines long, with a very short denticulate-ciliate limb. Petals free, nearly 1 in. long; anthers adnate, linear.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Burpengary, *Dr. Joseph Bancroft*; Diamantina, *Dr. T. L. Bancroft*; Sandy Cape, *R. Brown*; Suttor River, *Bowman*.

## 2. VISCUM, Linn.

(Referring to the sticky berries.)

Flowers unisexual. Calyx-border inconspicuous, or rarely forming a scarcely prominent line. Petals 3 to 5, very short, having the appearance of a simple perianth. Anthers sessile on the petals, short and broad, opening inwards in several pores in transverse rows. Stigma sessile. Fruit a one-seeded berry.—Parasitical glabrous shrubs. Branches opposite or dichotomous. Leaves opposite or none. Flowers very small, green or yellowish, monoecious and clustered at the nodes in all the Australian species, dicecious and in the forks of the branches in the common European one.

The genus is spread over Asia, Africa, and temperate Europe. The three Australian species are all Asiatic also. They are sometimes found growing upon species of *Loranthus*, as well as upon the trees that feed them.

Leaves opposite at the nodes. Petals deciduous . . . . . 1. *V. orientale*.  
 Leaves none.  
 Branches slender, angular, not flattened. Petals deciduous . . . . . 2. *V. angulatum*.  
 Branches flattened. Petals persistent . . . . . 3. *V. articulatum*.

1. **V. orientale** (eastern), *Willd.*; *DC. Prod.* iv. 278; *Benth. Fl. Austr.* iii. 396. Branches elongated, nearly terete, always leafy. Leaves opposite, narrow-oblong or lanceolate, and 1 to 1½ in. long, narrowed at the base, 3 or 5-nerved. Flowers minute, in 1 to 3 sessile or shortly pedicellate clusters in each axil, each cluster consisting of 3 or 5 flowers, the central one or rarely 3 females, each under 1 line long, the 2 lateral ones males and much smaller, all sessile in the clusters within 1 or 2 small bracts. Petals 4 or rarely 3, deciduous. Berry globular, 2 or rarely 3 lines diameter.

Hab.: Rockhampton, *Bowman*; a single small specimen in Herb. F. Mueller. Common in India and the Archipelago, extending westward almost to the Mediterranean.

2. **V. angulatum** (angular), *Heyne*; *W. and Arn. Prod.* iv. 380; *Benth. Fl. Austr.* iii. 396. Quite leafless. Branchlets opposite or dichotomous, articulate, rather slender, angular, not flattened, the older branches terete. Flowers minute, in sessile clusters of 3 to 6 at the nodes, the males and females in the same clusters, each one half-immersed in a cup-shaped 2-lobed bract. Petals usually 4, very deciduous. Berry small, globular.

Hab.: Gilbert River, *F. v. Mueller*; Edgecombe Bay, *Dallachy*; Port Denison, *W. Hill*; Brisbane River, Moreton Bay, *A. Cunningham*.

3. **V. articulatum** (articulated), *Burm.*; *DC. Prod.* iv. 284; *Benth. Fl. Austr.* iii. 396. Very much branched, forming tufts from a few in. to 1 or 2ft. diameter. Branches flattened, articulate, sometimes forked at almost every node, sometimes elongated; the articles thick, mostly ½ to ¾ in. long and 2 to 4 lines broad, but sometimes as broad as long or above 1 in. long and very narrow. Flowers minute, sessile and clustered at the nodes, males and females in the same clusters, the females scarcely ½ line long, nearly globular, half-buried in a cup-shaped bract, the males still smaller. Petals usually 3, very minute, persistent and crowning the very small globular berry.—*V. moniliforme*, Blume; *DC. Prod.* iv. 284; *Wight, Ic. t.* 1018 and 1019.

Hab.: Common.

3. NOTOTHIXOS, Oliv.

(Alluding to the plants being Southern Mistletoes.)

Flowers unisexual. Calyx-border quite inconspicuous. Petals 4, rarely 3 or 5. Anthers almost sessile, at the base of the petals, not adnate, transversely 2-lobed inside, with parallel lobes obscurely locellate. Stigma sessile. Fruit a 1-seeded berry.—Parasitical dichotomous shrubs, more or less covered with a golden or hoary tomentum, rarely at length nearly glabrous. Leaves opposite, flat, 3 or 5-nerved, but the nerves often obscure. Stipules minute, rigid, acute. Flowers minute, sessile in little pedunculate heads, solitary or several on a common terminal peduncle.

The genus is endemic in Australia. As in the case of *Viscums*, they are found sometimes parasites on species of *Loranthus*.

Leaves small, cuneate or spathulate. Flower-heads solitary (or in threes?).  
 Plant hoary . . . . . 1. *N. incanus*.  
 Leaves obovate-oblong or broadly cuneate Flower-heads in a terminal raceme, sometimes reduced to 1 or 3 heads. Plant hoary or nearly glabrous . . . . . 2. *N. cornifolius*.

1. **N. incanus** (hoary), *Oliv. in Journ. Linn. Soc.* vii. 104; *Benth. Fl. Austr.* iii. 397. Densely branched and hoary with a minute tomentum, the branchlets much flattened below the leaves, the older branches terete. Leaves



oblong-cuneate or spatulate, narrowed into a petiole, very obtuse and rarely mucronulate, 1/2 to 3/4 in. long or rarely more, the nerves faint or inconspicuous. Flower-heads solitary or 3 together on very short terminal peduncles, usually with few flowers, the females about 1/2 line long, the males considerably smaller. Fruits about 3 lines long.—*Viscum incanum*, Hook. Ic. Pl. t. 73.

Hab.: Brisbane River, Moreton Bay, *Fraser, F. v. Mueller.*

2. **N. cornifolius** (leaves Cornus-like), *Oliv. in Journ. Linn. Soc.* vii. 103; *Benth. Fl. Austr.* iii. 397. A larger species than the preceding one, the young parts hoary-tomentose, becoming at length nearly glabrous; branches terete. Leaves obovate-oblong or oblong-cuneate, obtuse, narrowed into a short petiole, mostly 1 1/2 to 2 in. long. Flower heads several, opposite, in pairs, in a terminal raceme nearly as long as the leaves, with minute bracts both under the short peduncles and under the heads. Flowers sessile in the heads, the females not 1/2 line long, the males still smaller.

Hab.: Brisbane River, Moreton Bay, *A. Cunningham, Fraser.*

Var. *subaureus*. Divaricately branched, the young parts and under side of the leaves densely covered with a more or less golden tomentum. Leaves ovate, obtuse, narrowed into a short petiole, mostly about 3/4 to 1 in. long. Each partial flower-head, 1/2 to 3/4 in. long, the lateral ones very divaricate or recurved.—*N. subaureus*, *Benth. Fl. Austr.* iii. 397; *Viscum subaureum*, *F. v. M. in Herb. Hook.*—Brisbane River, Moreton Bay, *F. v. Mueller*; Ipswich, Neenst.

ORDER CXV. SANTALACEÆ.

Flowers hermaphrodite or more or less diœcious. Perianth-tube adnate to the ovary, either entirely or at the base only, or the adnate part reduced to the broad base of the ovary; simple or showing a slightly prominent ring outside the limb above the ovary, the limb of 3 to 5 rarely 6 segments, valvate in the bud. Stamens as many as the lobes and opposite to them, inserted at their base or within the free part of the tube; anthers 2-celled, the cells opening longitudinally, sometimes confluent and apparently opening in 4 valves. Ovary inferior or if superior attached by a broad base, usually 1-celled, with 2 to 5 ovules suspended from a free placenta, but the structure often obscure or apparently homogeneous before fecundation; stigma terminal, entire or lobed, sessile on the ovary or borne on a short style. Fruit an indehiscent nut drupe or berry, with a single erect seed. Albumen fleshy; embryo straight, usually very small near the top of the albumen, with a superior radicle and small cotyledons.—Herbs or shrubs rarely trees, usually glabrous or nearly so. Leaves alternate or rarely opposite, entire, without stipules, often reduced to minute scales or very deciduous. Flowers usually small, sometimes minute, in terminal or lateral heads cymes or spikes, or rarely solitary.

The Order is widely dispersed over the temperate parts of the globe with a few tropical species.

TRIBE I. **Thesicæ**.—*Perianth-tube adnate at the base, with the upper campanulate ovoid or cylindrical portion superior. No scales or glands between the stamens. Fruit a small nut.*

Herbs or small shrubs, with alternate linear leaves . . . . . 1. THESIUM.

TRIBE II. **Osyrideæ**.—*Perianth superior, tube adnate to the ovary, not produced above it. Fruit a drupe.*

Scales or glands alternating with the stamens at the base of the perianth limb. Ovary at first free. Trees or shrubs, with flat leaves mostly opposite . . . . . 2. SANTALUM.

Disk 4-lobed. Anthers with 2 parallel cells opening longitudinally. Fruit a drupe. Trees or shrubs, with opposite flat leaves . . . . . 3. FUSANUS.

Anthers terminal, with cells confluent, opening in 2 or 4-lobes. Leaves alternate, minute and scale-like, or deciduous or none. Flowers minute. Flowers solitary or clustered, surrounded by 2 to 4 scale-like bracts . . . . 4. CHORETRUM.

Flowers in little spikes or clusters or rarely solitary, each subtended by a single scale-like bract often very deciduous . . . . . 5. LEPTOMERIA.

TRIBE III. **Anthoboleæ**.—*Perianth inferior, the lobes divided to the broad base or dilated summit of the peduncle.*

Flowers diœcious, usually 3 or 4-merous, the female solitary, the males in clusters. Leaves alternate, linear-terete or minute and scale-like . . . . . 6. ANTHOBOLUS.

Flowers polygamous, inflorescence and foliage of *Leptomeria*, or the leaves developed and flat . . . . . 7. EXOCARPUS.

### 1. THESIUM, Linn.

(A Greek name for this or some similar plant.)

Flowers hermaphrodite. Perianth-tube adnate at the base, the free portion campanulate or tubular, with 5 or rarely 4 persistent lobes, with a tuft of hairs inside at the base of or behind the stamens. Stamens inserted near the base of the lobes; filaments short; anthers with 2 parallel cells opening longitudinally. Ovary inferior; placenta filiform often flexuose, with 3 ovules suspended from near the apex; style more or less elongated with a terminal obtuse or capitate stigma. Fruit a small nut, usually ribbed outside and crowned by the persistent free portion of the perianth.—Herbs or small shrubs, with slender wiry stems. Leaves alternate, usually linear. Flowers small, of a greenish-yellow, solitary or in small cymes, pedunculate in the axils, but the peduncle usually adnate at the base to the subtending leaf, with 2 bracts on the short free portion.

The genus is widely dispersed over the temperate and warmer regions of the Old World, the species particularly numerous in South Africa. The only Australian species appears to be the same as an East Asiatic one.—*Benth.*

1. **T. australe** (southern), *R. Br. Prod.* 353; *Benth. Fl. Austr.* vi. 212. A glabrous perennial, with ascending or erect wiry branches, rarely above 1ft. high. Leaves linear, often above 1in. long, but the upper ones much shorter and more slender, and a few of the lowest short and broad. Peduncles 1-flowered, very short, adnate at the base to the subtending leaf. Perianth scarcely above 1 line when in flower, cylindrical; lobes 5, about as long as the tube. Style reaching to the level of the anthers, with a capitate stigma. Nut ovoid or nearly globular, 1 to 1½ line long, marked when dry with 8 to 10 longitudinal ribs more or less branched into intermediate reticulations, and crowned by the small persistent upper portion of the perianth.—*A. DC. Prod.* xiv. 653; *Hook. f. Fl. Tasm.* i. 337.

*Hab.*: Moreton Bay, Dawson and Burnett Rivers. Common in many localities.

I am unable to distinguish from this species the *T. chinense*, Turcz.; *A. DC. Prod.* xiv. 649, from N. China, or the *T. decurrens*, Bl., *A. DC. l.c.* 652, from Japan, Formosa, and Loo-choo. Taking the flowers at the same age, I find the same shape and proportions of the perianth-tube and lobes in all three.—*Benth.*

### 2. SANTALUM, Linn.

(From the Persian name of one species.)

Flowers hermaphrodite. Perianth-tube adnate at the base, the free portion campanulate or ovoid, lined with the disk which is entirely adnate but produced between each two stamens into a spatulate or ovate triangular scale, the lobes 4 or rarely 5, with a tuft of hairs inside behind each stamen. Stamens inserted at the base of the lobes, the filaments usually longer than the intervening scales; anthers 2-celled, the cells parallel turned inwards and opening in longitudinal slits. Ovary semi-inferior, with an erect placenta with 2 or 3 adnate ovules free only at the lower extremity, the placenta produced above them into a long point. Style elongated, with a small 2 or 3-lobed stigma. Fruit a globular drupe, the epicarp fleshy but not thick, marked above the middle or on the summit with a circular scar left by the deciduous perianth-lobes, the endocarp hard and usually

rugose.—Trees or shrubs. Leaves opposite or rarely alternate, petiolate, entire, coriaceous or somewhat fleshy, the midrib only or when old a few lateral pinnate veins conspicuous. Flowers rather larger than in the other genera, in small axillary or terminal trichotomous panicles usually shorter than the leaves and sometimes almost reduced to simple racemes. Bracts very small and scale-like, falling off long before the flowers open.

Besides the Australian species which appear to be endemic, there are a few nearly allied ones in East India, the Eastern Archipelago, and the N. and S. Pacific islands.

Flowers several in the panicle. Perianth 3 lines long or more. Fruit  $\frac{1}{2}$  to  $\frac{3}{4}$  in. diameter, marked with the scar of the perianth-lobes considerably below the summit. . . . . 1. *S. lanceolatum*.

Flowers few (rarely above 3) on the peduncles. Perianth rarely 2 lines long.

Fruit 3 to 4 lines diameter, the terminal scar enclosing a small area.

Leaves oblong or lanceolate, obtuse . . . . . 2. *S. obtusifolium*.

1. ***S. lanceolatum*** (lanceolate), *R. Br. Prod.* 356; *Benth. Fl. Austr.* vi. 214. "Bolan," Palmer River, *Roth*. "Tharra-gibberab," Cloncurry, *Palmer*. An erect shrub from 2 or 3 to 15ft. high, or sometimes a small tree, with pendulous or spreading branches. Leaves mostly oblong or lanceolate, rather acute and shortly tapering into a petiole of 2 or 3 lines, the limb usually  $1\frac{1}{2}$  to  $2\frac{1}{4}$  in. long but occasionally varying much in size and breadth, rarely obtuse, the lateral veins often conspicuous on old leaves. Flowers rather large, in trichotomous panicles in the upper axils or at the ends of the branches, rarely exceeding the leaves. Perianth 3 to  $3\frac{1}{2}$  lines long, the adnate turbinate base very short, the lobes about as long as the campanulate free portion. Anthers oblong, rather large, on short filaments alternating with broad thick obtuse or spatulate scales or glands. Drupe obovoid-globular,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. diameter, the circular scar of the limb considerably below the summit.—*A. DC. Prod.* xiv. 682; *F. v. M. Fragm.* i. 85; *S. oblongatum*, *R. Br. Prod.* 355, *A. DC. lc.* 683.

*Hab.*: Islands of the Gulf of Carpentaria, *R. Brown*; Endeavour River, *Banks and Solander*, *A. Cunningham*; Port Denison, *Fitzalan, Dallachy*; Rockhampton, *Thozet*, and others; Bulandool River, *Looker*; Nercool Creek, *Bowman*; Armadilla, *Barton*.

Wood of a bright-yellow color, close in the grain, firm; useful for cabinet work.—*Bailey's Cat. Ql. Woods*, No. 353.

Leaves burnt in the fire to withstand mosquitoes.—*Roth*.

*Var. angustifolium*. Leaves narrow, often with a fine incurved point. "Natives Willow" of some.—*Diamantina, Dr. Thos. L. Bancroft*; Georgina River, *Bailey*; Blackall, *R. A. Ranking*; Charters Towers, *C. F. Plant*.

*Var. venosum*. Small tree. Wood fragrant. Branchlets slender, often somewhat flattened, often somewhat purplish. Leaves oblong, membranous, 3in. long, lin. broad, pale-green above, glaucous beneath, tapering into a slender rather flattish petiole of a few lines; primary veins except the lowest not so oblique as in the other form, but as well as the veinlets very distinct. Peduncles slender, about lin. long, with 3 terminal branches about  $\frac{1}{2}$  in. long, bearing at the summit usually 3 branches about  $\frac{1}{2}$  in. long, each bearing from 3 to 6 shortly-pedicellate flowers.

*Hab.*: Somerset, *Frank L. Jardine*, who wrote me word that the wood is fragrant and is being exported to China where it fetches a good price. The thin texture of the leaves and fragrant wood distinguish this from other varieties.

2. ***S. obtusifolium*** (leaves obtuse), *R. Br. Prod.* 356; *Benth. Fl. Austr.* vi. 215. A tall slender shrub of livid aspect (*A. Cunn.*). Leaves opposite or the uppermost rarely alternate, linear-oblong lanceolate or broadly oblong, obtuse, rather thick, the margins often revolute in drying, 1 to 2in. long. Flowers few, in small shortly pedunculate axillary racemes or cymes, the short pedicels or lateral branches rarely bearing 2 or 3 flowers. Perianth not 2 lines long, the tube campanulate, shortly adnate at the base, the free part much longer; lobes shorter than the tube, triangular, concave. Scales or glands alternating with the stamens, ovate or triangular. Ovary semisuperior, with an elongated style, the placenta acuminate as in *S. lanceolatum*. Fruit purplish, globular or ovate-globose, 3 to 4 lines diameter, the scar of the apex enclosing a small area.—*A. DC. Prod.* xiv. 632; *F. v. M. Fragm.* viii. 11.

*Hab.*: Macpherson Range, *H. Schneider* and *H. Tryon*.

## 3. FUSANUS, Linn.

(From French name of Spindle-tree, which it is supposed to resemble.)

(Eucarya, Mitch.)

Flowers hermaphrodite. Perianth-tube adnate, turbinate, shortly produced beyond the ovary into a broad open free portion, lined by the sinuately 4-lobed disk, the margin of which is continuously free inside the stamens, the perianth-lobes 4, with a tuft of hairs behind each stamen. Filament short, inflected over the notches of the disk; anthers short, with 2 parallel cells opening longitudinally. Ovary inferior, with an erect rather thick placenta, scarcely acuminate at the top, the 2 or 3 adnate ovules distinct only at the base and the whole difficult to separate from the fleshy ovary before fecundation. Style very short and conical or scarcely any, with 2 or rarely 3 distinct terminal stigmata. Fruit a globular drupe, crowned by the persistent perianth-lobes or rarely by the scar only of the fallen lobes, the epicarp more or less fleshy or succulent, the endocarp hard and usually rugose or pitted.—Trees or shrubs with the habit foliage and inflorescence of *Santalum*, but with smaller flowers. Bracts small, and very deciduous so as to be rarely seen.

The genus is limited to Australasia. It is united by De Candolle with *Santalum*, but the perianth, the disk, the ovary, and the style appear to me to be sufficiently distinct to maintain the Linnæan genus adopted by Brown, and to show an approach almost as much to *Choretrum* as to *Santalum*.—Benth.

Leaves mostly acuminate. Panicles terminal. Perianth-lobes persistent

till the fruit is nearly ripe . . . . .

Leaves mostly acute. Panicles axillary. Perianths pedicellate, the lobes

falling off immediately after flowering . . . . .

1. *F. acuminatus*.

2. *F. persicarius*.

1. **F. acuminatus** (acuminate), *R. Br. Prod.* 355; *Benth. Fl. Austr.* vi. 215. A tall shrub or a tree of 20 to 30ft. Leaves opposite, lanceolate, acute or sometimes when young with a short hooked point, mostly 2 or 3in. long and tapering into a petiole of 2 or 3 lines, but very variable in size and breadth, coriaceous, with the lateral veins often prominent when old. Flowers rather numerous, in a terminal pyramidal panicle scarcely longer than the leaves, but sometimes much reduced. Perianth spreading to about  $2\frac{1}{2}$  lines diameter, the lobes somewhat concave even when open. Free margin of the disk very prominent, broadly rounded between the stamens which curve over the notches. Anthers very short. Style exceedingly short and conical or scarcely any, with a deeply 2 or 3-lobed stigma. Fruit globular,  $\frac{1}{2}$  to  $\frac{3}{4}$ in. diameter, with a succulent epicarp, and a hard bony much pitted endocarp, the perianth-lobes persisting on the top till the fruit is nearly or quite ripe.—*Santalum acuminatum*, A. DC. *Prod.* xiv. 684; *S. Preissianum*, Miq. in *Pl. Preiss.* i. 615, A. DC. l.c., *F. v. M. Fragm.* i. 85; *S. cognatum*, Miq. l.c. 616, A. DC. l.c.; also *Fusanus acuminatus*, Miq. l.c. 617, according to *F. v. M.*

Hab.: South-western inland localities, *A. J. Hockings*.

2. **F. persicarius** (from local name of fruit, viz.: Native Peach), *F. v. M.*; *Benth. Fl. Austr.* vi. 216. Native Peach, "Tangber," St. George, *Wedd.* A tall shrub or small tree, with opposite or scattered lanceolate or linear leaves, often very much like those of *F. acuminatus*, but the lateral veins less conspicuous or quite evanescent, and more frequently terminating in a hooked point. Panicles mostly or all in the upper axils and shorter than the leaves, the primary branches bearing usually a small cyme of few flowers. Perianth almost rotate, opening to about 2 lines diameter, the margin of the disk less prominent than in *F. acuminatus*, but the structure of the flowers otherwise the same. Fruit globular, differing according to *F. v. M.* in the epicarp not succulent and the endocarp minutely not coarsely pitted, a character rarely to be verified in dried specimens, which however show that the perianth-lobes fall away immediately

after flowering, leaving only a scarcely prominent circular scar enclosing a larger terminal area than the persistent lobes of *F. acuminatus*.—*Santalum persicarium*, F. v. M. in Trans. Vict. Inst. 1855, 41; Fragm. i. 86.

Hab.: Western Downs.

*Eucarya Murrayana*, Mitch. Three Exped. ii. 100, with a woodcut, is most probably this species.—*Benth.*

4. CHORETRUM, R. Br.

(The name is derived from the Greek word signifying a rustic according to some, others say it is from the ventricose perianth.)

Perianth-tube adnate, turbinate, slightly produced above the ovary, lined by the truncate or sinuately 4 or 5-lobed disk, and the border of the tube more or less prominent outside the base of the limb; segments of the limb 4 or 5, of a somewhat different texture from the tube, inflected or thickened at the end. Stamens inserted near the base of the segments; filaments short; anthers terminal, with confluent cells opening out in 4 valves. Ovary inferior, with an epigynous disk lining the free part of the perianth-tube. Style very short, with an entire or slightly 2-lobed stigma. Fruit a globular or ovoid drupe, crowned by the persistent perianth-lobes, the epicarp succulent, the endocarp hard and rather thick.—Shrubs with numerous slender or rigid apparently leafless branches, the leaves all reduced to minute scales usually deciduous. Flowers minute, solitary or in little clusters along the branches, surrounded by an involucre of 2 to 4 or more minute scale-like bracts.

- The genus is limited to Australia.
- Flowers 2 to 5 together in shortly pedunculate or almost sessile lateral distant clusters . . . . . 1. *C. glomeratum*.
- Flowers solitary within each involucre.
- Branches slender terete. Outer rim of the perianth-tube scarcely prominent . . . . . 2. *C. lateriflorum*.
- Branches slender acutely angular. Outer rim of the perianth-tube prominent . . . . . 3. *C. Candollei*.

1. **C. glomeratum** (clustered), *R. Br. Prod.* 354; *Benth. Fl. Austr.* vi. 218. An erect shrub, sometimes scarcely 1ft. high, sometimes almost aborescent, with numerous erect slender wiry angular branches. Leaves reduced to minute subulate deciduous scales. Flowers smaller than in *C. lateriflora*, 2 to 5 together sessile and clustered on a common peduncle of  $\frac{1}{2}$  to 1 line, each cluster surrounded by 3 or 4 minute almost orbicular bracts. Perianth about  $\frac{3}{4}$  line long, the broadly turbinate adnate tube not above half the length of the lobes, the external margin very slightly prominent. Drupe when dry 2 to 4 lines long, globular or slightly ovoid.—*A. DC. Prod.* xiv. 676; *Miq.* in *Pl. Preiss.* i. 608; *Endl. Iconogr.* t. 45.

Hab.: Dalby, *Dr. T. L. Bancroft*.

2. **C. lateriflorum** (flower lateral), *R. Br. Prod.* 354; *Benth. Fl. Austr.* vi. 219. A shrub, with erect slender broom-like branches, terete and slightly striate, the raised decurrent lines not nearly so prominent as in *C. Candollei* and more continuous. Scale-like leaves very small, spreading and more persistent than in that species. Flowers very shortly pedunculate along the ends of the branches, solitary within each subtending bract but surrounded on the peduncle by 4 nearly equal bracts and some smaller ones outside, all shorter than the perianth-tube. Perianth scarcely 1 line long, the lobes about as long as the adnate tube, the marginal rim of which is prominent round the base of the lobes.—*C. pauciflorum*, *A. DC. Prod.* xiv. 676; *Leptomeria aphylla*, *Sieb. Pl. Exs.*, not of *R. Br.*

Hab.: Islands of the coast and on coastal lands.

3. **C. Candollei** (after A. P. De Candolle), *F. v. M. Herb.*; *Benth. Fl. Austr.* vi. 219. An erect glabrous shrub, attaining several feet, with numerous very slender wiry broom-like branches, acutely angled by short prominently raised lines decurrent from the subulate minute scale-like leaves, which are very deciduous, the branches appearing leafless at the time of flowering. Inflorescence bracts and perianths of *C. lateriflora*, except that the rim or margin of the adnate perianth-tube is scarcely prominent outside the lobes.—*C. lateriflorum*, A. DC. Prod. xiv. 675, not of R. Br.; *Leptomercia Billardieri*, Sieb. Pl. Exs., not of R. Br.

Hab.: Wide Bay, *Bidwill*; Darling Downs, *Law*; Moreton Bay, *F. v. Mueller*; and southern inland localities.

### 5. LEPTOMERIA, R. Br.

(Referring to the slender stems and branches.)

Perianth-tube adnate, usually narrow, the border not at all or scarcely prominent outside; segments of the limb 5 or rarely 4, inflated or somewhat thickened at the end. Stamens inserted near the base of the segments; filaments short; anthers terminal, with confluent cells opening out into 4 valves or lobes or into an almost entire disk, the centre often very prominent and angled or lobed. Ovary inferior, with a more or less distinct epigynous disk. Style very short, with an entire or slightly lobed stigma. Fruit a small globular or ovoid fleshy or dry indehiscent drupe, crowned by the persistent perianth-lobes. Shrubs with numerous slender or rigid apparently leafless branches, the leaves all reduced to minute alternate scales usually deciduous, or rarely longer linear terete and persistent. Flowers minute, in little terminal or lateral spikes racemes or clusters, each one sessile or shortly pedicellate in the axil of a single minute scale-like deciduous or persistent bract, or rarely the bracts developed into leaves and the raceme into a leafy branch.

The genus is limited to Australia.

SECT. I. **Xeromeria**.—Bracts subtending the flowers falling off long before the flower expands.

Racemes loose, often  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Perianth-lobes fulvous when dry.

Disk not lobed

1. *L. acida*.

Racemes loose,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Perianth-lobes white when dry. Disk

lobed

2. *L. Billardieri*.

1. **L. acida** (acid), *R. Br. Prod.* 353; *Benth. Fl. Austr.* vi. 222. An erect broom-like shrub, attaining 6 to 8 feet, the virgate branches much more angular than in *L. Billardieri*, leafless at the time of flowering, the minute linear-lanceolate scale-like leaves falling off very early from the young shoots. Spikes more slender than in *L. Billardieri*, often  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long and the flowers much smaller. Perianth-tube narrow-turbinate, tapering at the base but sessile, the limb of the same fulvous colour as the tube, barely  $\frac{3}{4}$  line diameter when open, the lobes much hooded, with reflexed tips. Epigynous disk somewhat angular but not lobed, stigma minutely lobed.—A. DC. Prod. xiv. 677; Endl. Iconogr. t. 74.

Hab.: Moreton, and other coastal localities.

2. **L. Billardieri** (after Labillardiere), *R. Br. Prod.* 354; *Benth. Fl. Austr.* vi. 222. An erect broom-like shrub, attaining sometimes 6 or 7 ft. though sometimes under 2 ft., the branches rather slender and angular, but not so much so as in *L. acida*, leafless at the time of flowering, the minute linear-lanceolate scale-like leaves falling off early from the young shoots. Spikes or racemes lateral, loose,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Bracts ovate-lanceolate, acute, concave, falling off long before the flowering. Perianth-tube tapering into a distinct pedicel, the limb whitish when dry, spreading to about 1 line diameter. Epigynous disk distinctly

lobed. Stigma minutely 5-lobed. Drupe small, with a fleshy scarcely succulent epicarp.—A. DC. Prod. xiv. 677; Hook. f. Fl. Tasm. i. 357; *Thesium drupaceum*, Labill. Pl. Nov. Holl. i. 68, t. 93.

Hab.: Coastal and southern inland localities.

## 6. ANTHOBOLUS, R. Br.

(From the casting off of the flowers.)

Flowers diœcious. Perianth free, divided to the broad base into 3, 4 or rarely 5 segments, more or less inflected or concave at the end. Male flower: Stamens inserted near the base of the segments, filaments very short; anthers with 2 distinct cells opening longitudinally, turned inwards in the bud, but opening out back to back. Ovary free, thick and fleshy; stigma sessile, pulvinate, obscurely lobed (or furrowed by the pressure of the margins of the perianth-segments). Drupe ovoid or oblong, sessile on the thickened pedicel, the exocarp succulent but not thick; endocarp crustaceous or rather hard.—Glabrous shrubs, with rigid or slender branches. Leaves either linear-terete and persistent or minute scale-like and deciduous. Flowers very small, pedicellate on a common axillary peduncle, the males usually 3 to 5 together, the females solitary or 2 together. Bracts at the base of the pedicels minute and very caducous.

The genus is limited to Australia.

Leaves linear terete or filiform, persistent, slender. Perianth usually 3-merous. Endocarp not pitted.

Tropical species.

Branches terete or nearly so . . . . .	1. <i>A. filifolius</i> .
Branches angular . . . . .	2. <i>A. triqueter</i> .
Branches leafless, the minute scale-like leaves falling off from the very young shoots . . . . .	3. <i>A. leptomerioides</i>

1. ***A. filifolius*** (leaves thread-like), *R. Br. Brod.* 357; *Benth. Fl. Austr.* vi. 226. A tall shrub, with slender nearly terete branches. Leaves linear-filiform,  $\frac{3}{4}$  to 2 in. long. Male flowers 3 or 4 together on a common peduncle of 3 lines, the pedicels about 1 line long, the bracts very small and deciduous. Female flowers solitary or 2 together, the common peduncle and pedicel each about 1 line long or often twice as long when in fruit. Perianth 3-merous, scarcely  $\frac{3}{4}$  line long. Ovary thick, with a pulvinate stigma. Fruit ovoid, the endocarp smooth, not pitted.—A. DC. Prod. xiv. 687.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

2. ***A. triqueter*** (triangular), *R. Br. Prod.* 357; *Benth. Fl. Austr.* vi. 226. Very closely allied to *A. filifolius*, and probably a variety only, the stems and leaves rather thicker and the young branches slightly angular, the female flowers and fruits rather larger.—A. DC. Prod. xiv. 687.

Hab.: Endeavour River, *Banks and Solander*; a single specimen in Herb. *R. Brown*.

3. ***A. leptomerioides*** (Leptomeria-like), *F. v. M. Fragm.* i. 21; *Benth. Fl. Austr.* vi. 227. A shrub of several feet, with rigid broom-like terete branches, often pungent at the extremity, and leafless at the time of flowering, the minute linear scale-like leaves falling off from the very young shoots. Male flowers in sessile clusters of about 4 or 5, each one on a pedicel of  $\frac{1}{2}$  to  $\frac{3}{4}$  line, the perianth about as long, 4-merous, the anthers rather large. Female flowers solitary (or 2 together?), the perianth broadly cylindrical, very shortly 4-lobed, without any stamens. Ovary thick and fleshy, with a thick pulvinate stigma quite enclosed in the perianth but free. Drupe oblong, 3 to 4 lines long, the exocarp not thick, the endocarp hard and smooth. Embryo straight, linear-terete, more than  $\frac{3}{4}$  the length of the albumen, the cotyledons at least as long as the radicle.

Hab.: Burdekin, Suttor and Burnett Rivers, *F. v. Mueller*; Barcoo and Georgina Rivers.

## 7. EXOCARPUS, Labill.

(Referring to the fleshy pedicel resembling a fruit.)

Flowers hermaphrodite or males by the abortion of the ovary. Perianth free, divided to the broad base into 5 rarely 4 segments, slightly concave at the end. Stamens inserted near their base; anther-cells distinct, adnate to a very short broad filament and either nearly parallel and turned inwards, or divergent and marginal opening longitudinally. Ovary free, thick fleshy and somewhat conical, reduced in the male flowers to a flat disk. Stigma sessile, rather small, entire or obscurely lobed. Drupe or nut ovoid or nearly globular, resting on the enlarged usually succulent pedicel, the epicarp thin and not readily detached from the crustaceous or hard endocarp, the perianth-lobes either persistent round the base of the fruit or deciduous leaving the enlarged apex of the pedicel truncate. Seed erect, with a very thin testa; albumen copious; embryo minute near the apex, slightly divided at the lower end into 2 minute cotyledons. Trees or shrubs. Leaves alternate or rarely opposite, often reduced to minute scales or very deciduous, rarely enlarged and persistent. Flowers minute, in small axillary spikes sometimes reduced to sessile clusters, each flower sessile or nearly so, in a notch of the rhachis or in the axil of a minute scale-like bract, one only or rarely 2 or 3 in the spike fertile with the pedicel rapidly enlarged, the others falling off without any enlargement of the semi-abortive ovary.

Of the following species one extends over the Eastern Archipelago, the others are endemic. Some of the leafless species closely resemble some species of *Leptomeria*, but are at once distinguished by the free ovary.-- *Benth.*

Spikes cylindrical, mostly shortly pedunculate.

- |   |                               |
|---|-------------------------------|
| Leaves ovate, flat, 1 to 2in. long . . . . .  | 1. <i>E. latifolia</i> .      |
| Leaves reduced to minute tooth-like spreading persistent scales . . . . .   | 2. <i>E. cupressiformis</i> . |
| Leaves linear-subulate, 1 to 2 lines long and deciduous, or rarely rather longer and persistent . . . . .   | 3. <i>E. spartea</i> .        |
| Spikes very short and scarcely pedunculate, the rhachis pubescent. Branches stout, often spinose. Leaves reduced to minute ovate deciduous scales . . . . . | 4. <i>E. aphylla</i> .        |

1. ***E. latifolia*** (leaves broad), *R. Br. Prod.* 356; *Benth. Fl. Austr.* vi. 228. "Oringorin," Rockhampton, *Thozet*. A small tree, the young parts slightly hoary with a minute stellate or almost scaly pubescence. Leaves alternate, petiolate, from broadly ovate to oval-oblong, very obtuse, coriaceous, with several more or less distinct nerves diverging from the base, 1 to 2in. long. Spikes rather slender, mostly about  $\frac{1}{2}$ in. long, shortly pedunculate, solitary or several in a short raceme in the upper axils. Flowers 5-merous or rarely 4-merous, not closely packed. Fruit ovoid, 3 to 4 lines long, on a thickly turbinate truncate pedicel of above 2 lines.—A. DC. *Prod.* xiv. 688; *E. miniata*. Zipp. and *E. luzoniensis*, Presl; A. DC. l.c.; *E. ovata*, Schnitzl. *Iconogr.* ii. t. 108\*\*\*.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown, Heine*; Keppel Bay and Shoal Bay, *R. Brown*; Wide Bay, *Bradwill*; Burdekin River, *F. v. Mueller*; Port Denison, *Fitzalan*; Rockingham Bay and Rockhampton, *Dallachy*; Bowen River, *Bowman*; Kennedy District *Daintree* (with leaves 2 $\frac{1}{2}$ in. long and broad); common from the Tweed to the Gulf of Carpentaria.

The species is generally dispersed over the Eastern Archipelago to the Philippine islands.

Wood fragrant, dark colored, coarse in grain and hard; useful in cabinet work.—*Bailey's Cat. Ql. Woods*, No. 355.

2. ***E. cupressiformis*** (Cypress-like), *Labill. Voy.* i. 155, t. 14; *Benth. Fl. Austr.* vi. 229. "Denjungah," Taromeo, *Shirley*. "Por-nu-poy," Mt. Cook, *Roth*. "Tchimmin dillen," Stradbroke Island, *Watkins*. Usually a tree of about 20ft., the very numerous green wiry rigid or filiform apparently leafless branches sometimes collected in a dense conical head, sometimes loose and pendulous at the extremities, all terete but more or less furrowed. Leaves reduced to minute alternate scales. Flowers minute, in little terminal or lateral very



shortly pedunculate spikes of  $1\frac{1}{2}$  to 3 lines, each one sessile in a notch of the rhachis or in the axil of a minute tooth-like bract. Perianth-segments 5, about  $\frac{1}{2}$  line long. Anthers divergent, adnate to the margin of a broad almost triangular filament. Ovary immersed in and continuous with the broad disk; stigma sessile; 2-lobed. The great majority of the flowers, although with apparently perfect stigmas remain sessile and soon fall off, a few only (usually no more than one in each spike) after fecundation are raised on an obconical pedicel, which under the small, ovoid globular fruit, enlarges to 2 or 3 lines, becoming thick red and succulent.—R. Br. Prod. 356; A. DC. Prod. xiv. 689; Hook. f. Fl. Tasm. i. 336; *Leptomeria acerba*, Sieb. Pl. Exs. not of R. Br.

Hab.: Sandy Cape, *R. Brown*; Moreton Bay, *F. v. Mueller*, *C. Stuart*; Rockhampton, *O'Shanesy*.

Fruit eaten by aborigines.—*Roth*.

Wood of a pinkish-grey, soft, close-grained and light.—*Bailey's Cat. Ql. Woods*, No. 356.

3. **E. spartea** (Broom-like), *R. Br. Prod.* 356; *Benth. Fl. Austr.* vi. 229. An erect shrub of 6 to 8ft, or small tree of 15 to 20ft., the branches usually rather slender erect or horizontal and pendulous at the ends, scarcely furrowed, but often somewhat angular. Leaves alternate, distant, linear-subulate, usually 1 to 2 lines long, acute and recurved at the end, sometimes a few of them smaller and deciduous, sometimes rather thicker and 4 to 6 lines long, at other times short and thick, in all often falling off before the fruit ripens. Flower-spikes 2 to 4 lines long, usually rather slender, often more than one in the same axil and generally flowering from near the base. Flowers mostly 4-merous. Fruit ovoid or oblong, red, the thick succulent pedicel usually shorter than the fruit itself.—A. DC. Prod. iv. 690; *F. v. M. Pl. Vict.* t. 88 (ined.); *E. glandulacea*, *Miq.* in *Pl. Preiss.* i. 619; A. DC. Prod. xiv. 689; *E. spicata*, DC. l.c. (from the character given); *E. pendula*, *F. v. M.* in *Trans. Vict. Inst.* 1855, 42.

Hab.: Head of Flinders River, *Bowman*.

4. **E. aphylla** (leafless), *R. Br. Prod.* 357; *Benth. Fl. Austr.* vi. 230. An erect much-branched shrub of 4 to 6ft., growing out sometimes into a small tree, with stout rigid terete finely-furrowed branchlets, sometimes spinescent at the end. Leaves reduced to minute ovate-appressed scales, distant and very deciduous. Flower-spikes ovoid or oblong, sessile or very shortly pedunculate, very dense, 1 to 2 lines long, the rhachis usually slightly pubescent. Flowers 5-merous. Fruit rather small, ovoid-globular, the short broad thickened peduncle more or less succulent and at length truncate by the fall of the perianth-lobes.—A. DC. Prod. xiv. 690; *E. leptomerioides*, *F. v. M.*; *Miq.* *Stirp. Nov. Holl.* 7; A. DC. l.c.

Hab.: Peak Downs, *Herb. F. Mueller*; *Armadilla*, *Barton*.

## ORDER CXVI. BALANOPHOREÆ.

Flowers unisexual. Male flowers: Perianth 3-cleft, the lobes or segments valvate in the bud, or rarely no perianth. Stamens as many as perianth segments and opposite to them, the filaments united, or when there is no perianth stamens free and 2 only or solitary; anthers 2 or several-celled or rarely 1-celled. Ovary none. Female flowers minute, without any apparent perianth, or the ovary produced at the top into a small lobed limb. Ovary 1-celled, with a simple terminal stigma. Fruit a minute utricle nut or drupe, enclosing an adherent seed.—Stout succulent leafless root-parasites. Stem reduced to a tuberous often lobed rhizome, with short thick erect scapes. Leaves replaced by concave scales. Flowers in dense thick terminal spikes, usually very numerous and closely packed.

A small Order, chiefly tropical, both in the New and the Old World. One monotypic genus is found as far north as the Mediterranean, and another is in New Zealand in the south. The Australian genus extends over E. India and the Eastern Archipelago.—*Benth*.

1. BALANOPHORA, Forst.

(Bearing acorn-like heads.

Male perianth regular, usually of 3 or 4 but varying from 2 to 8 segments. Stamens all united; anthers 4-celled. Female flowers consisting of a naked ovary, terminating in a single style. Scapes bearing alternate or imbricate scales and a diœcious or monœcious spike; when monœcious, the males occupying the lower, and the females the upper portion.

The genus comprises few species, natives of E. India, the Archipelago, and the S. Pacific islands; the Australian one is found also in the New Hebrides.

1. **B. fungosa** (Fungus-like), *Forst. Char. Gen.* 99, t. 50; *Benth. Fl. Austr.* vi. 232. Rhizome short, thick, irregularly lobed, with a minutely granular surface. Scapes thick, 2 to 4 in. high. Scale-like leaves ovate, obtuse, concave, membranous,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Female flowers exceedingly numerous and minute, very densely packed in a globular terminal head of various colours, from 1 to 2 in. diameter, the males occupying a loose ring under it, 3 or 4 lines broad, each one on a pedicel of  $1\frac{1}{2}$  to 2 lines. Perianth-lobes 3 or 4, spreading or reflexed, oblong, concave, about 1 line long. Anthers forming a globular mass, on a short stipes consisting of the united filaments.—*Hook. f. in Trans. Linn. Soc.* xxii. 46, t. 8; *Cynomorium balanophora*, *Willd. Spec. Pl.* iv. 177.

Hab.: Rockingham Bay, common on roots of trees in tropical scrubs, *Dallachy*; Gould Island in the same bay, *M. Gillivray*; abundant at Mackay; common.

ORDER CXVII. EUPHORBIACEÆ.

Flowers always unisexual. Perianth either simple and calyx-like or almost petal-like, usually small, or double with 4 or 5 petals alternating with the calyx-lobes, or sometimes entirely wanting in one or both sexes. Stamens various. Ovary superior, consisting of 3 or sometimes 2, or more than 3, united or 1-celled, or rarely 2-celled carpels, very rarely reduced to a single one. Styles as many as carpels, free or more or less united, entire or divided, the stigmatic surface usually lining their inner face. Ovules 1 or 2 in each carpel, pendulous from the inner angle of the cells, the funicle usually thickened into a cellular mass often termed an *obturator*. Fruit either capsular, separating into as many 2-valved cocci as carpels, leaving a persistent axis, or more rarely succulent and indehiscent with the endocarp consisting of as many indehiscent nuts or cocci as carpels or cells. Seed laterally attached at or above the middle, with or without an arillus or caruncle. Embryo straight, with flat cotyledons and a superior radicle, in a fleshy albumen, or very rarely the cotyledons fleshy, with little or no albumen.—Trees shrubs or herbs, often abounding in milky juice, exceedingly various in habit. Leaves alternate or opposite, rarely divided or compound, usually with stipules. Inflorescence very varied. Flowers usually small.

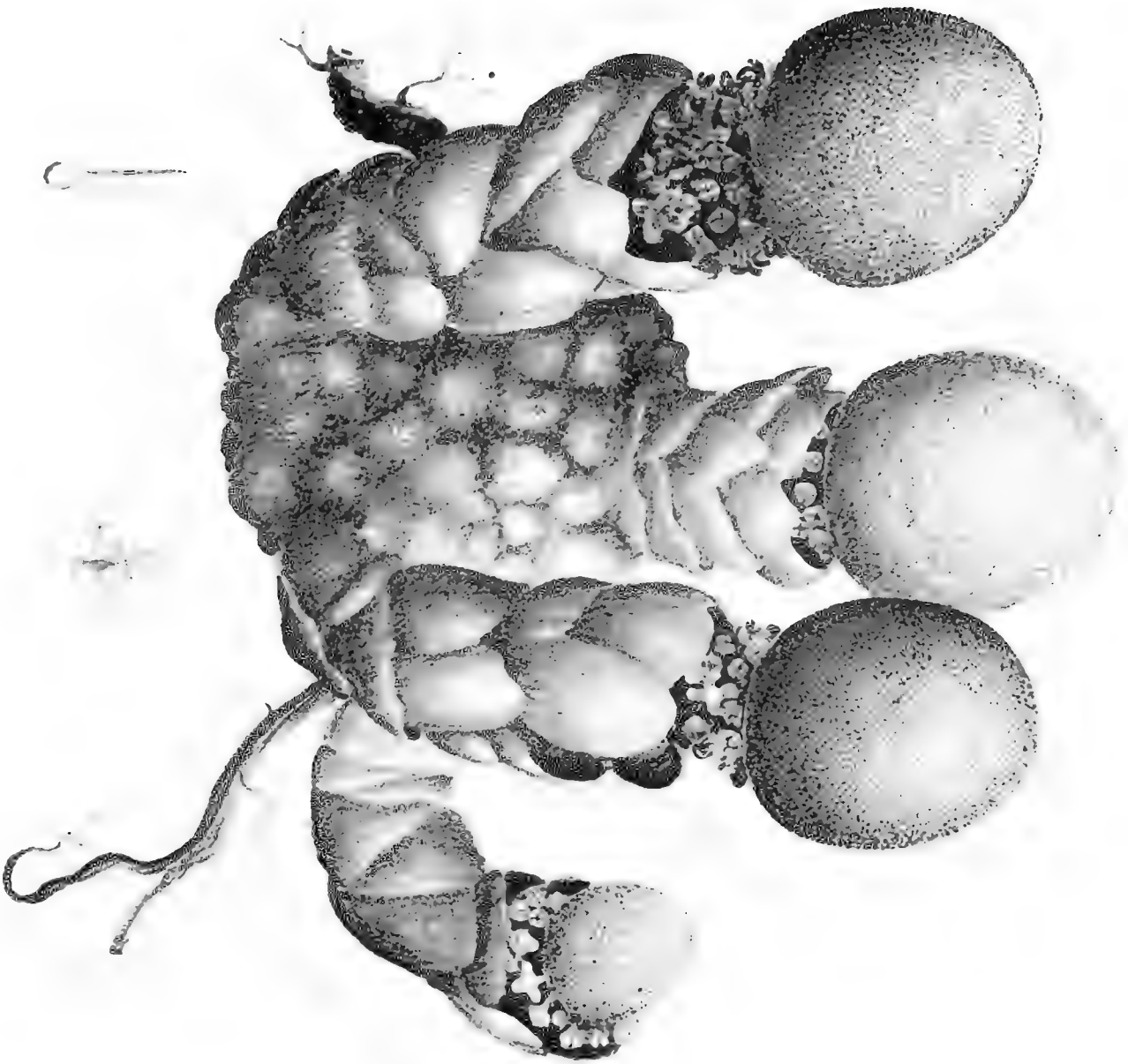
A very large Order, most abundant within the tropics, both in the New and the Old World, gradually diminishing in numbers in more temperate regions, and very few ascending into alpine or cold climates.

TRIBE I. **Euphorbiæ**.—*Involute calyx-like, including several male-flowers, each of a single stamen without any perianth, and one central female one, a single pedicellate pistil without any or rarely with a perianth, the whole flower-head resembling a single-flower. Embryo with broad cotyledons and a narrow radicle. Raphe of ovule ventral.*

Trees, shrubs or herbs with a milky juice . . . . . 1. EUPHORBIA.

TRIBE II. **Stenolobæ**.—*Flowers distinct, both sexes with a perianth. Embryo linear, the cotyledons not at all or scarcely broader than the radicle. Shrubs often heath-like, with entire coriaceous leaves or rarely herbs with small membranous leaves.*

Ovules 2 in each cell.  
 Anther-cells opening in terminal pores. Styles 2-fid. Capsule depressed globular. Flowers white, in head-like racemes forming terminal corymbs . . . . . 2. PORANTHERA.





- Anther-cells opening longitudinally. Ovary and capsule 3-lobed, the lobes ending in simple styles.  
 Stamens free or scarcely united at the base. Flower clusters mostly axillary.  
 Capsule 2-celled. Leaves in alternate threes . . . . . 3. MICRANTHEUM.  
 Capsule 1-celled and 1-seeded. Leaves solitary . . . . . 4. PSEUDANTHUS.
- Ovules 1 in each cell.  
 Stamens indefinite, usually numerous.  
 Stigma petate, entire or 3-lobed. Petals usually small. Flowers axillary . . . . . 5. BEYERIA.  
 Styles 2-fid. Petals usually longer than the calyx. Flowers mostly terminal . . . . . 6. RICINOCARPUS.  
 Styles 2 to 4-fid. Calyx petal-like but no petals. Capsule usually 1-celled. Flowers axillary . . . . . 7. BERTYA.  
 Stamens definite, twice as many as petals or calyx-lobes or fewer.  
 Petals present. Style-branches fringed. Capsule without appendages. Flower-cymes terminal . . . . . 8. MONOTAXIS.  
 No petals. Style-branches entire. Capsule with 6 erect toothlike appendages. Flowers in dense sessile clusters in the axils or at leafless nodes . . . . . 9. AMPERFA.
- TRIBE III. **Phyllanthææ**.—*Sepals 1-2 seriate. Petals minute or none. Stamens 1-2 seriate; outer series opposite the sepals, or all in the centre of the flower. Ovary 2, many celled, cells 2-ovulate. Raphe of ovule ventral. Inflorescence axillary or lateral.*  
 \* *Leaves alternate, undivided, quite entire. Petals present. Stamens 3-6. Male flowers in axillary fascicles or solitary.*  
 † Calyx valvate. Filaments united in a column.  
 Ovary 2-celled. Fruit a drupe . . . . . 10. BRIDELIA.  
 Ovary 3-celled. Fruit capsular . . . . . 11. CLEISTANTHUS.  
 †† Calyx imbricate. Filaments free.  
 Trees or stout shrubs. Flowers large. Male disk 5-lobed. Cotyledons crumpled . . . . . 12. ACETEPHILA.  
 Herbs or slender shrubs. Flowers small. Male disk of 10 linear scales . . . . . 13. ANDRACHNE.  
 \*\* *Leaves alternate (rarely opposite), undivided, quite entire. Sepals imbricate. Styles or their branches slender (except in Glochidion). Petals none. Stamens 3 or more. Male flowers in axillary fascicles or solitary.*  
 † Fruit dry, capsular, of 3 or more 2-valved cocci.  
 Herbs, shrubs or trees. Sepals 4 to 6. Disk present in both sexes. Styles terminal, free or united below . . . . . 14. PHYLLANTHUS.  
 Shrubs or trees. Calyx 4 to 6-lobed, toothed or partite. Disk none in either sex. Styles confluent in a long or short head, cone or column . . . . . 15. GLOCHIDION.  
 †† Fruit a berry or of 3 to 6 cocci enclosed in a fleshy or dry indehiscent rarely 6-valved epicarp.  
 Shrubs. Flowers monœcious. Sepals 5 or 6. Stamens 5 or 6 exserted. Styles 2, clavate or broad, undivided. Fruit 3 2-valved cocci . . . . . 16. NEORÆPERA.  
 Shrubs. Flowers dicecious. Sepals 5. Stamens 3 to 5. Styles elongate. Fruit fleshy or dry; with 6 cocci . . . . . 17. FLUEGGEA.  
 Slender shrubs. Sepals and stamens 4 to 6. Fruit a berry with 6 to 12 crustaceous seeds . . . . . 14. KIRGANELIA.  
 Shrubs or trees. Male calyx turbinate or hemispheric, lobes minute inflexed.  
 Anthers 3. Fruit dry or fleshy with 3 to 6 indehiscent cocci . . . . . 18. BREYNIA.  
 \*\*\* *Leaves alternate, undivided, entire or serrulate. Sepals imbricate. Petals none. Stamens few or many. Styles or stigmas 2 to 3 dilated. Fruit a drupe. Trees or shrubs. Male flowers in axillary fascicles or solitary.*  
 Trees. Flowers, male with the stamens indefinite in a central column. Female flower with large flat lobed stigmas. Fruit separating into 4 2-valved cocci . . . . . 19. PETALOSTIGMA.  
 Tree. Flowers dicecious axillary. Stamens indefinite. Stigma broadly reniform. Drupe 1-celled . . . . . 20. HEMICYCLIA.  
 Trees. Flowers monœcious. Stamens 4, or more central free. Style linear, undivided. Leaves opposite . . . . . 21. DISSILIARIA.  
 \*\*\*\* *Trees. Leaves alternate, tri-foliolate. Sepals imbricate. Petals none. Fruit a berry. Flowers paniculate.*  
 Sepals 5, imbricate. Stamens 5 . . . . . 22. BISCHOFIA.

\*\*\*\* Trees or shrubs. Leaves alternate, quite entire. Styles or stigmas usually very minute. Fruit various. Flowers in axillary spikes, racemes or panicles.

† Male sepals imbricate. Fruit indehiscent or tardily dehiscent.

Male flowers most minute in dense flowered catkin-like spikes. Stamens 2 to 5. Ovary 2-celled. Stigmas 2 to 5-fid . . . . . 23. APOROSA.

Stamens 2 to 5. Ovary 1 or 2-celled. Drupe 1 or 2-seeded. Seeds compressed . . . . . 24. ANTIDESMA.

TRIBE IV. **Crotoneæ**.—Perianth single, or of the male, or of both sexes, double. Stamens 1 to 2-seriate, outer series alternate with the sepals or central in the flower. Ovary 2 to 3-celled. Cells 1-ovulate. Inflorescence terminal or axillary.

SUBTRIBE I. **Jatropheæ**.—Flowers in terminal 2-3-chotomous cymes; cymes unisexual, or with the central flower female, petaliferous.

Leaves digitately nerved or lobed. Stamens many. Fruit capsular . . . . . 25. \*JATROPHA. Leaves digitately nerved. Stamens 8 to 20. Fruit a drupe . . . . . 26. ALEURITES.

SUBTRIBE II. **Eucrotoneæ**.—Flowers in terminal androgynous spikes or racemes, males petaliferous, females often apetalous. Filaments inflected in bud with the anthers reversed.

Petals usually villous. Capsule of 3 cocci . . . . . 27. CROTON.

SUBTRIBE III. **Chrozophoreæ**.—Flowers in axillary (rarely terminal) spikes racemes or panicles. Males petaliferous, females often apetalous. Filaments straight in bud, or tips inflected and anthers erect.

\* Calyx imbricate, truncate lobed or toothed, or of free sepals. Petals free. Fruit capsular.

† Sepals not enlarged or leafy in fruit.

Stamens 15 to 30, free. Styles slender, entire . . . . . 28. CODIÆUM.

Stamens indefinite. Styles 3, distinct or shortly united at the base, 2-branched . . . . . 29. BALOGHIA.

Stamens central 25 to 30. Style thick, undivided . . . . . 30. FONTAINEA.

SUBTRIBE IV. **Adrianeæ**.—Racemes or spikes terminal. Flowers apetalous. Styles distinct or shortly connate at the base.

Anthers erect, the cells adnate and parallel. Styles 2-fid, the inner surface fringed or with much raised papilla . . . . . 31. ADRIANA.

SUBTRIBE V. **Acalypheæ**.—Flowers in axillary rarely terminal spikes, racemes or panicles, apetalous. Calyx of male closed in bud, usually membranous, oblong, globose or ovoid, and splitting valvately into 3 to 5 concave sepals. Petals none. Styles usually long, entire, bifid, multifid or papillosely fimbriate. Fruit capsular, very rarely drupaceous.

\* Filaments free; anthers erect, 2-celled, cells united by their base only.

Styles undivided . . . . . 32. CLAOXYLON.

Styles very long fimbriate or lacerate. Female flowers in large bracts . . . . . 33. ACALYPHA.

\*\* Filaments free; anthers 2-celled or 4-celled; cells oblong or globose, laterally attached by a narrow or broad connective.

Stamens 4 or more, filaments slender; anthers 2-celled, cells oblong parallel . . . . . 34. ALCHORNEA.

Leaves opposite or alternate. Stamens very numerous, central in the flower; anthers 2-celled, cells usually globose, adnate to the often broad connective . . . . . 35. MALLOTUS.

Anthers 4-lobed, opening in 4 valves or longitudinally in 2 valves. Styles undivided, fringed or not . . . . . 36. MACARANGA.

Stamens very numerous, filaments branched; anther-cells distinct, distant, sub-globose, divergent . . . . . 37. \*RICINUS.

SUBTRIBE VI. **Plukenetieæ**.—Flowers in axillary spikes or racemes, apetalous. Male calyx valvate, Styles connate. Fruit capsular. Leaves alternate.

† Twining shrubs. Filaments straight in bud.

Racemes androgynous. Male calyx 3 to 5-partite. Stamens 1 to 3. Styles spreading above . . . . . 38. TRAGIA.

SUBTRIBE VII. **Hippomaneæ**.—Perianth single. Calyx of male minute and open in bud or obsolete.

Racemes terminal. Male calyx compressed, 2-partite. Stamens 6 to 50. Small trees . . . . . 39. HOMOLANTHUS.

Flowers cymulose nearly terminal. Stamens 2 or 3, filaments connate.  
 Anthers 2-celled. Climbing shrubs. Leaves biglandular. Fruit large, 2,  
 3 or 4-celled . . . . . 40. OMPHALEA.  
 Racemes terminal and axillary. Ovary 3-celled. Stamens 2 or 3. Capsule  
 separating into 3 2-valved cocci . . . . . 41. SEBASTIANIA.  
 Calyx minute. Stamens 3 or 2. Seeds without any carunculus . . . . . 42. EXCÆCARIA.

1. EUPHORBIA, Linn.

(After Euphorbus; a physician to Juba, King of Mauritania.)

(Anisophyllum, Haw.)

Flower-heads resembling single flowers. Involucre small, cup-shaped, with 4 or 5 small teeth alternating with and often concealed by as many horizontal prominent glands, which are sometimes expanded into or bordered by petal-like appendages. Within are about 10 to 12 male flowers consisting each of a single stamen with an articulated filament, and usually intermixed with or surrounded by thin membranous bracts, and in the centre a single female flower consisting of a stipitate 3-celled ovary protruding from the involucre, with 1 pendulous ovule in each cell. Style 3-cleft, the branches (or distinct styles) entire or 2-lobed. Capsule separating into 3 2-valved cocci.—Herbs or shrubs abounding in milky juice often very acrid. Stem-leaves entire or denticulate, in the majority of non-Australian but in very few Australian species alternate without stipules, the flowering branches umbellate, dichotomous with usually opposite leaves; the majority, however, of the Australian species belong to a section with herbaceous dichotomous stems with the leaves opposite from the base and small interpetiolar stipules, and some species not Australian are succulent leafless shrubs.

A very large genus dispersed over nearly the whole world. Of the seventeen Australian species one is a common tropical weed, three are maritime plants extending more or less over the coasts of the Indian Archipelago, southern Asia and the Pacific islands, the remainder appear to be endemic, although one or two may be nearly allied to E. Indian species.

SECT. I. **Anisophyllum**.—Leaves all opposite with small interpetiolar stipules. Involucral glands usually bordered by a petal-like appendage (except E. atoto and E. pilulifera.) Seeds without any carunculus.

\* Flower-heads in small distinct terminal cymes with the floral leaves or bracts as long as or longer than the involucre. Capsules and whole plant glabrous.

Seeds smooth. Appendages of the involucral glands scarcely conspicuous 1. *E. atoto*.  
 Seeds rugose. Appendages conspicuously petal-like, entire.

Lower leaves ovate, upper ones lanceolate or linear. Cymes loose with filiform peduncles. Involucres  $\frac{1}{2}$  line long . . . . . 2. *E. Mitchelliana*.  
 (See also 11. *E. Macgillivrayi*, with much larger involucral appendages).

\*\* Flower-heads solitary or two together, terminal or in the upper axils. Stems hairy or pubescent.

Stem and leaves pubescent or shortly hirsute.

Involucres  $1\frac{1}{2}$  line long, the glands with a broad palmately lobed appendage . . . . . 3. *E. schizolepis*.

Involucres not  $\frac{1}{2}$  line long, the glands with a very small usually lobed appendage . . . . . 4. *E. Schultzii*.

\*\*\* Flower-heads solitary in the upper or in nearly all the axils or forks.

Stem and leaves pubescent or hirsute.

Involucres about  $\frac{1}{2}$  line long, the gland-appendages usually lobed. Stems much branched, usually 6in. to 1ft . . . . . 5. *E. australis*.

Involucres about 1 line long, the gland-appendages entire. Dwarf plant with rigid stems of 1 to 2in. . . . . 6. *E. Muelleri*.

Whole plant quite glabrous.

Involucres about 1 line long. Dwarf plant with rigid stems of 1 to 2in. 6. *E. Muelleri*.

Involucres  $\frac{1}{2}$ — $\frac{3}{4}$  line long.

Diffuse or prostrate branching stems forming at length a perennial rhizome. Gland-appendages usually entire.

Styles notched only at the end . . . . . 7. *E. Drummondii*.

Styles slender bifid . . . . . 8. *E. alsinæflora*.

- Annual with erect and slender stems. Gland-appendages usually entire . . . . . 9. *E. Wheeleri*.
- \*\*\* Flower-heads numerous, in dense or rather loose terminal or axillary cymes, the floral leaves, except sometimes the lowest pair, reduced to small bracts shorter than the involucre.
- Dwarf glabrous perennial. Leaves ovate or oblong. Gland appendages large and very white . . . . . 10. *E. micradenia*.
- Pubescent perennial with erect or ascending stems. Leaves ovate or oblong. Gland-appendages large and very white . . . . . 11. *E. Macgillivrayi*.
- Glabrous erect or procumbent annual. Leaves linear. Gland-appendages rather large . . . . . 12. *E. serrulata*.
- Pubescent perennial with erect or ascending stems, the ultimate branches filiform and cymes loose. Gland-appendages large and very white. Seeds rugose . . . . . 13. *E. pilipes*.
- Involucral gland  $\frac{1}{4}$  line broad, white or slightly coloured. Seeds pruinose, quite smooth . . . . . 14. *E. Coghiani*.
- Hirsute annual. Leaves ovate or lanceolate. Flower-heads minute, very numerous in dense head-like axillary cymes. Involucral glands without appendages . . . . . 15. *E. pilulifera*.

SECT. II. **Eremophila**.—Leaves opposite or the lower ones and sometimes those of lateral branches alternate. Stipules very minute or none. Involucral glands without appendages. Seeds carunculate.

Stems erect, dichotomous. Leaves linear. Flower-heads solitary in the axils . . . . . 16. *E. eremophila*.

SECT. III. **Euphorbium**.—Shrubs or trees, with fleshy terete ribbed angled or flattened stems and branches. Leaves none or alternate, or the upper opposite. Stipules none or glandular or of prickles, involucre axillary or terminal or in the forks, often sessile, rarely cymose, glands without a petaloid limb.

A tall glabrous shrub, branches terete, thickening upwards; the compound cymes terminal, the ultimate portions recurved. Capsule nearly globular, 4 lines diameter . . . . . 17. *E. corynocladia*.

SECT. IV. **Tithymalus**.—Herbs rarely shrubby below, usually erect, branches terete, not fleshy. Leaves alternate, upper (rarely all) opposite, exstipulate. Involucre in terminal or axillary umbels radiating in threes; glands without a petaloid limb.

Annual, glabrous, umbels usually 3-rayed. Involucral glands crescent-shaped. Capsule smooth. Seeds pitted . . . . . 18. *E. \*Peplus*.

SECT. V. **Poinsettia**.—Herbs, undershrubs or shrubs. The lower or all leaves alternate. Involucral bracts often colored.

A branching shrub of 2 or 3ft.; leaves variously shaped, often coloured . . . . . 19. *E. \*heterophylla*.

1. **E. atoto** (name in Sandwich Islands), *Forst.*; *Boiss. in DC. Prod.* xv. ii. 12; *Benth. Fl. Austr.* vi. 46. A glabrous diffuse or procumbent perennial of 1 to  $1\frac{1}{2}$ ft., the primary stems thick and hard, the branches more slender and sometimes dichotomous. Leaves opposite, shortly petiolate, broadly oblong or rarely narrow, obtuse or mucronulate, more or less cordate and usually unequally so at the base, rather thick, 1 to  $1\frac{1}{4}$ in. long. Stipules usually fringed when old. Flower-heads in small dichotomous cymes in the upper axils, scarcely exceeding the leaves and forming a terminal leafy corymb. Bracts or floral leaves oblong, about as long as the involucre or rather longer. Involucre shortly pedicellate, nearly 1 line long, the glands transversely oblong, with very narrow scarcely distinct borders. Capsules glabrous. Seeds smooth.—*Baill. Adans.* vi. 282; *H. oraria*, *F. v. M.* in *Herb. Kew.*; *E. levis*, *Poir.*; *Boiss. in DC. Prod.* xv. ii. 13.

Hab.: Sandy Cape, *R. Brown*; Port Curtis, *M'Gillivray*; Isles off Cape Flattery and Moreton Island, *F. v. Mueller*; Sir C. Hardy's Island, *Henne*; Rockingham Bay, *Dallachy*.

A sea-coast plant, found also on the coasts of E. India, the Archipelago, and the Pacific Islands.

2. **E. Mitchelliana** (after Sir T. Mitchell), *Boiss. in DC. Prod.* xv. ii. 25; *Benth. Fl. Austr.* vi. 47. A perfectly glabrous perennial, attaining 1 to  $1\frac{1}{2}$ ft., the rhizome at length woody, the stems erect or diffuse, slender, dichotomous, the ultimate branches filiform. Leaves opposite, shortly petiolate, the lower ones ovate and small, the upper oblong or linear, entire,  $\frac{1}{2}$  to 1in. long, oblique or



unequally cordate at the base. Flower-heads very small, not numerous, in loose terminal dichotomous cymes, the pedicels filiform, the floral leaves or bracts linear, mostly as long as or longer than the flower-heads. Involucre about  $\frac{1}{2}$  line long, the glands bordered by a petal-like obovate or orbicular appendage, varying from  $\frac{1}{4}$  to  $\frac{1}{2}$  line in breadth. Capsule glabrous. Seeds transversely rugose.

Hab.: Port Bowen, Keppel Bay, Northumberland Islands, *R. Brown*; Sandy Beach, Lizard Island, *A. Cunningham*; Port Curtis, *M'Gillivray*; Port Denison, *Fitzalan*; Rockingham Bay, *Dallachy*; Belyando River, *Mitchell*; Bowen River, *Bowman*; Sutton River, *Thozet*; Rockhampton, *O'Shanesy*; N. Kennedy district, *Daintree*.

Var. *glauca*. Leaves rather more coriaceous. Flower-heads very small, in irregular somewhat elongated leafy cymes. Gulf country.

3. **E. schizolepis** (scales split), *F. v. M.*; *Boiss. in DC. Prod.* xv. ii. 20; *Benth. Fl. Austr.* vi. 47. An annual, but with hard, often woody-looking stems of about 1ft. high, dichotomously branched and more or less pubescent with crisped hairs. Leaves opposite, almost sessile, ovate or ovate-oblong, acute, oblique and unequally cordate at the base,  $\frac{2}{3}$  to 1in. long, sprinkled on both sides with short hairs. Flower-heads shortly pedicellate in the upper axils, forming sometimes terminal leafy cymes. Involucre about  $1\frac{1}{2}$  line long, the glands peltate with a broad spreading palmately-lobed or fringed appendage, not so white as in most species. Capsule and seeds not seen.

Hab.: Gulf country.

Var.? *glabra*; perfectly glabrous, with the gland-appendages much less lobed; perhaps a distinct species. Gulf country.

4. **E. Schultzii** (after —. Schultz), *Benth. Fl. Austr.* vi. 47. A slender annual of 6in. to 1ft., apparently erect when young, but soon much-branched and diffuse, with pubescent or shortly hirsute stems and foliage. Leaves opposite, nearly sessile, ovate or oblong, serrate, very oblique or semi-cordate at the base, the lower ones 4 to 8 lines long, those of the lateral branches half that size. Flower-heads very small, solitary or 2 together, terminating short leafy branches in the upper axils. Involucre not  $\frac{1}{2}$  line long, hirsute, the glands small with a very narrow usually lobed petal-like margin sometimes scarcely conspicuous. Capsule small, hirsute, with prominent angles. Seeds rugose.

Hab.: Between Croydon and Blackbul, *R. C. Burton*.

5. **E. australis** (Australian), *Boiss. Cent. Euph.* 15 and in *DC. Prod.* xv. ii. 36; *Benth. Fl. Austr.* vi. 48. Apparently a perennial, forming at length a hard woody rhizome, the stem prostrate, much branched, often 1ft. long, more or less villous as well as the foliage. Leaves opposite, nearly sessile, ovate-oblong or nearly orbicular, obtuse, mostly serrate, very oblique at the base, 3 or 4 lines long, those of the flowering branches much crowded. Flower-heads solitary in the upper axils, the short flowering branches usually crowded at the ends of the principal ones. Involucres and capsules small as in *E. Drummondii*, but more or less hirsute and the petal-like appendages of the glands more or less lobed, varying from white to red.—*Baill. Adans.* vi. 283; *E. vuccaria*, *Baill. l.c.* 286; *E. erythrantha*, *F. v. M. Fragm.* ii. 152.

Hab.: *Bowman*; Gilbert River, *F. v. Mueller*; Hetzers Plains, *F. J. C. Wildash*; and many other inland localities.

6. **E. Muellerei** (after Baron Mueller), *Boiss. in DC. Prol.* xv. ii. 27; *Benth. Fl. Austr.* vi. 48. A dwarf plant with a thick woody rhizome and procumbent or ascending rather rigid stems of 1 to 2in., densely pubescent with short hairs or nearly glabrous. Leaves opposite, nearly sessile, rather crowded, ovate orbicular, or the upper ones oblong, rather thick, entire, 2 to 5 lines long, very oblique at the base, and the lower ones sometimes broader than long. Flower-heads larger than in *E. australis* and *E. Drummondii*, solitary and pedicellate in

the upper axils, forming almost a terminal leafy cyme. Involucre about 1 line long, glabrous or pubescent. Capsule  $1\frac{1}{2}$  line long, glabrous or shortly hairy. Styles short. Seeds irregularly rugose.

Hab.: Georgina River.

7. **E. Drummondii** (after J. Drummond), *Boiss. Cent. Euph.* 14 and in *DC. Prod.* xv. ii. 36; *Benth. Fl. Austr.* vi. 49. A prostrate or diffuse much-branched plant, closely resembling the European *E. chamaesgee*, Linn., and when flowering the first year easily confounded with it, but always quite glabrous and forming at length a perennial thick or woody rhizome. Leaves opposite, orbicular ovate or oblong, obtuse or notched, entire or serrulate, very oblique at the base, 2 to 4 lines long, firmer than in *E. chamaesgee*. Stipules entire fringed or lobed. Flower-heads very small, shortly pedicellate in the upper axils. Involucres about  $\frac{1}{2}$  line long, the glands with a narrow white border entire or nearly so. Capsule under 1 line long, glabrous. Styles notched only, varying from almost none to nearly as long as in *E. chamaesgee*. Seeds rugose.—*E. chamaesgee*, *E. Ferdinandi*, *E. Drummondii* and *E. Dallachyana*, Baill. *Adans.* vi. 284, 285.

Hab.: Broadsound and Thirsty Sound, *R. Brown*; Brisbane River, *F. v. Mueller*; Rockhampton, *Dallachy*, and others; Curriwillinghie, *Dalton*.

This weed is undoubtedly poisonous to sheep, except perhaps when dry, the most dangerous time for sheep to eat it is said to be in the early morning. Its effect on sheep is stated to be: The head swells to an enormous extent, becoming so heavy that the animal cannot support it, and therefore drags it along the ground; the ears get much swollen and suppurate.

The medical virtues ascribed to the plant are: In the form of tea it is considered by bushmen useful in kidney complaint, and a medical man in one of the southern colonies is said to have obtained an alkaloid from it which has proved a valuable local anesthetic in the cure of sciatica, and in cases of sprains. Some bushmen consider an infusion of the herb useful in cases of chronic dysentery and low fever.

8. **E. alsinæflora** (Alsine-leaved), *Baill. Adans.* vi. 288; *Benth. Fl. Austr.* vi. 49. A glabrous and glaucous perennial, with a hard knotted base or rhizome, and much-branched ascending or decumbent stems, often under 6in. high. Leaves opposite, very shortly petiolate, ovate or oblong, entire or obscurely serrulate, oblique or semi-cordate at the base, mostly 4 to 6 lines long. Stipules fringed or divided. Flower-heads solitary in the upper axils, very shortly pedicellate, not forming distinct cymes. Involucre rather above  $\frac{1}{2}$  line long, the petal-like appendages of the glands rather broad, entire crenate or sinuate. Styles rather slender and bifid. Fruit not seen.

Hab.: An inland species.

9. **E. Wheeleri** (After —. Wheeler), *Baill. Adans.* vi. 286; *Benth. Fl. Austr.* vi. 49. A perfectly glabrous plant, apparently annual, branching from the base into erect or ascending slender stems of 6in. to 1ft. Leaves opposite, in rather distant pairs, oval-oblong, entire or slightly serrulate, very oblique at the base, rarely above  $\frac{1}{2}$ in. long. Stipules entire or lobed. Flower-heads solitary in the forks and upper axils, on very short pedicels. Involucre scarcely above  $\frac{1}{2}$  line long, the glands with a petal-like entire or slightly lobed appendage scarcely broader than the gland itself. Capsule above 1 line long, on a long stipes. Seeds deeply rugose.—*E. divaricata*, A. Cunn. Herb.

Hab.: Towards Cooper's Creek.

This plant appears to be quite distinct from *E. Drummondii* in habit as well as in the capsule nearly twice as large. It may, however, prove to be the first year's state of *E. alsinæflora*.—*Benth.*

10. **E. micradenia** (referring to small glands), *Boiss. in DC. Prod.* xv. ii. 27; *Benth. Fl. Austr.* vi. 50. A dwarf perennial with a woody rhizome, closely allied to *E. Macgillivrayi* and *E. serrulata*, differing from the former in its

perfectly glabrous stem and foliage, and from the latter in its perennial rhizome, shorter and broader leaves, and in the involucre glands very small within the petal-like appendages, which are about 1 line diameter. Stems rarely above 6in. long. Leaves mostly semicordate, ovate or the upper ones oblong-lanceolate, obtuse, more or less serrulate,  $\frac{1}{2}$  to 1in. long. Involucres inflorescence and fruit those of the more petaloid specimens, of *F. Macgillivrayi*, of which it may be a variety.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Mackay, *H. L. Griffith*; Albany island, *F. v. Mueller*.

11. **E. Macgillivrayi** (after J. Macgillivray), *Boiss. in DC. Prodr.* xv. ii. 26; *Benth. Fl. Austr.* vi. 50. A perennial but often flowering the first year so as to appear annual, the rhizome at length hard and woody. Stems erect or ascending, from under 6in. to above 1ft. high, more or less pubescent as well as the foliage or at length nearly glabrous. Leaves opposite, petiolate, the lower ones usually ovate-oblong and under  $\frac{1}{2}$ in. long, the upper ones narrow-oblong often above 1in., obtuse, serrulate, oblique at the base or semicordate. Stipules often lobed or fringed. Flower-heads small, crowded in rather dense shortly pedunculate axillary or terminal cymes, the floral leaves reduced to small bracts or the lower pair only developed and leafy. Involucre  $\frac{1}{2}$  to  $\frac{3}{4}$  line long, the bracts bordered by white petal-like entire appendages, varying from  $\frac{1}{2}$  to 1 line in diameter. Capsule glabrous, above 1 line long. Seeds rugose.

Hab.: Thirsty Sound, *R. Brown*; Port Molle and Gould island, *M. Gillivray*; Brisbane River, *F. v. Mueller*; Port Denison, *Pitzalan*; Rockhampton, *Dallachy, Thozet*; Walloon, *Bowman*; Suttor River, *Thozet*.

12. **E. serrulata** (serrulate), *Reinw. ; Boiss. in DC. Prodr.* xv. ii. 25; *Benth. Fl. Austr.* vi. 51. A glabrous annual, the stems often hard at the base, erect or procumbent, sometimes exceeding 1ft. Leaves opposite, very shortly petiolate, linear, obtuse, rather firm, more or less denticulate, oblique and sometimes slightly cordate at the base,  $\frac{3}{4}$  to 1 $\frac{1}{2}$ in. long. Flower-heads in rather dense shortly pedunculate cymes in the upper axils, much like those of *F. Macgillivrayi*, the bracts small, the petal-like appendages of the involucre glands usually smaller than in that species. Capsule 2 lines long, smooth. Seeds grey, slightly tuberculose.

Hab.: Keppel Bay and Thirsty Sound, *R. Brown*; Rockhampton, *O'Shanesy*; Darr River, *C. W. de Burgh Birch*; Green Island, Trinity Bay, *Bailey*.

This species extends over the sea-coasts of the Archipelago, from Timor to S. China.

13. **E. filipes** (thread-like), *Benth. Fl. Austr.* vi. 51. A perennial allied to *F. Mitchelliana* and *F. Macgillivrayi*, with the habit and loose slender inflorescence of the former and the pubescent stems and foliage of the latter. Stems slender, erect or ascending, 6in. to 1ft. high, the ultimate branches filiform. Leaves opposite, oblong, the lower ones short and rather crowded, the upper ones narrow and distant. Flower-heads in rather loose irregular cymes, terminal or in the upper axils, the common peduncle as well as the petals filiform, the lower pair of floral leaves as long as the involucre, the upper ones reduced to small bracts. Involucres and capsules as small as in *F. Mitchelliana*, but the petal-like appendages to the glands broadly obovate or orbicular, the involucre sometimes hairy, the capsule glabrous. Seeds rugose.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown, Henne*; Cairns, *Bailey*.

14. **E. Coghlani** (after J. Coghlan), *Bail. Bot. Bull.* xiii. A small virgate shrub of 1 to 2ft. with dichotomous branches, which are glaucous and more or less covered with short white hairs. Leaves opposite, shortly petiolate, 3 to 6 lines long, oblong to ovate, obtuse or apiculate, often bearing on the veins hairs similar to those on the branches, very unequal-sided at the base, margins nearly

entire or sharply-toothed, parallel veins 3 or 5 starting from near the base; texture somewhat coriaceous. Stipules rather long, tapering from the base, filiform-plumose, very deciduous. Flower-heads shortly pedicellate, in rather loose irregular cymes, terminal upon the upper branchlets. Involucres small as well as the bracts, the petal-like appendage of the involucre glands  $\frac{1}{4}$ -line broad, nearly orbicular, entire, white or slightly coloured. Capsule 3-lobed, about  $1\frac{1}{2}$  line broad. Styles recurved, divided to about the middle. Seeds pruinose, quite smooth.

Hab.: Limestone Ridges of the Georgina River.

15. **E. pilulifera** (alluding to the globular inflorescence), *Linn.*; *Boiss. in DC. Prod.* xv. ii. 21; *Benth. Fl. Austr.* vi. 51. Asthma plant. A prostrate or ascending branched annual, attaining 1 to 2ft., the branches hirsute with spreading hairs and often rufescent. Leaves opposite, shortly petiolate, from ovate to ovate-lanceolate or oblong,  $\frac{3}{4}$  to  $1\frac{1}{2}$ in. long, rather obtuse, usually denticulate, very oblique and narrow or semi-cordate at the base. Stipules small, linear, inserted on a transverse raised line. Flower-heads minute and numerous, crowded in head-like cymes on short peduncles in one axil of each pair of leaves or terminating the branches. Involucre about  $\frac{1}{3}$  line long, the glands small and entire, without the petal-like appendages of the preceding species. Capsule  $\frac{1}{2}$  to  $\frac{3}{4}$  line diameter, more or less hairy. Seeds slightly rugose.

Hab.: Common throughout the colony. A common tropical weed of cultivation both in the New and the Old World.

"Tea" made from the dried leaves gives great relief to persons suffering from asthma.

16. **E. eremophila** (found in the desert), *A. Cunn. in Mitch. Trop. Austr.* 348; *Benth. Fl. Austr.* vi. 52. An erect glabrous hard annual or perhaps perennial, usually dichotomous and from 6in. to 1ft. high, but in some situations taller and more slender. Lower leaves and sometimes a few on lateral branches alternate, all the others opposite, petiolate, linear or rarely linear-lanceolate or oblong, more or less remotely serrulate or sometimes quite entire,  $\frac{1}{2}$  to above 1in. long, leaving when fallen off a gland-like scar and sometimes a second one immediately above, the stipules often scarcely perceptible or quite wanting. Flower-heads solitary in one axil only of the pair of leaves, on a short pedicel. Involucre scarcely 1 line long, the glands (5 or 4) broad, reniform, without appendages. Bracts within the involucre few and short. Capsule about 2 lines long, glabrous and smooth, the stipes rather long. Seeds granular-rugose, with a rather large variously shaped caruncle.—*Boiss. in DC. Prod.* xv. ii. 70, and *Euph. Ic.* t. 43; *E. deserticola*, *F. v. M. in Linnæa*, xxv. 440.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Broadsound and Shoalwater Bay, *R. Brown*; Port Curtis, *M. Gillivray*; Three Isles, Barrier Reef Passage, and islands of Moreton Bay, *F. v. Mueller*; Rockingham and Edgecombe Bays, *Dallachy*; Rockhampton, *Bowman* and others; Warrego River, *Mitchell*.

Often received from inland localities as a poison plant.

17. **E. corynoclada** (branchlets cup-shaped), *F. v. M., Sou. Sci. Rec.* ii. (new series), April, 1886. A glabrous shrub with an undivided stem, about 10ft. high; the ultimate branchlets terete, thickened gradually upwards, 8 to 9in. long, the summit about  $\frac{3}{4}$ in. thick, marked by almost semi-circular scars, arranged somewhat spirally. Cymes terminal, compound, the ultimate portions recurved, the pedicels clasped by a very narrow membrane. Bracts opposite, reddish, deltoid-ovate, not distant from the flower; tube of the involucre nearly hemispherical, slightly angular. Lobes 5, ovate, obtuse, membranous, fringed, shorter than the renate-orbicular entire glands; bracteoles within the involucre nearly as long as the stamens, somewhat fringed; filaments very short; anther-cells roundish and somewhat compressed laterally; segments of the

female calyx 3, very short, oval or roundish; styles free, undivided. Capsule about 4 lines diameter, smooth, nearly globular; seeds globular, about 2 lines diameter; testa brownish, smooth, no conspicuous arillus; embryo narrow. Cotyledons cordate-orbicular.

Hab.: On rocks, Waiwier Island, about 10 miles west of Thursday Island.—*W. Bauerlen*.

This cactus-like *Euphorbia* might be systematically placed near *E. aphylla*.

18. **E. \*Peplus** (old Greek name), *Linn.*; *Boiss. in DC. Prod.* xv. ii. 141. A glabrous annual plant of 3 to 9in. in height. Leaves below the flowering branches alternate, membranous, roundish, tapering into the petiole, very blunt, entire, smooth. Inflorescence dichotomous, the primary branches forming an umbel of about 3 rays, the floral leaves opposite without stipules; involueral glands crescent-shaped, without petal-like appendages. Capsule glabrous, smooth; seeds pitted.

Hab.: This European weed is now common in many gardens.

19. **E. \*heterophylla** (various leaved), *Linn.* A shrub of short duration, 2 to 3ft. high, glabrous or puberulous. Leaves variously lobed, the bract ones blotched with scarlet. Involucre pedicellate, with 5 incised lobes; glands cyathiform.—*Poinsettia cyathophora*, *Boiss.*

Hab.: South America. This plant is straying from garden culture.

## 2. PORANTHERA, Rudge.

(Anthers opening by pores.)

Flowers monœcious. Male flower: Calyx petal-like, deeply divided into 5 segments imbricate in the bud. Petals 5, small or occasionally deficient, with a small gland at the base of each. Stamens 5, opposite the calyx-segments; anther-cells completely divided, forming 4 distinct cells opening in terminal pores either quite distinct or at length confluent into 2. Rudimentary ovary of 3 small clavate or membranous bodies. Female flowers: Calyx and petals of the males. Stamens 0. Ovary broad, flat or concave at the top, 6-lobed, 3-celled, with 2 ovules in each cell. Styles 3, divided to the base into 2 linear branches. Capsule depressed globular, opening in 3 loculicidal valves or separating into 3 2-valved cocci, the valves usually separating more readily than the cocci, the whole falling away leaving a persistent clavate axis. Seeds strongly reticulate. Embryo terete, curved, the cotyledons not broader than the radicle.—Herbs either annual or after the first year becoming suffrutescent. Leaves alternate, membranous, entire, narrow or small. Stipules small, acuminate. Flowers small, white, in very short dense racemes almost contracted into heads, each one in the axil of a floral leaf or bract, the head-like racemes solitary or more frequently several in a terminal leafy corymb.

The genus is limited to Australia.

1. **P. microphylla** (leaves small), *Brongn. in Duperr. Voy. Coq. Bot.* 218, t. 50 B.; *Benth. Fl. Austr.* vi. 56. A low diffuse glabrous slender annual, sometimes becoming hard at the base, the branches ascending to from 3 to 6in. Leaves from linear-spathulate to obovate, obtuse, tapering into a rather long petiole, flat or with the margins slightly recurved,  $\frac{1}{4}$  to  $\frac{1}{2}$ in. long or sometimes longer when narrow or scarcely 2 lines long when obovate. Flower-heads in small very leafy corymbs, the outer floral leaves usually exceeding the flowers. Flowers minute, the petals very variable, sometimes fully half as long as the calyx, sometimes some or all much smaller or entirely deficient. After the flowers have fallen the rhachis is often much elongated.—*Muell. Arg. in DC. Prod.* xv. ii. 193; *Klotzsch in Pl. Preiss.* ii. 230; *Hook. f. Fl. Tasm.* i. 343; *P. Drummondii*, *Klotzsch, l.c.*, 231.

Hab.: Sandy Cape and Keppel Bay, *R. Brown*; Port Curtis, *M. Gillivray*; Endeavour River, *A. Cunningham*; Brisbane River, *Prentice*. A very common plant.

## 3. MICRANTHEUM, Desf.

(Flowers small.)

Flowers usually monœcious. Male flower: Perianth of 6 petal-like segments, the three inner ones often rather larger. No internal disk. Stamens either 3 opposite the outer perianth-segments, or 6 opposite all the segments, or 8 or 9 more irregularly inserted anthers with 2 parallel cells opening longitudinally. Rudimentary ovary small and lobed. Female flower: Perianth of the males. Ovary 3-lobed and 3-celled, the lobes alternating with the inner perianth-segments and terminating in simple styles. Ovules 2 in each cell. Capsule 3-celled. Seeds 2 (or 1 by abortion) in each cell, oblong, smooth, carunculate. Embryo linear, straight, the cotyledons twice as large as and not much broader than the radicle.—Much branched heath-like shrubs. Leaves on very short petioles, small, narrow, entire, coriaceous, in alternate threes on each side of the stem, supposed to be the 3 leaflets of a compound leaf, but without any common petiole. Flowers small, solitary or few together in the upper axils, the males on short pedicels, the females usually sessile.

The genus is limited to Australia.

1. *M. ericoides* (Heath-like), Desf. in *Mem. Mus. Par.* iv. 253, t. 14; *Benth. Fl. Austr.* vi. 57. A heath-like shrub of 1 to 2ft., the branches and sometimes the foliage hirsute. Leaves or leaflets in threes, linear, flat or with slightly recurved margins, about 3 or rarely 4 lines long, glabrous and smooth or scabrous-pubescent. Flowers in the axils of floral leaves which are often solitary or only 2-together, the males on pedicels shorter than the leaves. Perianth-segments ovate or oval-oblong, about  $\frac{3}{4}$  line long, the inner ones flat, the outer concave and smaller. Rudimentary ovary usually 3-lobed. Female flowers larger, the inner perianth-segments 2 lines long. Capsule smooth, about 3 lines long.—Muell. Arg. in DC. Prod. xv. ii. 195; *M. boroniaceum*, F. v. M. Fragm. i. 32.

Hab.: Port Bowen, R. Brown; Burnett River, F. v. Muehler.

## 4. PSEUDANTHUS, Sieb.

(False flowers; the petals wanting.)

Flowers monœcious. Male flower: Perianth petal-like or rather rigid, of 6 segments nearly equal or one of the inner ones deficient or replaced by a long filament. Stamens 3, 6 or more (as many as 20), free or very shortly united at the base with the small rudimentary ovary. Anthers with 2 separate cells opening outwards in 2 valves. Female flower: Perianth as in the males. Ovary 2- or 3-lobed, with thick diverging stigmatic lobes, 2- or 3-celled when very young with 2 ovules in each cell, but the dissepiments very early obliterated and all the ovules but one abortive. Capsule oblong, 1-celled, 1-seeded, opening in 4 or 6 valves. Seed oblong, smooth, carunculate. Embryo linear, the cotyledons longer but scarcely broader than the radicle.—Heath-like shrubs. Leaves opposite or alternate, small, coriaceous, obtuse, with thick margins and the midrib prominent underneath. Stipules small, subulate or with a broad base. Flowers small, sessile or shortly pedicellate in the upper axils, the males often several together, the females more sessile, solitary and alone or with one or more males.

The genus is endemic in Australia. From *Micranthemum*, *Pseudanthus* is readily distinguished by its solitary leaves, and by the capsule constantly 1-celled and 1-seeded by abortion.

Stamens 6.

Male perianth-segments linear, 5—6 lines long . . . . . 1. *P. pimeleoides*.  
Male perianth segments ovate or oblong-lanceolate, 1 line long or less.

Leaves mostly ovate, 1 to 2 lines long. Perianth 1 line long, inner  
stamens nearly as long . . . . . 2. *P. ovalifolius*.

Leaves mostly oblong-linear, 2—4 lines long. Perianth  $\frac{1}{2}$  line on a  
pedicel longer than itself. Stamens short . . . . . 3. *P. orientalis*.

1. **P. pimeleoides** (Pimelea-like), *Sieb. in Spreng. Syst. Cur. Post.* 25; *Benth. Fl. Austr.* vi. 59. An erect much-branched glabrous shrub 1 to 2ft. high. Leaves alternate, scarcely petiolate, lanceolate or linear, acute, mostly 4 to 6 lines long, smooth. Male flowers clustered at the ends of the branches, shortly pedicellate and very conspicuous from their coloured yellowish linear perianth-segments 4 to 5 or even 6 lines long and exceeding the upper leaves. Stamens 6, generally clustered round a small central rudiment of the ovary, which is sometimes slightly raised and shortly adnate to one of the filaments, but the whole are generally quite free as figured by Endlicher. Female flowers few and inconspicuous. Perianth-segments lanceolate, acute, jagged on the margin, rigid, about  $1\frac{1}{4}$  line long, the ovate ones rather smaller. Ovary narrow, 3-lobed, the dissepiments very imperfect at the time of flowering and only one ovule fertilised. Capsule oblong, acute,  $2\frac{1}{2}$  to 3 lines long, smooth, 1-seeded.—Muell. Arg. in DC. Prod. xv. ii. 196; Endl. Atakta, 11, t. 11, the analysis copied in Flora, 1832, ii. t. 4; Baill. Etud. Euph. t. 25, f. 16.

Hab.: Burdekin Expedition; Whitsunday Island, C. Moore; Repulse Bay, A. Cunningham.

2. **P. ovalifolius** (leaves oval), *F. v. M. in Trans. Phil. Inst. Vict.* ii. 66; *Benth. Fl. Austr.* vi. 59. A densely branched rigid low spreading shrub, quite glabrous or with a slight scabrous pubescence on the angles of the branches and midrib of the leaves. Leaves scattered, occasionally opposite but mostly alternate, on exceedingly short petioles, mostly ovate but varying from orbicular and 1 line diameter to oblong and 2 lines long, very obtuse, rigid, concave or complicate and often recurved at the end. Male flowers very shortly pedicellate in the upper axils; perianth white, the segments not very unequal, about 1 line long. Stamens 6 round a minute rudiment of the ovary, the three inner ones nearly as long as the perianth, the outer ones short and one sometimes very short. Female flowers sessile, the perianth-segments about  $\frac{1}{2}$  line long, red with white margins. Ovary narrow. Fruit not seen.—*Caletia ovalifolia*, Muell. Arg. in Linnæe. xxxiv. 55, and in DC. Prod. ii. 194; Baill. Adans. vi. 327.

Hab.: Recorded for Queensland by F. v. M.

3. **P. orientalis** (eastern), *F. v. M. Fragm.* ii. 14; *Benth. Fl. Austr.* v. 60. A low densely branched glabrous shrub. Leaves scattered, mostly alternate, often crowded, oblong-linear or linear-spathulate, 2 to 4 lines long, obtuse, thick, concave but often recurved at the end. Flowers in the upper axils very much smaller than in *P. ovalifolia*, the males on pedicels of nearly 1 line. Perianth yellow, scarcely  $\frac{1}{2}$  line long, the segments nearly equal. Stamens 6, the inner ones shorter than the perianth, the outer ones very short. Female flowers sessile, sometimes in the same axil as the males, the perianth rather larger. Ovary still narrower than in *P. ovalifolia*. Capsule narrow-oblong, about 2 lines long, 1-seeded by abortion.—Muell. Arg. in DC. Prod. xv. ii. 197; *Caletia orientalis*, Baill. Adans. vi. 326; *C. linearis*, Muell. Arg. in Linnæe, xxxii. 79 and in DC. Prod. xv. ii. 194; Baill. Adans. vi. 327.

Hab.: Logan River, Rev. B. Scortechini; Fraser Island, Miss Lovell; Bustard Heads, J. Keys; Moreton Island, J. Shirley.

## 5. BEYERIA, Miq.

(After a Dutch botanist, Beyer.)

(Calyptrostigma, Klotzsch; Beyerriopsis, Muell. Arg.)

Flowers monœcious or rarely diœcious. Male flower: Calyx of 5 rarely 4 broad segments, imbricate, concave and more or less petal-like. Petals as many, small or rarely exceeding the calyx, or fewer or more. Glands as many as petals and alternating with (or rarely opposite to) them. Stamens numerous, with very short filaments, crowded on a hemispherical receptacle, without any central

rudimental ovary; anthers with 2 distinct parallel cells opening outwards longitudinally in 2 valves. Female flower: Calyx-segments thicker and narrower than in the males, often enlarging after flowering. Ovary 3-celled, entire, with 1 ovule in each cell; stigma sessile, broad, entire or 3-lobed, peltate and flat or more or less calyptriform and almost conical, more rarely deeply 3-lobed. Capsule 3-celled, 3-seeded, or rarely oblique and 1-seeded by abortion. Seeds oblong, smooth, carunculate. Embryo narrow-linear, the cotyledons longer but scarcely broader than the radicle.—Shrubs often more or less glutinous, with alternate leaves, usually narrow, with recurved or revolute margins, white underneath with a close stellate pubescence. Flowers small, axillary, the males solitary or in clusters of 2 or 3, rarely racemose, the females solitary.

The genus is limited to Australia.

SECT. I. **Eubeyeria**.—*Anthers twice as long as broad, adnate to an entire or scarcely lobed connective. Stigma entire or scarcely lobed.*

Leaves oblong lanceolate or broadly linear, flat or with recurved margins, mostly 1 to 2in. long. Capsule glabrous . . . . . 1. *B. viscosa*.

SECT. II. **Oxygyne**.—*Anthers short, either adnate to a deeply 2-lobed connective, or partially free with the connective more entire. Stigma deeply 3-lobed. Male flowers in a loose raceme.*—*Tropical species.*

Leaves ovate or lanceolate, tapering at the base, 1 to 1½in. long . . . . . 2. *B. tristigma*.

1. **B. viscosa** (viscid), *Miq. in Ann. Sc. Nat. ser. 3, i. 350, t. 15; Benth. Fl. Austr. vi. 64.* A tall shrub or tree, the flowering and fruiting branches usually viscid. Leaves from oval-oblong to oblong-lanceolate or broadly linear, mostly obtuse, tapering into a petiole, the margins often recurved, glabrous above, pale or white-tomentose underneath, usually from 1 to above 2in. in length. Flowers axillary or lateral, on recurved pedicels of  $\frac{1}{4}$  to nearly  $\frac{1}{2}$ in., the females solitary, the males often 2 or 3 together. Calyx-segments broad, coloured, about 2 lines long. Petals small. Anthers (about  $\frac{1}{2}$  line long) twice as long as broad, the cells wholly adnate to the entire connective. Female calyx smaller than the male, the thickened pedicel appearing to form part of it, the segments narrow with frequently small glands alternating with them. Ovary nearly globular, the large calyptriform sessile stigma closely appressed when young, raised and flat or concave when fully out. Capsule ovoid-globular, about 4 lines long, hard and glutinous, 3-celled and 3-seeded.—*Muell. Arg. in DC. Prod. xv. ii. 202; Croton viscosum, Labill. Pl. Nov. Holl. ii. 72, t. 222; Calpytrostigma viscosum and C. oblongifolium, Klotzsch in Pl. Preiss. i. 176; Beyeria oblongifolia, Hook. f. Fl. Tasm. i. 339.*

Hab.: Mount Flinders and Cape Porteous, *A. Cunningham*; Moreton Bay, *F. v. Mueller*; sources of Cape River, *Bowman*; Mount Wheeler, *Sutherland*.

2. **B. tristigma** (stigma 3-lobed), *F. v. M. Fragm. vi. 181; Benth. Fl. Austr. vi. 68.* A small viscid shrub, glabrous except the underside of the leaves. Leaves resembling those of the common Olive, oval-elliptical or oblong-lanceolate, tapering into a short petiole, the margins recurved or revolute, 1 to 1½in. long. Flowers monœcious, the males very small, few in a loose raceme of about 1in. at the end of the branches, the pedicels 2 to 4 lines long. Calyx-segments 5, not  $\frac{1}{2}$  line long. Petals 3 times as long, ovate, obtuse, fringed inside at the base with a tuft of hairs. Stamens very numerous on a hirsute convex or hemispherical receptacle; anther-cells short, quite distinct. Female flowers on a pedicel of  $\frac{1}{2}$ in. or longer when in fruit, either solitary at the end of the branches or 1 or 2 at the base of the male raceme, smaller than the males at the time of flowering, but the calyx-segments enlarging under the fruit to nearly 1 line.



Ovary capsule and seed of the genus, but the stigma divided to the base or nearly so into 3 narrow flat recurved lobes.

Hab.: Hinchinbrook Island, Rookingham Bay, *Dallachy*.

The racemose male flowers, the petals much longer than the calyx, and the divided stigma or style bring this species near to *Ricinocarpus*, but the stamens are entirely those of *Beyeria*, and the stigmatic lobes are closely recurved as in that genus, to which on the whole it appears to be the nearest related.—*Benth*.

6. RICINOCARPUS, Desf.  
(Fruit resembling that of *Ricinus*)

(*Rœperia*, *Spreng.*)

Flowers monœcious. Male flower: Calyx deeply divided into 4 to 6 usually 5 lobes or segments. Petals as many as calyx-lobes and usually longer, rarely deficient. Glands as many as petals and alternating with them. Stamens numerous, united in a central column without any rudimentary ovary; filaments shortly free, anthers reflexed, with 2 parallel cells opening outwards longitudinally in 2 valves. Female flower: Calyx and petals of the males, very deciduous or rarely persistent. Ovary 3-celled, with 1 ovule in each cell. Styles 3, shortly united at the base, deeply divided into 2 branches. Capsule separating into 3 2-valved cocci. Seeds oblong, smooth, carunculate. Embryo (where known) linear, straight, the cotyledons longer but scarcely broader than the radicle.—Shrubs either glabrous or stellate-tomentose. Leaves alternate, entire, linear oblong or lanceolate, the margins recurved or revolute, usually pale white or tomentose underneath, without stipules. Flowers solitary or clustered, or the males rarely racemose, terminal or rarely apparently axillary from the reduction of the flowering branch, the females either alone or surrounded by or by the side of the male cluster or raceme. Pedicels usually subtended by small scale-like bracts, and often bearing a pair of bracteoles.

The genus is limited to Australia.

Glabrous plant with linear leaves. Flowers clustered.

Bracteoles deciduous or none. Male calyx divided scarcely below the middle. Female calyx deciduous. Capsule obtuse, as broad as long, densely muricate. Style-branches nearly terete, spreading or recurved . . . . .

1. *R. pinifolius*.

Branches and calyx tomentose. Flowers clustered.

Leaves linear, the margins much revolute, under 1in. long. Petals longer than the calyx. Ovary muricate . . . . .

2. *R. Bowmanni*.

Leaves linear, the margins revolute, 1 to 2½in. long. Petals as long as the calyx. Ovary tomentose . . . . .

3. *R. ledifolius*.

Leaves narrow-oblong, 3 or more in. long, the margins somewhat revolute

4. *R. speciosus*.

1. **R. pinifolius** (leaves Pine-like), *Desf. in Mem. Mus. Par.* iii. 459, t. 22; *Benth. Fl. Austr.* vi. 70. An erect handsome glabrous tree of 30ft., but often flowering as a shrub of 2 to 3ft. Leaves rather crowded, linear, mucronate or almost obtuse, with the margins revolute to the midrib, ¾ to 1½in. long, contracted into a short petiole. Flowers in a terminal cluster, usually 1 female with 3 to 6 males, but sometimes either the female or the males deficient, the pedicels to 1in. long, bearing a pair of minute caducous bracteoles above the middle, each pedicel embraced at the base to the subtending bract. Male calyx 1½ to 2 lines long, divided to the middle or rather lower into 4 to 6 lobes. Petals white, usually about ½in. long. Female calyx more deeply divided and falling away very early. Capsule nearly globular, very obtuse, densely muricate, about ½in. long.—*Muell. Arg. in DC. Prod.* xv. ii. 205; *Baill. Etud. Euph.* t. 12, f. 39 to 44, and *Adans.* vi. 294; *Hook. f. Fl. Tasm.* i. 338; *Endl. Iconogr.* t. 124; *Rœperia*

*pinifolia*, Spreng. Syst. iii. 147; *Echinosphæra rosmarinoides*, Sieb. Pl. Exs.; *Ricinocarpus sidæiformis*, F. v. M. in several Herb., quoted by Baill. Etud. Euph. 344 as *R. sidæifolius*.

Hab.: Stradbroke and Moreton Islands, *A. Cunningham*; Logan River, *B. Scortechini*.

Wood light-coloured, soft, close in the grain and easily worked.—*Bailey's Cat. Ql. Woods*, No. 357.

2. **R. Bowmanni** (after E. Bowman), *F. v. M. Fragm.* i. 181; *Benth. Fl. Austr.* vi. 72. An erect bushy shrub, usually small, the branches and inflorescence tomentose. Leaves almost sessile, linear, the margins usually recurved to the midrib, smooth or scabrous-tuberculate, from under  $\frac{1}{2}$  in. to nearly 1 in. long. Male flowers pink, in terminal clusters of 3 to 6, the pedicels about as long as the leaves. Calyx densely tomentose, the segments obtuse, about 2 lines long. Petals not twice as long. Glands flat, mostly 2-lobed and hairy. Female flowers solitary, alone or in the male cluster. Capsule 4 to 5 lines long, hirsute with rather long hairs which at length wear off. Styles divided to the base.—*Muell. Arg. in DC. Prod.* xv. ii. 206; *R. puberulus*, Baill. Etud. Euph. 344, name only, referred by *Muell. Arg.* without doubt to *R. Bowmanni*, but described by Baill. *Adans.* vi. 295, from a specimen with male flowers only, as doubtfully distinct.

Hab.: Upper Maranoa River, *Mitchell*.

3. **R. ledifolius** (Ledum-leaved), *F. v. M. Fragm.* i. 76; *Benth. Fl. Austr.* vi. 72. A shrub attaining 8 to 10 ft., the branches and inflorescence tomentose. Leaves shortly petiolate, oblong-linear or lanceolate, with recurved margins, white-tomentose underneath, 1 to 2 in. long. Male flowers in terminal clusters of 3 to 5, the pedicels 3 to 5 lines long, occasionally bearing 2 flowers. Calyx tomentose, about 2 lines long, the segments very obtuse. Petals about as long as the calyx. Glands more or less united in a crenulate ring. Female flowers solitary, alone or with the males, on a rather longer and stouter pedicel, and rather larger. Capsules about 2 lines long, densely stellate-tomentose.—*Muell. Arg. in DC. Prod.* xv. ii. 206; Baill. *Adans.* vi. 294.

Hab.: Burdekin River, *F. v. Mueller*; Darling Downs, *Dallachy*; Rockhampton, *O'Shanesy* Herbert's Creek, *Bowman*.

4. **R. speciosus** (sightly), *Muell. Arg. in DC. Prod.* xv. ii. 204; *Benth. Fl. Austr.* vi. 73. A tall, slender, erect shrub, 5 to 7 ft. high. Branches clothed by a close, hoary, slightly rusty, stellate tomentum. Leaves shortly petiolate, oblong-linear or lanceolate, the margins recurved, the upper surface bright green when old, but while young covered by stellate hairs, densely white-tomentose on the under surface, 3 or more inches long and over  $\frac{1}{2}$  in. broad, on petioles of about 3 lines. Bracts linear, nearly as long as the pedicels. Flowers terminal, about 5 together, mostly male, the pedicels about  $\frac{1}{2}$ -inch long, with a pair of minute bracteoles about the middle. Calyx-lobes about 2 lines long, 1 line broad, rather obtuse, larger under the fruit. Petals white, oblong, 5 lines long,  $2\frac{1}{2}$  lines broad, and shortly clawed. Glands distinct, very broad and densely ciliate, with long white hairs. Capsule oblong, about  $\frac{1}{2}$  in. long, densely clothed by stellate hairs and bearing the prominently divided styles.

Hab.: Belmont Scrub, near Brisbane.

## 7. BERTYA, Planch.

(After Count Léonce de Lambertye.)

Flowers monœcious. Male flowers: Perianth (calyx?) deeply divided into 5 petal-like segments, without inner petals or glands. Stamens numerous, united in a central column without any rudimentary ovary; filaments shortly

free, spreading or recurved; anthers with 2 parallel cells opening longitudinally and outwards in 2 valves. Female flowers: Perianth of the males, but the segments usually smaller and narrower, and sometimes much enlarged round the fruit. Ovary 3-celled, with 1 ovule in each cell, but usually only one of the three fertilized. Styles 3, free or shortly united at the base, each one more or less deeply divided into 2 to 4 (usually 3) branches. Capsule ovoid or oblong, obtuse, or acute, usually 1-celled and 1-seeded by abortion. Seed oblong, smooth, carunculate; embryo (where known) linear, straight, the cotyledons longer but scarcely broader than the radicle. Shrubs often glutinous, more or less stellate-tomentose, or glabrous. Leaves alternate or opposite without stipules, the margins recurved or revolute, rarely flat, glabrous above when full-grown, tomentose or white underneath. Flowers axillary, solitary or few together, pedicellate or almost sessile, with 3 to 8 small bracts on the pedicel, either persistent and imitating a calyx (but imbricate and not uni-seriate) or deciduous.

The genus is limited to Australia.

- Leaves narrow, revolute to the midrib. Ovary glabrous, tapering to the top. Fruiting perianth much enlarged. Whole plant glabrous or nearly so. . . . . 1. *B. pinifolia*.
- Leaves narrow, revolute to the midrib. Ovary densely villous, tapering at the top. Fruiting perianth scarcely enlarged, or much shorter than the capsule. . . . .
- Flowers pedicellate, the perianth-segments scarcely above 1 line . . . . . 2. *B. rosmarinifolia*.
- Flowers solitary in both sexes and sessile. Leaves opposite . . . . . 3. *B. oppositifolia*.
- Leaves narrow, 1 to 2in. long, with the margins less revolute showing the underside. Ovary densely villous, obtuse. Fruiting perianth much enlarged . . . . . 4. *B. olecefolia*.
- Leaves narrow, 1 to 2in. long, with recurved margins. Flowers pedicellate. Pedicels 2 to 3 lines. Bracts usually few, very deciduous or none. Ovary villous. . . . . 5. *B. pedicellata*.

1. **B. pinifolia** (leaves Pine-like), *Planch. in Hook. Lond. Journ.* iv. 473; *Benth. Fl. Austr.* vi. 75. A tall shrub, glabrous or nearly so and apparently viscid. Leaves narrow-linear, sessile or nearly so, with the margins much revolute, mostly 1 to 1½ in. long. Flowers almost sessile. Bracts thick, unequal, the outer ones linear, the inner ones mostly acuminate from a broad base. Male-perianth segments nearly 2 lines long. Ovary quite glabrous, tapering into a neck or united base of the styles of nearly 1 line, the styles divided to below the middle usually into 3 branches. Capsule enclosed in the enlarged perianth, oblong and obtuse.—*Muell. Arg. in DC. Prod.* xv. ii. 211.

Hab.: Brisbane River, *Fraser*; Stanthorpe.

2. **B. rosmarinifolia** (Rosemary-leaved), *Planch. in Hook. Lond. Journ.* iv. 473; *Benth. Fl. Austr.* vi. 76. A handsome bushy heath-like shrub, attaining 6 to 8ft., the young branches and foliage clothed with a short close stellate tomentum wearing off with age. Leaves sessile or nearly so, linear, with the margins much revolute, mostly about ½ in and rarely nearly 1 in. long. Flowers small, mostly solitary, on a peduncle of ½ to nearly 1 line below the bracts, which are small thick nearly equal about 6 in number and assuming more the appearance of a calyx than in any other species. Perianth-segments rather above 1 line, the female not much enlarged after flowering. Ovary densely villous. Styles divided to the base into 2 or 3 branches. Capsule ovoid-oblong, stellate-hirsute, 3 to 4 lines long and usually at least half as long again as the perianth-segments.—*Muell. Arg. in DC. Prod.* xv. ii. 210; *Hook. f. Fl. Tasm.* i. 339; *Croton rosmarinifolium*, *A. Cunn. in Field, N.S. Wales*, 355; *Ricinocarpus tasmanicus*, *Sond. in Linnæa*, xxviii. 562; *Bertya tasmanica*, *Muell. Arg. in Linnæa*, xxxiv. 63, and in *DC. Prod.* xv. ii. 211.

Hab.: Towards the border of N.S.W.

3. **B. oppositifolia** (leaves opposite), *F. v. M. and O'Shanesky, Wing's S. Sci. Rec.* ii. 98; *Fragm.* xii. 9. A tall slender shrub. Leaves opposite, oval or oblong-elliptical, slightly recurved margins, shortly petiolate, somewhat thick, about 2in. long and 1in. broad, velvety-tomentose on the underside, the upper side nearly or quite glabrous. Flowers of both sexes solitary, sessile. Perianth-segments 4, oval, nearly glabrous, three times as long as the 4 opposite persistent ovate bracts. Staminal-column as long as the perianth. Anthers but little longer than broad. Styles 3 or oftener 4, dilated at the base, deeply cleft into 2 or 4 rather long stigmatic lobes. Ovary 4 or rarely 3-celled. Capsule 4 lines long, ovate-globular, velvety-tomentose, 1 to 3 seeded.

Hab.: Expedition Range, *A. Thozet and Kilner*; Nogo River, *P. O'Shanesky*.

4. **B. oleæfolia** (Olive-leaved), *Planch. in Hook. Lond. Journ.* iv. 473; *Benth. Fl. Austr.* vi. 76. An erect shrub of 3 to 4ft., the branches densely stellate-tomentose. Leaves very shortly petiolate, linear or oblong-lanceolate, with recurved margins, coriaceous, 1 to 2in. long and sometimes above 2 lines broad, thinly scabrous, tomentose above, densely white-tomentose underneath. Flowers more or less dioecious, solitary in the axils and almost sessile, with 5 to 8 unequal bracts, the inner ones nearly 2 lines long. Male perianth with 5 oval-oblong lobes  $2\frac{1}{2}$  to 3 lines long, contracted into a very short turbinate pedicel within the bracts. Female perianth-lobes narrower and more acute than the males. Ovary obtuse, densely hirsute. Styles free from the base and divided nearly to the base into 3 or 4 branches. Capsule enclosed in the enlarged perianth but not seen ripe.—*Muell. Arg. in DC. Prod.* xvii. ii. 209.

Hab.: Mantuan Downs, *Mitchell*; Copperfield, *Grev. Smith* (flowering specimen).

5. **B. pedicellata** (flowers stalked), *F. v. M. Fragn.* iv. 143; *Benth. Fl. Austr.* vi. 77. An erect shrub, with the habit and foliage nearly of *B. oleæfolia*, but the white tomentum very close and soon disappearing from the branches. Leaves linear or oblanceolate, with recurved margins, tapering into a short petiole, glabrous above, white-tomentose underneath,  $1\frac{1}{2}$  to 2 or even  $2\frac{1}{2}$ in. long. Flowers solitary or 2 or 3 together on a short common peduncle, the lower bracts closely complicate, ovate-lanceolate, acuminate, 3 to 4 lines long and very deciduous, smaller ones on the pedicels very deciduous or none. Perianths glabrous. Males only seen loose, with oblong petal-like segments 2 lines long, the staminal column and anthers entirely those of the genus. Female perianths on pedicels of 1 to 2 lines, with 3 or 4 small linear very deciduous bracts, the segments linear, acuminate, nearly  $1\frac{1}{2}$  line long. Styles free from the base, 2 or 3-branched. Ovary tomentose-villous. Capsule narrow-ovoid, rather acute, 3 to 4 lines long, the surrounding perianth not at all enlarged in some specimens, somewhat longer and broader than when in flower in others.—*Baill. Adans.* vi. 298.

Hab.: Rockhampton, *Thozet*.

## 8. MONOTAXIS, Brongn.

(A single arrangement.)

Flowers monœcious. Male flowers: Calyx of 4 or 5 imbricate spreading usually petal-like segments. Petals as many as calyx-segments and shorter or longer. Stamens twice as many as petals or fewer, the filaments distinct or very shortly united at the base, without any rudiment of the ovary; anthers with 2 distinct small almost globular cells, separated by a curved thick connective. Female flowers: Calyx and petals of the males. Ovary 3-celled, with 1 ovule in each cell. Styles 3, each one deeply divided into 2 fringed branches. Capsule globular or tridymous, without appendages, separating into 3 2-valved cocci. Seeds ovate or oblong, smooth, carunculate. Embryo linear, straight or slightly

curved, the cotyledons much longer but scarcely broader than the radicle.—Herbs or undershrubs, usually small and glabrous. Leaves alternate, entire flat or with recurved margins. Stipules very small. Flowers small, in dense head-like cymes, sessile or shortly pedunculate in the forks or at the ends of the branches between the last leaves, the flowers more or less pedicellate within the cymes, the males usually numerous, the females single in the centre or few. Bracts usually several, small and scale-like, subtending the pedicels or the outer ones empty.

A genus of about eight species endemic in Australia.

1. **M. macrophylla** (leaves long), *Benth. Fl. Austr.* vi. 79.—An erect glabrous slightly branched annual of about 1ft. Leaves opposite or alternate, on rather long petioles, oblong or ovate-oblong, obtuse, entire, thin and flat, 1 to 2in. long. Flower-heads (or dense cymes) shortly pedunculate above the last leaves, containing several female flowers intermixed with or surrounded by numerous males. Male calyx of 4 very slightly imbricate petal-like segments of about  $\frac{3}{4}$  line. Petals minute. Stamens 7 or 8. Ovary of the females only seen in very young bud, the styles then short and involute, and of the capsules the specimens examined only showed the persistent axis, about 1 line long, from which the cocci had fallen away.

Hab.: Summit of Mount Danger near Moreton Bay, *A. Cunningham*; Bundaberg, *Jas. Keys* (may belong to this species but specimens imperfect).

## 9. AMPEREA, A. Juss.

(After M. Ampère)

Flowers monœcious or diœcious. Male flower: Perianth campanulate, somewhat petal-like, 3- to 5-lobed, without inner petals. Stamens twice as many as perianth-lobes or fewer, the filaments free or shortly united at the base, without any rudimentary ovary and sometimes surrounded by as many small glands as perianth-lobes; anthers 2-celled or 1 or more of the outer ones one-celled, the cells distinct, globular or ovoid, parallel, opening longitudinally in 2 valves, the connective usually tipped with a small gland. Female flower: Perianth more deeply divided than the males into 5 rarely 4 rather rigid lobes, persistent but scarcely enlarged under the fruit. Ovary 3-celled, with one ovule in each cell. Styles 3, more or less deeply divided into 2 branches. Capsule ovoid, crowned by a ring of 6 erect tooth-like appendages, each on the back of one of the valves, separating into 3 2-valved cocci. Seeds ovoid-oblong, smooth, carunculate. Embryo, where known, linear, slightly curved, the cotyledons longer but scarcely broader than the radicle.—Perennials or undershrubs with a hard often woody base or rhizome, the stems erect or procumbent, usually rigid, sometimes almost or quite leafless. Leaves when present alternate, linear, either entire with closely revolute margins, or flat and then sometimes toothed. Stipules small brown and scarious. Flowers very small in small axillary closely sessile tufts, surrounded by scarious bracts, the males usually numerous, the females few or solitary, all on very short pedicels or almost sessile. Capsule small.

The genus is endemic in Australia, and the species, so far as at present known, all Western except *A. spartioides*.

1. **A. spartioides** (Spartium-like), *Bronqn. in Duperr. Voy. Cog.* 226, t. 49 A; *Benth. Fl. Austr.* vi. 84. Stems, from a hard woody base or rhizome, erect, 1 to 2ft. high, rigid, flat or 3-angled, often above 1 line or even 2 lines broad, usually leafless at the time of flowering. Leaves few only on the young stems or in the lower portion, cuneate-oblong, often toothed, contracted into a short petiole;  $\frac{1}{2}$  or sometimes 1in. long, the floral ones when present few and very much smaller, linear and entire. Stipules small, deeply fringed or lobed.

Flowers nearly sessile in clusters at the nodes, the males often numerous, the females solitary, either alone or surrounded by a few males. Bracts small, broad, mostly fringed. Male perianth nearly 1 line long, broadly campanulate, divided to the middle into 4 rarely 5 lobes. Stamens 8 rarely 10, all with 2-celled anthers. Female perianth more deeply 5-lobed. Ovary crowned by 6 acute dorsal teeth or appendages. Styles rather short, more or less bifid.—Muell. Arg. in D.C. Prod. xv. ii. 214; A. Rich. Sert. Astrol. 53, t. 20; *A. cuneiformis*, F. v. M. Herb. and in Baill. Etud. Euph. 455; *Leptomeria siphoclada*, Sieb. in Spreng. Syst. Cur. Post 109.

Hab.: Islands of Moreton Bay, *Rev. B. Scortechini*.

### 10. BRIDELIA, Willd.

(After Prof. Bridel, the muscologist.)

Flowers monœcious, in axillary clusters or solitary. Male flowers: Calyx deeply divided into 5 segments, valvate in the bud, spreading when in flower. Petals 5, scale-like, stipitate or spatulate, the small lamina usually broad and dentate. Disk broad, with a free entire or slightly lobed margin. Stamens 5, inserted on a central column arising from the disk, the filaments spreading horizontally under an abortive or lobed style which terminates the column without any ovary. Anther-cells parallel, opening longitudinally. Female flowers: Calyx of the males or with longer narrow segments. Disk the same but with the addition of an inner erect margin or cup closely surrounding the ovary. Ovary 2-celled or very rarely and exceptionally 3-celled, with 2 ovules in each cell. Styles distinct or connate at the base, more or less 2-lobed or nearly entire. Fruit a small berry or drupe, with a succulent indehiscent epicarp, the endocarp rather hard or crustaceous, separating into two indehiscent cocci or pyrenes. Seeds usually solitary in each pyrene, with a longitudinal furrow on the inner face; albumen copious; embryo nearly straight, with broad flat cotyledons and a short narrow radicle.—Shrubs or trees. Leaves alternate, petiolate, entire, with fine parallel diverging primary veins and transverse veinlets prominent on both sides. Stipules small. Flowers small, sessile or very shortly pedicellate, and surrounded by small scale-like bracts, the males and females in the same or separate clusters. Berries or drupes small, red or black.

The genus extends over the warmer regions of Asia and Africa. Of the three Queensland species, one is also Asiatic, the two others are endemic.

Whole plant glabrous. Flowers few together. Male calyx-segments 1 line long. Staminal column not half so long as the filaments. Styles very short. 1. *B. exaltata*.

Young shoots and underside of the leaves tomentose-pubescent.

Flowers in dense clusters. Female calyx about  $\frac{3}{4}$  line long . . . . . 2. *B. tomentosa*.

Flowers solitary or 2 or 3 together. Female calyx at least 1 line long . . . 3. *B. faginea*.

1. ***B. exaltata*** (tall), *F. v. M. Fragm.* iii. 32; *Benth. Fl. Austr.* vi. 119. A tree of 60 to 70ft. perfectly glabrous. Leaves shortly petiolate, ovate-lanceolate, acute or rather obtuse, with much more numerous primary veins than in *B. tomentosa*, 2 to 6in. long, somewhat glaucous underneath. Flowers few together and almost sessile, the floral leaves often deciduous or abortive. Male calyx-segments above 1 line long, thin and spreading. Disk large. Staminal column very short, the filaments at least twice as long. Berries glossy brown, oval, about  $3\frac{1}{2}$  lines, globular. Styles exceedingly short.—*B. orata* var. *exaltata*, Muell. Arg. in DC. Prod. xv. ii. 495; *Amanoa orata*, Baill. Adans. vi. 336.

Hab.: Brisbane River and other southern localities.

Wood of a dark-drab color, hard and close in the grain, somewhat resembles walnut and suitable for cabinet work.—*Bailey's Cat. Ql. Woods*, No. 358.

2. **B. tomentosa** (tomentose), *Blume: Muell. Arg. in DC. Prod.* xv. ii. 501; *Benth. Fl. Austr.* vi. 120. A tree with rather slender branches, minutely tomentose-pubescent when young as well as the underside of the leaves, but often becoming soon glabrous. Leaves from elliptical-oblong to ovate-elliptical, membranous, with 7 to 15 primary divergent veins on each side of the midrib, and the transverse veinlets also conspicuous,  $1\frac{1}{2}$  to 3in. long. Male flowers densely clustered, sessile or nearly so. Calyx-segments lanceolate, acute, horizontally spreading, rather above  $\frac{1}{2}$  line long. Petals about half as long, stipitate or spathulate, broad and lobed. Disk broad, with a rather thick flat free and entire margin. Staminal column slender, the free part of the filaments about as long, radiating from the top of the column round the central abortive 3 to 5-lobed pistil. Female flowers on very short thick pedicels. Calyx rather larger than in the males and petals more entire. Disk with a double margin, the outer one flat and entire or nearly so, the inner one forming a short cup immediately round the ovary and usually 5-lobed. Ovary 2-celled. Styles shortly and thickly 2-lobed, connivent or spreading. Fruit nearly globular, ripening usually only 1 seed in each cell, and the cocci or rather pyrenes scarcely separating.—*Amanoa tomentosa*, Baill. Adans. vi. 336.

Hab.: Rockhampton, *O'Shaneys*; Somerset and Thursday Island.

Var. *ovoides*. Fruits ovoid. Wood Island, *Gulliver*.

The species is also in East India and the Archipelago, extending northward to South China.

3. **B. faginea** (Beech-like), *F. v. M. Herb.*; *Benth. Fl. Austr.* vi. 120. A tall shrub or small tree, the slender branches and underside of the leaves tomentose-pubescent or at length glabrous. Leaves ovate or elliptical, very obtuse or almost acute, 1 to 2in. long, firmer than in *B. tomentosa*, and on some branches under 1in. long and obovate or almost orbicular. Stipules lanceolate. Bracts small. Flowers closely sessile, solitary or 2 together, mostly female in specimens examined, but the males appear to be also solitary. Male calyx-segments rather broad, obtuse, scarcely above  $\frac{1}{2}$  line long. Petals entire or nearly so. Stamens of *B. tomentosa*. Female calyx-segments narrow and at least 1 line long, the inner disk large. Fruit red, globular, fully 2 lines diameter, hard but not thick, separating into 2 cocci or pyrenes, and ripening only one seed in each.—*Amanoa faginea*, Baill. Adans. vi. 336.

Hab.: Rockhampton, *Dallachy, Bowman*; Keppel Bay, *Dallachy*; Port Denison, *Fitzalan*; Gowrie Mountain, Darling Downs (fruiting specimens).

Wood greyish-brown, mottled and becoming darker towards the centre, an easily worked wood.—*Bailey's Cat. Ql. Woods*, No. 358A.

## 11. CLEISTANTHUS, Hook. f.

(Flowers shut or closed.)

Flowers monœcious, in sessile clusters, axillary or in leafless spikes. Male flower: Calyx deeply divided into 5 lobes or segments, valvate in the bud, spreading when in flower. Petals 5, stipitate or spathulate, with a small lamina usually broad and dentate. Disk broad with an entire or slightly lobed free margin. Stamens 5, inserted on a central column arising from the disk, the filaments diverging or spreading horizontally under an abortive lobed style terminating the column without any ovary; anther-cells parallel, opening longitudinally in 2 valves. Female flower: Calyx less deeply divided than in the males, the base forming a cup under the ovary. Disk adnate with an entire sometimes scarcely prominent free margin, and within it an erect cup or margin close under the ovary. Ovary 3-celled, with 2 ovules in each cell. Styles 3, distinct, bifid. Capsule globular or depressed, 3-furrowed, separating into 3 2-valved deciduous cocci, leaving, besides the central axis, a broad persistent base. Seeds with a rather scanty albumen; cotyledons broad, rather thin,

often more or less folded.—Trees or shrubs. Leaves alternate, coriaceous, entire, the primary veins not so prominent as in *Briedelia*, arcuate and anastomosing far within the margin, the veinlets reticulate, not transverse.

The genus extends, like *Briedelia*, over the warmer regions of Africa, Asia, and the South Pacific islands, but the Australian species appear to be all endemic. The abortion of the floral leaves in many species gives them a peculiar inflorescence, different from that of any other Australian *Phyllanthææ*.

Flower-clusters all axillary, small. Leaves mostly under 2in. Stamens very shortly united.

Capsule stipitate. Leaves obtuse . . . . . 1. *C. Cunninghamii*.

Capsule sessile. Leaves mostly acuminate . . . . . 2. *C. apodus*.

Flower-clusters mostly in leafless interrupted ferruginous spikes. Leaves above 2in. long. Staminal column as long as the filaments.

Calyx-segments  $1\frac{1}{2}$  line long. Leaves green on both side. Capsule glabrous . . . . . 3. *C. Dallachyanus*.

Calyx-segments scarcely 1 line long. Leaves pale or glaucous underneath. Young capsule villous . . . . . 4. *C. semiopacus*.

1. **C. Cunninghamii** (after A. Cunningham), *F. v. M. Arg. in DC. Prod.* xv. ii. 503; *Benth. Fl. Austr.* vi. 122. A tall shrub, quite glabrous or the young shoots slightly pubescent. Leaves petiolate, ovate-oblong or elliptical, rather thinly coriaceous, obtuse or rarely obtusely and obscurely acuminate, mostly  $1\frac{1}{2}$  to 2in. long, often glaucous underneath. Flowers in dense axillary clusters, sessile or nearly so. Male calyx glabrous. Petals small, obovate-cuneate. Stamens very shortly united at the base. Female calyx with a broadly turbinate base, the lobes spreading, under 1 line long. Disk lining the turbinate base and produced into a short cup round the ovary. Ovary very villous, the tapering base half included in the base of the calyx. Styles rather long. Fruit depressed globular, tridymous, at first very villous, but becoming nearly glabrous when ripe, borne on a stipes usually exceeding the calyx but variable in length.—*Lebediera Cunninghamii*, Muell. Arg. in *Linnaea* xxxii. 80; *Amanoa Cunninghamii*, Baill. Adans. vi. 335.

Hab.: Brisbane River, Moreton Bay, *A. Cunningham*, Fraser, *F. v. Mueller*; Burnett River, *F. v. Mueller*; Rockhampton, *Dallachy*.

Wood hard, close-grained and light-colored.—*Bailey's Cat. Ql. Woods*, No. 359.

2. **C. apodus** (stalkless), *Benth. Fl. Austr.* vi. 122. "Gillowari," Barron River, *F. Cowley*. A straggling shrub or small bushy tree, usually quite glabrous, nearly resembling *C. Cunninghamii*, but the leaves more ovate, and usually acute or acuminate, the male flowers rather smaller, the calyx-segments scarcely above 1 line long, the female calyx-lobes broader, 1 line long. Ovary hirsute with a few long hairs. Styles united at the base in a short column, the bifid branches spreading. Capsule closely sessile within the persistent calyx, quite glabrous, 3 to 4 lines diameter.

Hab.: Cape York, *M'Gillivray*, *Daemel*; Rockhampton Bay, *Dallachy*.

3. **C. Dallachyanus** (after J. Dallachy), *Baill. in Herb. F. v. M.*; *Benth. Fl. Austr.* vi. 122. A handsome tree, the inflorescence and sometimes the young shoots ferruginous pubescent, the adult foliage glabrous. Leaves ovate-obtuse or more frequently obtusely acuminate, rounded at the base, rather thickly coriaceous, shining above, scarcely glaucous underneath, mostly 2 to 4in. long. Flowers sessile in sessile clusters, which are sometimes distant in the axils of floral leaves of  $\frac{1}{2}$  to 1in., more frequently nearer together and from the abortion of the floral leaves, forming more or less interrupted spikes of 1 to 3in. Bracts small but very broad, obtuse and concave, enveloping the buds, ferruginous-villous as well as the rachis. Male calyx glabrous, the segments rather thin,  $1\frac{1}{2}$  line long. Petals not half so long, very broad and more or less



stipitate. Filaments united in a column to more than half their length. Female flowers on distinct branches of the same tree (*R. Brown*). Ovary glabrous (*Baillon*), Capsule closely sessile.—*Amanoa Dallachyana*, Baill. Adans. vi. 335.

Hab.: Herbert River, *H. G. Eaton*; Northumberland and Cumberland islands, *R. Brown*; Rockhampton, *Dallachy*, *Thozet*.

4. **C. semiopacus** (scarcely shining), *F. v. M. Herb.*; *Benth. Fl. Austr.* vi. 123. A tree with the branches more slender than in *C. Dallachyanus*, but the inflorescence and young shoots ferruginous-pubescent as in that species, the adult foliage glabrous but glaucous underneath. Leaves ovate, acuminate, rather thickly coriaceous, 2 to 4in. long. Flowers smaller than in *C. Dallachyanus*, the clusters closely sessile in interrupted leafless spikes of 1 to 2in., and sometimes paniculate, or the lower clusters in the axils of floral leaves. Calyx-segments pubescent outside, nearly 1 line long. Petals small, broad, entire or toothed. Staminal column as long as the free part of the filaments. Ovary and young capsule sessile, densely pubescent. Outer margin of the disk scarcely prominent under the very short cup. Fruit depressed-globular, tridymous, nearly 3 lines diameter, ferruginous-villous or at length nearly glabrous.

Hab.: Rockingham Bay, *Dallachy*.

12. ACTEPHILA, Blume.

(*Acte*, the sea-shore, and *philos*, fond. Coastal plants.)

Flowers monœcious, in axillary clusters or solitary. Male flowers: Perianth of 5 or 6 segments spreading out flat, the inner ones rather larger than the outer. Petals (or petal-like glands?) small, as many as perianth-segments, and alternating with them or none. Stamens 3 to 6, inserted near the centre of a broad concave disk and surrounding a 2 or 3-fid style, the ovary abortive. Anthers with 2 cells at first parallel and turned inwards, at length usually divaricate, opening longitudinally in 2 valves. Female flowers: Perianth and disk of the males. Ovary 3-celled with 2 ovules in each cell. Styles 3, shortly 2-fid, or entire, free or united at the base. Fruit separating into 3 2-valved cocci, the pericarp hard. Seeds large, with a membranous brittle testa; albumen very scanty or none. Embryo curved, the cotyledons very thick fleshy and folded one over the other or much contortuplicate.—Trees or shrubs. Leaves alternate, petiolate, entire, usually large, coriaceous when full-grown. Flowers rather small, often several females as well as males in the same cluster, all pedicellate. Capsule globular, usually large and smooth.

The genus comprises few species, dispersed over tropical Asia; the Australian ones are, however, all endemic.

Leaves on petioles of  $\frac{1}{2}$  to 1in.

Petals present (very small). Stamens 5 or 4. Leaves oblong-lanceolate or narrow-elliptical, tapering into the petiole.

Pedicels  $\frac{1}{2}$  to 1in. long . . . . . 1. *A. grandifolia*.

Pedicels 1 to 3 lines long . . . . . 2. *A. Mooreana*.

No petals. Stamens 5. Leaves obovate or broadly elliptical . . . . . 3. *A. latifolia*.

No petals. Stamens 3. Leaves ovate-lanceolate, rounded at the base, on rather long petioles . . . . . 4. *A. petiolaris*.

Leaves sessile or nearly so, oblong, cordate at the base . . . . . 5. *A. sessilifolia*.

1. **A. grandifolia** (leaves large), *Baill. Adans.* vi. 330, 360, t. 10; *Benth. Fl. Austr.* vi. 89. A glabrous tree or shrub of various heights. Leaves petiolate, oblong-lanceolate or elliptical, shortly and obtusely acuminate, tapering towards the base, coriaceous, smooth, 5 to 8in. long, on a petiole varying from under  $\frac{1}{2}$ in. to  $\frac{3}{4}$ in. Flowers of both sexes in the same cluster usually rather more females than males, on pedicels of  $\frac{3}{4}$  to 1in. Male perianth spreading to a diameter of 3 lines, the inner segments larger than the outer. Petals? 5,

very small, obovate, inserted under the raised margin of the broad disk. Stamens 4 or 5, rather shorter than the perianth. Female perianth rather larger than the male. Styles 3, free and shortly united at the base, more or less bifid. Fruit fully  $\frac{3}{4}$  in. diameter, epicarp splitting at the sutures before the endocarp separates as in *Dissiliaria*. Cotyledons described by Baillon as large and very much contorted. —*Lithoxylon grandifolium*, Muell. Arg. in Linnæa xxxiv. 65 and in DC. Prod. xv. ii. 232.

Hab.: Scrubs in southern localities.

2. **A. Mooreana** (after C. Moore), *Baill. Adans.* vi. 330, 366; *Benth. Fl. Austr.* vi. 89. A tree or shrub closely resembling *A. grandifolia*. Leaves oblong-lanceolate, rather obtuse, entire or irregularly sinuate, tapering at the base into a petiole of about 5 lines, finely veined, about  $2\frac{1}{2}$  in. long.\* Pedicels of the male flowers not above 1 line long, of the females about 3 lines, the structure of the flowers otherwise as in *A. grandifolia* (Baillon).

Hab.: Mount Lindsay, C. Moore; Logan River, Rev. B. Scortechini.

3. **A. latifolia** (leaves broad), *Benth. Fl. Austr.* vi. 89. A glabrous shrub or tree. Leaves obovate or broadly elliptical, sometimes nearly orbicular, obtuse or shortly and obtusely acuminate, rounded or tapering at the base, firmly coriaceous, penniveined as in *A. grandifolia*, but the reticulate veinlets obscure, 3 to 6 in. long, on a petiole varying from under  $\frac{3}{4}$  in. to near 1 in. long. Pedicels slender,  $\frac{1}{2}$  to 1 in. long. Perianth-segments 5 or 6, petal-like with glandular ends, about 2 lines long in the males, rather longer in the females. No petals. Stamens 5. Styles 3, united at the base, rather short, spreading, slightly dilated and notched at the end but not branched. Fruit not seen.

Hab.: Cape York, Daemel; Rockingham Bay, Dallachy.

4. **A. petiolaris** (referring to long petiole), *Benth. Fl. Austr.* vi. 89. A glabrous shrub or tree. Leaves ovate-lanceolate or ovate-acuminate, rounded at the base, thinner than in *A. grandifolia*, 3 to 4 in. long, on a petiole of 1 in. or more. Male perianth-segments 1 line long, petal-like with dark streaks. Petals none. Disk, stamens and rudimentary ovary of *A. grandifolia*, except that there are only 3 stamens. Female flowers of that species but rather smaller and no petals. Disk and ovary the same. Styles rather more united at the base.

Hab.: Rockingham Bay, Dallachy.

5. **A. sessilifolia** (leaves sessile), *Benth. Fl. Austr.* vi. 90. A glabrous shrub of 4 to 6 ft. Leaves oblong, obtuse, entire, slightly cordate at the base and sessile or nearly so, thinly coriaceous, 2 to 3 in. long. Male flowers not seen. Female pedicels slender, about 1 in. long. Perianth deeply 6-lobed, about 2 lines diameter, with very small petals (or petal-like lobes of the disk?). Styles 3, united at the base, rather short, spreading, undivided. Capsule globular, coriaceous, about  $\frac{1}{2}$  in. diameter, slightly scabrous-punctate.

Hab.: Cave mountains, five miles west of Morinish, Thozet. There seems to be but little doubt that this is an *Actephila*, although I have only seen a single female flower in Herb. F. Mueller, in other specimens being in fruit only.—*Benth.*

### 13. ANDRACHNE, Linn.

(The name of the Purslane in Greece.)

Flowers monœcious, in axillary clusters or the females solitary. Male flowers: Calyx more or less deeply divided into 5 or 6 lobes or segments. Petals as many as calyx-lobes and shorter than them. Glands as many as petals and opposite to them. Stamens as many as petals and alternate with them; anther-cells distinct, parallel, opening longitudinally in 2 valves. Rudimentary ovary

in the centre very small. Female flowers: Calyx usually larger than in the males. Petals minute or none. Ovary 3-celled, with 2 ovules in each cell. Styles 3, more or less deeply divided into 2 entire branches. Capsule separating into 3 2-valved cocci. Seeds curved, 3-angular, rugose, not carunculate. Embryo curved, with broad cotyledons.—Herbs or undershrubs, with procumbent ascending or erect branching stems. Leaves alternate, petiolate, entire, usually small. Flowers very small, pedicellate in the axils, the females solitary, with or without a few males in the same axil.

The genus contains but few species, dispersed over the temperate and subtropical regions of both the New and the Old Worlds. The only one in Australia is also in Timor and in the Eastern Archipelago. The habit is often that of a *Phyllanthus*, from which the genus differs in the presence of petals and of a central rudimentary ovary in the male flowers.

1. **A. Decaisnei** (after J. Decaisne), *Benth. Fl. Austr.* vi. 88. Apparently annual, but the stems hard and woody-looking at the base, much branched, decumbent, attaining 1 to 2 or even 3ft., the whole plant softly villous. Leaves broadly obovate or obovate-oblong,  $\frac{1}{2}$  to  $\frac{3}{4}$ in. long, on rather long petioles. Male flowers 2 or 3 together on very short pedicels. Calyx-segments 5, lanceolate, acute, spreading, about  $\frac{1}{2}$  line long. Petals narrow, nearly as long as the calyx. Female flowers solitary in the same axils as the males, on pedicels attaining 1 line when in fruit. Calyx-segments under the fruit broadly ovate, fully 1 line long, the base of the calyx contracted into a distinct stipes. Styles divided to the base into 2 branches. Capsule depressed, orbicular, villous, about 2 lines diameter.—*A. fruticosa*, Deene. according to Muell. Arg. in DC. Prod. xv. ii. 235, not of Linn.

Hab.: Near Peak Downs, *Bowman*; Flinders River, *C. F. Plant*.

#### 14. PHYLLANTHUS, Linn.

(Some species (not Australian), having phyllodia which bear the flowers).

(*Kirganelia*, *A. Juss.*; *Synostemon*, *F. v. M.*; *Reidia*, *Wight.*)

Flowers small monœcious, usually in axillary clusters, apetalous. Disk various, rarely none. Male flowers: Sepals 4 to 6, imbricate in 2 series. Disk glands various. Stamens 3 to 5 in the centre of the flowers, filaments free or connate; anthers 2-celled, oblong or didymous, rarely reniform, cells parallel or diverging, slits extrorse vertical or transverse by the confluence of the cells. Pistillode none. Female flowers: Sepals of the male. Ovary 3 or more celled. Styles free or connate, usually 2-fid with slender branches, rarely dilated; ovules 2 in each cell. Fruit of 3 or more crustaceous or coriaceous rarely bony 2-valved cocci, with or without a separable coriaceous rarely fleshy epicarp. Seeds 3-gonous, estrophiolate, testa crustaceous, albumen fleshy; cotyledons flat or flexuous. Herbs, trees or shrubs. Leaves distichous, alternate, quite entire.

Species in all warm countries.

SECT. 1. **Synostemon**.—Undershrubs shrubs or perennial herbs. Leaves small. Stamens 3, the anthers adnate to a central column, the cells parallel. Ovary 3-celled. Styles distinct or connate at the base. No glands or disk in either sex.

Male perianth-segments narrow, erect, herbaceous or rigid, united or free. Hoary or glaucous undershrubs or rarely small shrubs.

Styles thick but free. Stems from a woody base decumbent or ascending. Leaves rather rigid, glaucous, under  $\frac{1}{2}$ in. long.

Male perianth-segments connate nearly to the apex . . . . . 1. *P. thesioides*.

Styles more or less connate or very short. Stems branching, ascending or erect.

Male perianth-segments united to the middle.

Undershrub. Leaves linear, distant . . . . . 2. *P. hirtellus*.

Small shrub. Leaves small obovate or emarginate, clustered at the nodes . . . . . 3. *P. rigens*.

- Male perianth-segments ovate. Erect much-branched almost leafless undershrub . . . . . 4. *P. ramosissimus*.  
 Male perianth-segments small, spreading.  
 Erect branching shrubs. Anthers oblong, occupying nearly the whole column.  
 Leaves petiolate, thin. Pedicels filiform . . . . . 5. *P. albiflorus*.  
 Leaves almost sessile, ovate or oblong, hoary, 1 to 3 lines long. coriaceous. Pedicels very short . . . . . 6. *P. elachophyllus*.
- SECT. II. **Kirganelia**.—*Shrubs, often large. Leaves distichous, usually petiolate. Stamens 5, the filaments usually connate at the base. Glands present. Ovary and capsule 3 or more-celled, usually fleshy or succulent. Styles distinct or connate at the base, short in the Australian species.*  
 Leaves obovate-oblong. Flowers on filiform pedicels of 2 to 3 lines.  
 Capsule globular, 3 lines diameter . . . . . 7. *P. Novæ-Hollandiæ*.  
 Capsule depressed-globular about  $1\frac{1}{2}$  line diameter . . . . . 8. *P. brisbanicus*.
- SECT. III. **Paraphyllanthus**.—*Shrubs or herbs of varied habit. Stamens 3, the filaments free or more or less united. Anthers free, the cells parallel, opening longitudinally. Glands present. Ovary 3-celled. Styles free. Capsule dry.*  
 \* *Filaments more or less united.*  
 Leaves narrow-oblong or linear-lanceolate.  
 Annuals or perennials with virgate branches and distichous leaves.  
 Flowers nearly sessile. Ovary and capsule smooth . . . . . 9. *P. maderaspatanus*.  
 Erect bushy shrub. Leaves rigid, under  $\frac{1}{4}$  in. long. Flowers nearly sessile . . . . . 10. *P. Mitchellii*.  
 Leaves obovate-oblong. Pedicels filiform, 2 to 4 lines long.  
 Perianth scarcely enlarged under the fruit . . . . . 11. *P. Gasstræmii*.  
 Fruiting perianth much enlarged, as long as the capsule. . . . . 12. *P. Dallachyanus*.  
 \*\* *Filaments free.*  
 † *Fruiting perianth much enlarged, usually as long as or longer than the capsule.*  
 Leaves ovate or lanceolate, acute . . . . . 13. *P. suberenulatus*.  
 Leaves obovate or oblong, obtuse or mucronate. Male pedicels 1 line long or less. Capsule glabrous.  
 Glabrous plant not glaucous. Shrubby with elongated slender branches. Seeds smooth . . . . . 14. *P. similis*.  
 Glabrous. Branchlets very numerous,  $\frac{3}{4}$  in. long . . . . . 15. *P. microcladus*.  
 (See also 12 *P. Dallachyanus*, in which the filaments are sometimes almost free.)  
 Capsule pubescent or hairy.  
 Hoary-tomentose plant, shrubby and branched. Capsule pubescent 16. *P. Fuernrohrii*.  
 Tomentose or villous plant, shrubby and branched. Capsule sprinkled with hairs . . . . . 17. *P. hebecarpus*.  
 †† *Fruiting perianth shorter than the capsule.*  
 Low diffuse annuals. Leaves oblong, obtuse.  
 Stipules minute. Capsule depressed-globular, scarcely 2 lines diameter . . . . . 18. *P. lacunarius*.  
 Stipules spreading. Capsule globular, 3 lines diameter . . . . . 19. *P. trachyspermus*.  
 Erect shrub, with virgate branches more or less pubescent. Leaves small, coriaceous, not distichous. Fruits almost sessile . . . . . 20. *P. thymoides*.
- SECT. IV. **Euphyllanthus**.—*Three shrubs or herbs of varied habit. Leaves usually distichous. Stamens 3, the filaments free or more or less united; anthers free, the cells short, more or less diverging or opening transversely, and often separated by a broad connective. Glands present. Ovary 3-celled. Styles free. Capsule dry. Flowers usually minute.*  
 Stems annual or from a perennial base, slightly branched, rather rigid,  $\frac{1}{2}$  to 1 ft. high. Leaves oblong . . . . . 21. *P. simplex*.  
 Stems from a woody base, numerous, filiform, under 6 in. Leaves obovate or orbicular . . . . . 22. *P. filicaulis*.  
 Stems annual, filiform, branching,  $\frac{1}{2}$  to 1½ ft. long. Flowers very minute . . . . . 23. *P. minutiflorus*.  
 Leaves distichous, 4 lines long. Stamens 6. Fruit 4 lines diameter . . . . . 24. *P. hypospodius*.  
 Leaves ovate, 12 to 16 lines long. Male flowers in pairs, female flowers solitary . . . . . 25. *P. laxifolius*.

1. **P. thesioides** (Thesium-like), *Benth. Fl. Austr.* vi. 98. Probably herbaceous, quite glabrous, the stems slender but rigid, much branched, erect or ascending, 4 to 12 in. high. Leaves linear-linear-cuneate or the lower ones

oblong-spathulate, obtuse, rather thick, flat or with recurved margins, 2 to near 6 lines long. Flowers apparently dioecious, solitary on pedicels of 1 to  $1\frac{1}{2}$  line. Male perianth tubular, 2 lines long, narrow, slightly dilated upwards, with 6 very short broad thick rounded and inflexed lobes, the 2 or 3 inner ones still smaller than the outer ones. Anthers connate, occupying rather more than half the length of the staminal column, the connective scarcely projecting beyond the cells. Female flowers much smaller, the perianth-segments short and spreading. No disk. Ovary glabrous, 3-celled, with 3 short thick free styles, spreading at the end but not lobed.

Hab.: Near Brisbane River and other southern localities to Springsure.

2. **P. hirtellus** (hairy), *Muell. Arg. in DC. Prod.* xv. ii. 326; *Benth. Fl. Austr.* vi. 98. Apparently herbaceous, or perhaps an undershrub, the stems not above 6 in. long, slender, minutely-pubescent as well as the foliage. Leaves distichous but rather distant, linear or oblong, mostly somewhat cuneate,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Stipules very minute. Flowers mostly solitary, the males on pedicels of 1 to  $1\frac{1}{2}$  line. Perianth-tubular, nearly 2 lines long, narrow, slightly dilated upwards, with 6 broad lobes not  $\frac{1}{3}$  as long as the tube, 2 of the inner ones smaller than the others. Anthers connate, occupying about half the length of the staminal column, the connective very slightly projecting beyond the cells. Female flowers on pedicels of 1 to 2 lines or sometimes 3 lines when in fruit. Perianth divided to the base into ovate very obtuse segments of nearly  $\frac{3}{4}$  line. Styles united at the base, shortly free, broad and spreading at the top. Capsule ovoid, pubescent, 4 or 5 lines long.—*Synostemon hirtellus*, F. v. M. *Fragm.* iii. 89.

Hab.: Rockhampton, Connors River, Walloon, *Bowman*; Brisbane River.

3. **P. rigens** (stiff), *Muell. Arg. in Flora* 1864, 513, and in *DC. Prod.* xv. ii. 325; *Benth. Fl. Austr.* vi. 99. Probably a small shrub, with rigid terete branches quite glabrous and perhaps spinescent. Leaves very small, clustered at the nodes, obovate or cuneate and emarginate, rather thick, 1 to 3 lines long. Male flowers sessile. Perianth-segments connate high up, ovate, obtuse; anthers connate, with the connective projecting beyond the cells. Female flowers on slender pedicels much longer than the leaves. Perianth-segments linear, rigid, rather above 1 line long. Ovary glabrous, contracted at the top. Styles 3, very short, spreading, rather broad, entire or notched. Capsule glabrous, 3 to 4 lines long.—*Synostemon rigens*, F. v. M. *Fragm.* ii. 153.

Hab.: Aramac and other southern localities.

4. **P. ramosissimus** (much branched), *Muell. Arg. in Linnæa* xxxiv. 70, and in *DC. Prod.* xv. ii. 326; *Benth. Fl. Austr.* vi. 99. A slender wiry rigid much-branched undershrub of about 1ft., leafless or nearly so at the time of flowering. Leaves few and only on the very young branches, linear, thick, almost terete, 2 to 4 lines long. Stipules small but persistent. Male flowers sessile or nearly so. Perianth-segments ovate, about  $\frac{1}{2}$  line long. No glands. Anthers 3, connate, occupying nearly the whole of the column. Female flowers on pedicels varying from 2 to 6 lines, solitary or 2 together. Perianth narrow, about 1 line long. Ovary glabrous. Styles free, thick, dilated and shortly 2-lobed at the end. Capsule ovoid, 3-celled, 3 to 4 lines long.—*Synostemon ramosissimus*, F. v. M. *Fragm.* i. 33.

Hab.: Mackenzie Range, *F. v. Mueller*; and towards Cooper's Creek, *Beckler*.

5. **P. albiflorus** (flowers white), *F. v. M.*; *Muell. Arg. in Linnæa*, xxxiv. 70, and in *DC. Prod.* xv. ii. 326; *Benth. Fl. Austr.* vi. 100. A much-branched glabrous shrub, varying from 3 or 4ft. to twice that height, the branches terete or slightly angular, the smaller ones slender but rigid. Leaves obovate-oblong

to narrow cuneate, very obtuse, sometimes mucronulate, contracted into a very short petiole, membranous, glaucous underneath, rarely above  $\frac{1}{2}$  in. long. Stipules small, brown. Flowers solitary, on filiform pedicels of 4 to 5 lines, surrounded by small brown scale-like bracts, the female pedicels sometimes much longer. Perianth-segments nearly equal, ovate, rather above 1 line long. No glands. Anthers 3, connate, occupying nearly the whole of the central column. Ovary globular, 3 or sometimes 4-celled, glabrous. Styles distinct, recurved, cuneate, and emarginate at the end. Capsule depressed-globular, nearly 4 lines diameter.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller*, *C. Stuart*; Rockhampton, *Dallachy* and several others.

6. ***P. elachophyllus*** (leaves hoary), *F. v. M. Herb.*; *Benth. Fl. Austr.* vi. 101. A bushy shrub, with numerous rigid branchlets, hoary as well as the foliage with a rigid almost papillose pubescence. Leaves distichous, ovate or oblong, rigidly coriaceous, 1 to 3 lines long. Stipules almost gland-like. Male flowers very small, few in the axil, on exceedingly short pedicels. Perianth-segments ovate, rather thick, about  $\frac{1}{4}$  line long. No glands. Anthers 3, very short, connate in a ring round the dilated apex of the column as in *P. trachyspermus*. Female perianth-segments narrow, fully  $\frac{3}{4}$  line long under the fruit. Styles short, erect, distinct, very shortly bifid. Capsule 3-celled, globular, 3 lines diameter.

Hab.: Newcastle Range, *F. v. Mueller*; Einasleigh River, *Daintree*.

7. ***P. Novæ-Hollandiæ*** (of New Holland), *Muell. Arg. in DC. Prod.* xv. ii. 346; *Benth. Fl. Austr.* vi. 101. A small spreading glabrous shrub. Leaves distichous, petiolate, oblong-obovate, very obtuse, often acute at the base, membranous, 4 to 8 lines long. Flowers probably diœcious, the males in clusters of 2 to 4, on filiform pedicels of 2 to 3 lines, the females solitary, with thicker pedicels. Male perianth-segments 5, broad, obtuse, petal-like, about 1 line long. Glands distinct. Stamens 5, the 3 inner filaments connate, the 2 outer free or nearly so; anthers quite distinct, the cells parallel. Female flowers none. Ovary according to *Mueller Arg.* 5-celled. Styles 5, bifid and recurved. Capsule somewhat fleshy, globular, 2 lines diameter.—*P. uberiflorus*, *Baill. Adans.* vi. 343.

Hab.: Port Denison, Edgecombe Bay, *Dallachy*.

8. ***P. brisbanicus*** (of Brisbane), *Bail.* A slender branching shrub from 1 to 2½ ft. high, glabrous, stem in the lower part nearly or quite terete, the upper portion more or less sulcate, often of a brownish colour; the branches very slender. Leaves distichous, oblong, obtuse or minutely apiculate, and slightly tapering to a short petiole, pale on the underside, 3 to 10 lines long, lateral nerves distant. Stipules coloured with membranous borders, narrow-lanceolate. Male and female flowers in the same axil, 1, 2 or more of each sex together; pedicels varying in length, filiform, generally about 3 lines long. Male perianth-segments 5 or 6, about  $\frac{1}{2}$  line broad, roundish petal-like (narrower and somewhat acute in the female), the centre green, margins white. Stamens 5, filaments free. Disk-glands 5, distinct, almost orbicular. Female flowers size of the males. Disk-glands forming a small, shortly and truncately lobed cup. Ovary 3-celled; cells 2-ovulate. Styles horizontally spreading, bifid. Capsule depressed-globular, smooth,  $1\frac{1}{2}$  line in diameter, 3-celled. Seeds trigonous, 2 in each cell, light-brown, and closely punctate.

Hab.: I have known this plant about Brisbane for many years, but whether indigenous or introduced I am not certain. It, however, differs from all of which I have the descriptions. It is of local interest on account of its being a prolific weed. As some doubt remains as to habitat, the name here used must be considered provisional only.

9. ***P. maderaspatanus*** (of Madras), *Linn.*; *Muell. Arg. in DC. Prod.* xv. ii. 362 var. *angustifolius*; *Benth. Fl. Austr.* vi. 103. An erect simple or branched rather rigid annual (or perennial?) of 1 to 1½ ft., the branches slender, virgate,

somewhat angular. Leaves distichous, oblong-linear or cuneate, obtuse or mucronate, contracted towards the base but sessile or nearly so,  $\frac{1}{2}$  to 1 in. long. Stipules usually bordered with white. Flowers very small, usually 1 female with or without 2 or 3 males in each axil, the pedicels about  $\frac{1}{2}$  line long. Male perianth-segments 6, obovate, about  $\frac{1}{4}$  line long. Glands minute. Anthers 3, distinct, erect on the top of a short column, the cells parallel. Female perianth about twice the size of the male. Ovary 3-celled. Styles distinct, spreading, dilated and very shortly 2-lobed at the end. Capsule depressed, 3-furrowed, about  $1\frac{1}{2}$  line diameter. Seeds elegantly marked on the back with minute tubercles arranged in 10 to 12 longitudinal rows.—Wight Ic. t. 1895; *P. brachypodus*, F. v. M. in several herb.

Hab: Rockhampton, *Boeman*, *O'Shanesy*; Charleville, *Giles*; Peak Downs, *Burkitt*; Georgina River, *A. H. Glisson*.

The species is common in the tropical and subtropical regions of the Old World. The shape of the leaves in the Australian specimens is very nearly that figured by Wight, although much narrower than in the commener forms of the species.

10. **P. Mitchelli** (after Sir T. Mitchell), *Benth. Fl. Austr.* vi. 103. An erect bushy shrub, much resembling some of the narrow-leaved less pubescent forms of *P. thymoides*, with which it is united by Muell. Arg., but the plant is quite glabrous, the male flowers larger on shorter pedicels, with the segments more united at the base, and the filaments united to above the middle. Leaves not distichous, narrow-cuneate, rigid, complicate,  $1\frac{1}{2}$  to 3 lines long. Flowers probably diœcious, all males in the specimens seen.—*Micranthemum triandrum*, Hook. in *Mitch. Trop. Austr.* 342; *P. triandrus*, Muell. Arg. in *DC. Prod.* xv. ii. 195 (among the species excluded from *Micranthemum*) a name reserved p. 299 for the *Kirganelia triandra*, Blanco; *P. thymoides*, var. Muell. Arg l.c. 372.

Hab.: Pyramid Depôt, *Mitchell*.

11. **P. Gasstrœmii** (after —. Gasstrœm), *Muell. Arg. in DC. Prod.* xv. ii. 358; *Benth. Fl. Austr.* vi. 104. An erect glabrous shrub or under-shrub of 1 to 2ft., the branches often compressed, the smaller ones slender. Leaves very shortly petiolate, obovate-oblong, very obtuse, contracted at the base, membranous, from under  $\frac{1}{2}$  in. to nearly  $\frac{3}{4}$  in. long. Stipules brown. Flowers very small, monœcious or almost diœcious, the males in clusters of 3 or 4, the females solitary. Male perianth-segments usually 6, about  $\frac{1}{2}$  line long, very obtuse and petal-like with dark centres. Glands small. Anthers 3, distinct, ovate, rather large, erect on a short slender column, the cells parallel, minutely tipped with the projecting connective. Female perianth-segments larger and more acute than in the males, but not enlarged after flowering as in *P. Dallachyanus*, greenish, bordered with white. Ovary 3-celled. Styles longer than the ovary, linear, bifid according to Mueller Arg., or entire. Capsule depressed-globular, glabrous, smooth, about 2 lines diameter.—*P. indigiferoides*, A. Cunn. Herb.

Hab: Burnett River, *F. v. Mueller*; and many other southern localities, Walsh's Pyramid in the North.

12. **P. Dallachyanus** (after J. Dallachy), *Benth. Fl. Austr.* vi. 104. A glabrous shrub, the young branches often flattened, the smaller branchlets slender, 3 to 5 in. long. Leaves distichous, obovate broadly oblong or almost orbicular. Flowers monœcious, the males clustered few together on filiform pedicels of about 2 lines, the females solitary in a very few of the upper axils and on some branches none at all, the pedicels either not longer than the males or sometimes  $\frac{1}{2}$  in. long. Male perianth-segments ovate, petal-like, obtuse or mucronate,  $\frac{3}{4}$  to nearly 1 line long. Stamens 3; the filaments united to about the middle; anther-cells parallel, but separated by a broad thick connective.

Female perianth larger, the segments ovate, enlarging round the fruit to about 3 lines. Disk with a broad free margin. Styles 3, thick, diverging, 2-lobed to about the middle.

Hab.: Rockingham Bay, *Dallachy*.

13. **P. subcrenulatus** (somewhat crenulate), *F. v. M. Fragm.* i. 108; *Benth. Fl. Austr.* vi. 104. A glabrous branching shrub of 1 to 1½ ft., the branches acutely angular. Leaves sessile or nearly so, ovate-lanceolate, more acute than in almost any other species, rounded at the base, rather rigid, with a prominent midrib, 4 to 12 lines long. Stipules brown. Flowers monœcious, solitary or very few together, on pedicels of ½ to 1½ line. Male perianth of 6 ovate petal-like segments, nearly ¾ line long. Stamens 3, the filaments distinct from the base; anther-cells parallel, but distinct and almost stipitate. Glands conspicuous. Female perianth longer than the male, the segments more herbaceous, bordered with white, and growing out to 1½ line or more under the fruit. Styles 3, not long but slender and divided to about the middle into 2 branches. Capsule globular, glabrous, smooth, fully 3 lines diameter. Seeds slightly striate longitudinally.—*Muell. Arg. in DC. Prod.* xv. ii. 368,

Hab.: Upper Brisbane River, *F. v. Mueller*; Rockhampton, *O'Shanesy*; Stanthorpe.

14. **P. similis** (resembling another), *Muell. Arg. in Linnæa* xxxiv. 71, and in *DC. Prod.* xv. ii. 369; *Benth. Fl. Austr.* vi. 106. A glabrous shrub, the branches elongated, slender, slightly compressed. Leaves distichous, shortly petiolate, obovate-oblong, membranous, mostly about ½ in. long. Flowers monœcious, shortly pedicellate, the males in clusters of 3 to 6, the females solitary. Male perianth-segments about ½ line long, petal-like. Glands large. Stamens 3, the filaments free; anther-cells parallel. Female perianth-segments somewhat enlarged after flowering, the inner ones bordered with white and as long as the capsule, the outer ones smaller. Ovary glabrous. Styles free, spreading, divided to about the middle into 2 branches. Capsule depressed-globular, not 2 lines diameter. Seeds smooth.

Hab.: Moreton Bay, *F. v. Mueller*; Demon Creek, *C. Stuart*.

15. **P. microcladus** (branchlets small), *Muell. Arg. in Linnæa* xxxiv. 71, and in *DC. Prod.* xv. ii. 369; *Benth. Fl. Austr.* vi. 106. A densely branched shrub, glabrous or nearly so, the main branches rather stout, the ultimate branches very numerous, solitary or clustered, filiform, about ¼ in. long, mostly with 3 leaves each. Leaves scarcely petiolate, cuneate or obovate-spathulate, obtuse, rigid, glabrous, 4 to 7 lines long. Stipules minute. Flowers monœcious, mostly solitary, the males on very short pedicels, the females on longer ones, attaining ½ to ¾ in. when in fruit. Male perianth-segments ovate. Glands prominent. Stamens 3, the filaments free; anther-cells parallel. Female perianth when in fruit about 2 lines diameter. Glands connate into a lobed cup. Ovary glabrous. Styles deeply divided. Capsule depressed-globular, about 2 lines diameter.

Hab.: Moreton Bay and other southern localities.

16. **P. Fuernrohrii** (after Dr. A. E. Fuernrohr), *F. v. M. in Trans. Phil. Soc. Vict.* i. 15, and in *Hook. Kew Journ.* viii. 332; *Benth. Fl. Austr.* vi. 107. Stems erect, branching, 1 to 1½ ft. high, hard and almost woody at the base but perhaps annual, hoary as well as the foliage with a minute tomentum. Leaves not distichous, very shortly petiolate or almost sessile, obovate-oblong, rarely above ½ in. long. Flowers monœcious, the females solitary on pedicels of about 1 line, alone or with 1 or 2 males on shorter pedicels. Male perianth-segments pubescent, about ¾ line long. Glands rather large. Stamens 3, the filaments free; anther-cells parallel. Female perianth-segments at first about 1 line, but



enlarging to from  $1\frac{1}{2}$  to 2 lines. Disk entire or broadly lobed. Ovary pubescent. Styles 3, divided to about the middle. Capsule pubescent, depressed-globular. Seeds smooth.—Sond. in *Linnæa* xxviii. 566; Muell. Arg. in DC. Prod. xv. ii. 373.

Hab.: Walsh River, *R. C. Burton*; Cleveland Bay, *A. Cunningham*; Dawson River, *F. v. Mueller*; Rockhampton and Rockingham Bay, *Dallachy*; Rockhampton, *O'Shanesy*; Herbert's Creek and Saunders' Creek, Expedition Range, *Bowman*; Barcoo, *Schneider*.

17. **P. hebecarpus** (fruit downy pubescent), *Benth. Fl. Austr.* vi. 108. An erect rigid shrub, with virgate terete branches, more or less hoary tomentose or villous as well as the foliage. Leaves scarcely distichous, very shortly petiolate or almost sessile, mostly erect, oblong or elliptical; from under  $\frac{1}{2}$  in. to nearly 1 in. long. Flowers apparently diœcious, solitary, on very short pedicels, lengthening out to 1 or 2 lines under the fruit. Male perianth-segments narrow, petal-like but hirsute outside,  $1\frac{1}{2}$  line long. Glands large. Stamens 3, the filaments erect and closely contiguous but free. Female perianth larger than in the males, the segments broad, herbaceous, tomentose outside and attaining 2 to 3 lines when in fruit. Styles 3, spreading, divided to the middle into 2 branches. Capsule globular, scarcely 3 lines diameter, smooth but more or less sprinkled with hairs. Seeds smooth.

Hab.: Burdekin River, *F. v. Mueller*; Roma, *Rev. B. Scortechini*.

18. **P. lacunarius** (having depressions), *F. v. M. in Trans. Phil. Soc. Vict.* i. 14, and in *Hook. Kew Journ.* viii. 332; *Benth. Fl. Austr.* vi. 108. A small diffuse or much-branched annual, mostly under 6 in. high, glabrous but often very glaucous, the branches flattened or angular. Leaves very shortly petiolate, oblong or linear-cuneate, contracted at the base, under  $\frac{1}{2}$  in. long. Stipules minute. Flowers very small, monœcious, usually 1 female with 2 or 3 males on very short pedicels; lengthening out under the fruit to nearly 1 line. Male perianth of 6 ovate often eclosed white or reddish segments of about  $\frac{1}{4}$  line. Glands small. Stamens 3, the filaments free; anther-cells parallel. Female perianth rather larger, the segments about  $\frac{1}{2}$  line long or slightly larger under the fruit. Styles short, spreading, 2-lobed. Capsule glabrous, depressed-globular, 3-furrowed. Seeds finely striate longitudinally.—Sond. in *Linnæa* xxviii. 566; Muell. Arg. in DC. Prod. xv. ii. 370.

Hab.: Southern localities.

19. **P. trachyspermus** (seeds rough), *F. v. M. in Trans. Phil. Soc. Vict.* i. 14, and in *Hook. Kew Journ.* viii. 210; *Benth. Fl. Austr.* vi. 108. A glabrous glaucous annual, with ascending branching stems about 6 in. high. Leaves almost sessile, broadly oblong, obtuse,  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long. Stipules spreading and very minute. Flowers monœcious (*Muell. Arg.*), but no males seen. Females solitary in the axils, on very short pedicels. Perianth-segments ovate, spreading, about  $\frac{3}{4}$  line long. Styles 3, very short, spreading, broad and emarginate at the end. Capsule not seen perfect, but from the remains examined it appeared to have been ovoid-globular, about 3 lines long.—Sond. in *Linnæa* xxviii. 566; Muell. Arg. in DC. Prod. xv. ii. 327.

Hab.: Southern localities.

20. **P. thymoides** (Thyme-like), *Sieb. Pl. Ecs.*; *Sond. in Linnæa* xxviii. 566; *Benth. Fl. Austr.* vi. 109. A shrub of 1 to 2 ft., more or less pubescent or hirsute, at least the young branches. Leaves not distichous, nearly sessile, from broadly obovate to narrow-cuneate, obtuse mucronate, truncate or emarginate, the margins recurved or revolute, coriaceous, rarely above  $\frac{1}{2}$  in. and sometimes only 1 to  $1\frac{1}{2}$  line long, the midrib very prominent underneath and sometimes the whole leaf complicate. Stipules small and black. Flowers dicecious, the males

2 or 3 together, the females solitary, on pedicels of  $\frac{1}{2}$  to 1 line. Male perianth-segments 6, rarely 5,  $\frac{3}{4}$  to nearly 1 line long, obtuse or the inner ones mucronulate. Glands large. Stamens 3, the filaments free; anther-cells parallel. Female perianth larger than the male; with ovate herbaceous segments. Ovary more or less hirsute. Styles 3, deeply divided into 2 branches. Capsule depressed-globular, 2 to  $2\frac{1}{2}$  lines diameter. Seeds smooth or minutely-tuberculate.—Muell. Arg. in DC. Prod. xv. ii. 372; *P. hirtellus*, F. v. M. Herb.; Muell. Arg. in Linnæa xxxii. 22; *P. ledifolius*, A. Cunn. Herb.

Hab.: Logan River, *Rev. B. Scortechini*.

21. **P. simplex** (simple), *Retz.*; *Muell. Arg. in DC. Prod. xv. ii. 391*; *Benth. Fl. Austr. vi. 111*. A glabrous annual or perennial, with decumbent ascending or erect stems, rarely above 1ft. high, flattened when young. Leaves distichous, almost sessile, lanceolate or almost linear and acute or the lower ones oblong and more obtuse, rarely above  $\frac{1}{2}$  in. long. Stipules very small, brown or white. Flowers monœcious or almost diœcious, the males in clusters of 3 to 6, on filiform pedicels of  $\frac{1}{2}$  to  $\frac{3}{4}$  line, with occasionally a single female on a filiform pedicel of 3 to 4 lines, the females when without males often 2 or even 3 from the same axil, all turned to one side. Male perianth-segments 6, spreading, coloured, not  $\frac{1}{4}$  line long. Glands prominent. Stamens 3, the filaments free, anther-cells globular, opening obliquely or transversely. Female perianth-segments longer and narrower than in the males, attaining  $\frac{1}{2}$  line under the fruit. Styles 3, more or less deeply 2-branched. Capsules depressed, glabrous, smooth, scarcely  $1\frac{1}{2}$  line diameter. Seeds usually punctate or tuberculate when quite ripe, but sometimes paler coloured and smooth, although apparently full-grown.

Hab.: Endeavour River, *A. Cunningham*; Rockingham Bay, *Dallachy*; Islands of Torres Strait, *Bailey*; Rockhampton, *Bowman*, *O'Shanesy*; Rosewood Creek, *Laidley*.

Var. *leiospermus*. Stems 1 to  $1\frac{1}{2}$  ft. high, and evidently annual. Pedicels shorter than usual. Seeds almost or quite smooth.—Narran River, *Mitchell*.

22. **P. filicaulis** (stems thread-like), *Benth. Fl. Austr. vi. 111*. A small glabrous plant, with a perennial woody base and numerous filiform stems, from 1 to 6 in. long. Leaves obovate or the lower ones orbicular, under  $\frac{1}{4}$  in. long. Stipules minute. Flowers monœcious, minute, on filiform pedicels of  $\frac{1}{2}$  to 1 line, lengthening to near 2 lines under the fruit. Male perianth-segments ovate, coloured, under a  $\frac{1}{4}$  line long. Glands small. Stamens 3, the filaments free; anther-cells globular, divergent. Female perianth-segments narrower and rather longer than in the males. Disk truncate and lobed. Styles 3, bifid. Capsule glabrous and smooth, under 1 line diameter.

Hab.: Near the border of N. S. Wales.

23. **P. minutiflorus** (flowers small), *F. v. M. Herb.*; *Muell. Arg. in Linnæa xxxiv. 75* and in *DC. Prod. xv. ii. 398*; *Benth. Fl. Austr. vi. 112*. A glabrous annual, with filiform procumbent or ascending stems from a few inches to above 1ft. long. Lower leaves broadly ovate or almost orbicular, 2 to 3 lines long, the upper ones oblong-lanceolate or almost linear,  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long. Flowers exceedingly minute, the females on filiform pedicels of  $\frac{1}{2}$  to  $1\frac{1}{2}$  line, the males on shorter pedicels, the female perianth not  $\frac{1}{4}$  line long and the male still smaller. Glands apparently distinct in both sexes. Stamens 3, the filaments free; anthers not seen perfect. Styles short, deeply 2-lobed. Capsules depressed, under 1 line diameter. Seeds smooth.

Hab.: Tropical inland localities.

Var. *gracillimus*. Filiform branches very slender, 1ft. long. Leaves all narrow, 2 to 4 lines long.—Moreton Bay, *F. v. M.*; common.—*P. gracillimus*, *F. v. M. in Herb. Hook.*

The above are probably all forms of one species, but with the minuteness of the flowers it is difficult to establish definite characters from the imperfect specimens in our herbaria.

24. **P. hypospodius** (grey on underside of leaves), *F. v. M., Vict. Nat. March 1892*. A glabrous shrub, of about 14ft. in height. Leaves distichous, entire, attaining 4in. in length and 2in. in breadth, ovate or elliptic-lanceolate, on short petioles, thinly veined, upper surface dull-green, whitish-grey on the underside. Sepals pale-coloured. Male flowers minute, on very short pedicels, each cluster of flowers containing one or two female ones of larger size. Outer perianth-segments almost ovate, inner ones more orbicular and slightly longer. Stamens 6; anthers free, roundish, and nearly as long as the filaments. Style hardly any, stigmas 3, channelled or flattened, undivided, finally rigid. Fruit about 4 lines in diameter, much longer than the perianth-segments, brownish outside. Seeds nearly 2 lines long.

Hab.: Russell River, *Stephen Johnson*.

25. **P. buxifolius** (Buxus-leaved), *Reinw. in Blume Cat.* A shrub. Leaves ovate unequally-rhomboid, entire, glabrous, 12 to 16 lines long. Flowers axillary, pedicellate, males in pairs, females solitary, appearing racemose from the branchlets often losing their leaves.—*Scepasma buxifolia*, Blume, *Miq. Fl. Bata. i. 2. 378*; *F. v. M. Fragm. x. 121*.

Hab.: Estuary of the Burdekin River, *E. Fitzalan (F. v. M.)*.

(I have no specimens of these last two species, and the scanty descriptions leave the affinity doubtful).

## 15. GLOCHIDION, Forst.

(From the glochidiate style.)

(*Bradleya, Gærtn.*).

Flowers monœcious or dicecious, apetalous eglandular (without disk-scales or glands). Male flower: Sepals 6, rarely 5, spreading in 2 series, imbricate. Anthers 3 to 8, connate in an ellipsoid or oblong sessile column with linear cells, dehiscence extrorse, connective produced into separate points or connate in an umbonate head. Pistillode none, or very rarely minute and hidden between the anthers. Female flowers: Calyx usually of 6 short imbricate sepals, or shortly tubular and unequally toothed or cleft. Ovary 3 to 15-celled; styles connate in a globose conical or sub-clavate column; lobed or toothed at the tip, sometimes obscure or confluent with the top of the ovary, usually lengthening during or after the flowering; ovules 2 in each cell. Capsule of 3 or more 2-valved cocci, often with twice as many lobes as cells, globose or orbicular and depressed or intruded at the base and top, crowned by the often enlarged style; cocci coriaceous or crustaceous, epicarp separable or not. Seeds hemispherical or laterally compressed, testa crustaceous with often a succulent coat, albumen fleshy, cotyledons flat.—Trees or shrubs. Leaves alternate, distichous, shortly petiolate, entire. Flowers small in axillary clusters.

Species numerous in tropical Asia and Africa.

In the *Flora Australiensis* vi. 93 and also in *Benth. and Hook. Gen. Pl. iii. 273*, this genus is reduced to a section of *Phyllanthus*, but as one of the authors of the latter work has since in the *Fl. of Brit. Ind. v. 305* given to it generic rank, I have followed his example. Sir J. D. Hookers reasons for keeping *Glochidion* distinct from *Phyllanthus* is the total absence of a disk, and the singular modification of its styles and stigmas.

Trees.

Ovary and capsule slightly furrowed, 3 to 7-celled . . . . . 1. *G. Ferdinandi*.  
Ovary and capsule deeply lobed, 3-celled . . . . . 2. *G. lobocarpus*.

1. **G. Ferdinandi** *Muell. Arg. in Flora 1865, 379, and in DC. Prod. xv. ii. 300*; *Benth. Fl. Austr. vi. 96*. "Jow-war," Stradbroke Island, *Watkins*. A small tree quite glabrous in the typical form except the ovary. Leaves shortly petiolate, elliptical or ovate-lanceolate, more or less acuminate, often obliquely contracted at the base, usually somewhat coriaceous and

shining on the upper side,  $1\frac{1}{2}$  to 6 in. long. Flower-clusters in the typical form sessile in the axils, the pedicels 2 to 3 lines long. Male perianth-segments sometimes nearly 2 lines long but usually smaller. Anthers 3 or rarely 4, linear, erect on a very short central column, with the connective very shortly produced above the parallel cells. No glands within the perianth in either sex. Female perianth smaller than in the male, with narrower segments. Ovary pubescent, scarcely contracted into 5 to 7 short erect thick more or less united styles, often reddish or yellow and seedless, or seeds abortive. Capsules glabrous or nearly so, orbicular, 5 to 7-celled, much depressed in the centre in the typical form, slightly furrowed between the cells, about  $\frac{1}{2}$  in. diameter when fully ripe.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Rockingham Bay, *W. Hill, Dallachy*; Fitzroy Islands, *M'Gillivray*; Wide Bay, *C. Moore*.

A very common tree found by most creek sides.

Wood of a grey colour, close in the grain, and easy to work; warps a good deal in drying.—*Bailey's Cat. Ql. Woods, No. 361.*

Var. *minor*. Leaves smaller. Pedicels shorter. Styles longer and more slender.—Bremer River, *A. Cunningham*.

Var. *supra-axillaris*. Leaves of the typical form or larger and more coriaceous. Flower-clusters very shortly pedunculate and inserted shortly above the axils. Capsule 4 to 6-celled, not more than 4 lines diameter and less depressed in the centre, quite glabrous in most specimens, but pubescent in a few.—Rockingham Bay, *Dallachy*; Rockhampton, *Thozet, O'Shanesy*.

Var. *mollis*. Branches, foliage, and flowers softly pubescent. Anther-column very short.—Rockingham Bay, *Dallachy*. A sub-variety from the same locality has the leaves narrow and not 2 in. long.

The above three varieties are given by Bentham in the *Flora Austr.* vi. 96 and 97 but so variable is the species that distinctive names cannot be given to varieties all so run one into the other.

**2. *G. lobocarpus*** (fruit lobed), *Benth. Fl. Austr.* vi. 97. A small tree, the young branches minutely pubescent. Leaves shortly petiolate, oblong-lanceolate or elliptical, obtuse or almost acute, usually oblique at the base, 2 to 3 in. long, green above, very pale or white underneath and rather thin. Stipules very small. Flowers diœcious, the males 2 or 3 together, on recurved pedicels of about 1 line, the females solitary, on pedicels lengthening to 2 lines. Male perianth-segments about  $\frac{3}{4}$  line long, obtuse and concave, the 3 inner ones rather longer than the 3 outer. Anthers 3, erect and connivent on a very short column, the cells parallel, with the connective much produced beyond them. No glands within the perianth in either sex. Female perianth rather smaller than the male, and slightly pubescent. Ovary depressed, almost 3-partite, the carpels deeply 2-lobed. Styles 3, short and thick, erect in the central depression, stigmatic inside. Capsule about 4 lines diameter, much depressed, more or less deeply divided into 6 or fewer lobes according to the number of seeds perfected. Seeds orange-red when ripe.

Hab.: Rockhampton, *O'Shanesy*; Nerook Creek, *Bowman*.

Wood of a pinkish colour, close grained, tough and elastic, useful for tool-handles.—*Bailey's Cat. Ql. Woods, No. 361A.*

## 16. NEORCÆPERA, Muell. Arg.

(New-Rœpera.)

Flowers monœcious, in axillary clusters. Male flower: Perianth divided to the base into 5 or 6 petal-like segments. Stamens 5 or 6, exserted, surrounding a broad central irregularly-lobed disk or abortive ovary; anthers with 2 parallel cells, opening longitudinally in 2 valves. Female flower: Perianth deeply divided into 6 lobes, narrower than in the male. Disk shortly-lobed. Ovary 3-celled, with 2 ovules in each cell. Styles 2, clavate or broad, undivided. Capsule globular, separating into 3 2-valved coriaceous cocci. Seeds ovate-oblong, slightly compressed, without any carunculus. Testa smooth and shining, without any

internal cavity. Albumen rather copious; embryo nearly straight, with broad cotyledons.—Shrubs. Leaves alternate, shortly petiolate, entire, coriaceous. Flowers not so small as in *Flueggea*. Capsule much larger.

The genus is limited to Australia.

Leaves elliptical-oblong, mostly about lin. long. Styles elongated clavate . . . 1. *N. buxifolia*.  
 Leaves cuneate-oblong or almost obovate,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Styles short broad and thick . . . . . 2. *N. Banksii*.

1. ***N. buxifolia*** (leaves *Buxus*-like), *Muell. Arg. in DC. Prod.* xv. ii. 489. *Benth. Fl. Austr.* vi. 116. A glabrous shrub. Leaves elliptical-oblong, obtuse, entire, coriaceous, shining, not exceeding lin., very much like those of some varieties of *Buxus sempervirens*. Male flowers numerous in the clusters, on pedicels of 3 to 4 lines. Perianth about 1 line long, of 5 or 6 segments, the inner ones larger than the outer, very concave or almost cucullate; stamens exerted. Female flowers solitary in the male clusters, on rather longer and stouter pedicels. Perianth-segments rather longer and narrower, shortly united at the base. Styles 3, rather long, clavate at the end but not divided. Capsule globular, about 3 lines diameter.—*Ræpera buxifolia*, F. v. M. Herb.; *Securinega Muelleriana*, Baill. Adans. vi. 333.

Hab.: Princhester Creek, *Bowman*; Lizard Island, *Walter*. Some specimens, also without flowers, from Endeavour River, *A. Cunningham* and referred by him to *Sersalisia obovata*, appear to belong to the species.

2. ***N. Banksii*** (after Sir Joseph Banks), *Benth. Fl. Austr.* vi. 117. A twiggly glabrous shrub of several feet. Leaves cuneate-oblong, very obtuse or emarginate, rarely mucronate, contracted at the base and very shortly petiolate or almost sessile, coriaceous, slightly veined,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Flowers few in the clusters, the males rather smaller than in *N. buxifolia*, and the stamens not exerted in our specimens, in which, however, the flowers are not yet full blown. Female flowers on pedicels of about  $\frac{1}{2}$  in., but only seen in fruit, which is the same as in *N. buxifolia*, except that the styles are short and very broad. Seeds not seen quite ripe.—*Phyllanthus Banksii*, A. Cunn. Herb.

Hab.: Sandy ridges, north shore, Endeavour River, *A. Cunningham*.

17. FLUEGGEA, Willd.

(After John Flügge.)

(*Securinega*, *Juss.*)

Flowers diœcious, in axillary clusters. Male flower: Perianth divided to the base into 5 petal-like segments. Stamens 5 or sometimes 4, exerted, alternating with as many glands, and surrounding a central 2-fid or 3-fid pistil without any ovary, but often as long as the stamens; anthers with 2 parallel cells opening longitudinally in 2 valves. Female flower: Perianth of the males. Disk flat, with a free dentate margin. Ovary 3-celled, with 2 ovules in each cell. Styles 3, recurved and bifid. Fruit dry or scarcely succulent, the pericarp thin, irregularly separating into cocci. Seeds triangular, with the inner edge straight, the back semicircular; testa crustaceous, with a ventral cavity between the inner and outer coating. Albumen rather scanty, curved round the cavity of the seed. Embryo also curved, the cotyledons broad, parallel to the back of the seed.—Shrubs. Leaves alternate, petiolate, distichous, entire. Flowers very small. Fruits red.

Species few, belonging to the old world tropics.

The large pistillode of the male flower, and the usually long recurved styles united below into an erect column of the female, are considered the best character for this genus.

Branches unarmed. Leaves above lin. long . . . . . 1. *F. microcarpa*.  
 Branches often spinescent. Leaves  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, often emarginate or very obtuse . . . . . 2. *F. Leucopyrus*.

1. **F. microcarpa** (small-fruited), *Blume Bijl.* 580, *Hook. in Fl. Brit. Ind.* v. 328. "Tharginyah," Cloncurry; "Arrimby," Mitchell River, *Palmer*, "Koy-ka," Cooktown, "Eramba," Palmer River, *Roth*. A tall unarmed shrub, quite glabrous but sometimes glaucous, the smaller branches often angular when young. Leaves ovate, usually broad and sometimes almost orbicular, rarely broadly oblong, very obtuse, 1 to 2 in. long or when very luxuriant nearly 3 in., prominently penniveined and the numerous reticulate veinlets often also prominent underneath. Flowers minute, the males usually very numerous in the cluster, the females fewer, both on filiform pedicels of 1 to 2 lines. Perianth in both sexes about  $\frac{1}{2}$  line long, the 3 inner segments rather larger than the outer. Stamens longer than the perianth, the anthers opening outwards. Styles rather broad. Capsule red, depressed-globular, not exceeding 2 lines in diameter.—*Flueggea melanthesoides*, *F. v. M.* in *Trans. Bot. Soc. Edinb.* vii. 490; *Xylophylla obovata*, *Willd.* *Enum. Hort. Berol.* 329; *Leptonema melanthesoides*, *F. v. M.* in *Hook. Kew Journ.* ix. 17; *Securinega obovata*, *Muell. Arg.*, *Benth.* in *Fl. Austr.* vi. 115; *Chorizandra pinnata*, *Wight Ic.* t. 1994.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Sweers Island, *Henne*; Cape York, *M'Gillivray*; Gilbert River and Howick's Group, *F. v. Mueller*; Port Denison, *Fitzalan*; Rockingham and Edgecombe Bays, *Dallachy*; Broadsound and Bowen River, *Bowman*; Kennedy District, *Daintree*; Flinders River, *Sutherland*; Port Mackay, *Nerst*; and many other tropical countries.

Wood of a yellow color, close-grained and firm.—*Bailey's Cat. Ql. Woods*, No. 361b.

Fruit eaten raw by aboriginals.—*Palmer and Roth*.

The species is common in tropical Asia and Africa.

2. **F. Leucopyrus** (Whitethorn), *Willd.*; *Hook. in Fl. Brit. Ind.* v. 328; *Benth. Fl. Austr.* vi. 116. A large straggling shrub, quite glabrous, with numerous small rigid branchlets occasionally terminating in a spine. Leaves ovate obovate or almost orbicular, very obtuse or emarginate, smaller and more membranous than in *F. microcarpa*, and usually not above  $\frac{1}{2}$  in. long. Flowers and fruit entirely those of *F. microcarpa*.—*Securinega virosa*, *Baill. Adans.* vi. 334, and several synonyms given by *Muell. Arg.* l.c.; *Securinega Leucopyrus*, *Muell. Arg.*, *Benth. Fl. Austr.* vi. 116.

Hab.: Gilbert River, *F. v. Mueller*; Rockhampton, *Dallachy*, *O'Shaunesy*; Bowen River, *Bowman*.—Common in many parts of East India.

## 18. BREYNIA, Forst.

(After J. Breyn.)

(*Melanthesa*, *Blume*; *Melanthesopsis*, *Muell. Arg.*)

Flowers monœcious, axillary, solitary or few together. Male flower: Perianth turbinate, flat-topped, the small orifice in the centre almost closed by 6 short lobes. Stamens 3, united in a central column, without any rudimentary ovary; anthers 2-celled, adnate to the column, the cells parallel, opening longitudinally in 2 valves. Female flower: Perianth turbinate or campanulate, with 6 very short lobes or teeth, sometimes minute or obsolete. Ovary sessile or shortly stipitate, 3-celled, with 2 ovules in each cell, thick and fleshy above the cells. Styles 3, very short, erect or slightly spreading and entire in the Australian species. No glands or disk in either sex. Fruit a globular or depressed indehiscent berry. Seeds triangular, with a straight inner angle and a curved back, the hilum small, the lower end with a large nearly closed ventral cavity between the inner and outer coating. Albumen not very copious. Embryo curved, the cotyledons broad, parallel to the back of the seed.—Shrubs or small trees, the smaller branches slender, the foliage usually but not always drying black. Leaves alternate, petiolate, usually broad, entire. Flowers small, on short pedicels. Fruit usually red.

The genus is generally spread over tropical Asia and the Pacific Islands; it is allied to *Glochidion*, but readily distinguished by the peculiar male perianth, and by the more baccate fruit.

- Fruiting perianth spreading flat to a diameter of about 3 lines . . . . . 1. *B. cernua*.  
 Fruiting perianth broadly turbinate or concave, enlarging to about 2 lines diameter. Styles very short erect or spreading on the obtuse fruit . . . . . 2. *B. oblongifolia*.  
 Fruiting perianth scarcely enlarged. Ovary and capsule more or less contracted into stipes at the base and crowned with three protuberances surrounding the styles . . . . . 3. *B. stipitata*.

1. ***B. cernua*** (drooping), *Muell. Arg. in DC. Prod.* xv. ii. 439; *Benth. Fl. Austr.* vi. 113. A glabrous shrub, with the broad almost orbicular leaves and the flowers of *B. stipitata*, but the female perianth rather larger at the time of flowering, very shortly broadly and retusely 6-lobed, and when in fruit spreading out quite flat to the diameter of fully 3 lines. Capsule sessile, globular, without appendages, crowned by the very short styles.—*Melanthesa cernua*, *DCne. Herb. Tim. Descr.* 155.

Hab.: Cape York, *Daemel*.

2. ***B. oblongifolia*** (leaves oblong), *Muell. Arg. in DC. Prod.* xv. ii. 440; *Benth. Fl. Austr.* vi. 114. "Willgar," *Bundaberg, Keys*. A glabrous shrub, attaining 10 to 15ft., with slender branches. Leaves petiolate, ovate or broadly oblong, obtuse,  $\frac{1}{2}$  to 1in. long. Stipules small, rather rigid, acute. Flowers monœcious, the females solitary, with or without 1 or 2 males, the males often in clusters of 2, 3 or more, and the cluster sometimes growing out into a short raceme, with a rachis of  $\frac{1}{2}$  to 1 line, covered with imbricate stipule-like bracts. Pedicels usually about 1 line long. Male perianth nearly 1 line long, broadly turbinate, flat-topped with the orifice closed, the stamens quite included, the anthers covering the greater portion of the central column. Female perianth spreading and shortly and broadly 6-lobed, about 1 line diameter when in flower, enlarging to 2 lines under the fruit but remaining concave, not spreading flat as in *B. cernua*. Styles short, entire, erect or spreading. Capsule sessile, globular, about 3 lines diameter, obtuse, without any protuberances round the styles.—*B. cinerascens*, *Baill. Adans.* vi. 344.

Hab.: Broadsound, *R. Brown*; Brisbane River, Moreton Bay, *F. v. Mueller*; Percy Island, *A. Cunningham* (with broader leaves); Rockhampton, *O'Shanesy, Thozet*; Cape York, *Daemel*.  
 Wood straw-coloured, close-grained and firm.—*Bailey's Cat. Ql. Woods, No.* 362.

3. ***B. stipitata*** (stalked), *Muell. Arg. in DC. Prod.* xv. ii. 442; *Benth. Fl. Austr.* vi. 114. A tall glabrous shrub. Leaves petiolate, ovate or almost orbicular, very obtuse,  $\frac{3}{4}$  to 1 $\frac{1}{2}$ in. long. Flowers both male and female usually solitary. Male perianth of *B. oblongifolia*. Female perianth broadly turbinate, very shortly and obtusely sinuate-lobed, scarcely enlarged although more open under the fruit. Capsule globular, contracted at the base into a stipes sometimes very short sometimes half as long as the capsule, crowned by 3 or more less confluent protuberances forming a fleshy ring round the short styles and about their length, both the stipes and the terminal protuberances already apparent on the ovary at the time of flowering.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown, Henne*; Prince of Wales Island, *R. Brown*; Rockingham Bay, *Dallachy*; Barron River, *E. Cowley*; Cleveland Bay, *Bowman* (with narrower leaves).

## 19. PETALOSTIGMA, F. v. M.

(Stigmas petal-like.)

(*Hylœoccus*, *R. Br.*)

Flowers monœcious, in axillary clusters or the females solitary. Male flower: Perianth of 4 to 6 imbricate calyx-like segments. Glands none. Stamens indefinite, united in a central column without any rudimentary

ovary, the filaments shortly free; anthers adnate, with parallel cells opening longitudinally in 2 valves. Female flower: Perianth as in the males, but the segments narrower and very deciduous. Ovary 4-celled or sometimes 8-celled, with 2 ovules in each cell. Styles 4 or 3, expanded into large flat almost petal-like stigmatic branches. Fruit globular or almost ovoid, with a fleshy exocarp and a hard endocarp, separating into 4 or 3 2-valved and spuriously 2-celled cocci. Seeds oblong, slightly compressed, with a small carunculus (sometimes wanting).—A tree. Leaves alternate, entire. Stipules minute or none. Inflorescence of *Phyllanthus*, but the flowers larger than is usual in that genus.

The genus consists of a single species, endemic in Australia.

1. *P. quadriloculare* (4-celled), *F. v. M. in Hook. Kew Journ.* ix. 17; *Benth. Fl. Austr.* vi. 92. "Ungwe," Bundaberg, *Keys*. "Muntenpin," Stradbroke Island, *Watkins*. "Oolgar," St. George, *Wedd*. A small or moderate-sized tree, the branches and underside of the leaves closely-silky or more loosely tomentose. Leaves shortly petiolate, in the typical form ovate or sometimes almost orbicular, very obtuse or almost acute,  $\frac{1}{2}$  to  $1\frac{1}{2}$  in. long, becoming glabrous above when old. Male flowers several together, on very short pedicels. Perianth-segments orbicular or broadly obovate, silky-pubescent or villous, varying from scarcely more than 1 line to nearly 2 lines long. Staminal column villous with long hairs, the free part of the filaments glabrous. Anthers somewhat incurved, the glabrous or hairy connective shortly projected beyond the cells. Branches of the styles cuneate, more or less undulate and crenate. Fruit orange-coloured, often  $\frac{1}{2}$  in. diameter. Seeds slightly compressed, smooth.—*Muell. Arg. in DC. Prod.* xv. ii. 273; *Hylococcus sericeus*, R. Br. in *Bauer Ic. ined.*; *Mitch. Trop. Austr.* 389; *Petalostigma triloculare*, *Muell. Arg. l.c.* 274; *P. Australianum*, *Baill. Adans.* vii. 356, t. 2.

Hab: Islands of the Gulf of Carpentaria. *Henne*; Broadsound, *R. Brown*; Endeavour River and Moreton Bay, *A. Cunningham*; Moore River, *Mitchell*; Rockhampton, Port Denison, Edgecombe Bay, *Dalalchy* and others; Albany Island, *W. Hill*; Somerset, Cape York, growing close on to the beach and flowering and fruiting as a shrub of 3 to 4 ft.

Wood dark-brown, hard and close-grained, shrinks much in drying; somewhat resembles the English Laburnum.—*Bailey's Cat. Ql. Woods*, No. 363.

Var. *glabrescens*. A slender tree, leaves elliptical-lanceolate,  $1\frac{1}{2}$  to nearly 3 in. long, becoming nearly glabrous, and the ovary and fruit much less villous than in the typical form or only shortly tomentose or sometimes quite glabrous.—Moreton Bay, *W. Hill*; Cape Sidmouth, *Curdië*.

## 20. HEMICYCLIA, Wight et Arn.

(Referring to the semi-orbicular stigma.)

Flowers diœcious, axillary. Male flower: Perianth of 4 or 5 much imbricate segments, the inner ones usually more petal-like concave and larger than the outer. Stamens indefinite (4 to 23) inserted round a broad central concave entire or undulate-lobed disk; filaments free; anthers with 2 parallel cells, opening longitudinally in 2 valves. Female flower: Perianth of the males, or rather larger. Disk flat, with a free margin. Ovary obliquely 1-celled, with 2 ovules. Style or stigma single, broadly reniform or slightly orbicular, flat or recurved, entire or emarginate. Fruit an indehiscent drupe, with a succulent mesocarp and a bony endocarp. Seed usually solitary, oblong, furrowed down one side; testa rather thin; albumen copious. Embryo straight or nearly so, with broad flat cotyledons and a short narrow radicle.—Trees or shrubs. Leaves alternate, petiolate, entire, coriaceous when full grown. Flowers solitary or few together, small, pedicellate, the male clusters sometimes apparently forming a short raceme from the abortion of the leaves on the very short flowering branches.

The genus contains but few species, dispersed over the East Indian Peninsula, Ceylon, and the Eastern Archipelago. Of the two Queensland species, one appears to be the same as the commonest of the Indian ones, the other is endemic.



Filaments exerted, much longer than the small ovoid anthers . . . . . 1. *H. sepiaria*.  
 Filaments very short: anthers twice as long, oblong, not exceeding the  
 perianth. Ovary glabrous . . . . . 2. *H. australasica*.

1. ***H. sepiaria*** (hedge-plant), *W. & Arn.*; *Muell. Arg. in DC. Prod.* xv. ii. 487, var. ? *oblongifolia*; *Benth. Fl. Austr.* vi. 117. A shrub of 6 to 9ft., the young shoots minutely pubescent, the adult foliage glabrous. Leaves petiolate, ovate-oblong or oblong-lanceolate, obtuse, coriaceous and shining when full-grown, but most of those on the flowering specimens still young and membranous, finely veined underneath,  $1\frac{1}{2}$  to  $2\frac{1}{2}$ in. long. Male flowers several together in axillary clusters sometimes growing out into short racemes, the filiform pedicels about 2 lines long. Perianth-segments 4, broad, about 1 line long. Stamens 6 to 8, inserted round a hollow disk, with the margin undulate as in *H. australasica*. No female specimens seen of the Australian variety.

Hab.: Mackay, *H. L. Griffith*.

The species is common in Ceylon from the sea-coast to an elevation of 1500ft., and appears also to have an extended range in the Peninsula. The Australian variety differs slightly in its narrower leaves as well as in the disk, but probably a variety only; the stamens are entirely those of *H. sepiaria*, and not of the following species.

Wood greyish, hard, heavy, and close in the grain.—*Bailey's Cat. Ql. Woods*, No. 364.

2. ***H. australasica*** (Australian), *Muell. Arg. in DC. Prod.* xv. ii. 487; *Benth. Fl. Austr.* vi. 118. A spreading tree attaining 40ft., rarely reduced to a shrub, the young shoots slightly pubescent, but soon becoming glabrous, sometimes rather glaucous. Leaves petiolate, from broadly ovate to ovate-oblong, obtuse, coriaceous, often shining above, finely veined underneath,  $1\frac{1}{2}$  to 3in. long. Flowers solitary or few together in axillary clusters, or the males sometimes forming short racemes with a rhachis from under 1 line to 3 or 4 lines, the pedicels 1 to 2 lines long in the males, rather longer in the females. Male perianth-segments broad and concave, especially the inner ones,  $1\frac{1}{4}$  to  $1\frac{1}{2}$  line long. Stamens varying from 5 to 10 on the same specimen; anthers oblong, longer than the very short filaments, and not exceeding the perianth. Margin of the disk usually undulate. Female perianth rather larger than the male. Fruit ovoid-globular, 5 to 6 lines long, very smooth, red and succulent, with a bony endocarp.—*H. sepiaria* var. *australasica*, *F. v. M. Fragm.* iv. 119.

Hab.: Islands of Torres Straits, *Henne*; Edgecombe and Rockingham Bays, *Dallachy*; Burdekin River, *F. v. Mueller*; Cleveland Bay, *Bowman*; Kennedy District, *Daintree*; Rockhampton, *O'Shanesy*; Cape Sidmouth, *Brasier*; Brisbane River.

Wood yellow when fresh, changing to a greyish-yellow when dry, tough and hard, grain close.—*Bailey's Cat. Ql. Woods*, No. 365.

## 21. DISSILIARIA, F. v. M.

(Referring to the complete bursting of the capsule.)

Flowers monœcious (or diœcious?) in axillary clusters or solitary (appearing terminal when the terminal bud is not developed). Male flower: Perianth of 4 to 6 segments, imbricate in the bud, the inner ones rather larger and more petal-like. Glands none. Stamens few or many, inserted on a central receptacle without any rudimentary ovary; filaments very short. Anthers dorsally attached, the cells parallel, opening longitudinally in 2 valves. Female flower: Perianth of 3 or 4 segments. Disk shortly cup-shaped or annular. Ovary 3-celled, with 2 ovules in each cell. Styles linear, spreading, undivided, free or very shortly connate at the base. Capsule more or less tridymous, dividing into 2-valved cocci, the pericarp thick and hard, the epicarp usually separating from the endocarp in each valve. Seeds without any carunculus. Albumen copious.

Cotyledons flat and broad.—Trees or shrubs. Leaves opposite, undivided, entire or crenulate, penniveined and slightly reticulate. Male flowers very small, on short pedicels, females few together or solitary. Fruits usually solitary.

The genus is endemic in Australia; it differs from other Australian *Phyllanthæ* by having opposite leaves.

- Capsule 8 or 9 lines diameter, the thick corky exocarp deeply furrowed on the back of the cocci . . . . . 1. *D. baloghioides*.  
 Capsule 4 or 5 lines diameter, the corky exocarp slightly furrowed on the back of the cocci . . . . . 2. *D. Muellerei*.  
 Capsule about 4 lines diameter, truncate on the top, the cocci not furrowed on the back, with a short conical point or horn on the top . . . . . 3. *D. tricornis*.

1. ***D. baloghioides*** (Baloghia-like), *F. v. M.*: *Baill. Adans.* vii. 359; *Benth. Fl. Austr.* vi. 90. "Currungul," Nerang, *Schneider*. A glabrous tree. Leaves ovate oblong or elliptical, entire, coriaceous, smooth and shining, 2 to 3 in. long, on a petiole of about  $\frac{1}{4}$  in. Female flowers 3-merous (*Baillon*). Fruiting pedicels 2 to 4 lines long, thick, solitary, apparently terminal. Capsule about an inch diameter, minutely-tomentose, with a thick corky exocarp separating from the hard endocarp, marked outside with narrow furrows between the cocci and a broad deep furrow along the line of dehiscence on the back of each coccus. Ovules 2 in each cell but only one usually enlarged. Seeds oval, shining.

Hab.: Moreton Bay, *A. Cunningham*, also *Leichhardt*, and Pine River, *Fitzalan*.

Wood hard, close-grained, brown, becoming darker towards the centre of the tree; might be used for any purpose to which the English apple is put, which it somewhat resembles.—*Bailey's Cat. Ql. Woods*, No. 366.

Wood used for nullahs, spears and paddymelon sticks, *Schneider*.

2. ***D. Muellerei*** (after Baron Mueller), *Baill. Adans.* vii. 359, t. 1; *Benth. Fl. Austr.* vi. 91. A glabrous shrub or tree. Leaves broadly ovate, sometimes almost cordate, obtuse, irregularly crenulate, 1 to 3 in. long and broad, on a petiole of about  $\frac{1}{4}$  in. Female flowers in short cymes apparently terminal, the fruiting pedicels  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long. Calyx of 3 or 4 broad segments, imbricate in the bud. Petals rather longer than the calyx. Disk short, crenulate, close round the base of the ovary. Capsule globular, 4 to 5 lines diameter, slightly tridymous and furrowed on the backs of the cocci, the thick corky exocarp separating from the endocarp as in *D. baloghioides*.

Hab.: Rockhampton, *Thozet*, *Dallachy*.

3. ***D. tricornis*** (3-horned), *Benth. Fl. Austr.* vi. 91. A shrub, with the young branches pubescent, the adult foliage nearly glabrous. Leaves ovate elliptical or almost lanceolate, very obtuse, crenulate, rounded or contracted at the base, coriaceous, shining and veined above, pale with the midrib pubescent underneath, 1 to 1 $\frac{1}{2}$  in. long, on a petiole of  $\frac{1}{4}$  in. or less. Flowers in sessile clusters in the upper axils or appearing terminal from the non-development of the terminal bud, the males numerous, on slender pedicels of 1 to 3 lines, the females 1 or 2 in each axil on shorter thick pedicels. Bracts small, villous. Male perianth glabrous, of 4 rarely 6 broad segments,  $\frac{1}{2}$  to  $\frac{3}{4}$  line long, somewhat petal-like, especially the inner ones which are rather longer. Stamens 4, rarely 6 or more, on a hairy receptacle, longer than the perianth. Female perianth of 3 rather acute or mucronulate glabrous segments, and 3 smaller inner lanceolate or linear ones alternating with them. Disk very hairy, but not prominent. Ovary very short, tapering into 3 distinct styles much thickened at the base as in *Pseudanthus*. Capsules on pedicels of 2 to 4 lines, pubescent, about 4 lines diameter, tridymous, flat-topped, hard, with a small conical point or horn on the top of each coccus but no furrow on the back. Seeds only ripening one of the two ovules of each cell, ovoid, without any carunculus.

Hab.: Rockingham Bay, *Dallachy*.

## 22. BISCHOFIA, Blume.

(After M. Bischof).

Male flower: Sepals 5, concave, obtuse, imbricate, concealing the anthers. Disk none. Stamens 5, filaments short; anthers large, cells parallel. Pistillode short, broad. Female flower: Sepals ovate, caducous. Staminodes 5, small, or none. Ovary exerted, 3 to 4-celled; styles long, linear, stout, entire; ovules 2 in each cell. Fruit globose, fleshy, with 3 to 4 cells lined with a parchment-like 2-valved endocarp. Seeds turgidly oblong, testa fibro-crustaceous, albumen fleshy; cotyledons broad flat, radicle straight elongate.—A glabrous tree. Leaves alternate, 3-foliolate; leaflets often crenate. Flowers in axillary or lateral paniculate racemes, minute, diœcious, apetalous: males scattered or clustered, females longer, pedicellate.

1. **B. javanica** (of Java), *Blume; Hook. Fl. of Brit. Ind. v. 345.* A round-headed, more or less deciduous glabrous tree, 30 to 40ft. high. Bark smooth. Leaves very variable; petiole 1 to 6in. long; leaflets 3 to 5in., from ovate to oblong-lanceolate, acuminate, repand-toothed, petiolules 6 to 9 lines. Panicles very slender, flowers green. Male minute on short slender pedicels. Female 2 lines diameter, on stout pedicels. Fruit fleshy, on long thickened pedicels, smooth, size of a pea, blue-black. Seeds smooth, shining, testa splitting longitudinally, dark-brown.—*B. trifoliata*, *Hook. Ic. Pl. t. 844; Microbius Roeperianus*, *Wight. Ic. t. 1880.*

Hab.: Rockingham Bay.

## 23. APOROSA, Blume.

Flowers minute, diœcious, rarely monœcious, apetalous; males most minute in axillary catkin-like spikes; female sessile or shortly pedicellate in very short bracteate spikes. Male flower: Sepals 4 (3 to 6), membranous, imbricate. Stamens 1 to 5 in the centre of the flower, filaments capillary; anthers didymous. Pistillode minute or none. Female flower: Sepals of the males but larger. Ovary 2 (rarely 3) celled; stigma small, plumose, short, spreading or recurved, simple or 2 to 4-cleft, rarely elongate and 2-partite; ovules 2 in each cell. Fruit globose, ellipsoid or ovoid, bursting irregularly, or partially 2 to 4 valved from the base upwards, epicarp thin or thick and spongy or fleshy, endocarp thin, often separable; cells glabrous or hairy within, especially on the septum. Seeds oblong or suborbicular, usually plano-convex, albumen fleshy; cotyledons broad, flat.—Tree. Leaves alternate, quite entire, rarely sinuate-toothed, penninerved.

1. **A. australiana** (Australian), *F. v. M. Syst. Cens. Pl.* (name only).

I have never seen specimens of this plant, and so far as known F. v. Mueller never published a description or placed specimens in the Nat. Herb. Melbourne.

## 24. ANTIDESMA, Linn.

(From *anti*, like, and *desmos*, bond; the bark used in rope making.)

Flowers diœcious, the males in dense or interrupted spikes or catkins, the females in spikes or racemes. Male flower very small: Perianth of 3 to 5 segments, slightly imbricate in the bud. Stamens 2 to 5, opposite the perianth-segments, round a central rudimentary ovary. Anthers 2-celled, the cells separated by and terminating the thick more or less 2-lobed connective. Glands alternating with the stamens and often concrete with the rudiment of the ovary in a depressed lobed mass. Female flower: Perianth of the male. Glands more distinct and usually flattened. Ovary 1-celled or rarely 2-celled (in the very young state 3-celled?) with 2 ovules in each cell. Styles 3, very short, usually 2-lobed. Fruit a small more or less oblique drupe. Seed usually 1 only, without

any arillus or carunculus. Cotyledons broad.—Trees or shrubs. Flowers small, the spikes solitary or several together in the upper axils or forming a terminal panicle.

The genus is spread over the tropical and subtropical regions of the Old World. Among the Queensland species two only are recognised as identical with widely dispersed Asiatic species, the remaining four are endemic.

Flowers inside, glands and rudimentary ovary in the males, ovary in the females pubescent or hirsute. Spikes paniculate.

Female flowers nearly sessile. Perianth-segments ovate acute. Leaves rounded at the end . . . . . 1. *A. Ghæsembilla*.

Female flowers pedicellate. Perianth-segments very broad and obtuse. Leaves often obtusely acuminate . . . . . 2. *A. Dallachyanum*.

Flowers in the interior perfectly glabrous.

Spikes or racemes mostly paniculate. Flowers nearly sessile . . . . . 3. *A. Bunius*.

Spikes or racemes mostly simple. Female flowers pedicellate.

Leaves  $\frac{1}{2}$  to 1 in. long, ovate or obovate. Spikes  $\frac{1}{2}$  to 1 in. Perianth-segments broad. Fruit small . . . . . 4. *A. parvifolium*.

Leaves oblong-lanceolate or elliptical, 2 to 4 in. long. Female-perianth shortly and broadly 4-lobed. Fruit small, black . . . . . 5. *A. erosre*.

Leaves oblong or elliptical, mostly sinuate, 2 to 4 in. long. Female perianth shortly and broadly 4-lobed. Fruit rather large . . . . . 6. *A. sinuatum*.

1. **A. Ghæsembilla** (taken from Burmann's name for *Embelia Ribes*, not this.—Cyl. Fl. pt. iv. 43), *Gartn. Fruct.* i. 189, t. 39; *Benth. Fl. Austr.* vi. 85. Black Currant-tree of Walsh River. A shrub or small tree, the young branches foliage and inflorescence more or less pubescent or tomentose, the full-grown leaves often glabrous. Leaves on very short petioles, broadly ovate obovate or nearly orbicular, very obtuse, rounded or contracted at the base, rather thin, but often shining above,  $1\frac{1}{2}$  to 2 or rarely 3 in. long. Male spikes dense, 1 to 2 in. long, the females shorter and looser, both solitary or more frequently several in a terminal panicle. Male flowers sessile or nearly so; perianth deeply divided into 5 or rarely 4 ovate ciliate segments not  $\frac{1}{2}$  line long. Stamens varying from 3 to 5, the filaments at least 1 line long. Glands broad, hirsute. Female flowers on very short thick pedicels. Ovary when young pubescent or hirsute, but usually becoming glabrous as it enlarges. Styles short, united at the base, spreading upwards, shortly 2-lobed. Drupes purple, not above 3 lines long, usually obliquely ovoid and 1-seeded, but said to be occasionally didymous and 2-seeded.—Muell. Arg. in DC. Prod. xv. ii. 251; *A. paniculatum*, Roxb.; Wight Ic. t. 820, and other synonyms adduced by Muell. Arg. l.c.

Hab.: Walsh River, *T. Barclay-Millar*.

This species is widely diffused over East India and the Archipelago from Ceylon to S. China. Fruit used for jam making by the settlers.

Wood of a light colour, hard and close-grained.—*Bailey's Cat. Ql. Woods*, No. 367A.

2. **A. Dallachyanum** (after J. Dallachy), *Baill. Adans.* vi. 387; *Benth. Fl. Austr.* vi. 85. "Je-jo," Cape Grafton, *Roth*. A shrub or small tree, closely allied to *A. Ghæsembilla*, the young shoots rather less pubescent and the adult foliage often almost glabrous. Leaves from ovate to lanceolate-elliptical, obtuse or shortly and obtusely acuminate, 2 to 4 in. long on petioles of 2 to 4 lines. Male spikes pubescent, mostly paniculate, but sometimes solitary, more slender than in *A. Ghæsembilla* and more or less interrupted. Perianths sessile, deeply divided into 4 or 5 broad concave hirsute segments  $\frac{1}{2}$  line long. Stamens 3 to 5, usually 4. Rudimentary ovary rather large, hirsute as well as the glands. Female flower racemose, the pedicels  $\frac{1}{2}$  to 1 line long. Perianth-segments very broad, ciliate and hirsute as well as the glands and ovary. Styles broad, 2-lobed. Fruit obovoid, white and acid, twice as large as in *A. Ghæsembilla*.

Hab.: Rockingham Bay, *Dallachy*, and most tropical scrubs.

Fruit eaten by aborigines.—*Roth*.

Used for jam and jelly making, an excellent substitute for the European Red Currant.

3. **A. Bunius** (from *Bune*, the Malay name), *Spreng.*; *Muell. Arg. in DC. Prod.* xv. ii. 262; *Benth. Fl. Austr.* vi. 86. "Moi-kin," Tully River, "Chunka," Bloomfield River, *Roth.* A tree, usually quite glabrous. Leaves oblong, obtuse, acute or shortly acuminate, 4 to 5 in. long or sometimes more, somewhat coriaceous and shining, on petioles of 3 or 4 lines. Male spikes slender, interrupted, 4 to 6 in. long. Stamens usually 3 or 4. Female racemes much shorter, with the flowers nearly sessile. Fruits about 3 lines long, on pedicels of 1 to 1½ line long.—*Wight. Ic. t.* 819.

Hab.: Rockingham Bay, *Dallachy.* The species extends over the Indian Archipelago to the Philippines and South China.

Fruit useful for jam making.

Fruit eaten by aboriginals.—*Roth.*

Wood of a light-brown colour, dark towards the centre, soft; useful for cabinet work.—*Bailey's Cat. Ql. Woods, No.* 367.

4. **A. parvifolium** (leaves small), *F. v. M. Fragm.* iv. 86; *Benth. Fl. Austr.* vi. 86. A bushy shrub of about 4 ft., the young shoots and inflorescence very slightly pubescent, the adult foliage glabrous. Leaves ovate obovate or orbicular, very obtuse, not exceeding 1 in. and mostly smaller, on very short petioles. Male spikes axillary, interrupted, slender, ½ to 1 in. long. Perianth divided to the middle into 4 broad membranous glabrous lobes. Stamens 2 to 4. Glands and rudimentary ovary thick and glabrous. Female racemes usually shorter than the males, the flowers very shortly pedicellate. Perianth smaller than in the males, the lobes ovate, glabrous as well as the glands and ovary. Fruit red, not above 2 lines long.

Hab.: Port Denison, *Fitzalan, Dallachy*; Barron River.

Fruit useful for jam making.

5. **A. erostre** (gnawed), *F. v. M. Herb.*; *Benth. Fl. Austr.* vi. 87. A shrub, perfectly glabrous. Leaves oblong-lanceolate or elliptical, often acuminate, 2 to 4 in. long, on a short petiole. Male flowers unknown. Fruiting racemes axillary, slender, 1 to 1½ in. long, quite glabrous. Pedicels about 1 line long. Perianth shortly 4-lobed. Fruit small, black, glabrous. Styles very short.

Hab.: Rockingham Bay, *Dallachy*; Cairns.

Fruit used for jam making.

6. **A. sinuatum** (sinuate), *Benth. Fl. Austr.* vi. 87. A tree of about 30 ft., glabrous or the young shoots slightly pubescent. Leaves oblong or elliptical, entire or deeply sinuate, 2 to 4 in. long, on petioles of 3 to 6 lines. Male flowers unknown. Female fruiting racemes solitary, 1 to 3 in. long. Pedicels 1 to nearly 2 lines. Perianth glabrous or nearly so, broadly urceolate, shortly lobed. Fruits compressed, 3 to 4 lines long. Styles very short.

Hab.: Rockingham Bay, *Dallachy.*

Fruit used for jam making.

## 25. \*JATROPHA, Linn.

(From *iatros*, physician, and *trophe*, food; medicinal qualities).

Flowers in terminal cymes, monœcious, the central in the cyme or its fork usually female, often petaliferous. Male flower: Sepals 5, imbricate, often petaloid. Petals 5, contorted, free or connate. Disk entire or of 5 glands. Stamens many, filaments of all or of the interior ones only, connate, anthers erect. Pistillode none. Female flower: Perianth of the male. Ovary 2 to 4-celled; styles connate below, 2-fid, lobes entire or 2-lobed; ovules 1 in each cell. Capsule of 2 to 4 2-valved cocci, endocarp crustaceous or bony. Seeds ovoid or

oblong, testa crustaceous, albumen fleshy; cotyledons broad, flat.—Herbs, shrubs or trees, often glandular and prickly. Leaves alternate, entire or digitately lobed or partite; stipules often ciliate.

Species chiefly American.

Leaves palmately cut into many narrow lobes . . . . . 1. *J. multifida*.  
Leaves orbicular-cordate, entire or 3 to 5-lobed or angled . . . . . 2. *J. Curcas*.

1. **J. multifida** (leaves much cut), *Linn.*; *Hook. in Fl. Brit. Ind.* v. 383. A large shrub or small tree, glabrous. Leaves 3 to 5 in. in diameter, orbicular in outline, palmately cut into many narrow entire or lobulate cordate-acuminate segments, glaucous beneath; petiole as long as the blade; stipules capillary multifid eglandular; bracts and entire sepals glabrous. Cymes on long peduncles; flowers scarlet; anthers linear. Disk of female flowers urceolate.

Hab.: Native of South America. Met with as a stray from cultivation near townships.

2. **J. Curcas** (old generic name), *Linn.*; *Hook. in Fl. Brit. Ind.* v. 383. Physic or Purgig Nut. A large shrub or small tree, glabrous except the young shoots. Leaves orbicular-cordate, 4 to 6 in. diameter, entire or 3 to 5-lobed or angled, lobes obtuse or acute, quite entire; petioles long as the blade. Cymes or panicles terminal, glabrous or pubescent. Flowers yellow; corolla-tube of male villose within. Males at the end of the ramifications, females at the divisions. Ovary and styles glabrous. Capsule 1 to 1½ in. long and nearly as broad. Seeds nearly black.

Hab.: Native of the Coromandel Coast. Met with as a stray from cultivation.

## 26. ALEURITES, Forst.

(Referring to the mealy substance with which the plant is covered).

Flowers monœcious, in a terminal panicle. Male flower: Calyx entire and closed in the bud, splitting into 3 or rarely 2 segments. Petals 5, contorted in the bud. Disk with 5 or 10 slightly prominent lobes or glands. Stamens indefinite, on a central receptacle or disk without any rudimentary ovary; anthers erect in the bud, the cells parallel and adnate to a connective continuous with the filament, opening longitudinally in 2 valves. Female flower: Calyx and petals of the males. Disk of 5 minute glands. Ovary 2 to 5-celled, with 1 ovule in each cell. Styles 2 to 5, deeply divided into 2 branches. Fruit large, somewhat fleshy, the endocarp hard, tardily separating into cocci. Seeds nearly globular, with a distinct outer somewhat cartilaginous coating, the inner coating bony; albumen oleaginous; cotyledons broad, flat, with a short narrow radicle.—Trees with a stellate tomentum. Leaves alternate, petiolate, large, entire or lobed. Flowers in terminal panicles, the females usually few, terminating the main branches.

A genus of few species, natives of tropical Asia and the Pacific islands. The only Australian species is also widely spread over the Archipelago.

1. **A. moluccana** (of Molucca), *Willd.*; *Muell. Arg. in DC. Prod.* xv. ii. 723; *Benth. Fl. Austr.* vi. 128. Candle Nut. "Tar-kal," Cooktown, *Roth*. "Nappalla," Barron River, *J. F. Bailey*. A tree attaining sometimes a considerable size, the young foliage densely ferruginous-tomentose, becoming nearly glabrous when full-grown. Leaves crowded at the ends of the branches immediately under the panicle, broadly ovate-rhomboidal or ovate-lanceolate, obtuse or acuminate, rarely narrow-lanceolate, entire undulate-crenate or 3, 5 or 7-lobed, sometimes nearly 1 ft. long and broad but in herbaria usually 4 to 6 in., 3, 5 or 7-nerved, the primary veins pinnate with transverse secondary veins as in *Croton arnhemicus*. Flowers numerous, in broad terminal much-branched panicles, the pedicels short. Calyx tomentose, opening usually in 3 segments,

about 1½ line long. Petals obovate, about 3 lines long. Stamens 15 to 20, on a convex hairy receptacle, the filaments also hairy, scarcely longer or sometimes shorter than the anthers. Female flowers nearly similar to the males as to calyx and corolla. Styles deeply divided into 2 branches. Fruit fully 2 inches diameter.—*Jatropha moluccana*, Linn.; *Aleurites triloba*, Forst., and several other synonyms, as given by Muell. Arg. l.c.

Hab.: Rockingham Bay and other tropical scrubs.

Widely spread over the Eastern Archipelago and the islands of the South Pacific.

Fruit when fresh eaten by aboriginals.

Fruit one of the principal foods of the cassowary.

The oil of the nuts of this tree is known in commerce as candle-nut or country walnut oil. Mr. Staiger found the nuts to consist of the following:—The dry nuts—shell, 70 per cent.; kernel, 30 per cent. Kernel freed from shell—oil, 54·3 per cent.; amylaceous and nitrogenous substance, 45·7 per cent. This latter gives 10½ per cent. ashes rich in phosphoric acid.

Wood of a light color, soft and light; if cut when full of sap liable to decay.—*Bailey's Cat. Ql. Woods*, No. 368.

27. CROTON, Linn.

(From the resemblance of the seed to a tick).

Flowers monœcious or rarely diœcious in terminal racemes. Male flower: Calyx of 5, rarely 4 or 6 segments, imbricate or almost or quite valvate in the bud. Petals as many and usually as long as the calyx-segments. Glands small, alternating with the petals. Stamens indefinite (5 to above 30), inserted on a rather broad, usually hairy receptacle or disk; filaments free, inflected in the bud below the anther, erect and usually exceeding the expanded flower; anthers adnate to a connective continuous with the filaments, with 2 parallel cells opening longitudinally. Female flower: Calyx-segments usually narrower than in the males and sometimes enlarged. Ovary 3-celled (very rarely 2 or 4-celled), with 1 ovule in each cell. Styles divided into 2 or 4 branches. Capsule separating into 3 deciduous 2-valved cocci. Seeds smooth, with a small carunculus; testa crustaceous or hard. Albumen copious; cotyledons broad.—Trees, shrubs, or rarely herbs, usually clothed or sprinkled with stellate hairs or scales, rarely quite glabrous. Leaves alternate or very rarely opposite, sometimes almost verticillate immediately under the inflorescence, petiolate, entire, variously toothed or very rarely lobed, penniveined or rarely 3 or more nerved at the base, with 2 or more small sessile or stipitate glands at the top of the petiole or base of the lamina. Stipules usually minute. Flowers usually clustered along the rachis of a terminal raceme, the bracts very small.

The genus is a very large one, extending over the tropical regions of both the New and the Old World.

Stamens not more than 12. Leaves penniveined, rarely irregularly 3-nerved at the base.

Leaves densely clothed underneath with a stellate scaly or silvery tomentum. Female calyx under 1 line as well as the male.

Styles with 2 rather broad branches . . . . . 1. *C. insularis*.

Styles with 4 elongated branches.

Leaves all alternate . . . . . 2. *C. phebaliooides*.

Leaves all or nearly all opposite . . . . . 3. *C. opponeus*.

Leaves quite glabrous or very sparingly sprinkled when young with stellate hairs or scales.

Leaves rather thin. Stamens 10 to 12. Capsule globular, scarcely furrowed . . . . . 4. *C. Verreauxii*.

Leaves coriaceous. Stamens 5 to 8. Capsule longer than broad, scarcely furrowed . . . . . 5. *C. acronychioides*.

Leaves coriaceous. Stamens about 10. Capsule deeply 3-furrowed, 3-lobed at the top . . . . . 6. *C. triacros*.

Stamens 20 to 30 or more. Leaves broad, 5 or 7-nerved at the base, densely stellate-tomentose . . . . . 7. *C. arnhemicus*.

1. **C. insularis** (first found on South Sea Islands), *Baill. Adans.* ii. 217; *Benth. Fl. Austr.* vi. 124. Queensland Cascarilla Bark. A tall straggling shrub or small tree, the branches inflorescence and underside of the leaves silvery-white or slightly reddish with a close scaly tomentum. Leaves ovate to lanceolate, obtuse, entire or scarcely sinuate, rounded or tapering at the base, finely and often obscurely penniveined, the upper surface green, but sprinkled with a few small scales, mostly 2 to 3 in. long, on petioles of  $\frac{1}{4}$  to  $\frac{1}{2}$  in. Racemes 3 to 4 in. long, the upper portion male, the female flowers occupying the lower clusters, and often 1 or 2 with the males higher up, all on pedicels of 1 to 2 lines, lengthening under the fruit to 4 to 6 lines. Male calyx-segments  $\frac{3}{4}$  line long, very slightly imbricate or almost valvate. Petals about as long. Stamens about 11; anther connective rather broad. Female calyx-segments thick, rather obtuse,  $\frac{3}{4}$  line long. No petals. Styles 3, diverging from the base, deeply divided into 2 erect broad lobes with recurved margins. Capsule about 3 lines diameter.—Muell. Arg. in DC. Prod. xv. ii. 527; *C. phebalioides*, A. Cunn. Herb. not of F. v. M.

Hab.: Broadsound, *R. Brown*; Brisbane River, Moreton Bay, *A. Cunningham*, *Fraser*, *Leichhardt*, *F. v. Mueller*; Rockingham Bay, *Dallachy*; Burdekin River, *F. v. Mueller*; Rockhampton, *Thozet*, *Dallachy* and others; Walter Hill's Queensland Woods, *London Exhibition*, 1862, n. 82.

Wood of a yellow colour, close-grained, hard and very tough.—*Bailey's Cat. Ql. Woods*. No. 369.

2. **C. phebalioides** (indumentum *Phebalium*-like), *F. v. M.*; *Muell. Arg. in Flora* 1864 (*Oct.*) 485, and in DC. Prod. xv. ii. 581; *Benth. Fl. Austr.* vi. 125. A tree attaining 40 to 50 ft., with slender weak often pendulous branches, silvery-white as well as the inflorescence and underside of the leaves with a close scaly tomentum. Leaves petiolate, lanceolate, or the larger ones ovate-lanceolate, and the smaller ones narrow oblong, obtuse, or almost acute, entire or with very small distant teeth, the upper surface green, mostly  $1\frac{1}{2}$  to 3 in. long. Racemes 1 to 3 in. long, the flowers usually numerous, mostly males, with here and there a female in the same cluster; in some smaller-leaved forms the flowers few in shorter racemes, the male pedicels scarcely above 1 line, the female 2 to 3 lines long. Male calyx-segments almost or quite valvate, about 1 line long. Petals as long or rather longer. Stamens 10 or 11. Female calyx-segments lengthening to  $1\frac{1}{2}$  line. Styles divided to the base, or nearly so, into 4 narrow rather long branches. Capsule 3 to 4 lines diameter, hirsute with stellate hairs, and often shortly muricate, slightly tridymous—*C. stigmatosus*, *F. v. M. Fragm.* iv. 140 (*Nov.* 1864); *Muell. Arg. in Linnæa* xxxiv. 107, and in DC. Prod. xv. ii. 580.

Hab.: Burdekin River, *F. v. Mueller*; Port Denison, *Fitzalan*; Edgecombe Bay, *Dallachy*; Rockhampton, *Bowman*.

The species is also in New Caledonia.

Wood yellow, close-grained and tough.—*Bailey's Cat. Ql. Woods*, No. 370.

Var. *hirsuta*. An erect tree, the young shoots and leaves with numerous longish hairs among the scaly tomentum. Leaves oblong, four or more inches long, differing from the normal form in the larger foliage, which is much more hairy, and in the less silvery appearance.—Found in the scrubs of Taylor's Range, near Brisbane.

Wood of a yellow colour, close in grain, hard and tough.—*Bailey's Cat. Ql. Woods*, No. 370a.

3. **C. opponens** (opposite), *F. v. M.*, *Herb*; *Benth. Fl. Austr.* vi. 125. Foliage and indumentum of *C. phebalioides*, but leaves opposite, or nearly so, and the capsules on axillary peduncles of 2 or 3 lines are much larger, ovoid, nearly  $\frac{1}{2}$  in long, densely villous with short stellate hairs, scarcely furrowed, and mostly 4-celled. Calyx persisting under the capsule, of 5 broad imbricate sepals. Styles evidently 4-lobed, but not seen perfect.

Hab.: Recorded for Queensland by *F. v. M.*



4. **C. Verreauxii** (after M. Verreaux), *Baill. Etud. Euph.* 357; *Benth. Fl. Austr.* vi. 126. A small tree, either quite glabrous or the smaller branches and foliage sprinkled with a few scattered stellate hairs or scales. Leaves from almost ovate to oblong-elliptical or lanceolate, obtuse or acuminate, entire or dentate, rounded or tapering at the base, green on both sides, 2 to 4 in. long in most specimens, but occasionally the larger ones twice that size, the petioles also very variable in length. Racemes slender, rarely above 2 in. long. Flowers few in the clusters, the lower ones chiefly female, the upper chiefly or entirely male, on pedicels of 1 to 2 or rarely 3 lines long, and sometimes the racemes wholly males or chiefly females. Calyx-segments acute, valvate in the bud,  $\frac{1}{2}$  to  $\frac{3}{4}$  line long in the males, rather longer in the females. Petals fringed-ciliate with long woolly hairs. Stamens 10 to 12. Styles rather thick, divided to about the middle into 2 undivided branches. Ovary tomentose or hirsute with stellate hairs. Capsule nearly globular, variable in size, sprinkled with stellate hairs or at length glabrous.—*Muell. Arg. in Linnæa* xxxiv. 117, and in *DC. Prod.* xv. ii. 620; *F. v. M. Fragm.* iv. 141.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Brisbane River, Moreton Bay, *A. Cunningham*, *Fraser*, *F. v. Mueller*, *C. Stuart*.

Wood of a yellowish-colour, close-grained and firm.—*Bailey's Cat. Ql. Woods*, No. 371.

5. **C. acronychioides** (*Acronychia*-like), *F. v. M. Fragm.* iv. 142; *Benth. Fl. Austr.* vi. 127. A shrub or tree, the young shoots and inflorescence more or less sprinkled with a scaly tomentum, the adult foliage usually quite glabrous. Leaves shortly petiolate, elliptical oblong or almost ovate, entire or slightly sinuate-crenate, coriaceous, shining above, penniveined with fine much-anastomosing veins, 2 to 4 in. long, the basal glands sessile. Racemes 1 to 2 in. long, terminal as in the rest of the genus, but with the flowering branches often so short as to appear axillary, the female flowers few, usually only in the lowest cluster close to the floral leaves, the other clusters all male, the pedicels very short. Calyx-segments nearly 1 line long, rather broad, obtuse, slightly imbricate in the bud, somewhat ciliate. Petals narrow, ciliate. Receptacle hairy. Stamens 5 to 8. Female calyx-segments above 1 line long and narrow. Ovary densely hirsute. Styles broad, divided at least to the middle into 2 mostly bifid branches. Capsule 5 lines long and about 4 lines broad, more or less scaly. Seeds with a small carunculus.—*Baill. Adans.* iv. 300.

Hab.: Rockhampton and surrounding districts, *Dallachy*, *Bowman*, *Thozet*, and many other localities North and South.

6. **C. triacros** (capsule 3-lobed), *F. v. M. Fragm.* vi. 185; *Benth. Fl. Austr.* vi. 127. "Bo-atha," Mapoon, *Roth*. A tree or shrub, quite glabrous or the young shoots and inflorescence very sparingly scaly tomentose. Leaves ovate or elliptical, obtuse or shortly acuminate, entire or obscurely sinuate-crenate, rather coriaceous, smooth, penniveined, with fine and distant primary veins and obscure reticulations, 2 to 6 in. long or even more. Racemes sometimes very short, but some fruiting ones 3 or 4 in. long, often several together at the ends of the branches, some entirely or nearly entirely male, others entirely or nearly entirely female. Pedicels under 1 line long. Calyx-segments nearly 1 line long, imbricate in the bud. Stamens about 10. Styles rather deeply divided into 2 entire branches. Capsule sprinkled with stellate scales, tridymous, obtusely 3-lobed at the top with a deep central depression. Carunculus of the seeds very small.

Hab.: Rockingham Bay, *Dallachy*.

Timber used for spears.—*Roth*, l.c.

7. **C. arnhemicus** (of Arnheim's land), *Muell. Arg. in Linnæa* xxxiv. 112, and in *DC. Prod.* xv. ii. 599; *Benth. Fl. Austr.* vi. 127. A rather slender shrub of 5 or 6 ft., or a small straggling tree, clothed with a stellate tomentum, dense

and soft on the young branches inflorescence and underside of the leaves, more scattered on the upper surface. Leaves orbicular-cordate or broadly ovate in the typical form, obtuse or rarely with a short point, crenate, prominently 5 or 7-nerved at the base, with pinnate primary and transverse secondary veins, 3 to 5 in. long and nearly as broad, or smaller on the side branches. Racemes 3 to 6 in. long, the flowers usually numerous in the clusters, the lower ones chiefly females, the upper ones chiefly or entirely males. Pedicels varying from 1 to 3 lines. Calyx-segments broad, obtuse, rather above 1 line long, imbricate in the bud. Petals scarcely longer, ciliate-hairy. Stamens 20 to 30 or even more on a hairy receptacle, the filaments glabrous. Styles divided to the base into 2 long slender entire or very shortly 2-lobed branches. Capsule globular, not furrowed, hirsute with stellate hairs, fully 3 lines diameter.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

Var. *arenæfolius*. Bail. Adans. vi. 300. Leaves more ovate and often acuminate, usually 5-nerved. Flowers rather smaller.—Hab.: Cape York, *M'Gillivray*; Port Denison, *Fitzalan*; Edgecombe Bay, *Dallachy*; Gilbert River, *Daintree*; Harvey's Creek, Russell River.

## 28. CODIÆUM, Rumph.

(From the Malayan name—*Codebo*.)

Flowers usually monœcious in axillary or terminal racemes. Male flower: Calyx of 5 or 6 membranous segments much imbricate in the bud. Petals 5 or 6, very short. Glands as many as petals, alternating with them. Stamens indefinite, inserted on a slightly raised receptacle, without any rudimentary ovary; anthers with the cells divaricate or placed back to back and confluent at the top. Female flower: Calyx-segments thicker or larger than in the males. Disk obscurely lobed. Ovary 3-celled, with 1 ovule in each cell. Styles free, spreading or recurved, undivided. Capsule globular, separating into 2-valved cocci.—Shrubs or trees, quite glabrous. Leaves alternate, petiolate, entire. Flowers small, the males usually clustered but few together, the females solitary within each bract in separate racemes, or, in a species not Australian, at the base of the male raceme.

The genus comprises a few species from East India and the Archipelago, including the only Australian one.

1. *C. variegatum*, (variegated), *Blume*; var. *moluccanum*, *Muell. Arg. in DC. Prod.* xv. ii. 1119; *Benth. Fl. Austr.* vi. 147. A tall shrub or small tree, quite glabrous. Leaves from obovate-oblong to narrow elliptical or oblong-spathulate, 4 to 8 in. long, on petioles of  $\frac{1}{2}$  to 1 in., penniveined, green on both sides or especially in the typical form blotched or variegated with white. Flowers in long axillary or lateral racemes, and usually a male and female raceme in the same axil, the former longer than the latter. Male flowers in clusters of 2 to 6, on pedicels of 1 to 2 lines. Calyx-segments nearly orbicular and nearly 1 line diameter. Petals usually not above  $\frac{1}{2}$  as long as broad, or sometimes rather longer than broad, slightly dentate. Glands about the same length, broad, thick, and truncate. Stamens about 20. Female flowers on thick pedicels of 1 to 4 lines. Calyx-segments shorter and thicker than in the males. Disk obscurely lobed. Styles short thick and recurved. Capsule glabrous and smooth, 3 to 4 lines diameter.—*C. obovatum*, *Zoll*; *Baill. Adans.* vi. 303; *C. moluccanum*, *Dcne. Herb. Tim. Descr.* 157.

Hab.: Mount Elliott and Seaview Range, Rockingham Bay, *Dallachy*, and other northern scrubs.

## 29. BALOGHIA, Endl.

(After Dr. Joseph Balogh.)

Flowers dicecious or monœcious, in unsexual short terminal racemes. Male flower: Calyx 4- or 5-lobed, the lobes imbricate in the bud or very short. Petals as many as calyx-lobes. Disk with a thick raised undulate or irregularly lobed

border. Stamens indefinite, the filaments shortly united or inserted on a raised or conical central receptacle or column without any rudimentary ovary; anthers dorsally attached, with two distinct parallel cells opening outwards and longitudinally in 2 valves. Female flower: Calyx petals and disk as in the males. Ovary 3-celled, with one ovule in each cell. Styles 3, distinct or shortly united at the base, spreading, deeply divided into 2 branches. Fruit globular, the exocarp often fleshy or succulent, the endocarp rather hard, separating into 3 2-valved cocci. Seeds oblong, with a small carunculus; albumen copious, cotyledons flat, longer than and at least twice as broad as the radicle.—Trees or shrubs, glabrous except sometimes the flowers. Leaves opposite, coriaceous, finely veined. Flowers few, not small, the racemes sometimes almost reduced to umbels; bracts very deciduous, with 1 flower within each.

The genus contains but few species, chiefly from New Caledonia the Queensland one.

1. **B. lucida**, (shining) *Endl. Prod. Fl. Norf.* 84, and *Iconogr.* t. 122, 123; *Benth. Fl. Austr.* vi. 148. Scrub Bloodwood. A large tree, the trunk with the bark often much knotted and much stained by the flow of red sap. Leaves opposite, very shortly petiolate, oblong obovate-oblong or elliptical, obtuse or obtusely acuminate, rigidly coriaceous, glabrous, and shining, the primary veins numerous, fine but prominent, transverse and anastomosing. Flowers white, fragrant, few together in short loose sessile terminal racemes, the males and females usually on separate branches, but sometimes the lower 1 or 2 pair female and the upper 2 or 3 pair male; the pedicels opposite,  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long, solitary in the axils of very small bracts. Calyx deeply divided into 5 lanceolate lobes, varying to 4 only in the males, or rarely to 6 in the females, 2 to  $2\frac{1}{2}$  lines long. Petals oblong or lanceolate, nearly twice as long. Disk in both sexes with a thick irregularly lobed undulate margin. Stamens numerous, the filaments very shortly united in a conical or oblong column or receptacle. Styles divided almost to the base into 2 branches. Capsule echinate, hard, globular,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. diameter, somewhat tridymous, with a furrow bordered by 2 narrow ridges on the back of each coccus.—*Codiaeum lucidum*, Muell. Arg. in DC, *Prod.* xv. ii. 1116.

Hab.: Rockingham Bay, *Dallachy*; Rockhampton, *O'Shanesy*; Moreton Bay, *F. v. Mueller*; Taylor's Range.

Wood of a light-yellow, prettily marked, close in the grain, hard and tough; a useful cabinet-wood; might probably prove suitable for engraving.—*Bailey's Cat. Ql. Woods*, No. 373.

The red sap which flows copiously from this tree when cut, hardens to a red gum. Analysis of the inspissated juice according to Lauterer: Water 18.7; Arabin, 4.5; Tannin (derived from protocathechuic acid) 76.8.

### 30. FONTAINEA, Heckel.

(After R. F. Desfontaines).

Flowers dicecious or more rarely monœcious; calyx gamophyllous sacciform very shortly 4 to 5-dentate at apex, valvate, sometimes unequally broken. Petals 3 to 6 imbricate. Stamens numerous, central (of *Codiaeum*), exterior of base surrounded by continuous 4 to 6-gonal disk; anthers extrorsely rimose; cells adnate to linear connective or more or less high discrete at apex. Calyx of female flowers valvate, unequally broken. Petals as in the male flower. Disk hypogynous continuous surrounding base of gynœceum; ovary 3 to 6-celled; cells (when equal in number) oppositipetalous; style afterwards divided into branches, same in number, rather thick, stigmatiferous within; ovules solitary; micropyle obtected by short obturator. Fruit drupaceous, suboliviform or obtuse angular; putamen bony; cells 2 to 6; 1 (or rarely 2, 3) usually fertile, the others small effete. Seeds exarillate glabrous; albumen copious oily; cotyledons of central embryo foliaceous elliptical many times wider than terete radicle.—Trees, leaves alternate. Raceme axillary, *Heck. Baill. Hist. Pl.* v. 194.

1. **F. Pancheri** (after Capt. Pancher), *Heckel*. A slender tree of 50 to 60ft., glabrous except the flowers. Leaves alternate or here and there opposite, crowded at the end of the branches, obovate or obovate-oblong, obtuse, coriaceous, of a shining green, prominently veined, the veins oblique,  $1\frac{1}{2}$  to 3in. long. Male flowers in very short terminal sessile racemes almost reduced to an umbel. Pedicels slender, glabrous, 3 to 4 lines long. Calyx broadly cup-shaped, very shortly sinuate-lobed or almost truncate and sometimes irregularly splitting, tomentose on the margin. Petals nearly 3 lines long, glabrous outside, but the inner or upper surface very densely covered with a soft white loose tomentum or wool. Stamens indefinite, the central column prominent and tomentose-villous, the free part of the filaments glabrous or nearly so. Petals of female flowers as in the male. Fruit drupaceous, usually 4-celled.—*Codiaeum Pancheri*, Muell. Arg. in DC. Prod. xv. ii. 1117; *Baloghia Pancheri*, Benth. in Fl. Austr. vi. 149.

Hab.: Albert River and other localities in the south.  
The kernels of seeds highly poisonous

### 31. ADRIANA, Gaudich.

(After Adrian de Jussieu).

(Trachycaryon, Kl.).

Flowers dicecious, in terminal spikes. Male flower: Perianth globular and closed in the bud, opening in 4 or 5 valvate segments. No petals or glands. Stamens very numerous, crowded on a slightly raised central receptacle, without any rudimentary ovary; filament very short; anthers linear, erect, the cells adnate, parallel, opening longitudinally in 2 valves, the connective produced beyond them into a papillose point or linear appendage. Female perianth of 6 or 8 segments, imbricate in about 2 rows. Ovary 3-celled, with 1 ovule in each cell. Styles 3, distinct or very shortly connate at the base, bifid, densely covered or fringed with much raised or linear papillæ. Capsule separating into 2-valved cocci. Seeds ovoid, with a small carunculus. Testa crustaceous. Albumen copious. Cotyledons flat, much broader than the radicle.—Erect shrubs, glabrous or stellate-tomentose. Leaves alternate or opposite, 3 or 5-nerved, coarsely toothed and often 3-lobed. Male spikes usually rather long and interrupted, the flowers sessile in clusters of 3 to 6 in the axil of an ovate or lanceolate bract. Female spikes usually very short and dense, sessile or very shortly pedunculate within the last leaves.

The genus is endemic in Australia.

1. **A. acerifolia** (Maple-leaved), *Hook. in Mitch. Trop. Austr.* 371; *Benth. Fl. Austr.* vi. 131. A rather coarse shrub or 3 or 4ft., usually hoary or white with a stellate tomentum, sometimes dense and mixed with longer stellate hairs even on the upper surface of the leaves, sometimes very close or almost mealy, usually more sparing or almost wanting on the upper side of the leaves, or very rarely the whole plant glabrous and reddish. Leaves alternate, on rather long petioles, 3 or 5-nerved at the base, very variable in shape, usually either ovate-lanceolate and coarsely toothed or deeply 3-lobed with ovate-lanceolate and coarsely toothed lobes, the middle lobe the longest, the larger 3-lobed leaves often 4 to 6in. long, the upper ones often much smaller. Male spikes 2 to 3in. long; perianth-segments spreading, membranous, about  $1\frac{1}{2}$  line long; anthers about 1 line long on very short glabrous filaments. Females spikes very short and dense, sometimes contracted into a head, sessile within the floral leaves or petiolate bracts. Perianth-segments usually 6 but varying from 5 to 8, herbaceous, 2 to 3 lines long. Ovary and back of the styles more or less stellate-tomentose. Styles 4 to 6 lines long, divided to about the middle into 2 branches. Capsule 4 to 5 lines diameter, very obtuse. Seeds smooth.—Muell.

Arg. in DC. Prod. xv. ii. 890; Baill. Adans. vi. 312; *A. heterophylla*, Hook. in Mitch. Trop. Austr. 121; *Trachycaryon Cunninghamii*, F. v. M. in Trans. Phil. Soc. Vict. i. 15, and in Hook. Kew Journ. viii. 209.

Hab.: Maranoa and Balonne Rivers, *Mitchell*; Rockhampton, *Dallachy*, *Bowman*; North Kennedy district, *Daintree*; Moreton Bay, *C. Stuart*.

Var. *glabrata*. Glabrous or nearly so in all its parts.—*A. glabrata*, Gaudich. in Ann. Sc. Nat. ser. 1, v. 223, and in Freyc. Voy. Bot. 487.

### 32. CLAOXYLON, A. Juss.

(Alluding to the wood being brittle,)

Flowers diœcious or rarely monœcious, in axillary racemes. Male flower: Calyx at first globular, opening to the base into 3 rarely 4 valvate segments. Petals none. Stamens indefinite, on a central receptacle or disk, intermixed with glands or lobes of the disk, without any central rudimentary ovary; filaments not inflexed; anther-cells distinct, erect, opening longitudinally from the apex downwards. Female flower: Calyx less deeply divided than in the males into 3 or 4 valvate lobes. Disk with a free entire or lobed margin. Ovary 3-celled or rarely 2-celled, with one ovule in each cell. Styles short, entire, free or united at the base. Capsule separating into 2-valved cocci. Seeds without any carunculus, the outer coating loose and membranous, the inner testa crustaceous. Albumen copious. Cotyledons broad, with a narrow radicle.—Trees or shrubs, glabrous or sparingly pubescent with short appressed hairs, the foliage often taking a reddish tint when dry. Leaves alternate, petiolate, usually large, entire or toothed, penniveined. Racemes solitary or 2 together, shorter than the leaves. Flowers small, the males few together in clusters, the females solitary. Bracts minute.

The genus is spread over tropical Asia and Africa. The Australian species are all probably endemic, but the characters are difficult to ascertain without good specimens of both sexes.

- |  |                              |
|--|------------------------------|
| Leaves long and narrow, on petioles under $\frac{1}{2}$ in. Flowers monœcious on pedicels of $\frac{1}{2}$ to $\frac{1}{2}$ in. Ovary glabrous . . . . . | 1. <i>C. angustifolium</i> . |
| Leaves various, on petioles of $\frac{1}{2}$ to 1 in. Flowers diœcious or nearly so, on pedicels under 2 lines. Interstaminal glands glabrous.           |                              |
| Racemes in the axils of young leaves. Ovary glabrous. Styles united at the base . . . . .  | 2. <i>C. tenerifolium</i> .  |
| Racemes in the axils of full-grown leaves. Ovary pubescent. Styles free . . . . .  | 3. <i>C. australe</i> .      |
| Leaves large on petioles of 1 to 2 in. Flowers diœcious, on very short pedicels. Interstaminal gland and ovary pubescent . . . . .                       | 4. <i>C. Hillii</i> .        |

1. ***C. angustifolium*** (leaves narrow), *Muell. Arg. in Linnaea* xxxiv. 165, and in DC. Prod. xv. ii. 786; *Benth. Fl. Austr.* vi. 129. A shrub of 5 or 6ft., glabrous except a minute pubescence on the inflorescence. Leaves narrow-lanceolate, acuminate, irregularly toothed, tapering at the base, rather firm and smooth, 4 to 8in. long and rarely above 1in. broad, on a petiole of only 1 to 3 lines, the basal glands very small. Flowers monœcious, in racemes of about 1in., the rachis slender almost filiform, the males in clusters of 3 to 6 on pedicels of 2 to 3 lines, with occasionally a female in the same cluster on a pedicel twice as long. Male perianth of 3 segments, about  $\frac{1}{2}$  line long. Stamens 10 to 12, intermixed with small narrow glands; filaments thick, nearly as long as the perianth; anther-cells small, erect. Ovary glabrous or minutely pubescent; styles exceedingly short, tooth-like. Young capsule tridymous, glaucous, and quite glabrous, on a pedicel of above  $\frac{1}{2}$  in.—*Mercurialis angustifolia*, Baill. Adans. vi. 322.

Hab.: Cumberland isles and Port Denison, *Fitzalan*.

2. ***C. tenerifolium*** (leaves delicate, supple), *F. v. M. in Baill, Adans.* vi. 323; *Benth. Fl. Austr.* vi. 180. A tree of 20 to 30ft., the young shoots and inflorescence sparingly and minutely pubescent, otherwise glabrous. Leaves mostly ovate and acuminate, rarely more elliptical, dentate, tapering at the base,

3 to 4 in. long on a petiole of 1 in. or more when full grown, but in the flowering specimens smaller, penniveined with more or less of a reddish-purple hue underneath at least when dry. Flowers diœcious, the males in racemes of  $1\frac{1}{2}$  to 2 in. on slender pedicels varying from  $\frac{1}{2}$  line to above 1 line, the females in shorter racemes on thicker pedicels. Male perianth-segments 3, membranous, reflexed, about 1 line long. Stamens 12 to 20, about as long as the perianth, intermixed with globular glands. Female perianth divided to the middle into 3 valvate lobes. Disk with a broad thin almost petal-like broadly lobed margin. Ovary glabrous. Styles short, united at the base in a deciduous cone, spreading in the upper half. Capsule tridymous, nearly 3 lines diameter.—*Mercurialis tenerifolia*, Baill. Adans. vi. 323.

Hab.: Rockhampton, *Dallachy*, *O'Shanesy*; Broadsound and Cleveland Bay, *Bowman*.

3. **C. australe** (southern), *Baill. Etud. Euph.* 493; *Benth. Fl. Austr.* vi. 130. A tall shrub or straggling tree of 25 to 30 ft., the young shoots sparingly the inflorescence more copiously pubescent, or rarely quite glabrous. Leaves oblong, broad or narrow, more rarely ovate, obtuse, or rarely shortly acuminate, dentate, tapering at the base, 3 to 6 in. long, on a petiole of from  $\frac{1}{2}$  to 1 in., rather firm when full grown, green on both sides or rarely reddish-purple underneath, the basal glands very variable. Flowers diœcious, the male racemes 2 to 3 in. long, the females much shorter, the pedicels very short. Male perianth-segments 3, about 1 in. long. Stamens usually above 20, about as long as the perianth, intermixed with short ovate glabrous glands. Female perianth rather thicker and less deeply divided. Disk with a broad free ciliate margin. Ovary more or less pubescent. Styles distinct, at first very short and thick, at length spreading and about  $\frac{1}{2}$  line long. Capsule nearly 3 lines diameter, usually pubescent.—*Muell. Arg. in DC. Prod.* xv. ii. 738; *F. v. M. Fragm.* iv. 142; *Mercurialis australis*, Baill. Adans. vi. 322.

Hab.: Brisbane River, Moreton Bay, *A. Cunningham*, *Frazer*, *F. v. Mueller*; Port Bowen, *A. Cunningham*; Wide Bay, *Leichhardt?* (specimens very bad).

Wood of a light-yellow colour, hard and close-grained; useful for cabinet work.—*Bailey's Cat. Ql. Woods*, No. 375.

Var. *latifolia*. Leaves large and broad.—Rockhampton, *O'Shanesy*.

Var. *laxiflora*. Leaves long and narrow. Racemes longer and looser with longer pedicels than usual.—Southern, near border of N.S. Wales.

4. **C. Hillii** (after Walter Hill), *Benth. Fl. Austr.* vi. 131. A tree of 20 to 30 ft., the young shoots and inflorescence pubescent, the adult foliage glabrous, and often assuming a purplish hue. Leaves ovate, shortly acuminate, dentate, 6 to 8 in. long and 3 to 4 in. broad on petioles of 1 to 2 in. Flowers diœcious. Racemes in the upper axils of the previous year's wood or at the base of young shoots, the males 2 to 4 in. long, the flowers 3 to 5 together in distinct clusters, on very short pedicels. Perianth villous, of 3 valvate segments. Stamens 12 to 20, the intermediate glands ciliate-hairy. Female racemes under 2 in. long, the flowers not numerous, solitary within the bracts, on pedicels of about 1 line. Perianth of 3 short broad segments. Disk of 3 broad distinct segments (or petals?) alternating with the perianth-lobes and shorter than them. Ovary densely pubescent. Styles distinct, spreading, acute, less than  $\frac{1}{2}$  line long. Capsule tridymous, at length nearly glabrous, scarcely 3 lines diameter. Seeds globular, reticulate-rugose, about 1 line diameter, without any caruncles.

Hab.: Bellenden Ker Range, *Bailey*; Cape York, *M'Gillivray*, *Daemel*; Albany Island, *W. Hill*; Rockingham Bay, *Dallachy*.

Wood close-grained, and of a uniform yellow colour.—*Bailey's Cat. Ql. Woods*, No. 375A.

33. ACALYPHA, Linn.

(From *a*, privative; *kalos*, pleasant; and *aphe*, touch.)

Flowers monœcious or rarely diœcious. Male flowers: clustered in axillary spikes, with a small bract under each cluster. Perianth of 4 valvate segments. No petals or glands. Stamens 8 or rarely 8 to 16, inserted on a raised central receptacle, without any rudimentary ovary; filaments free; anther-cells distinct, linear, wavy or tortuous, attached by one end. Female flower: 1 to 4 together within a leafy bract, the bracts solitary or spicate. Perianth of 3, rarely 4 imbricate segments. Ovary 3-celled, with 1 ovule in each cell. Styles distinct, finely branched.—Shrubs or trees or in species not Australian herbs. Leaves alternate, usually dentate. Flowers very small, the males and females in separate spikes or the females solitary in separate axils, or one or more at or near the base of the male spikes.

A large genus dispersed over the tropical and subtropical regions of both the New and the Old World.

A weak pubescent shrub, branches angular. Leaves ovate, under 2in. long. Spikes terminated by a few male flowers, females crowded towards the base

- 1. *A. indica*.
- var. *australis*.

Villous shrub. Leaves 1 to 3in. long, ovate or broadly lanceolate.

Female flowering bracts 1 or more at the base of the male spikes or in separate axils

- 2. *A. nemorum*.

Glabrous or pubescent slender shrubs or trees. Leaves small, oblong.

Female flowering bracts sessile at the base of the males or in separate axils, or if pedicellate with abnormal deeply devided muricate fruits. Male clusters approximate

- 3. *A. eremorum*.

Female flowering bracts on filiform peduncles with normal capsules. Male clusters distant in filiform spikes

- 4. *A. capillipes*.

1. ***A. indica*** (Indian), *Linn.*; var. *australis* (Australian). A weak herbaceous pubescent shrub, branches angular. Leaves ovate, sometimes acuminate, under 2in. long on the specimen examined, base very slightly cuneate or almost truncate, margins crenate-serrate; petioles slender, longer than the blade. Spikes axillary sessile,  $\frac{1}{2}$  to 1 $\frac{1}{4}$ in. long, terminated by a few minute male flowers, female flowers rather crowded at the base; bracts broadly cuneiform, toothed. Capsules concealed by the bract, 3-seeded, slightly hispid. Seed ovoid, nearly smooth.

Hab.: Walsh River, *T. Barclay-Millar*.

2. ***A. nemorum*** (found in groves), *F. v. M.*; *Muell. Arg. in Linnæa xxxiv. 38*, and in *DC. Prod. xv. ii. 858*; *Benth. Fl. Austr. vi. 132*. A shrub of from 3 to 4ft. to twice that height, the young shoots more or less softly villous, the adult foliage sparingly so. Leaves ovate-lanceolate or oblong, obtuse or scarcely acuminate, crenate, 3 or 5-nerved at the base, penniveined with transverse veinlets, those of the principal branches 2 to 3in. long, on petioles from under  $\frac{1}{2}$ in. to 1in. long, those of the lateral branches smaller, on short petioles. Male spikes slender, pedunculate, 1 to 2in. long, the flowers in clusters of 10 to 15 or more, on exceedingly short petioles, with a minute deeply fringed bract under each cluster. Perianth-segments 4, about  $\frac{1}{2}$  line long. Stamens usually 8, not longer than the perianth. Female flowers 1 to 3 at the base of some of the male spikes or in separate axils, and sometimes several crowded in a short spike, each within an orbicular crenate bract, attaining sometimes  $\frac{1}{2}$ in. diameter. Perianth-segments 3 or 4, very small. Ovary hirsute. Styles long, fringed with capillary lobes.—*A. Cunninghamii*, *Muell. Arg. in Linnæa xxxiv. 35*, and in *DC. Prod. xv. ii. 861*.

Hab.: Brisbane River, Moreton Bay, *A. Cunningham*, *Leichhardt*, *F. v. Muller*, *C. Stuart*; Burnett River, *F. v. Mueller*; Wide Bay, *Bidwill*.

The species is exceedingly variable in the indumentum, sometimes very dense and soft, sometimes scarcely any, in the breadth of the leaves and length of the petiole, in the female bracts few or many, crowded and clustered, or distant in a short interrupted spike, the teeth of the bracts also variable in number and breadth.—*Benth.*

3. **A. eremorum** (solitary), *Muell. Arg. in Flora* 1864, 440, and in *DC. Prod.* xv. ii. 863; *Benth. Fl. Austr.* vi. 132. A rigid shrub, with virgate or divaricate rather slender branches occasionally spinescent at the end, glabrous or the young shoots and foliage pubescent. Leaves small and distant, very shortly petiolate, oblong, crenate, contracted at the base,  $\frac{1}{2}$  to lin. long, or on some of the lateral branches much smaller and almost obovate. Male racemes slender, pubescent, from under  $\frac{1}{2}$  to nearly 1 in. long, the flowers minute, in dense usually approximate clusters, the bracts very minute. Female flowers solitary, dimorphous, mostly nearly sessile, alone or near the base of the male spikes, within a bract of 2 to 2 $\frac{1}{2}$  lines diameter deeply toothed or lobed. Perianth-segments 3, minute but broad. Ovary pubescent. Styles fringed in the upper half. Capsule tridymous, nearly glabrous, about 1 line diameter. Some female flowers are however borne on a filiform pedicel of 4 to 5 lines, the bract then very small and the capsule deeply divided into 3 muricate obovoid cocci.

Hab.: Brisbane River, *Fraser*; scrub on the Burdekin, *F. v. Mueller*; Rockhampton, *Dallachy*

4. **A. capillipes** (hair-like stalks of female flowers), *F. v. M.*; *Muell. Arg. in Linnæa* xxxiv. 40, and in *DC. Prod.* xv. ii. 823; *Benth. Fl. Austr.* vi. 133. A tall shrub or small tree, with divaricate slender branches, the smaller ones often articular and spinescent, resembling the spinescent specimens of *A. eremorum*, with which Bailion unites it as a variety. It is more glabrous, the leaves rather broader and thinner, the male spikes filiform, with still smaller flowers in distant clusters, the females apparently all solitary on filiform peduncles of  $\frac{3}{4}$  to lin., with a normal orbicular bract of nearly 2 lines diameter, the capsule glabrous and tridymous but the cocci not deeply separate as in the pedunculate fruits of *A. eremorum*, the styles with much more numerous capillary branches than in that species.

Hab.: On the borders of southern scrubs.

34. **ALCHORNEA**, Swartz.

(After a botanist of the name of Alchorne.)

(*Cladodes, Lour.*; *Cœlebogynæ, J. Sm.*)

Flowers dicœious or rarely monœcious, in terminal or axillary racemes or spikes. Male flower: Perianth globular and closed in the bud, opening in 4, rarely 3 or 2, valvate segments. No petals or glands. Stamens 8 or more, rarely 4, in the centre of the flower, without any rudimentary ovary; filaments free or very shortly united; anthers versatile, the cells parallel, opening longitudinally in 2 valves. Female flower: Perianth of 4, rarely 3, 5 or 6 segments or lobes, imbricate in the bud. No disk in the Queensland species. Ovary 2 or 3-celled, with 1 ovule in each cell. Styles entire or 2-branched, free or shortly connate at the base. Capsule separating into 2-valved cocci. Seeds without any carunculus. Testa crustaceous. Albumen copious. Cotyledons flat, much broader than the radicle.—Trees or shrubs. Leaves alternate, petiolate, undivided, toothed or in one species almost lobed, with 2 or more glands on the under side at the base of the lamina. Stipules small, usually subulate, or none. Male spikes slender, interrupted, often paniculate, the flowers very small, clustered along the rachis, with a small bract under each cluster. Female spikes or racemes usually single, the flowers solitary within each bract.

The genus is spread over the tropical regions of both the New and the Old World. The two Australian species are endemic.

- Leaves coriaceous, with broad short prickly-pointed lobes. Styles short, broad, spreading flat on the top of the ovary . . . . . 1. *A. ilicifolia*.
- Leaves thin, with obtuse or shortly pointed teeth. Styles erect, narrow, connate at the base . . . . . 2. *A. Thozetiana*.



1. **A. ilicifolia** (Holly-leaved), *Muell. Arg. in Linnæa* xxxiv. 170, and in *DC. Prod.* xv. ii. 906; *Benth. Fl. Austr.* vi. 16. "Mai," Bundaberg, *Keys*. A glabrous straggling evergreen shrub or undershrub, attaining 12 to 15ft. Leaves ovate or rhomboidal, broadly sinuate-toothed or shortly lobed, the teeth or lobes terminating in prickly points, coriaceous, penniveined and reticulate, resembling those of a holly,  $1\frac{1}{2}$  to 3in. long, tapering into a short petiole. Flowers dicæious. Racemes axillary or lateral, the males slender and often several together on a short common rhachis or leafless branch, the females solitary and under 1in. long. Male perianth-segments 4, about  $\frac{3}{4}$  line long. Stamens 8, not exceeding the perianth. Female flowers on thick pedicels of  $\frac{1}{2}$  to 1 line, the perianth-segments rather smaller than in the males. Ovary 3-celled. Styles broader than long, flat, closely spreading over the top of the ovary. Capsule depressed-globular, 3 or 2-celled, 3 to 4 lines diameter.—*Celebogyne ilicifolia*, J. Sm. in *Trans. Linn. Soc.* xviii. 512, t. 36; *Cladodes ilicifolia*, Baill. *Adans.* vi. 321.

Hab.: Brisbane River, Moreton Bay, *A. Cunningham*, *F. v. Mueller*; Rockhampton, *Dallachy O'Shanesy*, *Bowman*.

Wood of a yellow colour, close-grained, hard and tough.—*Bailey's Cut. Pl. Woods*, No. 376.

The seeds have occasionally two embryos united at the base.

2. **A. Thozetiana** (after A. Thozet), *Baill. in Herb. F. v. M.*; *Benth. Fl. Austr.* vi. 137. A glabrous shrub of 2 to 4ft. Leaves, in the typical form, ovate, obovate or rhomboidal, sharply toothed, but the teeth more numerous, less deep and not so pungent as in *A. ilicifolia*, and the leaf thinner,  $1\frac{1}{2}$  to 3in. long, penniveined and reticulate, tapering at the base and shortly petiolate, the basal glands often obscure and sometimes deficient. Stipules, also in the typical form, very small and subulate as in *A. ilicifolia*. Male flowers unknown. Female racemes terminal, 2 to 4in. long, the flowers distant. Perianth unequally 4- or 5-lobed, the lobes acute,  $\frac{1}{2}$  to  $\frac{3}{4}$  line long. Ovary usually 3-celled. Styles short, erect, narrow but flat, shortly united at the base. Capsule tridymous, about 4 lines diameter.—*Cladodes Thozetiana*, Baill. *Adans.* vi. 321.

Hab.: Rockhampton, *Thozet*.

Var. *longifolia*. Leaves 3 to 4in. long, acuminate, the teeth obtuse or with very small points. Stipules setiform, the upper ones sometimes 2 lines long. Female racemes and fruits as in the typical form.—Rockingham Bay, *Dallachy*.

### 35. MALLOWUS, Lour.

(Plants often villose.)

(*Rottlera*, *Rorb.*; *Echinus*, *Lour.*)

Flowers dicæious or rarely monæious, in terminal panicles or axillary racemes or spikes. Male flower: Perianth globular and closed in the bud, opening in 3 or 4 valvate segments. No petals or glands. Stamens indefinite, usually numerous, on a central receptacle, without any rudimentary ovary; filaments free or very shortly united; anther-cells distinct, parallel, separated by a broad connective, opening longitudinally in 2 valves. Female flower: Perianth more or less deeply 3 to 5-lobed or minutely toothed and at length spathaceous. Ovary 2 or 3-celled with 1 ovule in each cell. Styles free or very shortly united at the base, spreading, undivided, the upper or inner stigmatic surface fringed with raised papillæ or processes. Capsule separating into 2-valved cocci. Seeds usually globular, not carunculate; albumen copious; cotyledons flat, much broader than the radicle.—Shrubs or trees. Leaves alternate or rarely opposite, petiolate, usually broad and often large, entire toothed or lobed, sometimes peltate, usually 3 or more-nerved at the insertion of the petiole with 2 or sometimes more flat almost immersed glands on the upper surface near the base, sometimes however very

obscure or obsolete. Male flowers very shortly pedicellate, clustered along the rhachis of the spikes, with a small bract under each cluster; females usually solitary within each bract and more pedicellate.

The genus is generally spread over tropical Asia and Africa.

Anther-cells (small) separated by a broad connective. Capsules echinate with long soft processes.

Leaves mostly alternate. Inflorescence terminal. Capsule processes long and soft.

Tomentum of the plant soft and loose. Capsule very densely echinate with long crowded processes . . . . .

Tomentum close and white. Capsules echinate with few scattered processes . . . . .

Leaves opposite. Racemes axillary. Capsule processes setiform . . . . .  
Anther cells centrally attached to a small connective. Capsules tomentose without processes.

Panicles terminal.

Leaves oblong or ovate-lanceolate, 3 to 6 in. long. Capsules mostly 3-celled.

Leaves mostly alternate, minutely tomentose underneath. Capsule with a red tomentum . . . . .

Leaves alternate, green and glabrous on both sides, without small glands. Capsule tomentose . . . . .

Leaves often opposite, coriaceous, shining, glabrous except the small glands underneath. Capsules glandular, not red . . . . .

Leaves broadly ovate-rhomboidal. Capsules mostly 2-celled, the tomentum not red . . . . .

Racemes or interrupted spikes simple, axillary at the base of the young shoots.

Leaves nearly orbicular, the transverse veinlets prominent underneath . . . . .

Leaves ovate and acute or ovate-lanceolate, white underneath, the veins fine . . . . .

- 1. *M. ricinoides*.
- 2. *M. paniculatus*.
- 3. *M. claoxyloides*.
- 4. *M. philippinensis*.
- 5. *M. angustifolius*.
- 6. *M. polyadenus*.
- 7. *M. repandus*.
- 8. *M. nesophilus*.
- 9. *M. discolor*.

1. **M. ricinoides** (Ricinus-like), *Muell. Arg. in Linnæa* xxxiv. 187, and in *DC. Prod.* xv. ii. 963; *Benth. Fl. Austr.* vi. 139. A tall shrub or spreading tree, more or less clothed with a stellate often floccose tomentum, soon wearing off from the upper surface of the leaves, often very dense on the underside, as well as on the branches and inflorescence. Leaves broadly ovate or orbicular, acuminate, entire or slightly sinuate, either peltately attached near the base, or the petiole quite basal, 3, 5 or 7-nerved, with 2 glands near the base, varying from 4 to 10 in. diameter. Spikes terminal, more or less paniculate, the central one sometimes 6 in. long or more, the lateral ones shorter. Flowers nearly sessile, the males clustered with occasionally a female in the same cluster, the females solitary within their bract, and alone or with 1 or 2 males. Male perianth-segments about 1 line long. Stamens about as long and very numerous, the anthers small, very much shorter than the filaments, the cells separated by a broad connective. Female perianth usually 5-cleft, but very soon concealed under the woolly processes of the ovary. Styles 3, tomentose outside, densely fringed and glabrous on the inner or upper surface. Capsules very densely covered with long soft tomentose-villous processes, forming a dense moss-like mass of  $\frac{1}{2}$  in. or more in diameter.—*Croton ricinoides*, *Pers. Syn.* ii. 586; *C. mollissimus*, *Geisel. Crot. Monogr.* 73; *Echinus mollissimus*, *Baill. Adans.* vi. 316; *Mallotus pycnostachys*, *F. v. M. Fragma.* iv. 138, and *M. Zipellii*, *F. v. M. l.c.* 139, and numerous other synonyms quoted by *Muell. Arg. l.c.*

Hab.: Rockingham Bay, *Dallachy*; Mount Elliott, *Fitzalan*; and in several localities in the more southern parts. Extends also over the Eastern Archipelago to the Philippines and South China.

Wood of a light color, soft and light.—*Bailey's Cat. Ql. Woods* No. 377.

2. **M. paniculatus** (paniculate), *Muell. Arg. in Linnæa* xxxiv. 189, and in *DC. Pro-l.* xv. ii. 965; *Benth. Fl. Austr.* vi. 140. A tall spreading shrub or small tree, the branches inflorescence and underside of the leaves white or

ferruginous with a short close stellate sometimes almost scaly tomentum. Leaves on long petioles, ovate-rhomboid or almost orbicular, acutely acuminate, entire or obscurely sinuate or rarely lobed, not peltate, green and glabrous on the upper surface except when very young, 3 or 5-nerved at the base with 2 glands, 3 to 6in. long. Flowers monoëcious or almost diëcious, in terminal broadly pyramidal panicles of 6in. to 1ft., the males clustered along the branches, the females solitary within each bract, all on very short pedicels. Male perianth-segments about 1 line long. Anthers small, with a broad connective as in *M. ricinoides*. Female perianth rather longer than the male, usually 5-lobed with acute or acuminate lobes. Styles much shorter than in *M. ricinoides*. Capsule 3-celled, 3 to 4 lines diameter, tomentose and muricate with soft closely-tomentose processes, which are few and distant from each other, not densely covering the whole capsule as in *M. ricinoides*.—*Croton paniculatus*, Lam. Dict. ii. 207; *Mallotus chinensis*, Lour., and other synonyms quoted by Muell. Arg. l.c.

Hab.: Rockingham Bay, *Dallachy*.

Extends over the Eastern Archipelago to the Philippines and S. China.

3. **M. claoxyloides** (Claoxylon-like), *Muell. Arg. in Linnaea* xxxiv. 192, and in *DC. Prod.* xv. ii. 972; *Benth. Fl. Austr.* vi. 140. A tall straggling shrub or small tree, or sometimes a handsome tree the branches and foliage scabrous with scattered stellate hairs. Leaves opposite but those of each pair often unequal, petiolate, mostly ovate or elliptical and acuminate, but varying from broadly-oblong to almost orbicular, 2 to 6in. long, obtuse or acute, penniveined and often more or less distinctly 3-nerved at the base, green on both sides, with 2 or more glands near the base sometimes almost obsolete. Stipules rigidly setiform, short. Flowers diëcious, the males sessile or shortly pedunculate in 2 or 3 dense clusters collected in a head or in a short dense or scarcely interrupted axillary spike, the females 3 to 6 together in an umbel-like cluster on a common peduncle of  $\frac{1}{2}$  to 1in., the pedicels at first short and thick, but attaining under the fruit the length of the peduncle. Male perianth-segments about 1 line long. Stamens numerous, the anthers small with a broad connective as in *M. ricinoides*. Female perianth-segments lanceolate, attaining 2 lines under the fruit. Styles rather short, densely fringed on the inner face. Capsule 3-dymous, nearly  $\frac{1}{2}$ in. diameter, muricate with rather rigid setiform processes.—*Echinocroton claoxyloides*, F. v. Muell. *Fragm.* i. 32; *Echinus claoxyloides*, Baill. *Adans.* vi. 315; *Plagianthera? affinis*, Baill. *Etud. Euph.* 424.

Hab.: Brisbane River, Moreton Bay, *Fraser, W. Hill and F. v. Mueller, C. Stuart*; Rockhampton, *Dallachy*; Wide Bay, *Bidwill*; Lizard Island, *A. Cunningham*.

Wood of a bright-yellow colour, close-grained; useful for cabinet work.—*Bailey's Cat. Ql. Woods*, No. 378.

Var. *ficifolia*, Baill. Leaves broader, often orbicular and 3 or 5-nerved, entire or coarsely-toothed. Male flowers large.—Rockhampton, *Dallachy, Bowman*.

Var. *macrophylla*. Leaves broadly ovate, acuminate, 4 to 8in. long, usually 3-nerved at the base. Stipules longer.—Rockingham Bay, *Dallachy*.

Var. *angustifolia*, Baill. Bot. Bull. 2. A slender shrub, stems attaining 4 or 5ft., but often flowering and fruiting when only 6 to 12in. high. Leaves, except when very young, dark-green, appearing glabrous, the small stellate scales only visible under a lens, attaining 5 or 6in. in length, with a breadth under 1 $\frac{1}{2}$ in. tapering to an acute point and a very short petiole, penniveined, the usual basal pair scarcely distinct from the others, the primary veins ending in sharp marginal-teeth. Peduncle in the upper axils, slender, 2 to over 3in. long, bearing clusters of small flowers.

Hab.: Yandina.

4. **M. philippinensis** (of the Philippines), *Muell. Arg. in Linnaea* xxxiv. 196, and in *DC. Prod.* xv. ii. 980; *Benth. Fl. Austr.* vi. 141. A tree often acquiring a considerable size, the branches and inflorescence more or less ferruginous-tomentose. Leaves on long petioles, oblong ovate-lanceolate or almost ovate, acuminate or obtuse entire, contracted or rounded and 3-nerved at the base, 3 to 6in. long, more coriaceous than in the preceding species, the

upperside glabrous, with obscure glands near the base, the under surface pale or ferruginous with a minute tomentum, the principal veins ferruginous tomentose. Flowers diœcious, the racemes terminal or in the upper axils, the males more branched than the females, all much shorter than the leaves. Male perianth-segments membranous, about 1 line long. Filaments short, anthers rather large, the cells attached in the centre to a short connective often tipped with a red gland. Female perianth ovoid-tubular, 4 or 5-toothed, enclosing the ovary. Styles short, oblong, densely fringed on the inner face. Capsule tridymous, 3 to 4 lines diameter, covered with a red stellate tomentum without any processes. Seeds nearly globular.—*Croton philippinensis*, Lam. Dict. ii. 206; *Echinus philippinensis*, Baill. Adans. vi. 314; *Rottlera tinctoria*, Roxb. Pl. Corom. ii. 36, t. 168, and other synonyms quoted by Muell. Arg. l.c.

Hab.: Brisbane River, Moreton Bay, *A. Cunningham*, *F. v. Mueller*; Wide Bay, *Bidwill*; Pine River, *Fitzalan*; Rockhampton, *Thozet*; Rockingham and Edgecombe Bays, *Dallachy*.

In India the bark is used for tanning, and the red powder surrounding the ripe capsules is used for dying silk. As a purgative and anthelmintic, this red substance is known as "kamela," and is soluble in alcohol but not in water—amount, 3½ per cent.; the bark of the roots contain a similar dye.

Wood close-grained, hard and very tough, of a light straw-colour.—*Bailey's Cat. Ql. Woods*. No. 379.

Leaves sometimes infested with the blight-fungus *Asterina epiriva*, Berk.

The species is widely spread over tropical Asia, extending northwards to South China.

5. ***M. angustifolius*** (narrow-leaved), *Benth. Fl. Austr.* vi. 141. A small tree, glabrous, except the inflorescence and sometimes the young shoots pubescent with short spreading hairs. Leaves alternate, but often crowded at the ends of the branches so as to appear opposite or verticillate, on petioles varying in the same cluster from under ½ in. to above 1 in. long, oblong elliptical or almost lanceolate, acuminate, slightly and irregularly dentate, 4 to 8 in. long, and rarely 2 in. broad, rather rigid, penniveined, green on both sides without the small glands of the under surface of most *Malloti*. Flowers diœcious, in short sessile panicles at the ends of the branches. Bracts small, lanceolate or ovate, entire. Male perianth dividing into 4 lobes. Stamens numerous; anther-cells attached dorsally by a connective shorter than themselves. Female perianth of 5 imbricate acute segments. Ovary villous, 3-celled. Styles united at the base, spreading and bifid, but not long. Capsule tridymous, tomentose, not muricate, above 4 lines diameter.

Hab.: Rockingham Bay, *Dallachy*.

6. ***M. polyadenus*** (many glands), *F. v. M. Fragm.* vi. 184; *Benth. Fl. Austr.* vi. 142. A tall straggling shrub or small tree, glabrous except a minute scaly tomentum on the inflorescence. Leaves either opposite and unequal in the pair or alternate, shortly petiolate, oblong elliptical or ovate-lanceolate, obtuse or acuminate, coriaceous and sometimes shining above, covered underneath with the minute glands of *M. nesophilus* and of *M. discolor*, 3 to 6 in. long, penniveined, and sometimes 3 or 5-nerved at the base, the 2 to 4 glands of the upper surface very uncertain or obsolete. Flowers sometimes monœcious, but the two sexes in different spikes or racemes, and usually on different specimens, the racemes 1 to 4 in. long in the forks or upper axils, or forming a terminal panicle. Male flowers clustered, the pedicels rarely 1 line long. Filaments short. Anther-cells attached to a small connective. Female flowers solitary within the bracts, on pedicels at first short, but lengthening to 2 or 3 lines. Perianth divided nearly to the base into very small segments not enlarged under the fruit. Styles recurved and closely appressed to the ovary, the inner or upper surface very shortly fringed-papillose. Capsule tridymous, about 4 lines diameter, glabrous except a few of the scale-like glands of the rest of the plant.

Hab.: Cape York, *W. Hill*; Rockingham Bay, *Dallachy*.

Wood light-yellow outside, changing towards the centre to a brown, close in grain and hard; suitable for mallets, chisel-handles, &c.—*Bailey's Cat. Ql. Woods*, No. 379A.

7. **M. repandus** (repand), *Muell. Arg. in Linnæa* xxxiv. 197, and in *D.C. Prod.* xv. ii. 981; *Benth. Fl. Austr.* vi. 142. A large tree, the young branches inflorescence and underside of the leaves softly stellate-tomentose, with longer hairs often intermixed. Leaves on rather long petioles, broadly ovate rhomboidal or almost orbicular, acuminate, entire or obscurely sinuate-toothed, 2 to 4 in. long, slightly peltate, 3 or rarely 5-nerved at the insertion of the petiole, the flat glands of the upper surface obscure or obsolete, the minute glands of the underside almost concealed by the tomentum, darker and more glabrous above. Flowers diœcious, the racemes in terminal panicles, the central one in the males often 6 in. long. Males flowers clustered, the pedicels 1 to 2 lines long. Stamens numerous; anther-cells attached to a small connective. Female flowers (in Indian specimens) solitary within each bract, the perianth turbinate with 3 or 4 lanceolate lobes. Styles about 1 line long, the inner surface very densely fringed. Capsule 2-celled, about 4 lines broad, coriaceous, closely tomentose, without processes.

Hab.: Rockhampton and Rockingham Bay, *Dallachy*.

The species is also widely spread in tropical Asia. Benthams says: "The Australian specimens are all males; they agree better with the tomentose ones from the East Indian Peninsula, than with the more glabrous ones from Timor and New Caledonia."

8. **M. nesophilus** (an island plant), *F. v. M.*; *Muell. Arg. in Linnæa* xxxiv. 196, and in *DC. Prod.* xv. ii. 981; *Benth. Fl. Austr.* vi. 143. A tall shrub, the branches inflorescence and under side of the leaves whitish or slightly ferruginous with a close stellate tomentum. Leaves alternate, very broadly ovate or orbicular, mostly obtuse and entire, rarely sinuate and very shortly acuminate, the larger ones sometimes 4 in. long on petioles as long, but usually about half that size, and on lateral shoots much smaller on short petioles, 3-nerved or obscurely 5-nerved at the base, the upper surface very sparingly tomentose or at length glabrous, with two flat glands, the under surface minutely glandular, the primary veins and transverse reticulations prominent. Flowers diœcious, in single racemes in the lower axils of young shoots, the males 2 to 3 in. long, with clustered flowers on very short pedicels, the female racemes shorter, the flowers solitary within each bract. Stamens numerous, the anther-cells attached to a small connective. Female perianth narrow-turbinate, divided to about the middle into 3 or 4 lanceolate lobes. Styles short and broad, very densely fringed on the inner face. Capsule covered like that of *M. philippineusis* with an orange-red tomentum but smaller and most frequently didymous and 2-celled, rarely 3-celled.—*Echinus nesophilus*, *Baill. Adans.* vi. 314.

Hab.: Albany Islands, *W. Hill*; and Cape York, *Daemel* (with longer male pedicels); Cape Flinders, *A. Cunningham*.

9. **M. discolor** (2-coloured), *F. v. M.*; *Benth. Fl. Austr.* vi. 143. A tall tree, the branches inflorescence and underside of the leaves white with a short close tomentum, with more or less of longer hairs on the principal veins underneath. Leaves on rather long petioles, ovate or ovate-lanceolate, acute or acuminate, thinner and smoother than in *M. repandus*, 2 to 3 in. long, becoming quite glabrous on the upper side, rounded or acute and 3-nerved at the base, not at all peltate, the flat glands rather prominent, the small glands of the under surface very numerous as in the three preceding species. Male racemes slender, simple, 3 to 4 in. long, in the lower axils of the young shoots as in *M. repandus*. Flowers smaller than in that species, very shortly pedicilate. Stamens numerous, the anther-cells attached to a small connective. Female flowers unknown.—*Rottlera discolor*, *F. v. M.* in *Coll. Northern Woods N.S. Wales Lond. Exhib.* n. 82; *Macaranga mallotoides* var. *F. v. M. Fragm.* iv. 140.

Hab.: Rockhampton (rare), *O'Shanesy*; Moreton Bay, Queensland Woods, *London Exhibition*, 1862, n. 83, *W. Hill*.

The capsules give a bright-yellow dye.

Wood light-yellow, close in grain, and tough.—*Bailey's Cat. Ql. Woods.* No. 380a.

## 36. MACARANGA, Thou.

(Madagascar name.)

(Mappa, *A. Juss.*)

Flowers diœcious or rarely monœcious in axillary or rarely terminal spikes racemes or panicles. Male flower: Perianth globular and closed in the bud, opening in 3 or 4 valvate segments. No petals or glands. Stamens indefinite, usually numerous, on a central receptacle without any rudimentary ovary; filaments free or very shortly united; anthers terminal, 4-lobed, 2-celled, opening in 4 valves, or loculicidally in 2 valves. Female flower: Perianth ovoid oblong or almost globular, truncate or shortly toothed, opening obliquely into a broad cup or laterally into a spathe. Ovary 1, 2 or 3-celled, with 1 ovule in each cell. Styles free or shortly united at the base, undivided, minutely papillose or fringed with processes on the inner surface. Capsule separated into 2-valved cocci. Seeds usually globular, not carunculate; albumen copious; cotyledons flat, much broader than the radicle.—Shrubs or trees. Leaves alternate, petiolate, usually broad and often large, entire toothed or lobed, often peltate or 3- or more nerved at the insertion of the petiole, but sometimes penniveined without lateral nerves. Male flowers clustered along the rachis or branches of the inflorescence, sessile or very shortly pedicellate, with an entire toothed or fringed bract under each cluster. Female flowers in fewer clusters and few in the cluster, or solitary, the bract usually longer than in the male, and often fringed or ciliate.

The genus is generally spread over tropical Asia and Africa. Of the five Australian species two are also in the Eastern Archipelago, one of them extending over the greater part of East India and S. China, the other three are endemic. The genus is closely allied to *Mallotus*, although most species differ in habit, and some have a different female perianth, or fewer stamens, or the ovary reduced to a single cell and ovule, but the only constant character is that of the anthers.—*Benth.*

Leaves oblong elliptical or lanceolate, penniveined or scarcely 3-nerved at the base. Bracts very small and entire.

Inflorescences including the peduncle under 1in. Ovary not muricate, 2-celled. Styles short . . . . . 1. *M. Dallachyi*.

Inflorescences 2 to 4in. long. Ovary muricate, usually 2-celled. Styles long and filiform.

Leaves mostly toothed, pale underneath with numerous minute scales.

Female perianth lobes lanceolate, free . . . . . 2. *M. subdentata*.

Leaves mostly entire, green underneath with few scattered minute scales. Female perianth usually spathaceous . . . . . 3. *M. inamena*.

Leaves very broad, palmnerved. Bracts as long as or longer than the flowers and toothed or fringed.

Leaves slightly peltate. Stipules subulate. Ovary 1 or 2-celled . . . . . 4. *M. involocrata*

Leaves deeply peltate. Stipules broad. Ovary 3-celled . . . . . 5. *M. Tanarius*.

1. ***M. Dallachyi*** (after J. Dallachy), *F. v. M.*; *Benth. Fl. Austr.* vi. 144. A shrub variously described as small and straggling or tall, glabrous, except a small scaly tomentum on the inflorescence and young branches. Leaves elliptical or oblong, acuminate, penniveined, usually with a few depressed glands on the upper surface near the base, 3 to 5in. long, on a petiole of  $\frac{1}{2}$  to 1in. Male spikes intermixed with the females,  $\frac{1}{2}$  to 1in. long. Bracts and flowers very small, but the anthers entirely those of *Macaranga*. Perianth-segments usually 3, about  $\frac{1}{2}$  line long, glabrous or sprinkled with a very few scales. Female flowers 2 to 4 together almost clustered on axillary peduncles varying from  $\frac{1}{4}$  to 1in. Bracts small, entire. Perianth short and cup-shaped, opening laterally or rarely in 2 lobes. Ovary 2-celled, scaly-tomentose, without processes. Styles linear, thickened at the base, not fringed, rather acute, about 1 line long.—*Mallotus Dallachyi*, *F. v. M. Fragm.* vi. 184; *Echinus Dallachyanus*, *Baill. Adans.* vi. 314.

Hab.: Rockingham Bay, *Dallachy*.

The specimens examined by Baillon had female flowers only, but with them were loose male flowers and remains of spikes which belonged probably to *Mallotus polyadenus*, thence Baillon's mistake in referring *M. Dallachyi* to *Mallotus*.—*Benth.*

2. **MI. subdentata** (somewhat toothed), *Benth. Fl. Austr.* vi. 145. A shrub or small tree, glabrous except a minute scaly tomentum on the inflorescence and young shoots. Leaves oblong narrow-elliptical or lanceolate, acuminate, irregularly sinuate-toothed or rarely almost entire, penniveined, green on both sides but paler underneath from the minute scales they are more or less covered with, 3 to 9 in. long, on petioles varying from  $\frac{1}{2}$  to 1 in. Male flowers not seen. Female peduncles axillary, elongated, but much shorter than the leaves, bearing 2 to 5 flowers, of which 1 or 2 sessile or nearly so, and 2 or 3 on long pedicels. Perianth of 4 or 5 narrow-lanceolate segments scarcely 1 line long and quite distinct from the base. Ovary and capsule usually 2-celled, scaly-tomentose and shortly echinate. Styles filiform, scarcely thickened at the base, often above  $\frac{1}{2}$  in. long.

Hab.: Rockingham Bay, *Dallachy*.

3. **MI. inamœna** (unpleasant), *F. v. M.*; *Benth. Fl. Austr.* vi. 145. A tall shrub or small tree, the branches foliage and inflorescence scabrous-pubescent, the short hairs scarcely or irregularly stellate. Leaves oblong or narrow-elliptical, acuminate, entire, penniveined, green on both sides, the small glands underneath few and scattered, 3 to 5 in. long on a petiole of  $\frac{1}{2}$  to 1 in. Male spikes in the upper axils or several together at the ends of the branches, 2 to 4 in. long, the flowers clustered within small broad densely tomentose bracts, the clusters at length distant along the rhachis. Perianth-segments about  $\frac{3}{4}$ -line long. Stamens 20 to 30. Female peduncles axillary or lateral, elongated, bearing sometimes 3 pedicellate flowers at the end with another occasionally lower down, sometimes dichotomous with 1 to 3 flowers at the end of each branch. Pedicels at first very short, lengthening to from  $\frac{1}{2}$  to 1 in. Perianth of 4 or 5 narrow-linear segments 1 to 2 lines long, united in a spatheaceous calyx splitting open on one side (or rarely in the uppermost flower separate?). Ovary and capsule usually 2-celled, rarely 3-celled, echinate. Styles long and slender, thickened at the base, attaining sometimes 5 lines.—*Mallotus inamœnus*, *F. v. M. Herb.*

Hab.: Rockingham Bay, *Dallachy*.

Wood of a light-colour, tough and close grained.—*Bailey's Cat. Ql. Woods*, No. 380b.

4. **MI. involucrata** (bracts forming a kind of involucre), *Baill. Etud. Euph.* 432; *Benth. Fl. Austr.* vi. 146. A tree attaining sometimes 50 to 60 ft., but often small and straggling, the branches inflorescence and underside of the leaves softly pubescent. Leaves broadly ovate-rhomboidal, acuminate, entire or slightly sinuate and denticulate, usually slightly peltate, 3, 5 or 7-nerved, with 2 to 4 flat glands on the upper side, 3 to 6 in. long and sometimes as broad, on a petiole of 2 to 3 in. Stipules subulate. Male spikes in axillary panicles not much branched and shorter than the leaves, the flowers almost sessile, in dense clusters within an oblong or ovate toothed bract of about 2 lines. Perianth-segments about  $\frac{3}{4}$  line long, villous outside. Stamens 10 to 15. Female inflorescence simple or nearly so, the peduncle axillary or lateral, shorter than the leaves, with a single terminal or several distant clusters. Bracts broadly ovate or cordate, acute, toothed, often  $\frac{1}{2}$  in. long. Perianth sessile, short, broadly and obliquely cup-shaped. Ovary 1 or 2-celled, more or less muricate with soft processes. Styles 1 or 2, long, glabrous, fringed on the upper side. Fruit globular, 1-celled and 1-seeded, losing the processes of the ovary and sometimes quite glabrous and smooth.—*Muell. Arg. in DC. Prod.* xv. ii. 1011; *Urtica involucrata*, *Roxb. Fl. Ind.* iii. 592; *Macaranga mallotoides*, *F. v. M. Fragm.* iv. 139; *M. asterolasia*, *F. v. M. l.c.* 140, *Baill. Adans.* vi. 317.

Hab.: Endeavour River, *A. Cunningham*; Port Mollen, *M. Gillivray*; Rockingham Bay and Mount Elliott, *Dallachy*; Cape York, *Duemel*.

The species is also in the Eastern Archipelago.

Wood very light and soft, might be found serviceable for making splints.—*Bailey's Cat. Ql. Woods*, No. 380c.

5. **ML. Tanarius**, *Muell Arg. in DC. Prod.* xv. ii. 997; *Benth. Fl. Austr.* vi. 146. "Tumkullum," Stradbroke Island, *Watkins*. "Do-ang-al," Morehead River, *Roth*. A tall erect shrub, glabrous or the young parts minutely pubescent in the typical form, the branches and petioles often very glaucous. Leaves peltate, very broadly ovate or orbicular, acuminate or rarely obtuse, entire or obscurely sinuate, from 3 to 4in. to nearly 1ft. diameter, pale or almost canescent underneath, with about 9 nerves radiating from the top of the long petiole, pinniveined from the larger nerves with transverse veinlets. Stipules ovate-lanceolate, acute,  $\frac{1}{2}$ in. long, with broad membranous margins. Male panicles often much branched but shorter than the leaves, the flowers pedicellate in the clusters. Bracts ovate-lanceolate, concave, 2 to 3 lines long, fringed with long cilia. Perianth-segments scarcely  $\frac{1}{2}$  line long. Female peduncles simple, bearing few clusters. Perianth obliquely cup-shaped. Bracts ovate-cordate, often 4 to 6 lines long, deeply fringed. Ovary muricate with glabrous entire or bifid processes. Styles rather long, papillose or shortly fringed. Capsule 3-celled, coriaceous, shortly and sparingly muricate, about 4 lines diameter.—*Ricinus Tanarius*, *Linn.*; *Mapa tanaria*, *Spreng. Syst.* iii. 878.

Hab.: Northumberland Islands, *R. Brown*; Howick's Group, *F. v. Mueller*; Port Denison and Rockingham Bay, *Dallachy, Fitzalan*; Broadsound and head of Isaacs River, *Bowman*; Rockhampton, *Thozet*; Moreton Bay, *W. Hill, F. v. Mueller*; Liverpool River, *Gulliver*; Taylor's Range, and Islands of Moreton Bay.

Wood of a light colour, soft and close grained.—*Bailey's Cat. Ql. Woods*, No. 381.

Fibre used for twine and timber for spears.—*Roth*.

Var. *tomentosa*, *Muell. Arg.* Leaves softly tomentose. Capsules rather larger.—Rockingham Bay, *Dallachy*.

The species extends over East India and the Archipelago northward to South China.

### 37. \*RICINUS, Linn.

(From the resemblance of the seed to a tick).

Flowers large, in terminal subpaniculate racemes, monœcious, apetalous, the upper male crowded, lower female. Disk none. Male flower: Calyx membranous, splitting into 3 to 5 valvate segments. Stamens numerous, filaments crowded, variously connate or in branching clusters; anther-cells distinct, distant, subglobose, divergent. Pistillode none. Female flower: Calyx spathaceous, caducous. Ovary 3-celled; styles short or long, spreading, often very large, entire, 2-fid or 2-partite, feathery or papillose; cells 1-ovulate. Capsule of 3 2-valved cocci. Seeds oblong, testa crustaceous, albumen fleshy; cotyledons broad, flat.—Tall glabrous subarborescent shrubs.

Species generally tropical.

1. **R. communis** (common), *Linn.* The Castor Oil Plant. An evergreen, usually large shrub, the young growth often glaucous. Leaves green or reddish, 6 to 24in. in diameter, membranous, palmately lobed, the lobes often long and linear and glandularly serrate; petioles 4 to 12in. or more long. Racemes stout, erect. Male flowers  $\frac{1}{2}$ in. diameter; female calyx nearly as long; styles often highly coloured. Capsule  $\frac{1}{2}$  to 1in. long, globosely oblong, smooth or echinate. Seeds oblong smooth, mottled.

Hab.: Naturalised in most parts especially near large towns South and North.

Supposed to belong to Africa, but now naturalised in most hot countries.

### 38. TRAGIA, Linn.

(After Jerome Bock, a German botanist; generally called *Tragus*, the Greek for Bock [Buck].)

Flowers monœcious, in terminal or lateral racemes. Male flower: Perianth globular in the bud, of 5, 4 or 3 valvate segments. Disk none or with a slightly prominent margin. Petals none. Stamens numerous or few, the filaments free or connate, sometimes very short. Anthers dorsally attached, the cells



parallel, opening longitudinally in 2 valves. Rudimentary ovary none or small and obscure. Female flower: Perianth of 6 or fewer, rarely 7 or 8, imbricate segments, entire or pinnately divided. Ovary 3-celled or rarely 4 or 5-celled, with 1 ovule in each cell. Styles erect and connate at the base, free and entire at the end. Capsule separating into 2-valved cocci. Seeds globose, without any carunculus. Testa crustaceous. Albumen copious. Cotyledons flat, much broader than the radicle.—Twining or climbing perennials or undershrubs, rarely erect annuals, usually hispid with stinging hairs. Leaves alternate, petiolate, toothed, often cordate, 3 or 5-nerved. Flowers small, the racemes normally terminal, but often leaf-opposed from the elongation of the lateral shoot, or apparently axillary from the shortness of the flowering branch, the males in the upper, the females in the lower, part of the raceme, all usually solitary in the axil of a small bract.

The genus is spread over the tropical and subtropical regions of both the New and the Old World. The only Australian species appears to be endemic.

1. **T. Novæ-hollandiæ** (of New Holland), *Muell. Arg. in Linnæa* xxxiv. 180, and in *DC. Prod.* xv. ii. 929; *Benth. Fl. Austr.* vi. 138. A twining herb, attaining several feet, more or less hispid with simple rigid appressed or spreading stinging hairs. Leaves petiolate, ovate or ovate-lanceolate, acute, coarsely toothed, 3 or 5-nerved and broadly or deply cordate at the base, penniveined,  $1\frac{1}{2}$  to 3 in. long. Stipules small. Racemes slender, 1 to 2 in. long. Flowers solitary in the axils of small narrow bracts, the lower ones female and distant, the upper ones all male on very short pedicels. Male perianth-segments 5, rather thick, acute,  $\frac{3}{4}$  line long. Stamens varying from 3 to 5, inserted within the margin of a broad disk, the filaments exceedingly short, the anther-cells almost stipitate. Female perianth-segments usually 6, more acutely acuminate than the males, but imbricate in the bud, at least 1 line long. Styles 3, erect and connate to above the middle, recurved at the end and entire. Capsule tridymous, densely setose or nearly glabrous, about 4 lines diameter.

Hab.: Broadsound, *R. Brown, Bowman*; Brisbane River, Moreton Bay, *A. Cunningham, Leichhardt, F. v. Mueller*; Logan River, *Fraser*; Rockhampton, *Dallachy, O'Shanesy, Bowman, Thozet*; Rockingham Bay, *Dallachy*.

### 39. HOMALANTHUS, A. Juss.

(Smooth flowers).

(*Carumbium, Reinw.*; *Omalanthus, A. Juss.*; *Wartmannia, Muell. Arg.*)

Flowers monœcious, in terminal racemes. Male flower: Perianth small, at first irregularly truncate or shortly lobed, often dividing into 2 broad lobes. No glands or petals. Stamens few, inserted on a central receptacle, without any rudimentary ovary; filaments free; anther-cells distinct, divaricate or placed back to back, opening longitudinally in 2 valves. Female perianth nearly similar to the male, usually deciduous. Ovary 2-celled, with 1 ovule in each cell. Styles 2, linear, divergent, undivided, papillose on the inner surface. Capsule compressed, didymous, somewhat fleshy, indehiscent or tardily opening in 2 valves along the back of the cocci. Seeds with a fleshy arillus or carunculus.—Glabrous trees or shrubs. Leaves alternate, petiolate, broad, entire. Stipules membranous, often large and very deciduous. Flowers very small, the males in small clusters occupying the greater part or the whole of the raceme, the female solitary within each bract, one or few at the base of some of the male recemes, or alone.

The genus has but few species, limited to the Indian Archipelago and the Islands of the South Pacific. Of the two Australian species, one ranges generally oves the area of the genus, the other is endemic.

Capsule quite smooth. Seeds half-enveloped in a fleshy arillus. Bracts with 2 large glands

Capsule bearing usually 2 to 6 short conical processes or tubercles.

Seeds with a thick fleshy carunculus. Bracts with villous glands

1. *H. pepulifolium*.

2. *H. stillingiaefolium*,

1. **H. populifolius** (Poplar-leaved), *Grah. in Bot. Mag. t. 2780* (*Omalanthus*). A tall shrub or small tree, quite glabrous. Leaves broadly ovate-triangular or rhomboidal, acuminate, glaucous, prominently pinniveined and often turning red underneath, 2 to 4 in. or on luxurious shoots 6 in. long, and often as broad, on petioles usually about the same length. Stipules lanceolate,  $\frac{1}{2}$  to 1 in. long, but so deciduous as to be rarely seen except on the very young shoots, which being usually at the base of the inflorescence, these stipules have been described as barren bracts. Racemes 1 to 4 in. long. Bracts small, entire or denticulate, with 2 large glands at their base. Male flowers 3 to 6 together, on pedicels of 1 or rarely 2 lines. Perianth when young broadly cup-shaped and entire, expanding horizontally to a diameter of 1 to  $1\frac{1}{2}$  line, nearly flat and often splitting on one side or into 2 unequal lobes, and when pressed laterally in drying appearing often 2-auriculate at the base. Stamens 6, or fewer in the lateral flowers. Female flowers few at the base of the raceme, on pedicels varying from  $\frac{1}{4}$  to 1 in. Perianth like that of the males, but very deciduous. Capsule glaucous, didymous, 4 to 5 lines broad, opening very tardily along the margins or back of the cocci. Seeds more or less enveloped in a fleshy arillus or carunculus. — *Carumbium populifolium*, Reinw.; *Miq. Fl. Ind. Bot. i. part ii. 414*; *Benth. Fl. Austr. vi. 150*. *C. populneum*, Muell. Arg. in DC. Prod. xv. ii. 1144, with the synonyms adduced; *C. Sieberi*, Muell. Arg. in Linnæa xxxii. 85, and in DC. Prod. xv. ii. 1145, Baill. Adans. vi. 326; *C. platyneuron*, Muell. Arg. in DC. l.c.; *C. Pallidum*, Muell. Arg. in Linnæa xxxii. 85; *Omalanthus populifolius*, F. v. M. Fragm. i. 32.

Hab.: Shoalwater Bay, *R. Brown*; Moreton Bay, *F. v. Mueller*; Crocodile Creek, *Bowman*; Rockhampton and Rockingham Bay, *Dallachy*. A common scrub plant North and South.

Wood soft, of a light colour.—*Bailey's Cat. Ql. Woods, No. 381a*.

Considered poisonous to stock.

The foliage is, exceedingly variable in size and consistence according to age and luxuriance, and is often a prey to the fungus blight, *Asteromella Homalanthi*, C. and M.

2. **H. stilingiæfolius** (leaves *Stillingia*-like), *F. v. M. Fragm. i. 32* (*Omalanthus*). A glabrous shrub of 4 or 5 ft. rarely growing out into a small tree, the branches and foliage much more slender than in *H. populifolius*. Leaves broadly ovate-triangular or almost rhomboidal, usually acute but scarcely acuminate, whitish or glaucous underneath, 1 or 2 in. long, on a petiole sometimes shorter sometimes longer than the lamina. Stipules of *H. populifolius*, but, like the leaves, smaller. Racemes very slender, 1 to 2 in. long. Bracts ovate and acute or lanceolate and acuminate, without any or with very small glands, and sometimes borne on the cluster on a short peduncle. Male pedicels filiform,  $\frac{1}{2}$  to above 1 line long, the flowers very small. Female flowers few at the base of the raceme, on pedicels of  $\frac{1}{2}$  in. or more. Capsule about 3 lines broad, usually but not always muricate with a few very short conical processes, rather more readily dehiscent than that of *H. populifolius*. Seeds with a short fleshy carunculus.—*Carumbium stilingiæfolium*, Baill. Adans. vi. 325; *Benth. Fl. Austr. vi. 151*; *Warmannia stilingiæfolia*, Muell. Arg. in DC. Prod. xv. ii. 1147.

Hab.: Brisbane River, Moreton Bay, *A. Cunningham*, *Fraser*, *F. v. Mueller*.

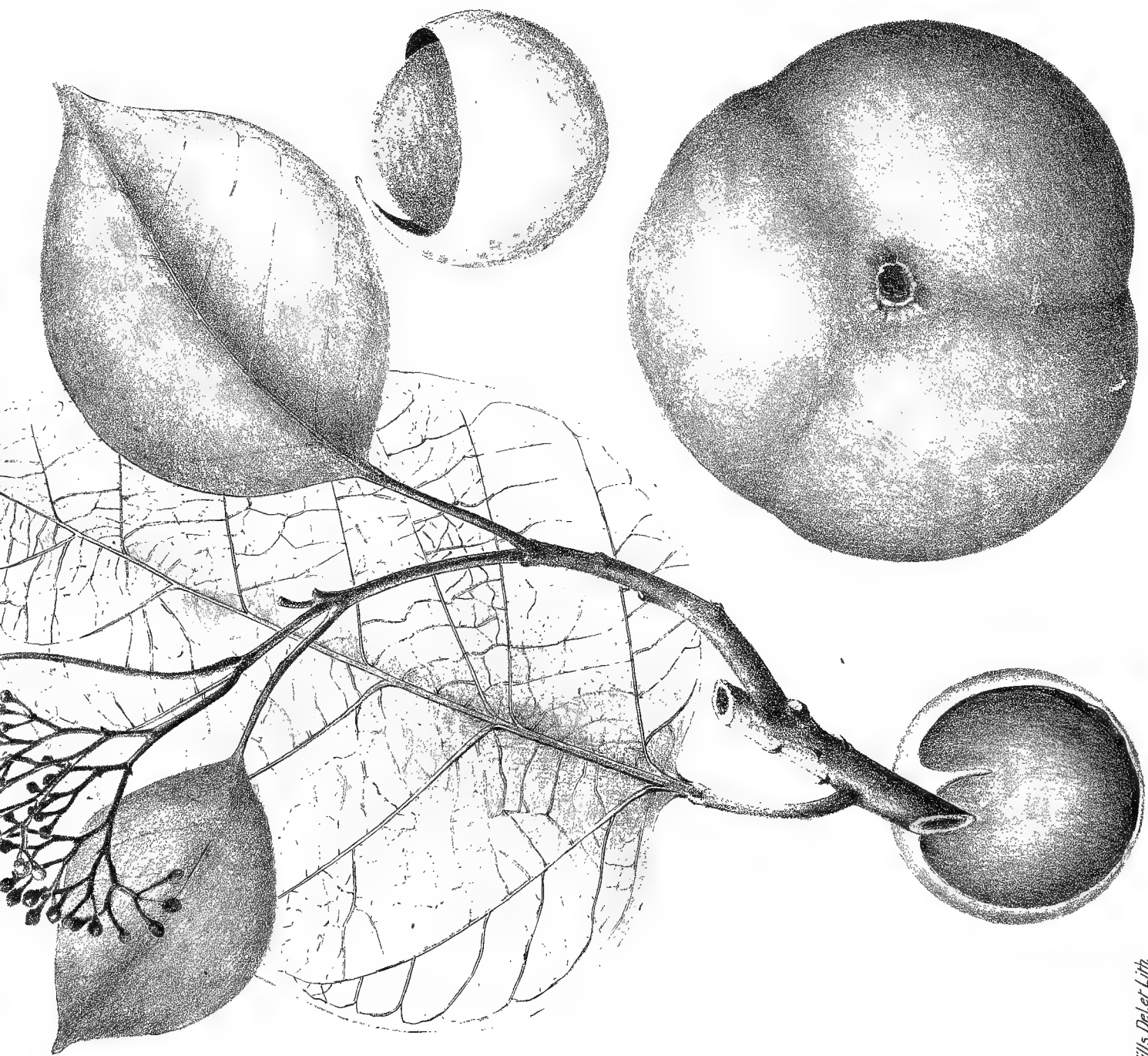
This species, so closely resembling *H. populifolius* in general habit and characters, has been generically distinguished by *Mueller Arg.* chiefly on account of the appendage of the seed, supposed to be in one a carunculus, in the other a true arillus. Although so different in size these appendages are shown by *Ballion* to be in both species of the same nature and origin.—*Benth.*

#### 40. OMPHALEA, Linn.

(Referring to the umbilicate anthers.)

Flowers monœcious, apetalous. Disk obscure, or none. Flowers (male): Segments 4 or 5, much imbricate; stamens 2 or 3; filaments connate in a short column, hemispherical or disciform incised at the margin, bearing 2-locular small





anthers; cells vertical, extrorsely rimose; ovary rudimentary or none. Flowers (female): Segments of the males; ovary 2 to 3-locular, cells 1-ovulate; style columnar, obtuse or very shortly 2 or 3-lobed. Fruit thick, 2 or 3-dymus, epicarp fleshy, endocarp hard, indehiscent, or at length bursting into 2-valved cocci. Seed subglobose, estrophiolate, with a thick fleshy albumen; cotyledons broad, plain. Tall climbing shrubs, rarely trees. Leaves alternate, bearing 2 glands at the top of the petiole, often, large entire, penniveined, and with 3 or 5 nerves starting from the base. Flowers cymulose in simple or ramified racemes, the central female; bracts often linear-spathulate, 2-glandular.

Species chiefly South American.

1. **O. queenslandiæ** (of Queensland), *Bail. 3rd Suppl. Syn. Ql. Flora.* A rampant climbing plant, extending 100ft. or more; stems terete, or with more or less prominent decurrent lines from the base of the petioles; central pith abundant. Leaves alternate, broadly ovate or oblong, obtusely acuminate, broad almost truncate at the base, entire, 5 to 6in. long, 3 to 4in. broad at the base or sometimes twice that size, glabrous and deep-green; petioles 1 to 2in. long with 2 sessile rather large glands at the top; nerves 5 to 7 on each side of the midrib, the lowest pair starting from the top of the petiole, the smaller reticulations fine, but prominent in the dried leaf. Inflorescence slightly ferruginously pubescent, in pedunculate cymes in the upper axils of lateral shoots, somewhat trichotomously branched, about 2in. long and broad. No male flowers found in the inflorescence examined. Female perianth of 5 imbricate hairy lobes,  $1\frac{1}{2}$  line long, the flowers very variable as to size and length of pedicels, some quite sessile; style very short with 3 spreading stigmatic branches. Fruit large, globular, yellow or nearly white, 3 to 5in. diameter, 2 to 3 or in some 4-celled; exocarp thick, fleshy, ultimately separating into as many cocci, with a thin hard endocarp containing a solitary globular seed. The flowers may probably sometimes have 4 stigmatic lobes.

Hab.: Johnstone River, Harvey's Creek.

A species, *O. Oleifera*, Hemsley, at Salvador, Sonsonate, is called by the natives "Tambor," and Dr. Dorat says that it yields a large quantity of a very fine oil, pleasant to the taste, and resembling castor oil in its purgative qualities, with the advantage that its action is painless. *Bio. Cent.—Ame. (Botany) iii. 134.*

Dr. Lindley, *Veg. King.* p. 279, says that the juice of a Guayana species, *O. triandra*, turns black in drying, and is there used in the place of ink. I notice that the coagulated sap of our native plant often forms small black lumps on the branches.

#### 41. SEBASTIANIA, Spreng.

(After a botanist of the name of Sebastiani.)

(*Gymnanthes*, Sw.; *Microstachys*, A. Juss.; *Elachocroton*, F. v. M.)

Flowers monœcious, in terminal or leaf-opposed racemes or spikes. Male flower: Perianth small, variously divided into 2 or 3 lobes or segments imbricate in the bud or open. No petals or glands. Stamens 2 or 3, inserted on a central receptacle without any rudimentary ovary; filaments free; anther-cells distinct, divaricate or placed back to back, opening longitudinally in 2 valves. Female perianth of 3 segments. Ovary 3-celled with one ovule in each cell. Styles 3, linear, undivided, free or very shortly connate at the base. Capsule separating in 2-valved cocci, leaving a central persistent axis. Seeds ovoid or oblong, carunculate.—Shrubs trees or (in the Australian species) annual or suffrutescent herbs. Leaves alternate, often minutely serrulate. Male flowers 2 or 3 together in clusters occupying the greater part or the whole of the raceme, females usually solitary or few at the base of the spike.

The genus is rather a large one in America, with a single species spread over tropical Asia and Africa, which is also the only Australian one.

1. **S. chamelæa**, Muell. *Arg. in DC. Prod.* xv. ii. 1175; *Benth. Fl. Austr.* vi. 151. An annual or perennial, with a hardy woody base and erect or ascending branching virgate stems of 1 to 1½ ft., glabrous and often glaucous. Leaves oblong-linear narrow-elliptical or lanceolate, mostly obtuse, minutely serrulate, 1 to 2 in. long, tapering into a very short petiole. Male spikes slender, 1 to 1½ in. long, mostly leaf opposed. Bracts very small, acute, with 2 large more or less stipitate glands sometimes as long as the point of the bract. Flowers 1 or 2 within each bract. Perianth segments about ¼ line long. Stamens 3, almost exerted. Female flowers usually solitary at the base of the male spike or lateral on the branch without any males, rarely 2 or 3 together within a separate bract, the bracts and perianths rather larger than in the males. Styles undivided, not very long. Capsule ovoid-truncate, tridymous, about 3 lines long, sometimes quite smooth but more frequently with 2 lines of prominent glands or conical processes on the back of each coccus.—*Tragia chamelæa*, Linn.; *Excæcaria chamelæa*, Baill. *Adans.* vi. 323; *Elachocroton asperococcus*, F. v. M. in *Hook. Kew. Journ.* ix. 17.

Hab: Islands of the Gulf of Carpentaria, *R. Brown, Henne*; Endeavour River, *A. Cunningham*; Baines Creek, *F. v. Mueller*; Connor's and Bowen Rivers, *Bowman*; Rockingham Bay, *Dallachy*; Cape York, *M'Gillivray*.

This, the only Old World species, is widely spread over tropical Asia and Africa.

#### 42. EXCÆCARIA, Linn.

(From *excæcus*, blindness, effect of sap.)

Flowers monœcious or diœcious, in terminal or axillary racemes or spikes. Male flower: Perianth of 3 or 2 very small segments. No petals or glands. Stamens 3 or 2, forming almost the whole flower, without any rudimentary ovary; filaments free or shortly united at the base; anther-cells distinct, placed back to back, opening longitudinally in 2 valves. Female flower: Perianth usually more distinctly 3-lobed or 3-partite than the male. Ovary 3 or 2-celled, with 1 ovule in each cell. Styles linear, undivided, free or shortly united at the base. Capsule dividing into 2-valved cocci. Seeds globular or ovoid, without any carunculus. Albumen copious; cotyledons flat, much broader than the radicle.—Trees or shrubs, with a very acrid milky juice. Leaves alternate, entire, or crenulate. Flowers very small, the males clustered 2 or 3 together along the rachis of the raceme or spike, or sometimes solitary within each bract. Stamens exerted. The females in separate shorter racemes.

The genus, if taken to include *Sapium*, is generally spread over the tropical regions of both the New and the Old World. Of the three Australian species, one is common on the sea-coasts of tropical Asia, the other two are endemic.

Leaves obovate or broadly elliptical, obtuse, entire or crenate, 2 to 3 in.

long . . . . . 1. *E. Agallocha*.

Leaves ovate-lanceolate or ovate, obtusely acuminate, crenate, 1 to 3 in.

long . . . . . 2. *E. Dallachyana*.

Leaves narrow-oblong, very obtuse, entire, ½ to 1 in. long . . . . . 3. *E. parvifolia*.

1. **E. Agallocha** (resembling *Aquilaria gallocha*, of Rumph.) *Linn.; Muell. Arg. in DC. Prod.* xv. ii. 1220; *Benth. Fl. Austr.* vi. 152. Milky mangrove or river poison-tree. "Coongera," Forest Hill, *Macartney*. "Me-la-ba," Cooktown, *Roth*. A small tree, quite glabrous. Leaves mostly obovate or broadly elliptical, obtuse or shortly and obtusely acuminate, rounded or contracted at the base, entire or somewhat crenulate, thick and shining when old, 2 to 3 in. long on a petiole of ¼ to ½ in. Spikes or racemes usually in the axils of the previous year's leaves or at the old nodes, solitary or 2 or 3 together, 1 to 1½ in. long. Male flowers rather crowded, the bracts rather thick, with 2 more or less distinct glands inside at the base. Within the bract the 2 or 3 stamens are supported on a short stipes, with a small lanceolate scale on each side at the base, and two or three still smaller alternating with the filaments, which are from ¼ to 1 line long.

Female flowers in short racemes on separate specimens, the pedicels 1 to 2 lines long. Perianth of 3 small acute rather thick lobes. Capsule tridymous, about 3 lines diameter.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; common along the whole coast. Timber for making canoes.—*Roth*.

In India the wood is considered useful for general carpentering purposes.

At some excavations carried out on the banks of the Brisbane River for the new Gasworks the workmen came, at a depth of some 20 to 30ft., upon large masses of fossilised leaves and wood. Many of the leaves and much of the wood have doubtless belonged to trees of this common coast swamp tree.

Wood of a light colour and soft, close in the grain, and easy to work.—*Bailey's Cat. Ql. Woods, No. 382*.

This species appears to be a common maritime tree in tropical Asia.

2. **E. Dallachyana** (after J. Dallachy), *Bail. Adans. vi. 324*, as a var. of *E. Agallocha*; *Benth. Fl. Austr. vi. 153*. Scrub Poison Tree. A slender scrub tree. Leaves dark green, ovate-lanceolate or ovate, obtusely acuminate, crenate, 1 to 3in. long; less coriaceous and the veins more prominent and reticulate underneath. Flowers of the male in slender spikes 1in. or more long; females in slender spreading panicles, capsule tridymous.

Hab.: Not uncommon in all river scrubs.

When clearing scrub land this tree is apt to spring up from the roots and poison cattle which may browse upon the young shoots.

Wood yellow with black heart, close in the grain and very tough; might be found suitable for axe-handles.—*Bailey's Cat. Ql. Woods, No. 383*.

3. **E. parvifolia** (leaves small), *Muell. Arg. in Flora 1861, 433*, and in *DC. Prod. xvii. 1221*; *Benth. Fl. Austr. vi. 153*. Gutta-percha tree. "Jil-leer," Cloncurry, *Palmer*. Very nearly allied to *E. Agallocha*, and reduced by Baillon like the last to a variety of that species, with narrow oblong very obtuse entire leaves of  $\frac{1}{2}$  to 1in., tapering into a short petiole. The male racemes are also smaller,  $\frac{1}{2}$  to 1in. long. Female flowers and fruit unknown.

Hab.: Common round the Gulf of Carpentaria, *R. Brown, F. v. Mueller, Landsborough*.

The natives use the bark mashed up in water in a wooden kooliman and heated with stones. The wash is applied externally to all parts of the body and rubbed in. Used for pains and sickness.—*Palmer*.

Wood near the outside yellow, the heart dark and very beautifully marked, close-grained and easily worked: an excellent wood for the cabinet-maker.—*Bailey's Cat. Ql. Woods No. 383*.

## ORDER CXVIII. BALANOPSEÆ.

Flowers dioecious, males in amentaceous spikes, shortly pedicellate or subsessile, 1-bracteolate. Stamens numerous (2 to 12, often 5 to 6), filaments very short or none. Anthers sub-sessile, ovate, 2-celled, the connective sometimes produced into a minute point. Ovary rudimentary or rarely in the terminal flowers minute, 2-partite. Female solitary, sessile within an involucre of imbricate bracts. Perianth none. Ovary sessile, placentas 2, parietal imperfectly 2-celled. Styles 2, parted almost to the base. Drupe within the persistent involucre ovoid, pyrenes 2 or 1 by abortion. Seeds in pyrene solitary, erect. Albumen fleshy. Embryo straight, radicle inferior.—Trees or shrubs. Leaves alternate, or subverticillate, coriaceous. Entire or slightly toothed, penniveined, exstipulate.

Besides the Queensland species there are several in New Caledonia:

### 1. BALANOPS, Baill.

(Fruit an acorn-like nut).

Characters of the Order.

1. **B. australiana** (Australian), *F. v. M. Fragm. x. 114*. A small evergreen tree, branchlets angular, soon glabrous. Leaves coriaceous, entire, oblong or lanceolate-obovate, 3 to 4in. long, 1 to 1½in. broad, cuneate at the base, more

glossy on the face than the back, distantly penninerved. Male flowers not seen. Female flowers axillary, solitary, sessile, the bracts involucrate, in a few series round, interior ones  $1\frac{1}{2}$  lines, exterior ones shorter, hoary-silky outside. Stigmas 2, about 1 line long. Fruit  $\frac{1}{2}$  in. or more long, pale brown, 2-celled or 1-celled by the obliteration of the placenta. Pericarp fragile, imperfectly separating from the endocarp. Seeds 2, ovate, often plano-convex. Testa brown, chartaceous-membranous. Albumen scarcely any, embryo straight; cotyledons plano-convex, radicle very short, inferior.

Hab.: Rockingham Bay, *J. Dallachy.*

ORDER CXIX. URTICACEÆ.

Flowers unisexual or very rarely polygamous. Perianth simple and calyx-like, of 3 to 5 segments (rarely reduced to 1 or 2) imbricate or induplicate-valvate in the bud. Stamens in the males as many as perianth-segments, and opposed to them, very rarely fewer or more; filaments short and erect or longer and inflexed in the bud; anthers usually with 2 parallel cells opening longitudinally. Ovary in the females free or rarely more or less adnate to the perianth, 1-celled. Style simple or more or less deeply divided into 2 branches or 2 distinct styles, stigmatic in the upper portion, or sometimes the style reduced to a sessile fringed or tufted stigma. Ovule 1, erect and orthotropous, or laterally attached and amphitropous, or pendulous and anatropous, the micropyle always superior. Fruit (of each separate flower) a small berry drupe nut or indehiscent utricle, and sometimes the fruits of a whole inflorescence united in a succulent syncarp, surrounding or subtended by or enclosed in a fleshy receptacle. Seed with a membranous testa, with or without albumen. Embryo straight curved or spirally involute, the cotyledons flat or folded, the radicle superior.—Trees shrubs or herbs very varied in habit and foliage.—Leaves alternate or opposite, entire toothed or rarely divided, penniveined and often 3-nerved. Stipules present, but usually very deciduous. Flowers small, in cymes clusters or heads, rarely solitary, the clusters or heads often racemose or paniculate, the receptacle of the heads very variously shaped and often bordered by an involucre of small bracts.

A very large order, spread over the New and the Old World, chiefly tropical, but a few species extending into temperate regions, both in the northern and the southern hemisphere, a very few only to be met with in cold climates. Weddell gives the name of *cystoliths* to certain calcareous concretions under the epidermis of the leaves, which, when linear, assume in the dried specimens the aspect of appressed superficial hairs, although really within the substance of the leaf. The form of these cystoliths has in some Urticæ been made use of as a specific character, but they are, I believe, dot-like in all the Australian species.—*Benth.*

TRIBE I. **Celtidææ**.—Flowers often polygamous, in axillary or lateral cymes. Filaments short, erect or slightly incurved in the bud. Style-branches 2, equal. Ovule pendulous. Embryo curved, the cotyledons often folded over the incumbent radicle. Trees or shrubs.

- Flowers polygamous, the fertile ones frequently hermaphrodite. Perianth segments imbricate in the bud. Style-branches (or styles) linear-oblong or dilated, truncate, or 2-lobed . . . . . 1. CELTIS.
- Flowers polygamous, the fertile ones frequently hermaphrodite. Male perianth-segments induplicate-valvate. Style-branches (or styles) short involute and persistent on the fruit . . . . . 2. TREMA.
- Flowers unisexual (monœcious). Perianth segments imbricate in the bud. Style-branches (or styles) subulate . . . . . 3. APHANANTHE.

TRIBE II. **Moreææ**.—Flowers unisexual in dense spikes or heads. Stamens inflected in the bud. Styles usually 2-branched. Ovules pendulous or laterally attached. Embryo incurved or involute. Trees or shrubs rarely herbs.

SUB-TRIBE 1. **Brousonetiææ**.—Male flowers capitate, spicate or racemose, females in globose heads. Style undivided, elongate. Shrubs or trees.

- Male flowers in dense spikes. Females in globular heads, their perianths urceolate with a small orifice. Style-branches elongated . . . . . 4. MALAISIA.



**SUBTRIBE 2. Eumorea.**—Male and female flowers spicate, or female sub-capitate. Sepals of the females fleshy in fruit and inclosing the achene. Trees or shrubs.

Male flowers in dense spikes. Females few in spikes or heads, their perianths of 4 segments. Style-branches elongated . . . . . 5. PSEUDOMORUS.

**SUBTRIBE 3. Dorsteniæ.**—Male and female flowers crowded on a narrow or broad flat fleshy receptacle.

Receptacle flat, entire or lobed. Herbs or shrubs . . . . . 6. \*DORSTENIA.

**TRIBE III. Artocarpeæ.**—Flowers unisexual in dense spikes or heads, or crowded on or inclosed in a fleshy receptacle. Stamens erect or slightly incurved in the bud. Styles undivided or 2-branched. Ovule pendulous or laterally attached. Embryo curved or straight. Trees or shrubs with a milky juice.

**SUBTRIBE 1. Ficeæ.**—Receptacle fleshy, globose or obovoid.

Flowers enclosed in the receptacle which is more or less closed at the small orifice by small bracts . . . . . 7. FICUS.

**SUBTRIBE 2. Euartocarpeæ.**—Inflorescence unisexual, naked or with 3 to 4 stipitate bracts at the base, heads or spikes, rarely racemes, or the females rarely 1-flowered.

Flowers in globular heads on a fleshy receptacle. Fruit a syncarp, formed of the enlarged fleshy perianths and receptacle . . . . . 8. CUDRANIA.

**TRIBE IV. Urticeæ.**—Flowers unisexual. Stamens 1 to 5, inflexed in the bud, with the anthers reversed. Style undivided or none. Ovule erect, orthotropous. Trees herbs or shrubs with a watery juice.

**SUBTRIBE 1. Urereæ.**—Herbs or shrubs, rarely trees, with stinging hairs. Flowers cymose, 2 to 5-merous.

Leaves opposite. Achene straight; stigma penicillate . . . . . 9. URTICA.

Leaves alternate; stipules connate. Achene oblique; stigma ovate or linear . . . . . 10. FLEURYA.

Leaves alternate. Female sepals 4. Achene oblique; stigma filiform . . . . . 11. LAPORTEA.

**SUBTRIBE 2. Procrideæ.**—Herbs, rarely shrubs, without stinging hairs. Inflorescence cymose, or flowers on a fleshy receptacle. Female flowers 3 to 5 partite. Stigma penicillate.

Leaves opposite. Flowers cymose or capitellata . . . . . 12. \*PILEA.

Leaves alternate. Flowers all on a fleshy receptacle. Female perianth small or none . . . . . 13. ELATOSTEMA.

**SUBTRIBE 3. Bœhmeriæ.**—Flowers not involucrate, spicate, fascicled, racemose or paniculate; male perianth 2 to 5 merous, female tubular or none. Shrubs or trees, rarely herbs, without stinging hairs.

\* Fruiting perianth membranous or dry, including the free or adnate achene.

Shrubs or undershrubs. Stigma filiform, persistent . . . . . 14. BŒHMERIA.

Herbs. Flowers 4-merous. Stigma deciduous filiform . . . . . 15. POUZOLZIA.

\*\* Fruiting perianth more or less fleshy, including the free or adnate achene; trees or shrubs; leaves alternate.

Leaves broad. Ovary free. Stigma linear deciduous . . . . . 16. PIPTURUS.

**SUBTRIBE 4. Parietariæ.**—Herbs or undershrubs, without stinging hairs. Leaves alternate, quite entire. Flowers in cymose involucre.

Stigma tufted. Male perianth-segments nearly flat . . . . . 17. PARIETARIA.

**SUBTRIBE 5. Forskohleæ.**—Herbs or undershrubs, without stinging hairs. Leaves toothed. Flowers in naked or involucrate clusters, males monandrous.

Stigma linear. Male perianth with 1 large outer lobe. Stamens 1. No bracts . . . . . 18. AUSTRALINA.

1. CELTIS, Linn.

(A classical named for the *Lotos*).

(*Solenostigma*, Endl.)

Flowers polygamous, in axillary or lateral cymes. Perianth in both sexes of 4 or 5 segments imbricate in the bud. Stamens in the male and hermaphrodite flowers as many as perianth-segments, not exceeding the perianth, but

slightly incurved in the bud. Disk hairy, with a rudimentary pistil in the males. Ovary in the female and hermaphrodite flowers inserted on a hairy disk. Style-branches (or distinct styles) 2, equal, linear oblong or dilated, recurved and papillose on the upper or inner surface, truncate or 2-lobed. Ovule pendulous or laterally attached near the top. Drupe ovoid or globose. Embryo curved, the cotyledons broad, conduplicate or rarely flat, incumbent on or embracing the ascending radicle.—Trees or shrubs. Leaves alternate, more or less 3-nerved entire, dentate in others. Stipules small and deciduous.

The genus is dispersed over the temperate and subtropical regions of both the New and the Old World, with a few tropical species, chiefly in mountainous districts. Both the Australian species extend to the Indian Archipelago.

Leaves broad, strongly 3-nerved, scarcely acuminate. Cotyledons flat or nearly so. . . . . 1. *C. philippinensis*.  
 Leaves ovate-lanceolate, the lateral nerves scarcely prominent. Cotyledons conduplicate. . . . . 2. *C. paniculata*.

1. ***C. philippinensis*** (of the Philippines), *Blanco, Fl. Filip.* 197; *Benth. Fl. Austr.* vi. 156. A tall shrub or stunted tree, or according to some collectors a fine tree, quite glabrous or with a minute pubescence on the young shoots. Leaves on petioles of 1 to 4 lines, ovate or broadly elliptical, shortly acuminate, entire, rounded and sometimes rather oblique at the base, varying from  $1\frac{1}{2}$  to 3 in. in the more rigid broader leaved specimens, to 3 to 5 in. in luxuriant ones, coriaceous, green on both sides, very prominently and strongly 3-nerved, with very fine reticulations. Cymes loose,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. diameter, those with all male flowers more crowded than the polygamous ones. Perianths pedicellate, the segments broad,  $\frac{3}{4}$  to nearly 1 line long. Stigmatic branches of the style (or styles) broadly cuneate truncate or 2-lobed, sometimes broader than long, sometimes much longer than broad and often the two of the same flower dissimilar. Drupe ovoid, 3 or 4 lines long, the endocarp bony. Embryo curved lengthwise but the cotyledons transversely flat in the seeds examined, not conduplicate as in *C. paniculata*.—*Planch. in Ann. Sc. Nat. ser. 3, x. 306*; *C. strychnoides*, *Planch. l.c.*

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Sunday Island, *A. Cunningham*; Port Denison, *Fitzalan, Dallachy*.

Wood light-coloured, hard and close-grained.—*Bailey's Cat. Ql. Woods, No. 384A.*

The species extends over the Archipelago to South China. The smaller more rigid-leaved specimens upon which the *C. strychnoides* was founded appear to have grown in open dry situations. *Cunningham's* larger-leaved specimens are stated by him to have been from moist shady situations.

2. ***C. paniculata*** (paniculate), *Planch. in Ann. Sc. Nat. ser. 3, x. 305*; *Benth. Fl. Austr.* vi. 156. A large tree, quite glabrous. Leaves from ovate-lanceolate to elliptical-oblong, acuminate, more or less cuneate at the base and often oblique or slightly falcate, entire, coriaceous, smooth, penniveined and 3-nerved at the base but the midrib alone prominent, the lateral veins or nerves short and fine or almost evanescent. Cymes sometimes dense and few-flowered, sometimes loose and 1 in. broad. Drupes smaller than in *C. philippinensis*. Style-branches truncate or 2-lobed, often unequally so. Cotyledons very broad and folded over the ascending radicle.—*Solenostigma paniculatum*, *Endl. Prod. Fl. Norf.* 42; *S. brevinerve*, *Blume Mus. Bot. ii. 67*; *C. sp. nova, n. 32*, *Planch. in Ann. Sc. Nat. ser. 3, x. 305*; *C. ingens*, *F. v. M. Fragm. iv. 88*.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown, Henne*; Broadsound, *R. Brown*; Endeavour River, *A. Cunningham*; Moreton Bay, *F. v. Mueller*; Rockhampton, *Thozet O'Shanesy*; Edgecombe Bay and Port Denison, *Dallachy*; Curtis Island, *Henne*; Keppel Bay, *Thozet*.

2. TREMA, Lour.

(Referring to the impressions on the hard inner part of fruit.)

(Sponia, Commers.)

Flowers polygamous, in small axillary cymes. Male perianth of 5, rarely 4 segments, induplicate-valvate in the bud. Stamens as many as perianth-segments, erect in the bud; filaments very short. Ovary rudimentary or more or less developed. Female perianth-segments nearly flat and slightly imbricate when entirely without stamens, more or less concave and induplicate in the hermaphrodite flowers. Style deeply divided to the base into 2 linear rather thick branches (or styles), hirsute along the inner stigmatic surface, and not exceeding the length of the ovary. Ovule pendulous, laterally attached near the top. Fruit a very small drupe, usually crowned by the persistent involute styles, with a slightly succulent exocarp, and a bony endocarp often pitted outside. Seed pendulous, with a thin testa and fleshy albumen. Embryo linear, curved, with a superior radicle.—Trees or tall shrubs. Leaves alternate, more or less distichous and often oblique, denticulate, 3-nerved and penniveined, the principal primary veins starting usually from both sides of the midrib and from the outer side only of the lateral veins. Flowers and fruits small, the cymes or even the whole specimens often unisexual.

The genus is widely spread over the tropical and subtropical regions of the New and the Old World.

- Leaves green and scabrous on both sides, sprinkled with scattered hairs or nearly glabrous . . . . . 1. *T. aspera*.
- Leaves green and glabrous above, and smooth or scabrous, white or hoary tomentose underneath . . . . . 2. *T. orientalis*.
- Leaves softly pubescent above, densely velvety-pubescent or hirsute underneath . . . . . 3. *T. amboinensis*.

1. **T. aspera** (rough), *Blume, Mus. Bot.* ii. 58; *Benth. Fl. Austr.* vi. 158. Peach-leaved Poison-bush. "Dinjin," Taromeo, *Shirley*. A slender tree, of 15 to 25ft. or a shrub of 8 to 10ft., the branches more or less pubescent with short rigid appressed or scarcely spreading hairs. Leaves shortly petiolate, obliquely ovate ovate-oblong or ovate-lanceolate, acuminate, regularly serrate-crenate, rounded or slightly cordate at the base, 3-nerved and obliquely penniveined, membranous, sometimes rather rigid, green on both sides or pale underneath, scabrous, usually more or less hirsute on the principal veins underneath and often sprinkled on both sides with short scattered hairs. Flowers small, in short cymes sessile or shortly pedunculate in the axils, sometimes all males but more frequently a few or several female or hermaphrodite ones in the same cymes. Male perianth scarcely 1 line diameter when open and the female smaller. Styles varying from half the length to the length of the ovary. Drupes black, ovoid, scarcely compressed, obtuse or rather acute, varying from under 1½ lines to nearly 2 lines in length.—*Celtis aspera*, Brongn. in Duperr. Voy. Coq. 213, t. 48; *Sponia aspera*, Planch, in Ann. Sc. Nat. ser. 3, x. 318.

Hab.: Brisbane River, Moreton Bay, *W. Hill, F. v. Mueller*, and others; and thence to Rockhampton, Rockingham and Wide Bays, and Burdekin River, *F. v. Mueller, Bidwill, Thozet* and others; Northumberland Islands, *R. Brown*.

Wood of a whitish colour, soft and light.—*Bailey's Cat. Ql. Woods*, No. 385.

Leaves sometimes infested with the blight-fungi, *Asterina pelliculosa*, Berk., *Asteromella epitrema*, Cke., and *Dimerosporium parvulum*, Cke.

Var. *viridis*. Leaves larger and less hairy, but no other difference. *Sponia viridis*, Planch. in Ann. Sc. Nat. ser. 3, x. 319; *Trema viridis*, Blume Mus. Bot. ii. 58.—Rockingham Bay, *Daltry*. This variety is referred by Planchon (DC. Prod. xvii. ined.) to the widely-spread *T. virgata*, Blume (*Celtis virgata*, Roxb., *Sponia virgata*, Planch.), from which it is certainly not easily distinguished. Brongniart's name has, however, the right of priority.

2. **T. orientalis** (eastern), *Blume Mus. Bot.* ii. 62; *Benth. Fl. Austr.* vi. 158. A tree sometimes attaining 40ft., the branches pubescent. Leaves ovate-lanceolate or lanceolate, acuminate, toothed, cordate at the base, green and scabrous or almost smooth on the upper surface and usually glabrous, white or hoary underneath with a close almost silvery tomentum or short soft pubescence, varying from 2 to 6in. long. Male cymes usually broad and many flowered, with the perianths larger than in *T. aspera*, the cymes as well as the flowers smaller when several or all of them are fertile.—*Celtis orientalis*, Linn.; *Sponia orientalis*, Planch. in Ann. Sc. Nat. ser. 3, x. 323.

Hab.: Albany Island, *W. Hill*; Port Moller, *M<sup>c</sup>Gillivray*; Port Denison, *Fitzalan*, *Dallachy*; Rockhampton, *Thozet*, and others; Bundaberg, *B. Scortechini*.

In parts of India this tree is allowed to grow for shade in coffee plantations. The wood is used for making gunpowder charcoal.

Wood of a red color, soft, and resembling cedar.—*Bailey's Cat. Ql. Woods*, No. 385A.

The species is widely spread over East India and the Archipelago.

3. **T. amboinensis** (of Amboyna), *Blume Mus. Bot.* ii. 61; *Benth. Fl. Austr.* vi. 159. "Birula," Forest Hill, *Macartney*. A fine tree of 40ft., the branches densely pubescent or villous. Leaves shortly petiolate, ovate or ovate-lanceolate, acuminate with long points, more equally rounded or cordate at the base than in *T. aspera*, 2 to 4in. long, rather thick, softly pubescent above, densely velvety-pubescent or villous underneath. Cymes compact, the bracts usually more acuminate than in *T. aspera*.—*Sponia amboinensis*, Planch. in DC. Prod. xvii. ined.; *S. velutina*, Planch. in Ann. Sc. Nat. ser. 3, x. 327; *Trema velutina*, Blume Mus. Bot. ii. 62.

Hab.: Rockingham Bay, *Dallachy*.

The species is widely spread over East India and the Archipelago, extending northward to South China. This may be the typical *Trema cannabina*, Lour.

### 3. APHANANTHE, Planch.

(Referring to the obscure flowers).

Flowers monœcious, the males in axillary cymes, the females solitary or 2 together. Perianth in both sexes of 4 or 5 segments, imbricate in the bud. Stamens in the males 4 or 5, filaments short, slightly incurved in the bud. Pistil rudimentary. Styles in the females deeply divided into linear acute entire branches papillose-hirsute inside. Ovule pendulous or laterally attached near the top. Drupe ovoid, slightly compressed, the endocarp crustaceous. Seed nearly globular; testa membranous; albumen little or none. Embryo curved or involute, the outer larger cotyledon enclosing the smaller one.—Tree or shrub. Leaves alternate, penniveined. Stipules very small or none. Male cymes in the axils of the old leaves, female flowers sessile or shortly pedicellate in the lower axils of the young shoots.

The genus is limited to the single Australian species, which is also in the Philippines, and probably in some of the islands of the Archipelago.

1. **A. philippinensis** (of the Philippines), *Planch. in Ann. Sc. Nat. ser. 3*, x. 387; *Benth. Fl. Austr.* vi. 160. "Mallban," Barron River, *E. Cowley*. A tree or tall shrub, glabrous or scabrous-pubescent. Leaves shortly petiolate, broadly ovate to elliptical, acute or almost obtuse, rigidly membranous or coriaceous, scabrous, the primary veins very prominent underneath and although anastomosing near the margin generally produced into small rigid mucronate teeth, the whole leaf 1 to 2in. long, but sometimes larger, ovate lanceolate, truncate or almost cordate at the base, the marginal teeth more prominent, on other plants the leaves smaller broader and deeply divided into pungent-pointed lobes. Male cymes almost sessile but loose. Perianth-segments broad, concave, ciliolate. Anthers half exerted when fully out. Female

perianth-segments narrower. Fruit ovoid, acuminate, about 8 lines long.—*Taxotrophis rectinervis*, F. v. M. Fragm. vi. 192; *Sponia ilicifolia*, S. Kurz in Flora, 1872, 448.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller*; Queensland Woods, London Exhibition, 1862, *W. Hill*, n. 86; Rockhampton, *O'Shanesy*; Rockingham Bay, *Dallachy*.

Wood close-grained, light in colour; might do for stamps.—*Bailey's Cat. Ql. Woods*, No. 386.

#### 4. MALAISIA, Blanco.

(Of the Malay Archipelago.)

(*Cephalotropis*, *Blume*; *Dumartroya*, *Gaudich*).

Flowers diœcious, the males in oblong or cylindrical spikes, the females in globular heads on a small receptacle. Male perianth deeply divided into 3 or 4 lobes or segments, valvate in the bud. Stamens 3 or 4, the filaments elongated, inflected in the bud. Female perianth urceolate, with a small orifice, enclosing the ovary. Style with 2 elongated stigmatic branches. Ovule pendulous. Fruiting-head not much enlarged, the nut enclosed in the slightly succulent perianths. Seed with a thin testa and very scanty albumen. Cotyledons very unequal, curved over the ascending radicle, the larger one embracing the smaller one in its concave surface.—A straggling tree or woody climber, with a milky juice. Leaves alternate, usually entire. Stipules small, deciduous. Inflorescence axillary.

The genus appears to be limited to the single Australian species, extending over the Indian Archipelago and Islands of the South Pacific to the Philippines.

1. *M. tortuosa* (winding), *Blanco*, *Fl. Filip.* 789; *Benth. Fl. Austr.* vi. 180. "Deng-ul-ka," Morehead River; "Kai-inuna," Mapoon, *Roth*. A small straggling tree with its upper branches twining or a tall climbing shrub, glabrous or the young shoots and inflorescence slightly pubescent. Leaves shortly petiolate, oblong-elliptical or almost ovate, very obtuse or acuminate, coriaceous, prominently pinniveined,  $1\frac{1}{2}$  to 3 in. long. Male spikes solitary or 2 together, sessile or shortly pedunculate, dense, often curved 2 to 6 lines long. Female heads  $1\frac{1}{2}$  to 2 lines diameter or rather larger when in fruit, tomentose, solitary on short peduncles or forming little axillary racemes (short leafless flowering branches) always much shorter than the leaves. Bracts numerous, concave, the prominent dorsal pubescent gibbosities densely imbricate. Flowers mostly rudimentary, only 2 or 3 in the head perfect, concealed under the bracts except the long filiform exerted style-branches.—*Bureau* in *Ann. Sc. Nat.* ser. 5, xi. 369, with the following Australian besides several other synonyms; *M. Cunninghamii*, *Planch.* in *Ann. Sc. Nat.* ser. 4, iii. 293, *F. v. M. Fragm.* vi. 193; *M. scandens*, *M. viridescens* and *M. acuminata*, *Planch.* l.c. 293, 294; *Dumartroya fagifolia*, *Gaudich.* in *Voy. Bonite*, t. 97; *Cephalotropis javanica*, *Blume*, *Mus. Bot.* ii. 76.

Hab.: Brisbane River, Moreton Bay, *A. Cunningham*, *F. v. Mueller* and others; thence to Rockhampton, Rockingham and Edgecombe Bays, and the Burdekin, *F. v. Mueller*, *Thozet*, *Dallachy*, *Fitzalan*, and others; Wide Bay, *Bidwill*.

Wood close-grained and tough, the outer part yellow the centre brown.—*Bailey's Cat. Ql. Woods*, No. 387.

Bark used for making fish lines.—*Roth. l.c.*

#### 5. PSEUDOMORUS, Bureau.

(False Mulberry.)

Flowers monœcious (or sometimes diœcious?), the males in dense cylindrical spikes, the females few in very short spikes almost reduced to heads. Male perianth of 4 segments, imbricate in the bud. Stamens 4, the filaments elongated, inflected in the bud. Pistil rudimentary. Female perianth of 4 segments, not enlarged after flowering. Style divided to the base or nearly

so into 2 linear stigmatic branches. Ovule pendulous. Fruit a small drupe, surrounded by the persistent perianth and crowned by the style branches; the epicarp succulent, the endocarp crustaceous or almost woody. Seed pendulous with a membranous testa; albumen very scanty or none; embryo curved; cotyledons semiglobular; radicle incumbent, ascending.—Tree or shrub with a milky juice. Leaves alternate. Stipules small, deciduous. Inflorescences axillary.

The genus is limited to the single Australian species, which extends into New Caledonia and Norfolk Island.

1. **P. Brunoniana** (after Dr. R. Brown), *Bureau in Ann. Sc. Nat. ser. 5, xi. 372*; *Benth. Fl. Austr. vi. 181*. A tall shrub or small tree, attaining sometimes 30 or 40ft., glabrous or nearly so. Leaves very shortly petiolate, elliptical ovate-lanceolate, or lanceolate, mostly acuminate, denticulate,  $1\frac{1}{2}$  to 4in. long, pinnately veined, often slightly pubescent on the underside especially on the nerves and sometimes scabrous above. Spikes solitary in the axils, sessile or shortly pedunculate, the males usually not above lin. long sometimes lengthening to 2 or even 3in. Perianth-segments about  $\frac{1}{2}$  line long. Female spikes very small, usually containing only 3 or 4 flowers, each within a minute bract. Berries globular, the size of a currant or sometimes rather larger.—*Morus Brunoniana*, Endl. *Atakta*, t. 32; *M. pendulina*, F. Bauer, in Endl. *Prod. Fl. Norf. 40*; *Streblus Brunoniana* and *S. pendulina*, F. v. M. *Fragm. vi. 192*.

Hab.: Brisbane River, Moreton Bay, A. Cunningham, F. v. Mueller and others; Rockampton, O'Shanesy, Bowman; Rockingham Bay, Dallachy.

Wood light-yellow, close-grained, hard and tough.—*Bailey's Cat. Ql. Woods, No. 388*.

## 6. \*DORSTENIA, Linn.

(After Theo. Dorsten.)

Flowers monœcious, crowded on a flat simple or lobed androgynous receptacle. Male flowers: Perianths more or less connate and adnate with the receptacle, obscurely 2-lobed or toothed. Stamens 1 to 3, inflected in the bud. Pistillode none. Female flowers: Deeply sunk in the receptacle; perianth-mouth almost closed. Ovary included, style excentric or lateral, branches 2, subulate; ovule pendulous. Achene minute, crustaceous. Albumen none; cotyledons subequal, contorted, embracing the upcurved radicle.—Herbs or small shrubs. Leaves alternate or radical, entire or lobed; stipules lateral.

Species American, African and Indian.

1. **D. arifolia** (Arum-leaved), *Lam. Encycl. Meth. ii. 317, Illustr. t. 88, f. 2*. Stem short. Leaves sagittate-hastate, the lobes obtuse or acute, 6 to 8in. long,  $1\frac{1}{2}$  to  $2\frac{1}{2}$ in. broad at the base, on petioles of from 5 to 9in. Peduncles long as the petioles. Receptacles with the margins irregularly lobed.—*Lodd. Bot. Cab. t. 999*; Brazil. *Fl. iv. 1, page 163, t. lx*.

Hab.: Brazil. Becoming a weed in many bushhouses.

This genus is given on account of the species mentioned having become a weed in several bushhouses, and probably in a few years may become naturalised in the damp scrubs.

## 7. FICUS, Linn.

(Old Latin name for the Fig-tree).

(*Urostigma* and *Covellia*, *Gasp.*)

Flowers unisexual, minute, enclosed in a hollow globular ovoid or pear shaped receptacle called a *fig* or *synœcium*; the minute orifice closed by bracts turned inwards, or the first rows erect outwards. Male flowers usually near the mouth of the receptacle, very rarely in separate receptacles and often very few. Perianth

of 3 to 6 lobes or segments, imbricate in the bud, rarely reduced to a single one. Stamens 1, 2, or rarely more, opposite the perianth-segments; anthers 2-celled or the cells confluent at the apex. Female perianth usually with narrower segments than the male and sometimes very much reduced or almost none. Styles usually lateral, at least after the growth of the ovary, filiform with a terminal peltate oblique or elongated and unilateral stigma. Ovule pendulous or laterally attached near the top. Fruiting receptacle usually enlarged, but remaining closed, the small seed-like nuts surrounded by the membranous or succulent persistent perianth. Embryo curved, in a fleshy albumen usually rather scanty. —Trees or shrubs with the juice usually milky. Leaves alternate or opposite, entire or lobed, penniveined and usually more or less distinctly 3-nerved at the base. Stipules usually very deciduous, convolute on the young buds. Receptacles usually in pairs, or solitary by the abortion of one of each pair, either axillary or on the old wood, and then often forming clusters or racemes on short leafless branchlets. Bracts usually 3, often small and scale-like either at the base of the receptacle or along the pedicel below it. Bracts within the receptacle subtending the flowers usually very numerous, varying with the perianth in consistence and colour, those near the orifice of the receptacle usually rather larger, without flowers and closing the orifice, the outermost rows sometimes exserted and erect, but usually horizontal or inflexed, those subtending the flowers sometimes very minute or replaced by hairs or setæ or obsolete. Male flowers usually fewer than the females, and in the upper part of the receptacle, sometimes numerous and intermixed with the females or in separate receptacles.

A very large genus, spread over the tropical and subtropical regions of the New and the Old World, but most abundant in the Indian Archipelago.

**SECT I. Urostigma.**—Male perianth 3-merous, rarely 5-6-merous. Stamen 1; anther-cells edistinct or confluent. Female perianth 4-6-merous. Stigma (in the Australian species) longated, acute. Leaves alternate, entire, usually coriaceous. Receptacles usually axillary.

- \* Receptacle setose inside between the flowers. Male perianth 5 to 6-merous. Stamen exserted. Leaves ovate-cordate, densely pubescent underneath . . . . . 1. *F. colossea*.
- \*\* Receptacle bracteate inside between the flowers. Male perianth 3-merous, longer than the stamens.

Leaves with rather distant principal primary veins and numerous transverse reticulations, with a few smaller fine primary veins between the principal ones.

- Receptacles oblong, sessile. Stipules and young shoots usually hairy . . . . . 2. *F. pilosa*.
- Receptacles globular or turbinate.
- Petioles  $\frac{1}{2}$  to 1 in. long.
- Receptacles sessile or on a peduncle of 1 line, not exceeding 5 lines diameter.
- Leaves obtuse or shortly and obtusely acuminate . . . . . 3. *F. nesophila*.
- Leaves abruptly and shortly acuminate . . . . . 4. *F. Cunninghamii*.
- Receptacles on peduncles of 2 lines,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. diameter . . . . . 5. *F. Henneana*.
- Receptacles on peduncles of 4 to 5 lines, solitary or in pairs, about 1 in. diameter . . . . . 6. *F. gracilipes*.
- Petioles under  $\frac{1}{2}$  in. long. Peduncles very short . . . . . 7. *F. validinervis*.

(*F. macrophylla* and occasionally some other species of the following group, approach those of the present group in venation.)

- Leaves with numerous parallel primary transverse veins all equal or every third or fourth more prominent.
- Leaves thinly coriaceous, mostly under 4 in.
- Receptacles sessile or on very short peduncles.
- Petioles under 3 lines. Leaves usually broad and very obtuse.
- Receptacles  $\frac{1}{2}$  in. diameter . . . . . 8. *F. retusa*.
- Petioles flattened, under  $\frac{1}{2}$  in. Leaves oblong, 2  $\frac{1}{2}$  to 5 in. long, shortly acuminate. Receptacles pearshaped more than  $\frac{1}{2}$  in. long . . . . . 9. *F. Thynnæana*.
- Petioles  $\frac{1}{2}$  to  $\frac{3}{4}$  in. Leaves oblong-lanceolate or elliptical, scarcely acuminate. Receptacles  $\frac{1}{2}$  in. diameter . . . . . 10. *F. eugenioides*.
- Petioles  $\frac{1}{2}$  to  $\frac{3}{4}$  in. Leaves ovate-oblong, abruptly acuminate.
- Receptacles under  $\frac{1}{2}$  in. diameter . . . . . 11. *F. Hillii*.

- Leaves more coriaceous, obtuse or shortly and obtusely acuminate, rarely under 3in. long.  
 Receptacles pedunculate.  
 Leaves softly pubescent underneath. Receptacles villous, scarcely umbonate . . . . . 12. *F. leucotricha*.
- Receptacles sessile or on very short or long thick peduncles.  
 Leaves mostly 3 to 4in. long.  
 Leaves ferruginous underneath when young . . . . . 13. *F. rubiginosa*.  
 Leaves glabrous or minutely pubescent and pale . . . . . 14. *F. platypoda*.  
 Leaves glabrous, with very short petioles and very prominent veins (doubtful species) . . . . . 15. *F. dictyophleba*.  
 Leaves mostly 6 to 10in. long, glabrous, brown on the underside . . . . . 16. *F. macrophylla*.  
 Leaves 6 or more inches long, green on both sides. Receptacles 1½in. long, umbonate . . . . . 17. *F. Walkinsiana*.
- SECT. 2. **Eusyce**.—Male perianth of 5 or 6 lobes or segments, rarely reduced to 1. Stamens 1, 2 or more; anther-cells distinct. Female perianth 4-6-merous. Stigma (in the Australian species) undivided, peltate, oblique or oblong. Leaves alternate or opposite, entire, toothed or lobed, often deciduous. Receptacles axillary or on the old wood.
- Leaves smooth, at least on the upper side, or scarcely scabrous.  
 Leaves large ( $\frac{1}{2}$  to 1½ft.) glabrous. Stigma not peltate.  
 Leaves obovate-oblong or elliptical. Stipules narrow, rigid. Stigma obtuse, scarcely thickened . . . . . 18. *F. magnifolia*.  
 Leaves cordate-ovate. Stipules membranous. Stigma oblong, thick . . . . . 19. *F. ehreticoides*.
- Leaves under 6in. long.  
 Stipules and young shoots silky-hairy or hoary. Stigma oblique, lanceolate.  
 Stems climbing. Leaves ovate-oblong, 2 to 4in. long. Receptacles globose,  $\frac{1}{2}$ in. diameter . . . . . 20. *F. scandens*.  
 var. *australis*.
- Quite glabrous. Leaves elliptical of oblong-ovate.  
 Petioles slender, 2 to 3 lines long. Leaves prominently reticulate underneath. Stigma oblique . . . . . 21. *F. leptoclada*.  
 Petioles  $\frac{1}{2}$ in. long. Leaves with scarcely conspicuous veinlets. Style short. Stigma peltate . . . . . 22. *F. depressa*.
- Adult leaves glabrous, from 4 to 10in. long. Petioles stout, about 3in. long. Receptacles verrucose, orange-red, no basal bracts . . . . . 23. *F. subulata*.
- Quite glabrous. Leaves 3 to 5in. long. Distinctly jointed with the petiole. Petiole slender, 1½ to 2in. long. Receptacles sessile, globose,  $\frac{1}{2}$ in. diameter . . . . . 24. *F. infectoria*.
- Petioles thick, under 3 lines. Stigma peltate. Male perianth of 1 narrow segment . . . . . 25. *F. philippinensis*.
- Underside of the leaves and receptacles softly villous. Stigma peltate . . . . . 26. *F. mollior*.
- Leaves very scabrous.  
 Receptacles unisexual, the males oblong-cylindrical, the females ovoid or globose. Leaves opposite or alternate . . . . . 27. *F. stenocarpa*.
- Receptacles androgynous, ovoid or globose.  
 Leaves all alternate, pubescent or villous underneath. Receptacles villous, the orifice broad with exserted bracts . . . . . 28. *F. scabra*.  
 Leaves frequently opposite. Receptacle globular, glabrous or rarely pubescent.  
 Leaves mostly glaucous, rigid, ovate or orbicular, the margins aculeate.  
 Branches glabrous . . . . . 29. *F. orbicularis*.  
 Branches hirsute or pubescent . . . . . 30. *F. aculeata*.  
 Branches slightly tomentose. Leaves ovate. Receptacles: Males cylindrical-ovate, females spherical urceolate-globose . . . . . 31. *F. subglabra*.  
 Branches slender glabrous. Leaves lanceolate with often long points. Receptacles 2 to 4 lines on peduncles of about the same length . . . . . 32. *F. Pinkiana*.
- Leaves entire or sinuate-crenulate, not aculeate, on the flowering branches ovate, 2 to 8in. long, petioles  $\frac{1}{2}$  to lin. . . . . 33. *F. opposita*.
- Leaves of the flowering branches obovate, 2 to 3in. long, petioles very short . . . . . 34. *F. scobina*.
- SECT. 3. **Covellia**.—Male perianth of 3 or 4 broad segments enveloping each other, enclosing 1 large anther with distinct cells. Female perianth very small or more rarely exceeding the stipes of the ovary. Style glabrous, short, with a peltate or oblique stigma. Leaves usually large. Stipular scar prominent. Receptacles chiefly on the old wood.



- Leaves all opposite. Receptacles  $\frac{3}{4}$  to 1 in. diameter, not ribbed . . . , 35. *F. hispida*.  
 Leaves all or mostly alternate, scabrous, 4 to 10 in. long. Receptacles about  $\frac{3}{4}$  in. diameter, 6-ribbed. Young shoots pubescent or hispid . . . 36. *F. fasciculata*.  
 Leaves 4 to 5 in. long, lanceolate, with long points. Receptacles globose 6 lines diameter on slender peduncles of about 9 lines, bearing distant bracts and starting from a mass of imbricated dark-coloured ones . . . 37. *F. mourilyanensis*.  
 Leaves nearly or quite glabrous, oblong,  $1\frac{1}{2}$  to  $3\frac{3}{4}$  in. long. Receptacles globose, 3 lines diameter on a stipes a little longer than the peduncle, 6-ribbed, the basal bracts 2, dark-coloured . . . 38. *F. esmeralda*.  
 Leaves 3 to 4 in., glabrous and smooth as well as the branches . . . 39. *F. casearia*.  
 Leaves all alternate, glabrous and smooth. Receptacles 1 to  $1\frac{1}{2}$  in. diameter, not ribbed. Stigma oblique . . . 40. *F. glomerata*.  
 Leaves crowded at the ends of the branches, ovate or obtuse-ovate, 5 to 8 in. long, thick coriaceous, petioles 3 in. long, 3 lines broad. Receptacles 2 in. long, 1 in. diameter, 3 or 4 angular. Peduncle 3-angular, often broader than long . . . 41. *F. crassipes*.  
 Leaves coriaceous, lanceolate, 4 to 11 in. long on petioles, 2 to 4 in. Receptacles cylindrical-conical,  $1\frac{1}{2}$  to 2 in. long, prominently ribbed . . . 42. *F. pleurocarpa*.

1. **F. colossea** (of great size), *F. v. M.*; *Benth. Fl. Austr.* vi. 163. Abbey-tree. "Ban-na-bool-ka" or "Ko-kò-ya," Cooktown, *Roth*. A tree attaining more than 100 ft. with immense abutments and a spreading head. The young shoots, petioles, and underside of the leaves densely and softly pubescent or villous. Leaves alternate, ovate cordate, acuminate, entire, mostly 4 to 5 in. long and 3 to 4 in. broad, minutely pubescent, and at length nearly glabrous on the upper surface, the primary veins rather distant, prominent underneath as well as some of the transverse veinlets, the basal pair not very prominent. Petioles 1 to  $1\frac{1}{2}$  in. long. Receptacle turbinate-globose, 6 to 8 lines diameter, shortly pubescent, on peduncles of 1 to 2 lines. Flowers within the receptacle intermixed with hairs or setæ about as long as the perianths, which are brown as well as the bracts. Male flowers very numerous. Perianth stipitate, with 5 or 6 ovate or oblong obtuse lobes. Stamen 1, the anther exerted, with 2 distinct parallel cells, the connective often slightly produced beyond them. Female flowers nearly sessile. Perianth-segments 5 (or 6?) nearly equal. Style very slender, with a filiform stigma, slightly dilated towards the base.

Hab.: Herbert River, Rockingham Bay, *Dallachy*.  
 Fruit eaten by aborigines, *Roth*.

2. **F. pilosa** (hairy), *Reinw. in Blume Bijdr.* 446; *Benth. Fl. Austr.* vi. 164. A tall deciduous tree with widely spreading head, the adult foliage and fruits and even the young leaves usually glabrous, the stipules alone on the terminal bud covered with ferruginous hairs sufficient to justify the name, very rarely the petioles and principal veins of the leaves also hairy. Leaves alternate, on petioles of  $\frac{1}{2}$  to 1 in., elliptical-oblong, shortly and abruptly acuminate, rounded or rarely slightly cordate at the base, the larger ones 6 in. to nearly 1 ft. long and 3 to 5 in. broad, coriaceous, the principal primary veins rather distant and very prominent, as well as the fine smaller veins and transverse reticulations, with 1 or 2 pairs of basal oblique veins. Receptacles red with yellow spots, orange coloured inside, usually in pairs, closely sessile in the axils or below the leaves, oblong, about  $\frac{3}{4}$  in. long, the small broad external bracts almost concealed under the base of the receptacle. Male flowers stipitate, intermixed with the females, and with numerous bracts without setæ. Perianth of 3 unequal segments hairy inside at the base. Stamen 1, the anther not exceeding the perianth, with 2 distinct parallel cells. Female flowers more sessile. Stigma subulate, acute, slightly dilated towards the base.—*Miq. in Ann. Mus. Lugd. Bat.* iii. 285; *Urostigma pilosum*, *Miq. Fl. Ind. Bat.* i. part ii. 351; *F. ellipsoidea*, *F. v. Muell. Herb.*

Hab.: Albany Island, Cape York, *F. v. Mueller*; Somerset, *F. M. Bailey*; Rockingham Bay, *Dallachy*.

The species is also in Timor and Java, and probably in other islands of the Archipelago. It is readily distinguished from all other Australian species by the shape of the receptacle.

3. **F. nesophila** (found on islands), *Miq. in Ann. Mus. Lugd. Bat.* iii. 286; *Benth. Fl. Austr.* vi. 164. A shrub or small tree, quite glabrous or with a very minute pubescence on the stipules and young buds. Leaves on petioles of  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. or sometimes even 2 in., ovate or oblong-elliptical, very shortly and obtusely acuminate, rounded or almost truncate at the base, 3 to 6 in. long,  $1\frac{1}{2}$  to 3 in. broad, coriaceous and shining above, with rather distant primary veins prominent underneath, the lowest pair starting from the base and more oblique, the smaller veins and reticulations conspicuous but fine. Receptacles solitary in pairs, in the lower axils or at the leafless nodes of the previous year's shoots, nearly sessile or on peduncles of 1 line, globular, 4 to 5 lines diameter when ripe, the outer subtending bracts short and broad. Male flowers few in the receptacles. Perianth stipitate, with 3 segments, brown as well as the bracts. Stamen 1, shorter than the perianth; anther-cells parallel. Female flowers very numerous. Stigma subulate, acute, slightly dilated towards the base.—*Urostigma nesophilum*, *Miq. in Journ. Bot. Neerl.* 1861, 287.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown, Gulliver*; Quail Island, *Flood*; Rockingham Bay, *Dallachy*.

4. **F. Cunninghamii** (after A. Cunningham), *Miq. in Ann. Mus. Lugd. Bat.* iii. 286; *Benth. Fl. Austr.* vi. 165. "Mooleeah," Bundaberg, *Keys*. "Be-ni," Mapoon, *Roth*. A large robust tree of 80 ft., quite glabrous. Scales of the leaf bud or tegmenta semideciduous, 2 or more inches long, often rosy pink. Leaves on petioles of  $\frac{1}{2}$  to 1 in., from ovate to oblong-elliptical, shortly and abruptly acuminate, rounded truncate or scarcely cordate at the base, 4 to 5 in. long, 2 to  $2\frac{1}{2}$  in. broad, coriaceous, shining above, but often less so than in *F. nesophila*, the primary distant veins prominent underneath, the smaller veins fine, anastomosing and often scarcely conspicuous. Stipules narrow, very deciduous,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Receptacles solitary or 2 together in the lower axils, closely sessile concealing the small outer bracts, globular and smooth, 4 to 5 lines diameter, nearly white, often spotted or at length quite purple. Male flowers few under the bracts near the orifice; perianth stipitate, of 3 brown segments, the single stamen rather shorter than the perianth. Female flowers numerous, sessile or nearly so; stigma filiform, acute, slightly dilated towards the base.—*Urostigma Cunninghamii*, *Miq. in Hook. Lond. Journ.* vi. 560; *U. Fraseri*, *Miq. in Hook. Lond. Journ.* vi. 561; *Ficus Fraseri*, *F. v. M. Fragm.* vi. 195; *Urostigma psychotriæfolium*, *Miq. in Hook. Lond. Journ.* vi. 561; *Ficus psychotriæfolia*, *Miq. in Ann. Mus. Lugd. Bat.* iii. 296.

Hab.: Brisbane River and Percy Island, *A. Cunningham*; Brisbane and Bremer Rivers, *Fraser*; Keppel Bay, *R. Brown*; Rockhampton, *Bowman, O'Shanesy, Dallachy*; Rockingham Bay, *Dallachy*.

Wood of a light-colour; soft and porous.—*Bailey's Cat. Ql. Woods*, No. 389.

Fruit eaten and bark made into a red twine for dilly-bags.—*Roth*, l.c.

5. **F. Henneana** (After —. Henne), *Miq. in Ann. Mus. Lugd. Bat.* iii. 216; *Benth. Fl. Austr.* vi. 165. A shrub or tree quite glabrous. Leaves on petioles of 1 to  $1\frac{1}{2}$  in., oval or oblong-elliptical, obtuse or very shortly and obtusely acuminate, entire, rounded or cordate at the base, 3 to 5 in. long,  $1\frac{1}{2}$  to  $2\frac{1}{2}$  broad, rather thinly coriaceous, the primary veins distant and prominent, the basal pair very oblique, the others spreading, the veinlets conspicuous but scarcely prominent. Stipules lanceolate, acuminate, glabrous. Receptacles in pairs on peduncles of about 2 lines, globular,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. diameter, smooth but mottled with white, the subtending bracts very deciduous, leaving a truncate margin under the ripe fig. Male flowers few, shortly stipitate, the perianth trimerous, with one large anther on a very short filament, and the subulate stigma of the females entirely those of the section.

Hab.: Booby Island, Torres Straits, *A. Cunningham, Henne*; also perhaps the same species, Rockingham Bay, *Dallachy*.

■ The species differs from *F. nesophila* chiefly in the receptacles twice as large on longer peduncles.

6. **F. gracilipes** (fruit-stalks slender), *Bail. Bot. Bull.* 3. A small tree of a somewhat drooping habit, and semi-deciduous like *F. Cunninghamii*, glabrous, or the stipules and young shoots slightly hoary; bark light-coloured; branchlets slender. Leaves on petioles of 1 to 1½ in., ovate or oblong-elliptical, very shortly and obtusely acuminate, rounded at the base, 2½ to 4 in. long, 1½ to 2½ in. broad, deep green on both sides, coriaceous, glossy above, midrib prominent, primary veins almost transverse and parallel but not conspicuous, the reticulation between them fine and close. Stipules narrow, under ½ in. long. Receptacles axillary, solitary or in pairs, smooth, globular, about 1 in. diameter, of a deep purple when ripe, red with prominent light-coloured spots before maturity, the spots not so conspicuous in the ripe fruit. Peduncles slender, 4 to 5 lines long, with a minute brown bract at the base. Male flowers few, near the orifice; perianth sessile, 3-lobed; anthers large, reniform, not exceeding the perianth. Stigma long, often much dilated towards the base. Gall flowers stipitate and often much elongated.

Hab.: Southern Queensland, *Rev. B. Scortechini*; Brookfield, *Arthur Exley*.  
An excellent fruit for preserving.

7. **F. validinervis** (nerves prominent), *F. v. M. Herb.*; *Benth. Fl. Austr.* vi. 166. A small tree, quite glabrous. Leaves elliptical or oblong, abruptly acuminate, entire, rounded or cuneate at the base, 4 to 8 in. long, 1½ to 2½ broad, coriaceous, the primary rather distant veins and the smaller intervening ones as well as the transverse reticulations very prominent underneath, the basal pair not very different from the others, the petiole thick, not above 2 or 3 lines long. Receptacles in the lower axils on peduncles of about 1 line. globular, 4 to 5 lines diameter, the internal structure apparently the same as in *F. Cunninghamii*, and the styles certainly those of *Urostigma*.

Hab.: Rockingham Bay, *Dallachy*.

This has the short petioles of *F. philippinensis*, but is evidently an *Urostigma*, and is remarkable for the very prominent venation of its very coriaceous leaves. I could find, however, no male flowers in the only receptacle I could open, not a perfect one.—*Benth.*

8. **F. retusa** (blunt), *Linn. Mant.* 129; *Benth. Fl. Austr.* vi. 166. "Tunduli," Cape Grafton, *Roth*. A small or large tree with a widely spreading head, quite glabrous. Leaves on rather broad petioles of 2 to 3 lines, varying from broadly obovate or almost orbicular and very obtuse or retuse to oval-elliptical or almost oblong, rounded or very shortly contracted at the base, 2 or 3 in. long and 1 to 2 in. broad, coriaceous, the transverse primary veins fine and parallel but not very numerous and frequently anastomosing. Receptacles sessile, in pairs, globular, attaining about ½ in. diameter when ripe, the external bracts nearly orbicular, about 1 line diameter. Perianths and stigma entirely those of *Urostigma*. Anther not exceeding the perianth.—*F. nitida*, Thunb.; *Wight. Ic. t.* 642; *Urostigma pisiferum*, *U. ovoideum*, *U. nitidum*, and *U. retusum*, *Miq. in Hook. Lond. Journ.* vi. 580, 581, 582.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Rockingham Bay, *Dallachy*.

Fruit eaten by aboriginals.—*Roth, lc.*

This species extends over East India, the Archipelago, and New Caledonia, reaching northward to the Philippines and South China.

9. **F. Thynneana** (after the Hon. A. J. Thynne, M.L.C.), *Bail. Ql. Agri. Journ.* i., part 3, with Plate. "Banyan." A rather dwarf glabrous tree, with dense spreading head, the horizontal branches extending often a distance of 30 or more feet, and emitting roots in abundance, which ultimately become additional stems of the tree (I counted twelve of such stems to one tree). Branchlets flattish-triangular. Leaves oblong, 2½ to 5 in. long, 2 to 3 in. broad or sometimes much smaller; apex rounded or shortly acuminate, base more or less cuneate, rather pale on the under surface, lateral nerves numerous, patent, looping near the margin; petioles flattened, seldom exceeding ½ in.; stipules narrow, acuminate,

under  $\frac{1}{2}$  in. Receptacles axillary, pear-shaped,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, in pairs, not unfrequently joined together at the base and spreading in an almost horizontal manner from the branchlet; bracts at base 3, orbicular,  $1\frac{1}{2}$  to 2 lines diameter, gibbous. Perianths sessile; segments 3, oblong in the female florets, shorter and more cymbiform in the male, enclosing a single stamen; anther with 2 distinct cells, rather large; pollen smooth, globose; style entire filiform, slightly enlarging at the stigma.

Hab.: The plate referred to representing a tree of this Fig., growing upon the beach at Cairns.

10. **F. eugenioides** (Eugenia-like), *F. v. M.*; *Miq. in Ann. Mus. Lugd. Bat.* iii. 286; *Benth Fl. Austr.* vi. 166. A small tree, quite glabrous. Leaves on petioles of  $\frac{1}{4}$  to  $\frac{1}{2}$  in., oblong lanceolate or elliptical-oblong, obtuse or scarcely acuminate, tapering at the base,  $1\frac{1}{2}$  to  $2\frac{1}{2}$  in. long,  $\frac{1}{2}$  to 1 in. broad, entire, coriaceous, with numerous fine parallel primary veins diverging from the midrib, which is alone prominent with sometimes a pair of very oblique basal veins. Stipules narrow. Receptacles sessile, mostly in pairs in the lower axils or at the nodes below the leaves, globular, about 3 lines diameter, the external bracts very short and broad. Male flowers intermixed with the females, the perianth stipitate and obtusely 3-lobed or rarely 4-lobed, filament very short adnate to one of the lobes, anther-cells confluent at the apex, and when open the anther becoming reniform or almost transverse as in *F. rubiginosa*. Stigma subulate, acute, more or less dilated at the base.—*Urostigma eugenioides*, *Miq. in Journ. Bot. Neerl.* 1861, 238.

Hab.: Northumberland Islands, *R. Brown*; Albany Island, *F. v. Mueller, W Hill*; Rockhampton, *Dallachy, Thozet*; Crocodile Creek and Berseker Range, *Bowman*.

11. **F. Hillii** (after Walter Hill), *Bail. Bot. Bull.* 3. Hill's Weeping Fig-tree. Tree of somewhat irregular habit, the upper shoot and branches drooping over to one side, all parts glabrous, or a very slight hoariness on the stipules and young petioles, the shoots thickly and prominently dotted with white lenticelles. Leaves on petioles of  $\frac{1}{3}$  to  $\frac{2}{3}$  in., ovate-oblong, abruptly and very shortly acuminate, tapering from above the middle to a sharply cuneate base, the lamina ending in minute thick glandlike lobes, 2 to 4 in. long, 1 to  $1\frac{1}{2}$  in. broad at the widest part, coriaceous and glossy above, paler beneath, the transverse veins close, very fine, looping within the margin in an even intramarginal vein, the venules few. Stipules  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Receptacles sessile, frequently solitary, axillary, globular, about 4 or 5 lines diameter, rosy red with small white dots, basal bracts 3, minute, orbicular, persistent, much thickened at the base, velvety outside. Male flowers few, intermixed with the females. Perianth trimerous; anthers not exceeding the perianth. Style very slender, long as the ovary. Stigma short.

Hab.: Scrubs of tropical Queensland, *Walter Hill*.

12. **F. leucotricha** (white hairs), *Miq. in Ann. Mus. Lugd. Bat.* iii. 285; *Benth. Fl. Austr.* vi. 167. A small tree, the small branches and petioles hirsute with spreading white hairs. Leaves shortly petiolate, ovate broadly oblong or elliptical, obtuse or very obtusely and obscurely acuminate, rounded or scarcely cordate at the base, entire, 3 to 5 in. long,  $1\frac{1}{2}$  to  $2\frac{1}{2}$  in. broad, rigidly coriaceous, pubescent, but the down almost disappearing on the upper side, remaining soft and dense underneath, the primary veins rather numerous, fine, and almost transverse. Stipules long and narrow. Receptacles axillary, usually in pairs, on peduncles of 2 to 4 lines, globular, somewhat rugose, very villous, attaining  $\frac{1}{2}$  in. diameter, the subtending bracts ovate, about  $\frac{1}{2}$  in. long. Male flowers intermixed with the females towards the orifice; perianth stipitate 3-merous, with one large anther with parallel cells. Female flowers nearly sessile; perianth 4-merous. Stigma linear and acute, but rather short. Bracts and

perianths as in most species of the section dark brown when dry.—*Urostigma leucotrichum*, Miq. in Journ. Bot. Neerl. 1861, 234; *Ficus lanata*, F. v. Muell. Herb.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

The bracts subtending the receptacle appear to be larger in this than in any other species.  
—*Benth.*

13. **F. rubiginosa** (rusty), *Desf.*; *Vent. Jard. Malm.* t. 114; *Benth. Fl. Austr.* vi. 168. A tree of small size in Queensland, with spreading branches, the young shoots and petioles more or less ferruginous-pubescent. Leaves on petioles of  $\frac{1}{2}$  to lin., oval or elliptical, obtuse or very shortly and obtusely acuminate, entire, rounded or very slightly cordate at the base, 3 to 4 in., and 2 to 2 $\frac{1}{2}$  in., broad when full grown, coriaceous, glabrous above, more or less ferruginous-pubescent underneath, with numerous parallel very divergent primary veins, of which 10 to 12 on each side of the midrib rather more prominent than the others, and the basal pair more oblique. Stipules narrow-acuminate. Receptacles axillary, mostly in pairs, on thick broadly turbinate peduncles of 1 line or rather more, globular, about 4 or 5 lines diameter, usually marked with prominent warts. Subtending bracts broad, membranous, about 2 lines diameter, very deciduous. Male flowers intermixed with the females. Bracts acuminate, brown as well as the perianths. Anther-cells confluent at the apex into a single reniform cell, and at length very divergent so as to appear to open transversely. Stigma linear and acute, not very long.—*Bot. Mag.* t. 2939; *F. australis*, Willd. Sp. Pl. iv. 1138; *Urostigma rubiginosum*, Gaspar Nov. Gen. Fic. 7, quoted in his *Ricerch. Caprif.* 82, t. 7, t. 6 to 13.

Hab.: Darling Downs, on isolated hills.

The species not very common in Queensland, and the leaves seem usually of a less coriaceous texture.

14. **F. platypoda** (petioles broad), *A. Cunn.*; *Miq. in Ann. Mus. Lugd. Bat.* iii. 287; *Benth. Fl. Austr.* vi. 169. "Djaka-oor," Taromeo, *Shirley*. A small tree of robust growth, perfectly glabrous in all its parts in the typical form, more or less pubescent in several varieties, but not ferruginous. Leaves in the typical form on broad petioles of about  $\frac{1}{2}$  in., ovate, obtuse, entire, rounded or slightly cuneate at the base, or the lower ones almost cordate, 2 $\frac{1}{2}$  to 4 in. long, and 2 to 2 $\frac{1}{2}$  broad, thickly coriaceous with numerous transverse parallel primary veins, the principal ones not distant, and the basal pair not very conspicuous. Receptacles axillary, mostly in pairs, sessile or on peduncles not exceeding one line, globular, not warted, without any umbonate prominence, 4 to 5 lines diameter. Male flowers few, intermixed with the females towards the orifice. Perianths all stipitate. Anther-cells contiguous at the apex, but scarcely confluent. Stigma linear-subulate and acute, or sometimes in the same receptacle shorter and more obtuse.—*Urostigma platypodum*, Miq. in *Hook. Lond. Journ.* vi. 561.

Hab.: Coastland southern localities.

Wood soft, of a light-yellow colour, with a strong fibre.—*Bailey's Cat. Ql. Woods*, No. 390.

The following forms may, some of them, when better known, prove to be sufficiently distinct to be received as species.—*Benth.*

Var. *petiolaris*. "Kunnen," Stradbroke Island, *Watkins*. Glabrous. Leaves usually larger than in the typical form, on petioles of 1 $\frac{1}{2}$  to 2 $\frac{1}{2}$  in. Stipules very long. Receptacles rather small, on short peduncles.

Hab.: Brisbane River, *Fraser*; Narran River, *Leichhardt*; Rockhampton and Cape River, *Bowman*; Cape Cleveland, *Burdekin Expedition*; Port Denison, *Fitzalan*; and nearly the same form but with smaller leaves, Maranoa River, *Mitchell*.

Var. *mollis*. Leaves of the last variety but velvety-pubescent on both sides as well as the young branches.

Hab.: Rockingham Bay, *Dallachy*.

Var. *subacuminata*. Leaves large on long petioles as in the last two forms, pubescent, but not so much so as in the var. *mollis*, and tapering above the middle so as to be sometimes almost ovate-lanceolate.

Hab.: Whitsunday Island, *Henne*.

15. **F. dictyophleba** (netted veins prominent), *F. v. M.*; *Miq. in Ann. Mus. Lugd. Bat.* iii. 218; *Benth. Fl. Austr.* vi. 170. This supposed species, described from leaves only, very much resembles the broad-leaved glabrous forms of *F. platypoda*, differing in the shorter petiole, usually from  $\frac{1}{4}$  to nearly  $\frac{1}{2}$  in. long, the more coriaceous shining leaves, with numerous veins much more prominent.

Hab.: Islands off Cape Flattery, *F. v. Mueller*.

16. **F. macrophylla** (long-leaved), *Desf.*; *Pers. Syn. Pl.* ii. 609; *Benth. Fl. Austr.* vi. 170. Moreton Bay Fig. "Peemith," Bundaberg, *Keys*. A large tree with a broad head, quite glabrous. Leaves brownish on the under side, oval-elliptical or broadly oblong, obtuse or obtusely acuminate, entire, 4 to 10 in. long, and 3 to 4 in broad, coriaceous, with numerous transverse parallel primary veins, but with the principal ones at some distance from each other more prominent than the intermediate fine ones. The tegmenta or scales of the leaf-buds often 5 in. long; the stipules proper about 2 in. long. Receptacles nearly globular or somewhat pear-shaped,  $\frac{3}{4}$  to 1 in. diameter, purple spotted with white, peduncles often exceeding 1 in., the internal structure entirely as in *F. platypoda*.—*Urostigma macrophyllum*, *Miq. in Hook. Lond. Journ.* vi. 560.

Hab.: A common tree of the coastal scrubs.

Wood light-coloured, coarse-grained, soft and light.—*Bailey's Cat. Ql. Woods*, No. 391.

17. **F. Watkinsiana** (after Geo. Watkins), *Bail. Bot. Bull.* 2. A very large glabrous tree, with lofty trunk and smooth light-coloured bark the base of stem flanging out, but not so prominently as in *F. macrophylla*. Leaves lanceolate, about 6 in. long and 2½ in. wide in the centre, green on both sides, texture coriaceous, the transverse parallel primary veins not very prominent, the intermediate ones very faint, all anastomosing and forming an intramarginal one some distance within the margin, much tapering towards a rather slender petiole of about 2 to 2½ in. Stipules about 3 in. long, narrow-acuminate. Receptacles in axillary pairs, oblong, 1½ in. long, 1 to 1¼ in. diameter, prominently umbonate, greenish with numerous small verrucose spots; peduncles nearly 1 in. long, very thick and often prominently angular, about ¾ in. long, verrucose like the receptacle, expanding at the top into a broad thick smooth edge, cartilaginous disk at the base of the receptacle. Male flowers seem to be confined to the top and umbonate portion of receptacle; bracts brown, acuminate from a rather broad base; stigma acute.

Hab.: Mooloolah, *Field Naturalists*, Dec. 1890; top of Bunya Mountains, *H. Tryon*; top of Blackall Range, *Alex. Anderson*.

Wood of a light colour, fairly close-grained, easily worked; may be useful for packing-cases.—*Bailey's Cat. Ql. Woods*, No. 391A.

18. **F. magnifolia** (large-leaved), *F. v. M. Fragm.* iv. 50, partly; *Benth. Fl. Austr.* vi. 171. A handsome tree, the foliage slightly scabrous, but otherwise glabrous. Leaves alternate, obovate-oblong or elliptical, shortly acuminate, entire, contracted towards the base, but rounded or cordate at the base itself, mostly 1 to 1½ ft. long, and 6 to 8 in. broad, but smaller on some of the lateral branches, the distant primary diverging veins and transverse anastomosing veinlets prominent underneath, the basal pair very oblique. Stipules narrow, rigid and often persistent. Receptacles on peduncles of about ½ in., mostly in pairs on the previous year's or older woods, depressed globular,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. diameter. Inner bracts and perianths white almost hyaline, the perianths of 4 or 5 very unequal segments. Male flowers few, with 2 or 3 stamens, and in some cases stamen and an ovary within the same perianth. Style glabrous, with a small obtuse-shortly oblong stigma.

Hab.: Mount Elliott and Rockingham Bay, *Dallachy, Fitzalan*.

19. **F. ehretioides** (Ehretia-like), *F. v. M. Herb.*; *Benth. Fl. Austr.* vi. 171. "Magura," Tully River, *Roth.* A tree of 40 to 60ft., quite glabrous or with a very slight pubescence on the young branches. Leaves alternate, on petioles of 1 to 5in., cordate-ovate, acuminate, entire or sinuate-toothed, 6 to 10in. long, and 4 to 6in. broad, membranous, with few distant primary diverging veins, and a few fine transversely anastomosing veinlets prominent underneath, the one or two lowest pair of veins starting from the base more oblique but not more prominent. Receptacles on the old wood, obovoid or turbinate-globular, and about 1in. diameter.

Hab.: Rockingham Bay, *Dallachy.*

Fruit eaten by aboriginals.—*Roth.*

20. **F. scandens** (climbing), *Forb.*, var. *australis*, *Ql. Agric. Journ.* i., part 5. Described by collector as a tall woody climber. Bark on branchlets ribbed and of a rusty colour. Leaves alternate on rather slender petioles of about 5 or 6 lines, ovate to ovate-oblong, 2 to nearly 4in. long, shortly acuminate and rounded at the base. Primary veins distant, about 5 or 6 pairs, the basal ones far distant from the others; the smaller veins or reticulation rather obscure, particularly on the underside, from a very close covering of ferruginous scales or short pubescence, which under a lens has a tessellated appearance. Receptacles axillary, solitary or in pairs, on peduncles about 1 line; globose, about  $\frac{1}{2}$ in. diameter, forming at its base a slender stipes of about 2 lines; the lower half of the globular portion with 5 or more ribs; the whole covered with very short ferruginous glandular scales or hairs; orifice umbilical, the branch near the orifice rather large and slightly jagged at the end. No male florets in the receptacles examined. Perianth-segments 3, oblong, of unequal length, slightly ribbed on the lower part, fleshy and of a deep red, achene oblong-smooth with a rather prominent margin, style elongated, infra-apical, rather flattened, constricted below the long straight stigma. I found some galls near the orifice, which were white, large, and globose, with a terminal nearly sessile flag-like stigma; besides these the usual galls are met with near the centre of the receptacle.

Hab.: Range about Kamerunga, *L. J. Nugent.*

The present plant differs but little from *F. scandens*, *Roxb.*, as described by Dr. King and others. The segments, however, of the perianths are only three; the receptacles also are stipitate on very short peduncles.

21. **F. leptoclada** (branches slender), *Benth. Fl. Austr.* vi. 172. A "beautiful tree of about 40ft." with slender branches, quite glabrous. Leaves elliptical-oblong, acuminate, entire, cuneate at the base, 2 to 4in. long,  $\frac{3}{4}$  to 1 $\frac{1}{2}$ in. broad, not scabrous, with rather distant primary veins and transverse reticulations prominent underneath, the lowest pair of veins oblique from a little above the base, the petioles 2 to 3 lines long. Stipules narrow, about as long as the petioles, membranous and deciduous, or here and there rigid and persistent. Receptacles shortly pedunculate in the axils, usually solitary, globular, 3 to 4 lines diameter, the bracts of the orifice forming a short broad neck, the external bracts small and scale-like alternating on the peduncle. Perianth-segments and inner bracts narrow and often brown as in the section *Urostigma*. Style glabrous, dilated at the apex into a short oblique or almost peltate stigma.

Hab.: Rockingham Bay, *Dallachy.*

Bentham found no male flowers in the two receptacles which he opened, and I have no specimens of fruit.

22. **F. depressa** (depressed), *Benth. Fl. Austr.* vi. 172. A tree, quite glabrous. Leaves alternate, on flattened petioles of  $\frac{1}{2}$ in. or more, obovate-oblong, about 3in. long and 1 $\frac{1}{2}$ in. broad in the imperfect specimen seen, thinly coriaceous smooth, the primary veins rather distant, the smaller veins and transverse veinlets fewer and less conspicuous than in any other Australian species, the

basal pair of veins prominent and very oblique. Receptacles axillary, in pairs, on slender pedicels of 2 to 4 lines, depressed-globular, flat-topped, 4 to 5 lines diameter, smooth or sparingly verrucose, very hollow inside. Empty bracts near the orifice orbicular and ciliate, those under the flowers small especially in the lower part of the fig. Flowers all closely sessile, the males few near the orifice. Perianth-segments 3, very broad and enveloping each other as in the section *Covellia*. Stamens 1 or 2, filaments very short and dilated into a cuneate connective bordered by 2 distinct cells. Female perianth of 2, 3 or 4 quite distinct segments about as long as the ovary, which is sessile on a broad base, the style short, lateral, with a peltate stigma.

Hab.: Mount Elliott, *Fitzalan*.

The internal structure of the receptacle is in many respects the same as in *F. mollior*, approaching that of *Covellia*; but in *F. depressa* there are no setæ between the flowers.

**23. *F. subulata*** (awl-shaped), *Blume, Bijl.* 461; *Hook, Fl. Brit. Ind.* v. 497. A semi-scandent or straggling shrub, the young parts puberulous. Leaves short-petiolate, membranous elliptic, elliptic-lanceolate, or subobovate-elliptic, sometimes slightly inequilateral; apex rather abruptly and shortly cuspidate, edges entire, waved; base acute, 3-nerved (with occasionally several subsidiary nervelets); lateral primary nerves 7 to 10 pairs rather prominent below; in the adult leaves both surfaces are glabrous, dull when dry, the lower rather pale-coloured; length of blade 4 to 5 or 10 in.; petioles about 3 in. long, stout, scaberulous; stipules conspicuously convolute, subulate, curving away from the axis, usually more than three times as long as the petiole. Receptacles axillary, short-pedunculate, sometimes almost sessile, in pairs (solitary by abortion or in fascicles; those bearing male flowers ovoid, and with the umbilicus rather prominent; the umbilical bracts numerous; those bearing fertile female flowers globose when ripe; both forms scaberulous, absolutely verrucose, orange-red, without basal bracts, but with a few bracts scattered irregularly along the sides, about 4 or 5 lines across; peduncles short, with numerous bracteoles at their bases. Male flowers (occurring only in the ovoid receptacles with the gall flowers): The perianth thick, fleshy, tubular, with 4 rather short teeth; stamen 1, the anther broad, pistil globular, insect-attacked. Gall flowers pedicellate, the perianth like that of the male, achene sub-globular, smooth; style short, lateral; stigma capitate. Fertile female flowers (in globular receptacles in which there are no male flowers): The perianth hairy, gamophyllous, with 4 long teeth; achene oblong; style lateral; stigma elongate.—Dr. Geo. King, *Annals Roy. Bot. Gar. Calc.* vol. i. 8, t. 6.

Hab.: Given as a Queensland plant in Muell. 2nd Syst. Cens. Austr. Pl. 33.

**24. *F. infectoria*** (producing a dye), *Rorb.*; *Fl. Ind.* iii. 550; *Hook. Fl. Brit. Ind.* v. 515. A low deciduous tree, all parts glabrous. Leaves membranous, 3½ to 5 in. long, oblong-ovate or ovate, abruptly shortly acuminate, margins entire subundulate, base usually rounded and emarginate or subcordate, sometimes narrowed or acute, distinctly jointed with the petiole, 3-nerved or of 5 to 7 pairs; petioles slender, 1½ to 2 in. long. Stipules about ½ in. long, broadly ovate, acute, pubescent. Receptacles in axillary pairs sessile, globose, when ripe ½ in. diameter, whitish flushed with red and dotted; basal bracts 3, ovate-rotund, minute. Male flowers few, sessile, near the mouth of the receptacle; anther broadly ovate, filament short; sepals 4 or 5, linear. Gall and female flower: Sepals 3 or 4, like those of the male, the latter often sessile; style of female long, of gall flower short; stigma elongate.—King *Fic.* 60 t. 75 to 79, *Griff. Ic. Pl. Asiat.* t. 550.

Hab.: Given as a Queensland plant in Muell. 2nd Syst. Cens. Austr. Pl. 33.

In Ceylon the bark is said to be chewed with betel.



25. **F. philippinensis** (of the Philippines), *Miq. in Hook. Lond. Journ.* vii. 435; *Benth. Fl. Austr.* vi. 173. A small tree, quite glabrous. Leaves on very short rather thick petioles, elliptical or oblong, acuminate, entire, contracted at the base, 3 to 4 in. long and about  $1\frac{1}{2}$  in. broad, thinly coriaceous, smooth, the principal primary veins rather distant, almost transverse, prominent underneath as well as the fine smaller veins and transverse reticulations, the basal pair very oblique but not very conspicuous. Stipules 3 to 4 lines long, acute. Receptacles on exceedingly short peduncles, solitary or in pairs, globular, not exceeding 3 lines diameter, quite glabrous, the bracts of the orifice not prominent. Perianths and internal bracts white-hyaline. Male flowers few, consisting of a single stamen in the axil of and shortly adnate to the single lanceolate or oblanceolate perianth-segment. Female perianth of 2 to 4 short narrow segments. Style short, glabrous, with a terminal concave peltate stigma.

Hab.: Family Island, Rockingham Bay, *Dallachy*.

A single specimen in Herb. F. Mueller, but quite similar to Archipelago specimens. The species extends northward to the Philippine Islands, and is also in New Caledonia.—*Benth.*

26. **F. mollior** (soft), *F. v. M. Herb.*; *Benth. Fl. Austr.* vi. 173. A tall tree, the young branches, petioles and underside of the leaves softly pubescent or villous. Leaves alternate, on petioles of about  $\frac{1}{2}$  in.; oblong elliptical or almost ovate, acuminate, entire, contracted towards the base but usually cordate at the base itself, 4 to 6 in. long, 2 to 3 in. wide, glabrous and rather smooth above, the rather distant primary veins and transverse reticulations prominent underneath, with 1 or sometimes 2 pairs of basal veins, oblique, but usually finer than some of the primary veins higher up. Receptacles on peduncles of 1 to 2 lines, axillary, solitary or in pairs, globular or somewhat obovoid, 4 to 5 lines long, shortly villous, the external subtending bracts small and scale-like; those round the orifice sometimes protruding almost as much as in *F. scabra*. Perianths and inner bracts dark brown as in *Urostigma*. Male flowers very few amongst the larger bracts near the orifice, the 3 perianth-lobes broad and enveloping each other, enclosing a single stamen as in *Covellia*. Female flowers intermixed with the long rigid hairs or setæ of the receptacle as in *F. colossea*, the perianth-segments narrow and unequal, scarcely exceeding the ovary. Style short, glabrous, with a terminal concave peltate stigma.

Hab.: Rockingham Bay, *Dallachy*.

27. **F. stenocarpa** (slender-fruited), *F. v. M. Herb.*; *Benth. Fl. Austr.* v. 174. A tree, of about 40 nearly glabrous, but all parts, especially the leaves very scabrous, with a minute scattered rigid pubescence. Leaves opposite or more frequently alternate, on rather slender petioles of  $\frac{1}{4}$  to  $\frac{1}{2}$  in., ovate obovate or elliptical, obtuse or acuminate, entire, rounded or contracted at the base and sometimes oblique, rigidly membranous, green on both sides, 3 to 5 in. long, distantly pinniveined, with a basal pair of oblique veins. Stipules small and narrow. Receptacles on peduncles of 2 to 4 lines, solitary or in pairs in the lower axils, and unisexual, the males cylindrical and 4 or 5 lines long, the females ovoid or nearly globose and fully as large, all minutely scabrous like the rest of the plant. Outer bracts scale-like on the peduncle below the receptacle. Perianths in both sexes white-hyaline as well as the bracts, the segments oblong, the bracts rather broad or fringed. Stamens usually 2. Style ending in a linear hirsute stigma obtuse and coloured towards the end.

Hab.: Rockingham Bay, *Dallachy*; Fitzroy Island, *Walter*; Brisbane River, *Bail*.

28. **F. scabra** (rough), *G. Forst. Fl. Ins. Austr. Prod.* 76; *F. v. M. Fragm.* x. 114. Rough or Purple Fig. "Noomaie," Rockhampton. "Balemo," Cleveland Bay, *Thozet*. A tree, sometimes described as small, sometimes as attaining 80 to 100ft., the young branches petioles and inflorescence hispid with

short hairs. Leaves on short petioles, oblong-elliptical, shortly acuminate, often irregularly toothed above the middle, rounded often oblique and sometimes emarginate at the base. 3 to 6 in. long and  $1\frac{1}{2}$  to  $2\frac{3}{8}$  in. broad, very scabrous above, pubescent or hispid underneath, the primary divergent veins distant and prominent underneath as well as the transverse reticulations, the basal pair of veins more oblique than the others. Receptacles axillary, on peduncles of 1 to 2 lines, solitary or in pairs, ovoid globular or urceolate, usually densely hispid, about 4 to 6 lines diameter, the orifice rather broad, with very numerous lanceolate bracts of  $\frac{1}{2}$  line, the outer rows erect forming a kind of neck to the receptacle, the succeeding rows closing the orifice and the inner ones reflexed as in other figs. Outer bracts subtending the receptacle near the top of the peduncle small, hispid, with green tips, very deciduous. Male flowers numerous intermixed with the females. Perianth stipitate, with 5 or 6 narrow concave segments. Stamens 2 to 4; anther-cells parallel, one often abortive in 1 or 2 of the stamens. Female perianths on a shorter stipes. Style glabrous with a terminal truncate or slightly peltate stigma.—*F. aspera*. Forst. Prod. 76; Benth. Fl. Austr. vi. 174; Miq. in Hook. Lond. Journ. vii. 425; Seem. Fl. Vit. tt. 64 and 65.

Hab.: Brisbane River, Moreton Bay, *A. Cunningham*, *Leichhardt*, *F. v. Mueller* and others. Leaves sometimes infested with the blight-fungus, *Fusarium hypocreoides*, C. and M. Wood yellow coloured, close-grained.—*Bailey's Cat. Ql. Woods*, No. 392.

29. **F. orbicularis** (orbicular), *A. Cunn.*; *Miq. in Hook. Lond. Journ.* vii. 426; *Benth. Fl. Austr.* vi. 175. A shrub usually of 4 or 5 ft., growing into a small tree of about 10 ft., glabrous or sparingly pubescent on the young shoots. Leaves alternate or rarely opposite, on petioles of 1 to 3 lines, very broadly ovate or orbicular, obtuse, more or less bordered by minute rigid teeth or callosities, mostly  $1\frac{1}{2}$  to 2 in. long and 1 to  $1\frac{1}{2}$  broad, but larger on luxuriant barren shoots, rigid and very scabrous above, nearly smooth underneath, with few distant primary veins, and 3-nerved from the prominence of the basal pair, the reticulate veinlets fine and little conspicuous. Stipules small and narrow. Receptacles axillary, peduncles very short or nearly as long as the petioles, solitary or rarely in pairs, globular, 3 to 4 lines diameter, usually scabrous and sometimes sparingly pubescent. Subtending bracts small and scale-like, 1 or 2 usually on the peduncle below the receptacle. Inner bracts and perianths white hyaline. Perianth-segments usually 5, narrow, three inner ones especially in the females much longer than the others. Male flowers few, often only 1 stamen with a large oblong anther. Style short, glabrous, with a terminal peltate stigma.—*F. inulecora*, *Miq. in Hook. Lond. Journ.* vii. 426 (with leaves not quite so broad).

Hab.: Batavia, *Dr. W. E. Roth*.

30. **F. aculeata** (prickly), *A. Cunn.*; *Miq. in Hook. Lond. Journ.* vii. 426; *Benth. Fl. Austr.* vi. 175. A tall shrub, very closely allied to *F. orbicularis*, and perhaps a variety, differing chiefly in the branches pubescent or hirsute. Leaves usually larger, more cordate at the base, still more scabrous above, and often tomentose, the margins more aculeate. Receptacles rather larger and more densely pubescent or hirsute, on exceedingly short peduncles.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*, *Henne*, *Gulliver*.

Var. *micracantha*. Leaves all or nearly all opposite. *F. micracantha*, *Miq. in Ann. Mus. Lugd. Bat.* iii. 221.

31. **F. subglabra** (almost glabrous), *F. v. M. Fragm.* ix. 152. A small tree with spreading head, almost glabrous. Leaves sometimes opposite, ovate, acuminate. Petioles somewhat short, margins entire, slightly repand. Receptacles unisexual, the male cylindrical-ovate; females spirical or urceolate-

globose. Perianths and inner bracts ciliolate. Stamens usually 2; styles slender, often acute-bidentate.

Hab.: Brisbane River.

The receptacles or fruits having a very disagreeable heavy scent.

Indumentum of the receptacle so short as to appear at first sight glabrous.

Hab.: Brisbane River, *F. v. Mueller*; Hunter's River, *R. Brown*.

32. **F. Pinkiana** (after James Pink), *F. v. M. in Wing's South Sci. Rec. ii. 273*. A small glabrous tree. Leaves lanceolate, shortly acuminate, scattered, chartaceous, smooth, 5 to 9 in. long,  $1\frac{3}{4}$  to 3 in. broad; almost equilateral on the very short petiole, margins entire; primary nerves, 10 to 15 pairs, patent, thinly reticulate veined. Stipules very narrow with long points. Receptacles 3 to 4 lines long on peduncles of the same length. Basal bracts distant from the receptacle; the upper inner bracts all reflexed and glabrous. Perianth-segments narrow and acute, downy. Ovary very gibbous. Style extremely slender. Stigma dilated and depressed.

Hab.: Tropical scrubs, *Walter Hill*; Bellenden Ker Range, *Bailey*.

33. **F. opposita** (opposite), *Miq. in Hook. Lond. Journ. vii. 426*; *Benth. Fl. Austr. vi. 175*. "Murn-tyul," Morehead River, *Roth*; "Mo-injal," Palmer River, *Roth*. A tall shrub or small tree, the young branches and underside of the leaves softly and densely pubescent. Leaves mostly opposite, exceedingly variable in size and shape, in the typical specimens broadly cordate-ovate and about 2 in. long on petioles not exceeding  $\frac{1}{2}$  in., in others ovate, ovate-oblong, or ovate-lanceolate, 6 to 8 in. long, on petioles of  $\frac{1}{2}$  to 1 in., all obtuse or acuminate, entire or very slightly undulate-crenulate, very scabrous above, distantly penniveined with the lowest pair starting from very near the base, the transverse veinlets and reticulations prominent underneath: on some barren branches the leaves are hastately 3-lobed with 1 long lanceolate central and 2 short lateral lobes. Stipules about 2 lines long. Receptacles axillary, solitary or in pairs, at first somewhat pear-shaped, at length nearly globular and about  $\frac{1}{2}$  in. diameter. Peduncles varying from 1 to 3 lines, the scale-like bracts usually at some distance from the fig, but sometimes close to it. Flowers entirely those of *F. orbiculata*. *F. inulecora*, *Miq. in Journ. Bot. Neerl. 1861, 242*, as to the specimens from Clarence River.

Hab.: Keppel and Shoalwater Bays and Broadsound, *R. Brown*; Bremer River, *Fraser*; Rodd's Bay, *A. Cunningham*; estuary of the Burdekin, *F. v. Mueller*; Port Denison, *Fitzalan*; Rockingham Bay, *Dallachy*; Rockhampton, *Bowman*; Fitzroy Island and at Springsure, *Walter and Wuth (F. v. M.)* with hastate leaves over 1 ft. long.

The leaves of this plant are sometimes infested by the blight-fungus, *Phyllachora rhytismoides*, Cav.

Fruit eaten raw. Leaves used like emery paper for smoothing the wommeras.—*Roth*.

34. **F. scobina** (rough like a file), *Benth. Fl. Austr. vi. 176*. A shrub or small tree of 8 to 20 ft., remarkable for the extreme asperity of both sides of the leaves as well as of the petioles and young branches, otherwise glabrous. Leaves alternate or rarely opposite, on very short petioles, mostly obovate or obovate-oblong, and very obtuse or shortly acuminate, rounded or contracted at the base, and 2 to 3 in. long, and  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. broad, but passing into oblong-elliptical, and on luxuriant barren branches sometimes oblanceolate, 4 to 5 in. long, and  $\frac{1}{2}$  to  $\frac{3}{4}$  in. broad, often slightly and irregularly sinuate-toothed at the end, the distant primary veins and transverse reticulate veinlets prominent underneath, without any distinct basal pair of veins. Receptacles mostly solitary, globose, the largest specimens seen 4 lines diameter, scabrous like the rest of the plant, but without hairs, the external bracts small and scale-like, either close under the receptacle or along the short peduncle. Male flowers few near the orifice. Perianth segments of both sexes narrow and unequal

and as well as the bracts white-hyaline as in *F. orbiculata*. Stamen 1 with a large 2-celled anther, and sometimes a second smaller one. Style glabrous, with a terminal truncate or peltate stigma.

Hab.: Lizard Island, *A. Cunningham*.

35. ***F. hispida*** (hispid), *Linn. f. Suppl.* 442; *Benth. Fl. Austr.* vi. 176. "Wo-o," Tully River, *Roth*. "Boombil," Johnstone River, *Harding*. A small tree, remarkable for the young branches, when luxuriant, very hollow and contracted at the nodes, the foliage and branches more or less sprinkled or covered with short stiff hairs. Leaves all opposite, broadly oblong-elliptical or almost ovate, usually acuminate, rounded or cordate at the base, mostly 6 to 10in. long and 4 to 5 broad, but very variable in size and shape, entire or sinuate-toothed, the indumentum scabrous above, soft underneath the primary veins distant, prominent underneath as well as the transverse veinlets, the basal pair very oblique. Receptacles either in pairs in the lower axils or more frequently in leafless clusters or racemes on the older wood, globose or somewhat turbinate,  $\frac{3}{4}$  to 1in. diameter, white, more or less hirsute. Male flowers amongst the larger bracts near the orifice, the segments brown hyaline, very broad, each one completely enveloping the next in the bud. Female perianth at length nearly as long as the ovary, with very obtuse or truncate lobes, but so thin and closely appressed as to be easily overlooked. Ovary stipitate. Style with a few hairs; stigma peltate.—*F. oppositifolia*, Willd. *Spec. Pl.* iv. 1151; *Roxb. Corom. Pl.* t. 124; *Wight Ic.* t. 638; *Covellia oppositifolia*, Gasp., and many other synonyms quoted by *Miq.* in *Ann. Mus. Ludg. Bat.* iii. 296; *King Fic.* tt. 154, 155.

Hab.: Northumberland Islands and Broadsound, *R. Brown*; Rockingham and Edgecombe Bays, *Dallachy*.

Wood of a light-yellow colour, coarse-grained and light.—*Bailey's Cat. Ql. Woods*, No. 393.

Bark used for fibre-twine and the leaves eaten raw for food.—*Roth*, l.c.

36. ***F. fasciculata*** (fruit in bundles), *Muell. Herb.*; *Benth. Fl. Austr.* vi. 177. "Ber-di-ga," Starcke River, *Roth*. A shrub of 10 to 15ft., the young shoots hispid with short stiff hairs. Leaves usually alternate, ovate or broadly-elliptical, shortly acuminate, irregularly sinuate-crenate, rounded contracted or slightly cordate at the base, 8 to 10in. long and 4 to 5 broad in some specimens, much smaller in others, the distant primary veins and transverse reticulations prominent underneath, slightly scabrous above, more so underneath, and the veins often pubescent or hispid. Receptacles in pairs, sometimes axillary, but most frequently several together on short leafless branches, forming oblong clusters or short racemes on the old wood, nearly globular, about  $\frac{1}{2}$ in. diameter, tubercular-scabrous, marked with about 6 prominent longitudinal ribs, and often depressed at the orifice. Bracts within the receptacle minute excepting near the orifice. Male flowers few under the innermost developed bracts, entirely like those of *F. hispida*. Female perianth scarcely any, or at length shorter than the stipes of the ovary and truncate. Style short, glabrous, with a large peltate concave stigma.

Hab.: Rockhampton, Fitzroy River, *Bowman*, *Thozet*, *Dallachy*.

Wood soft, coarse-grained and light-coloured.—*Bailey's Cat. Ql. Woods*, No. 394.

Bark used for making dilly-bags.—*Roth*.

Var. *subopposita*. Leaves here and there opposite and branches hollow as in *F. hispida*, but with the small 6-ribbed receptacles of *F. fasciculata*.

37. ***F. mourilyanensis*** (habitat), *Bail. Ql. Agri. Journ.* 1, Part 6. Described by collector as a large tree, bearing its fruit in clusters on the principal stems. Branchlets slender, angular, sulcate-striate between the angles. Leaves alternate, 4 or 5in. long, membranous on short slender petiole of about  $1\frac{1}{2}$  lines, lanceolate with long points, lateral nerves distant and irregular, the basal pair parallel with and near to the margin, joining with the others and

forming the looped intermarginal nerve; the transverse reticulation very open, the whole underside of leaf shown with the aid of a lens to be closely marked with dark dots. Stipules lanceolate, about 2 lines, sharply keeled. Receptacles on slender peduncles about 9 lines long, each with from 1 to 3 loose distinct bracts, in clusters on the old wood, starting from a mass of imbricated dark bracts, globose, about 6 lines diameter, umbonate, bracts of orifice purple. Florets male, near the orifice, segments 6, hyaline, purplish. Stamen 1. Anther large, lunate, 2-celled, somewhat resembling a grain of wheat. Florets female, segments purplish, as in the male but rather larger, enclosing ovary and style. Style shorter than the ovary, glabrous, stigma, some oblique, others peltate, concave, and slightly hairy.

Hab.: Mourilyan Harbour, near Esmeralda Plantation, *W. Muggford*.

This species is probably nearest to *F. fasciculata* amongst the Australian species.

38. **F. esmeralda** (habitat), *Bail. Ql. Agri. Journ.* 1, Part 6. Described by collector as a very attractive shrub, with orange-yellow fruit. Branchlets very slightly scabrous, sulcate. Leaves nearly or quite glabrous, alternate, oblong, or some of the smaller ones lanceolate,  $1\frac{3}{4}$  to  $3\frac{3}{4}$  in. long, 1 to  $1\frac{3}{4}$  in. broad, base oblique, rounded or cuneate, the apex more or less abruptly terminating in a short or rather long point, margins entire; primary lateral nerves nearly horizontal, about 9 on either side of midrib, the basal pair like the others, all looping near the margin, the transverse reticulation often joining and forming an intermediate pseudo nerve. Petioles very short, seldom exceeding 2 lines, and rather broad. Stipules narrow-acuminate, 5 or 6 lines long, seems to be somewhat tinged with red and slightly hairy near the base. Receptacles solitary or in pairs, axillary and lateral on peduncles of  $\frac{1}{2}$ -line, globose, about 3 lines diameter, on a stipes a little longer than the peduncle, marked in the lower half by 6 ribs; basal bracts 2, broad and dark-coloured, inner bracts and perianth-segments from ovate to lanceolate, with ciliate margins. Could find no male florets in the receptacles examined. Ovary oblong, style erect, clavate, or cuneate.

Hab.: Mourilyan Harbor, *W. Muggford*, near Esmeralda Plantation.

Fruit eaten by aboriginals.—*Roth*, l.c.

39. **F. casearia** (fruit cheese-like), *F. v. M. Herb.*; *Benth. Fl. Austr.* vi. 177. A tree with a broad spreading head, quite glabrous. Leaves alternate, on petioles of  $\frac{1}{4}$  to  $\frac{1}{2}$  in., ovate or elliptical, acuminate, entire, rounded or cuneate at the base, 3 to 5 in. long,  $1\frac{1}{2}$  to  $2\frac{1}{2}$  in. broad, membranous, not scabrous, the principal primary veins distant, slightly prominent underneath, the basal oblique pair very small or obsolete, the smaller veins and transverse reticulations very fine or inconspicuous. Stipules rather long, acuminate, deciduous. Receptacles usually below the leaves, nearly sessile or on peduncles of 2 to 4 lines, apparently obovoid when young, depressed-globular when full-grown, and attaining about  $\frac{3}{4}$  in. diameter, quite glabrous, with 6 longitudinal raised ribs outside, very hollow inside, the flowers very small, but their structure entirely as in *F. fasciculata*.

Hab.: Rockingham Bay, *Dallachy*; Fitzroy Island and Endeavour River.

Wood light-coloured, close-grained and firm.—*Bailey's Cat. Ql. Woods*, No. 394b.

40. **F. glomerata** (clustered), *Willd. Spec. Pl.* iv. 1148; *Benth. Fl. Austr.* vi. 178. Cluster Fig. "Moo-chai," Cooktown, *Roth*. "Parpa," Rockhampton, *Thosct*. A large tree, glabrous or the young shoots slightly pubescent. Leaves alternate, on petioles of 1 to 2 in., from ovate or ovate-lanceolate to oblong-elliptical, shortly acuminate, entire, rounded at the base, 3 to 5 in. long, 1 to  $2\frac{1}{2}$  in. broad, rigidly membranous, the primary veins distant and prominent underneath, the lowest pair rather more oblique, but starting from above the base, the transverse reticulations very fine and often inconspicuous. Stipules lanceolate, often 1 in. long, membranous, crowded on the young shoots, and often

persistent even when the leaves are full-grown. Receptacles in thick bunches or spikes on the principal stems all over the tree, globular or somewhat turbinate, 1 to 1½ in. diameter, slightly mealy or downy when young, crimson when ripe and edible. Subtending bracts small. Male perianths of broadly orbicular hyaline segments closely enveloping each other, and enclosing 1 or 2 equal or unequal stamens, the anther-cells distinct and parallel. Female perianth very short. Style glabrous, with an oblique terminal stigma, sometimes very short, but varying to lanceolate.—Roxb. *Corom. Pl. ii. t. 123*; Wight.  *Ic. t. 667*; *Covellia glomerata*, Mig. in Hook. *Lond. Journ. vii. 465*; *Ficus vesca*, F. v. M.; Miq. in *Journ. Bot. Neerl. 1861, 243*.

Hab.: Northumberland Islands, *R. Brown*; Port Denison, *Fitzalan*; Rockingham Bay, *Dallachy*; Rockhampton, *Bowman*, *Thozet*, *Dallachy*. A very common tree of the tropical scrubs.

The species is common in moist rich soil in East India.

Wood of a straw-colour, coarse in grain, light, soft and porous.—*Baileys Cat. Ql. Woods, No. 395*.

In India the wood is used for well-frame, as it is found, though soft, to last well under water.

Fruit eaten by aboriginals.—*Roth*.

41. **F. crassipes** (stalk of fruit thick), *Bail*. A large tree with a somewhat smooth light-coloured bark, very milky, ends of the branches very thick, marked with rings showing where the stipules were attached. Leaves alternate, very close on the ends of the branches, the internodes not being more than ¼ in. long; petioles somewhat flattened, about 3 in. long and 3 lines broad, glabrous or slightly hoary; lamina ovate or obtuse-ovate, with or without a short blunt point, usually rounded at the base, 5 to 8 in. long, 4 to 5½ in. broad, thick, coriaceous, and deep-green, the margins entire, the principal lateral veins parallel, except the basal pair, which starting from the top of the petiole meet the others at about ¼ up the leaf where, anastomosing with them, form intramarginal ones. Stipules about 2 in. long with very fine point. Receptacles crowded at the ends of the branches, obtusely 3-angular, some showing a fourth angle, about 2 in. long and 1 in. diameter, marked with oval purple spots, the apex beaked; peduncles 3-angular, often broader than long.—3rd Suppl. *Syn. Ql. Fl. 69*.

Hab.: Scrubs, Harvey's Creek, Russell River.

This fine tree resembles somewhat, in its long angular fruit, *F. pleurocarpa* of the Johnstone River.

42. **F. pleurocarpa** (ribbed fruit), *F. v. M. Fragm. viii. 246*. "Kar-pe," Atherton, *Roth*. A large tree slightly pubescent on the young shoots. Leaves ovate-lanceolate, coriaceous, 4 to 11 in. long, entire, upper side glossy, underside rather pale, lateral nerves rather thin as well as the reticulation. Petiole glabrous, flattish, or canaliculate, 2 to 4 in. long. Stipules 4 to 6 in. long, the tegmenta often 10 in. long, silky-hoary outside towards the base. Receptacle cylindrical-conical, 1½ to more than 2 in. long, and prominently longitudinally ribbed; peduncles thick turbinate, pubescent. Perianth lobes 3 to 6, imbricate, pubescent, the perianth of the males 1½ to 3 lines long. Filaments very short. Anther 1, large, cordate. Styles ½ line long, stigma peltate, very oblique.

Hab.: Johnstone River, *W. Hill*; Barron River and other tropical localities.

Fruit eaten by aboriginals.—*Roth*.

Wood light, soft and elastic, with very open pores.—*Bailey's Cat. Ql. Woods, No. 394A*.

## 8. CUDRANIA, Tréc.

(From the Malayan name *Cudrang*, given to a green dye yielded by one of the species.)

Flowers diœcious, in globular heads intermixed with small bracts, the receptacles more or less fleshy. Male perianth of 4 or 5 narrow segments, dilated and concave at the apex. Stamens 4 or 5, filaments erect and flattened.

Rudimentary pistil subulate. Female perianth of 4 segments imbricate in the bud. Style simple, with a filiform stigma. Fruit a syncarp formed of the enlarged somewhat fleshy perianths and receptacle. Nuts free but enclosed within the perianths and partially immersed in the receptacle, the pericarp crustaceous. Seeds nearly globular, the testa membranous; albumen very scanty or none. Cotyledons broad and thick, folded over the long incurved radicle.—More or less climbing shrub, often armed with axillary spines (abortive peduncles). Leaves alternate. Flower-heads axillary.

The genus is probably limited to a single species, extending from Eastern Africa over East India and the Archipelago and northward to Japan.

1. **C. javanensis** (of Java), *Trecul. in Ann. Sc. Nat. ser. 3, viii. 123*; *Benth. Fl. Austr. vi. 179*. Cockspur Thorn. A shrub usually climbing, attaining 1ft., in diameter and the stems clothed with loose yellowish bark, quite glabrous except the inflorescence. Leaves petiolate, oblong or elliptical, usually acute or acuminate but sometimes obtuse, quite entire,  $1\frac{1}{2}$  to 3in. long, penniveined and reticulate, but the veins impressed not prominent. Spines straight or recurved, attaining about  $1\frac{1}{2}$ in. Flower-heads solitary or 2 together, on peduncles of 1 to 3 lines, the males 2 to 3 lines diameter, the females smaller at first but attaining 6 to 8 lines when in fruit, and usually slightly tomentose.—Bureau in *Ann. Sc. Nat. ser. 5, xi. 378*, with the several synonyms adduced; *Maclura javanica*, *Miq.*; *Blume Mus. Bot. ii. 83, t. 31*; *Morus calcar-galli*, *A. Cunn. Herb.*

Hab.: Brisbane River, Moreton Bay, *A. Cunningham, F. v. Mueller*; Rockhampton, *O'Shanesy*; Stewart's Creek, *Bowman*; Rockingham Bay, *Dallachy*; Mackay R. ver. *Sutherland*.

Wood dark-yellow, close-grained, a desirable cabinet wood.—*Bailey's Cat. Ql. Woods, No. 396*.

The leaves are sometimes infested with the blight-fungus, *Rhytisma hypoxanthum*, *R. Br.*

Var. *Baneroftii*. This is a very beautiful variegated plant not differing from the typical form in habit.

## 9. URTICA, Linn.

(Referring to the stinging properties of some species.)

Flowers monœcious or diœcious, clustered but distinct. Male perianth depressed-globular in the bud, deeply divided into 4 concave nearly equal segments. Stamens 4; with a small rudimentary pistil. Anthers oblong-reniform. Female perianth with 2 outer segments usually smaller than the 2 inner, which become enlarged and ovate when in fruit. Stigma sessile or nearly so, tufted or divided into long cilia. Nut small, dry, enclosed in or surrounded by the persistent perianth. Herbs or rarely shrubs, more or less sprinkled or covered with rigid stinging hairs. Leaves opposite, toothed, 5, 7 or rarely 3-nerved. Stipules interpetiolar, free or the 2 on each side united into one. Flower clusters in axillary simple or branched interrupted spikes or panicles, usually shorter than the leaves, and often shorter than the petioles.

The genus is widely spread over the extra-tropical regions of both the northern and southern hemispheres in the New as well as the Old World, more rare within the tropics. The only indigenous Australian species is also in New Zealand, and is a close representative of a common northern one.—*Benth.*

Perennial. Male and female flowers in distinct inflorescence . . . . . 1. *U. incisa*.  
Annual. Male and female flowers in the same inflorescences . . . . . 2. *\*U. urens*.

1. **U. incisa** (the leaves cut), *Poir.*; *Wedd. in DC. Prod. xvi. i. 52*; *Benth. Fl. Austr. vi. 190*. "Cood-mo-co," Forest Hill, *Macartney*. A perennial, with stems usually weak or decumbent at the base, sometimes slender and rarely 1ft. long, sometimes trailing to the length of 10 or 12ft., glabrous between the stinging hairs. Leaves usually on long petioles, lanceolate or almost linear,

acute, deeply toothed, somewhat cordate at the base and 1 to 3 in. long, rarely ovate-lanceolate. Inflorescence usually simple or branching into 2 at the very base, the males mostly as long as or longer than the petiole, the clusters sometimes lengthening into short branches, the females shorter and more dense, but in some specimens the female inflorescences are long, slender, and branched, in others the males are reduced to dense sessile clusters. Male perianth  $\frac{3}{4}$  to 1 line diameter, glabrous or slightly scabrous; female perianth smaller when in flower, but the inner segments enlarging to  $\frac{3}{4}$  line round the nut, which is ovate, slightly compressed, as long as or rather longer than the persistent perianth.—Hook. f. Fl. Tasm. i. 343; *U. lucifuga*, Hook. f. in Hook. Lond. Journ. vi. 285.

Hab.: A common scrub plant.

This species, which is also in New Zealand, is usually distinguished from the northern *U. dioica*, Linn., by the weaker stems glabrous between the stinging hairs, narrower leaves and larger male flowers; some northern specimens, however, of *U. dioica* come very close to the Australian plant.—*Benth.*

2. ***U. urens*** (stinging), Linn.; *Wedd. in DC. Prod.* xvi. i. 40; *Benth. Fl. Austr.* vi. 191. Common English Nettle. An annual with erect or ascending branched stems rarely above 1 ft. high, glabrous with the exception of the rigid stinging hairs. Leaves petiolate, ovate or elliptical, deeply and regularly toothed, 1 to 2 in. long. Inflorescences contracted into loose axillary clusters seldom exceeding the petioles, the males and the females intermixed in the same clusters, of the same structure as in *U. incisa*, except that the larger segments of the female perianth are ciliate on the margin and usually bear a single dorsal stinging hair.

Hab.: A European weed. Darling Downs and a few other southern localities.

## 10. FLEURYA.

(After J. F. Fleury.)

Flowers monœcious or diœcious, clustered, clusters in solitary axillary cymes or spikes, unisexual or androgynous. Male flower: Sepals 4 to 5, ovate-lanceolate, subvalvate or imbricate. Stamens 4 to 5, inflected in bud. Pistillode globose or clavate. Female flower: Perianth cupular, 4-lobed, or sepals 4, imbricate, equal or very unequal, posticous hooded, anticous minute or none. Ovary oblique; style obliquely ovoid or linear, at length hooked, with sometimes 2 basal branches; ovule erect. Achene oblique, compressed, exserted, membranous. Seed nearly exalbuminous, cotyledons broad.—Annual herbs, with stinging hairs. Leaves alternate, 3-nerved; stipules connate in opposite pairs or none.

Species tropical.

1. ***F. interrupta*** (spikes interrupted), *Gaud. in Freyc. Voy. Bot.* 497, t. 83; *Hook. in Fl. Brit. Ind.* v. 548. Stems 1 to 3 ft. high, erect flexus, furrowed, branching. 2 to 6 in. long, ovate acuminate, crenate or serrate subcordate, truncate or cuneate at the base, sparsely clothed with stinging hairs, petioles long as the blade. Stipules 2-fid, cymes spiciform or paniculate, usually much longer than the petiole. Female perianth cupular, 4-lobed or toothed, stipitate. Style unequally 3-lobed.

Hab.: Several of the tropical scrubs. Besides Queensland this species is found in India and many other hot countries.

## 11. LAPORTEA, Gaudich.

(After M. Laporte.)

Flowers diœcious or monœcious, clustered but distinct. Male perianth depressed globular in the bud, deeply divided into 4 rarely 5 segments. Stamens 4, rarely 5, with a rudimentary pistil; anther-cells reniform. Female perianth



of 4 lobes or segments, the 2 inner ones usually larger than the other and dissimilar from each other. Stigma simple, elongated, incurved. Nut more or less compressed and oblique, enclosed in or surrounded by the persistent perianth. —Trees or shrubs, sprinkled or covered with rigid stinging hairs. Leaves alternate. Stipules entire or bifid, deciduous. Flower clusters in axillary panicles, usually shorter than the leaves.

The species are distributed over the warmer regions of the New and the Old World, but chiefly in the Indian Archipelago and Pacific Islands, one exceptionally herbaceous species is, however, North American and extratropical. The Australian species all appear to be endemic. They all belong to the section of *Sarcopus*, Wedd., comprising trees or shrubs with the majority of the fruiting pedicels thickened, fleshy and incurved, assuming frequently in the specimens the appearance of little grubs, and the lobes of the female perianths very unequal.—*Benth.*

- Leaves broadly ovate, cordate at the base, glabrous above, pubescent underneath . . . . . 1. *L. gigas*.
- Leaves ovate, not cordate, nearly glabrous. . . . . 2. *L. photiniphylla*.
- Leaves broad, more or less peltate at the base, pubescent or villous on both sides . . . . . 3. *L. moroides*.

1. ***L. gigas*** (large), *Wedd. Monogr. Urt. 129, t. 3 and 4, and in DC. Prod. xvi. i. 82; Benth. Fl. Austr. vi. 191.* Large Stinging Tree. “Burrie,” Taromeo, *Shirley*. A large tree, exceeding 80ft., the trunk erect, several feet in diameter, with a soft juicy fibrous wood and smooth ash-coloured bark, supported at the base by prominent angles or buttresses. Leaves broadly cordate-ovate, obtuse or shortly acuminate, entirely or obscurely or more distinctly sinuate-toothed, often above 1ft. long and nearly as broad, glabrous above or nearly so, and sprinkled with a few stinging hairs, more or less pubescent or villous underneath. Stipules ovate-lanceolate, very deciduous. Flowers diœcious, clustered along the branches of rather loose axillary panicles rarely exceeding the petioles. Male perianth scarcely  $\frac{1}{2}$  line diameter. Female perianth-lobes acute and hirsute, the 2 outer ones larger than the 2 inner. Nuts much flattened, very oblique, the pedicel and perianth much thickened into a curved fleshy mass.—*Urtica gigas*, A. Cunn. Herb.; *Urera rotundifolia*, Wedd. in Ann. Sc. Nat. ser. 4, i. 177, and *U. excelsa*, Wedd. l.c. 178.

Southern scrubs.

2. ***L. photiniphylla*** (shining-leaved), *Wedd. Monogr. Urt. 138, and in DC. Prod. xvi. i. 83; Benth. Fl. Austr. vi. 192.* Shining-leaved Stinging Tree. A fine tree of 60ft. with a straight soft-wooded stem of 30 to 40ft. Leaves ovate or almost elliptical, obtuse or more frequently acuminate, entire or sinuate-toothed, not cordate, 3-nerved, nearly glabrous but sometimes sprinkled with a few stinging hairs. Panicles axillary, often exceeding the petioles. Flowers of *L. gigas*, but more glabrous. Nuts rather larger, the pedicels usually enlarged into an incurved fleshy mass of a whitish colour.—*Urtica photiniphylla*, A. Cunn. Herb.; *Fleurya photiniphylla*, Kunth. Ind. Sem. Hort. Berol. 1846, 11 (*Weddell*).

Hab.: Brisbane River, Moreton Bay, *A. Cunningham*, *F. v. Mueller*; Rockhampton, *Thozet*, *OShanesy*, *Dallachy*; Nurrum-nurrum, *Leichhardt*.

3. ***L. moroides*** (Mulberry-like), *Wedd. Monogr. Urt. 142, and in DC. Prod. vii. i. 88; Benth. Fl. Austr. vi. 192.* A tall shrub or small tree, with most virulent stinging hairs. Leaves broadly ovate, peltate at the base, shortly acuminate, more prominently toothed than the other species and more pubescent or villous on both sides, 6 to 8in. long and almost as broad. In some of the tropical scrubs the leaves have been seen 19in. long and nearly as broad, on petioles 15in. long. Panicles axillary, rarely exceeding the petioles. Female

flowers of *L. gigas*. Fruits densely clustered, the pedicels rather less thickened but succulent, the whole fruiting panicle of a rich reddish-purple.—*Urtica moroides*; A. Cunn. Herb.

Hab.: Port Denison, *Fitzalan*; Mount Elliott and Edgecombe and Rockingham Bays, *Dallachy*.

Not uncommon in the coastal scrubs.

## 12. \*PILEA, Lindl.

(From *pilos*, a cap, alluding to the shape of one of the perianth-segments).

Flowers monœcious or diceious, minute in axillary long or short pedunculate dichotomously branched cymes; bracts small or none. Male flower: Sepals 2 to 4, free or connate in a cup, often gibbous or horned at the back. Stamens 2 to 4. Pistillode conic or oblong. Female flower: Sepals 3 rarely 4, very small and unequal, dorsal longest, sometimes gibbous or hooded. Staminodia minute, or of scales or none. Ovary straight; stigma sessile, penicillate; ovule erect. Achene ovoid or oblong, compressed, membranous or crustaceous, embraced or not, and at the base only, by the sepals. Seed erect, albumen very scanty, cotyledons broad.—Herbs rarely undershrubs. Leaves in opposite equal or unequal pairs, entire or serrate, 3-nerved, very rarely penninerved; stipules connate into one, intrapetiolar.

The species tropical.

1 *P. muscosa* (moss-like), *Lindl.* Gunpowder Plant. A small creeping or erect almost succulent weed. Leaves obovate-spathulate, petiolate, 1 to 2½ lines long, one of each pair often larger than the other, cymes axillary. Flower minute.—*P. microphylla*, *Liebon.* *Urtica microphylla*, *Linn.*

Hab.: South America. A bush-house weed.

## 13. ELATOSTEMMA, Forst.

(From *elatos*, elastic, and *stema*, stamen.)

Flowers monœcious or diceious, in dense unisexual heads, the receptacle usually flat or concave, surrounded by an involucre of several bracts. Male perianth of 4 or 5 distinct segments imbricate in the bud, each with a dorsal point at or near the top. Stamens 4 or 5, the filaments more or less adnate to the segments, the central rudimentary pistil usually very small; anthers with parallel cells placed back to back. Female perianth minute, of 3, rarely 4 segments. Stigma sessile, tufted. Nut ovate, slightly compressed.—Herbs rarely shrubby at the base, without stinging hairs. Leaves usually distichous, alternate or if opposite one of each pair much smaller than the other, sessile or very shortly petiolate, oblique or falcate, and unequal at the base or broadly semicordate. Flower-heads solitary in the axils, the outer bracts usually 4 or 5, the flowers very small and numerous, shortly pedicellate and intermixed with numerous narrow bracts or bracteoles.

The genus is spread over the tropical and subtropical regions of the Old World.

Coarse plant. Leaves 3 to 6 in. long. Male heads ½ to 1 in. diameter.

Females on short peduncles or nearly sessile . . . . . 1. *E. reticulatum*.

Slender plant. Leaves 1 to 2 in. long. Male heads 2 to 3 lines diameter.

Females on slender peduncles . . . . . 2. *E. stipitatum*.

1. *E. reticulatum* (reticulate), *Wedd. in Ann. Sc. Nat. ser. 4, i. 188, Monogr. Urt. 302, and in DC. Prod. xvi. i. 176; Benth. Fl. Austr. vi. 183.* A coarse straggling herb, the stems often rooting at the base, attaining 1 to 2 ft. and sometimes branched, the whole plant in the typical form either quite glabrous or with a few rigid hairs on the midrib of the leaves underneath. Leaves usually 3

to 6in. long, nearly sessile, broadly lanceolate oblong-lanceolate or obliquely ovate-elliptical, slightly falcate or curved, more or less acuminate, coarsely toothed, narrow towards the base especially the inner side, the outer side decurrent nearly to the base of the petiole, and often semicordate, penniveined, with 6 to 9 primary veins on each side, the lower ones not at all or scarcely more oblique than the succeeding, and always shorter. Flower-heads variable in size, the males usually  $\frac{1}{2}$  to near 1in. diameter when fully out, both sexes nearly sessile or the males on peduncles varying from  $\frac{1}{2}$  to 3in. in the typical form, the involucre of 4 or 5 acute or acuminate bracts nearly as long as the flowers. Perianth about 1 line long, of 5 broad segments. Female heads more globular, rarely above 3 or 4 lines diameter and the involucre much shorter. Nuts about  $\frac{1}{2}$  line long, contracted at the base almost into a stipes as long as the minute perianth.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller*; Killarney.

2. ***E. stipitatum*** (stalked), *Wedd. in Ann. Sc. Nat. ser. 4. i. 190*; *Monogr. Urt. 322, t. 9 D, f. 11-16, and in DC. Prod. xvi. i. 185*; *Benth. Fl. Austr. vi. 184*. A small slender diffuse or prostrate herb, the stems simple or branched, rooting at the base, a few inches or rarely nearly a foot long. Leaves quite sessile, oblong oblong-lanceolate or almost ovate, very shortly acuminate, rather deeply toothed, from under 1 to nearly 2in. long, the lower margin expanded into a rounded almost decurrent auricle, the principal veins as well as the stems more or less hispid. Flower-heads small, all pedunculate, the males 2 to 3 lines or very rarely nearly 4 lines diameter, the bracts much narrower than in *E. reticulatum*. Flowers nearly as in that species. Female heads still smaller.

Hab.: Mount Lindsay, *W. Hill*; and other southern localities.

#### 14. BOEHMERIA, Jacq.

(After G. R. Boehmer.)

Flowers monceciou or diceciou, in globular usually unisexual clusters, with small scarios bracts. Male perianth of 4, rarely 3 or 5, segments or lobes, valvate in the bud. Stamens as many as perianth segments, with a central clavate or globose rudimentary pistil. Female perianth tubular, compressed, more or less dilated below, usually contracted at the orifice, with a 2 or 4-toothed border. Nut dry, included in the persistent perianth, free or more or less adnate to it, sessile or stipitate, with a long linear-filiform papillose-hirsute style or stigma, protruding from the perianth and persistent on the ripe nut. Seed more or less albuminous.—Shrubs or small trees. Leaves alternate or opposite, petiolate, 3-nerved, toothed. Stipules usually deciduous. Flower-clusters axillary, either sessile and solitary or in simple interrupted spikes or short branched panicles.

The genus is spread over the tropical and subtropical regions of both the New and the Old World.

Leaves alternate. Flowers in short broad panicles . . . . . 1. *B. nivea*.

Leaves opposite. Flowers in long filiform spikes . . . . . 2. *B. platyphylla*

1. ***B. nivea*** (snow-white), *Hook. and Arn. in Bot. Beech. Voy. 214*; *Hook. Fl. Brit. Ind. v. 576*. "Jalcan Jalcan," Johnstone River, *W. C. Harding*. A shrub with herbaceous stems several feet high, the branches and petioles softly hairy. Leaves alternate usually broadly ovate, 3 to 6in. long; subsclabrous above, white with densely appressed hairs beneath, base cuneate or subcordate, marginal teeth triangular often up-curved; petiole  $1\frac{1}{2}$  to 4in. long. Stipules free,

subulate, deciduous. Panicles shorter than the petiole, sessile; upper flowers female. Styles exserted, hairy. Fruit oblong compressed hairy. *Urtica tenacissima*, Roxb. Wight Ic. t. 688.

Hab.: A native of the Malay Islands, China and Japan, and to all appearance indigenous in the scrubs of the Johnstone River.

2. **B. platyphylla** (broad-leaved), *Don*; *Hook. in Fl. Brit. Ind.* v. 578. A soft-wooded shrub of 5 or 6ft., more or less clothed with short hairs. Leaves opposite, ovate-lanceolate or cordate-ovate, acute, 6 to 8in. long, 3-nerved, serrated, on slender petioles 2 to 4in. long. Spikes axillary, filiform, interrupted, 4 to 7in. long. Flowers, male clusters 6 to 8-flowered, female 10 to 12 or more; male perianth of 4 2-toothed segments, stamens 4 with a rudimentary ovary; female perianth tubular, ventricose, contracted, 4-toothed at the apex enclosing the ovary; style long, filiform, stigma simple, acute, villous. Seeds oval, erect, enclosed in the perianth; exalbuminous radicle superior.—*B. macrostachya*, R. Wight. *Bail. in 2nd Suppl. Syn. Ql. Fl.* 55. *Splitgerbera macrostachya*, Wight Ic. t. 1977.

Hab.: Goamba Creek, Tambourine Mountain.

### 15. POUZOLZIA, Gaudich.

(*Memoralis*, *Ham.*; *Gonostegia*, *Turcz.*; *Hyrtanandra*, *Miq.*)

Flowers monœcious or rarely diœcious, in sessile usually androgynous clusters, with small scarious bracts. Male perianth of 4 or 5 lobes or segments, valvate in the bud. Stamens 3, 4 or 5, with a club-shaped or obovoid rudimentary pistil. Female perianth usually ovate, contracted at the orifice with a 2 or 4-toothed border, often enlarged in fruit and sometimes winged but not succulent. Nut enclosed in the persistent perianth, the linear filiform style deciduous.—Herbs undershrubs or shrubs. Leaves alternate or the lower ones or rarely all opposite, entire or very rarely toothed. Stipules free, usually persistent. Flower clusters axillary, solitary or in interrupted spikes.

The genus is spread over the tropical regions of both the New and the Old World. The Australian species are both of them East Indian and represent the two sections into which the genus has been divided.

SECT. 1. **Pouzolzia**.—*Male perianth-segments concave at the top, but rounded and obtuse on the back.*

Stems diffuse. Leaves all alternate . . . . . 1. *P. indica*.

SECT. 2. **Memoralis**.—*Male perianth-segments abruptly bent in near the top, with an acute transverse dorsal angle.*

Stems elongated. Lower leaves opposite . . . . . 2. *P. quinquenervis*.

1. **P. indica** (Indian), *Gaudich.*; *Wedd. Monogr. Urt.* 398, t. 13, and in *DC. Prod.* xvi. i. 220, *var. tetraptera subvar. pentandra*, *Wedd.*; *Benth. Fl. Austr.* vi. 186. A diffuse perennial with the habit of a *Parietaria*, more or less pubescent or hirsute, the stems usually from 6in. to 1ft. long. Leaves alternate or the lower ones rarely opposite, shortly petiolate, ovate, acute, entire, sometimes all under  $\frac{1}{2}$ in., rarely nearly 1in. long, 3-nerved, with the lateral nerves undivided. Flowers few in the clusters, the males and females mixed. Perianths hispid, the males usually of 5 segments. Fruiting female perianth about  $\frac{1}{2}$  line long, sometimes ovoid and equally 8 or 10-ribbed, but others in the same axils with 4 of the ribs produced into broad wings. Nuts black and shining.—*P. arnhemica*, *F. v. M. Fragm.* iv. 87.

Hab.: Rockingham Bay, *Dallachy*.

The species is common in East India and the Archipelago, with the male flowers usually 4-merous.

2. **P. quinquenervis** (5-nerved), *Benn. Pl. Jav. Rar.* 66; *Benth. Fl. Austr.* vi. 187. A perennial with ascending or erect stems (of 2ft or more?) scarcely branched except at the base, quite glabrous or the angles of the stems and

margins and nerves of the leaves very slightly pubescent. Leaves on very short petioles or almost sessile, the lower ones opposite the upper ones alternate, all lanceolate and entire, the lower ones 2 to 2½ in. long and 3 or 5-nerved, the upper ones often smaller and scarcely 3-nerved, but not reduced to small bracts as in some species. Flower-clusters rather loose, the two sexes usually mixed but in different proportions in different specimens. Male perianth nearly 1 line diameter, with a concave almost saucer-like broad apex, usually 5-merous. Female fruiting perianth with 3 or 4 rarely 2 or 5 usually unequal wings, and quite glabrous. Nut black, smooth and shining.—*Memoralis quinqueneris*, Ham.; Wedd. in DC. Prod. xvi. i. 235<sup>a</sup>; *Hyrtanandra*, *Pouzolsia* or *Memoralis lythroides*, F. v. M. Fragm. v. 194.

Hab.: Lagoons, Rockingham Bay, *Dallachy*; table-land of South Alligator River and Upper Lind River, *Leichhardt*.

The species is also in Sikkim, Khasia and Nepal.

### 16. PIPTURUS, Wedd.

Flowers diœcious, in dense globular clusters, with very small bracts. Male perianth 4 or 5-lobed, with ovate acute lobes. Stamens as many as perianth-lobes, with a central club-shaped rudimentary pistil. Female perianth ovoid, contracted and minutely toothed at the orifice, becoming slightly succulent as well as the receptacle when in fruit. Ovary enclosed in and adnate to the perianth, the linear elongated style or stigma hirsute on one side, and deciduous after flowering. Fruit forming a small succulent globular syncarp, the slightly succulent perianths, however, quite distinct at the top. Seeds with a very scanty albumen.—Trees or tall shrubs. Leaves alternate, entire or toothed, often white underneath, 3 or 5-nerved. Stipules axillary, deeply bifid, deciduous. Flower-clusters axillary, solitary, or in interrupted spikes. \*

The genus comprises but few species, dispersed over the Indian Archipelago, the Pacific Islands and the Mascarene group. The only Australian species has the general area of the genus.

1. *P. argenteus* (silvery), *Willd. in DC. Prod. xvi. i. 235<sup>10</sup>*; *Benth. Fl. Austr. vi. 185*. "Thil-la-wo," Forest Hill, *Macartney*. "Koomeroo Koomeroo," Stradbroke Island, *Watkins*. "Kongangn," Rockhampton, *Thozet*. A tree usually small but sometimes attaining 50ft., the young branches and underside of the leaves hoary or white with a close tomentum. Leaves on rather long petioles, ovate, shortly acuminate, slightly toothed or crenulate, rounded or very rarely slightly cordate at the base, 3 or 5-nerved, glabrous above, 3 to 6 in. long. Flower-clusters distant along the rachis of single axillary spikes, shorter than or not much exceeding the petioles, and sometimes reduced to a single axillary cluster, quite globular, forming when in fruit a white edible syncarp of 2 to 3 lines diameter, although not nearly so succulent as those of *Morus*, and appearing dry in the dried specimens.—*Urtica argentea*, Forst. Prod. 65; *P. propinquus*, Wedd. Monogr. Urt. 447, t. 15 D.

Hab.: Pine Head, *A. Cunningham*; Dawson River, *F. v. Mueller*; Fitzroy Island, *M'Gillivray*, *C. Moore* and others; Cape York, *Daemel*; Kennedy District, *Daintree*; Rockingham Bay, *Dallachy*; Rockhampton, *Dallachy*, *Bowman*, *Thozet*.

The species is also in the Indian Archipelago and the Pacific Islands.

Wood brown, close-grained and soft. Bark yields good fibre.—*Bailey's Cat. Ql. Woods*, No. 400.

### 17. PARIETARIA, Linn.

(From the European species being often found growing in the crevices of old walls.)

(Freira, *Gaud.*)

Flowers polygamous, in axillary cymes often reduced to loose clusters, the external bracts more or less united at the base. Perianth of the hermaphrodite

and male flowers deeply divided into 4 rarely 3 lobes, with as many stamens, in the females with a more developed tube and smaller lobes without stamens. Ovary in the hermaphrodite and female flowers free within the perianth-tube, in the males rudimentary. Style filiform or very short, with a densely tufted linear-spathulate recurved stigma, deciduous after flowering. Nut enclosed in the variously enlarged perianth, that of the hermaphrodite flowers usually cylindrical, not succulent.—Annual or perennial much-branched herbs, pubescent with more or less prehensile hooked hairs. Leaves alternate, entire, 3-nerved or triplinerved. Stipules none.

The genus is dispersed over the greater part of the globe, the only Australian species being one of the widest range.

1. ***P. debilis*** (weak), *Forst. Prod.* 73; *Benth. Fl. Austr.* vi. 188. A diffuse more or less pubescent branching annual of 6in. to above 1ft. Leaves on slender petioles, ovate or cordate, obtuse or acuminate, membranous, green on both sides or hoary underneath, 3-nerved from the base, varying from under  $\frac{1}{2}$ in. long in some specimens to above 1in. in others. Flowers 3 to 7 together in axillary cymes almost reduced to sessile clusters, the 3 or 4 external bracts shortly united at the base. Perianth-lobes usually 4 but sometimes 3 only. Fruiting perianth ovoid, that of the central hermaphrodite flower, although enclosing a perfect nut, often remaining unchanged and scarcely above  $\frac{1}{2}$  line long, those of the lateral female flowers more or less enlarged, sometimes  $\frac{3}{4}$  to 1 line long. Style scarcely any besides the dense stigmatic oblong tuft of hairs.—Hook. f. *Fl. Tasm.* i. 344; *Wedd. in DC. Prod.* xvi. i. 235<sup>46</sup>; *P. squalida*, Hook. f. in Hook. *Lond. Journ.* vi. 285; *Freirea australis*, Nees in *Pl. Preiss.* i. 638.

Hab.: Brisbane River, Darebin Creek and Buchan River, *F. v. Mueller*.

The species is spread over the tropical and temperate regions both of the New and the Old World, with the exception of Europe and North Asia.

## 18. AUSTRALINA, Gaudich.

(Australian).

Flowers monœcious, in the same or different axillary clusters, the males few together (1 to 5) sessile on a very short common peduncle, the females sessile or on very short pedicels. Male perianth irregularly bilabiate, the outer lip inflexed in the bud. Stamen 1, without any rudimentary pistil. Female perianth ovoid-tubular, obscurely 5-toothed. Ovary enclosed in the perianth but free, with a linear style villous especially on one side and persistent. Nut enclosed in the persistent perianth.—Diffuse or prostrate branching perennial herbs, with the habit of *Parietaria*. Leaves petiolate, alternate or rarely opposite, crenate or obtusely-toothed, membranous, 3-nerved. Stipules small.

Besides Australia, this genus is met with also in New Zealand and tropical Africa.

1. ***A. Muelleri*** (after Baron Mueller), *Wedd. Monogr. Urt.* 545; and in *DC. Prod.* xvi. i. 235<sup>40</sup>; *Benth. Fl. Austr.* vi. 189. Plant, creeping at the base, with ascending or erect stems of 6in. to 1ft., a few of the lower leaves sometimes small and orbicular, but those of the flowering stems always ovate or ovate-lanceolate, obtuse or almost acute, coarsely crenate-toothed, 1 to 1 $\frac{1}{2}$ in. long. Male peduncles short, bearing 2 to 4 flowers, all sessile in a whorl so as to resemble a single flower, the perianth green and hirsute. Female flowers in dense sessile clusters, often numerous, in separate axils or on separate plants from the males, or rarely 1 or 2 in the male axils. Fruiting perianth  $\frac{1}{2}$  to  $\frac{3}{4}$  line long.—*Urtica Tasmanica*, *F. v. M. First Gen. Rep.* 18 (as to the Victorian plant).

Hab.: Given as a Queensland by *F. v. M.*

ORDER CXX. CASUARINÆ.

Flowers unisexual, the males in cylindrical spikes, the females in globular or ovoid spikes or cones, both sexes sessile and solitary in the axils of whorled bracts, the bracts of each whorl united into a toothed sheath enclosing the base of the whorl of flowers, each flower within 2 small persistent bracteoles placed right and left. Male flower: Perianth of 1 or 2 (anterior and posterior) concave or hood-shaped segments, breaking off at their narrow base as they are forced off by the development of the stamen. Stamen 1, the filament folded in the bud, erect and exserted from the sheath of bracts when fully out. Anther with 2 large distinct cells, placed back to back, and opening in 2 valves. Female flower: Perianth none. Ovary minute, 1-celled. Style very shortly entire, with 2 long filiform stigmatic branches. Ovules 2, collateral, semi-anatropous, laterally attached above the base of the cell. Fruit a globular ovoid or cylindrical compact cone, formed of the enlarged thickened more or less woody bracts and bracteoles, the bracteoles closed against each other over the unripe nut, often protruding beyond the bracts, and opening as 2 valves when ripe. Nut much compressed laterally, smooth and shining, produced at the apex into a membranous often transparent wing, traversed longitudinally by an opaque nerve (the base of the style). Seeds solitary, erect, laterally attached by a funicle showing at its apex the second abortive ovule; testa membranous; no albumen; embryo with 2 large flattened cotyledons and a small superior radicle. —Trees or shrubs, with leafless wiry or rigid erect or pendulous branches and usually numerous deciduous verticillate branchlets, often articulate at the nodes. Leaves replaced by very small scales in whorls of 4 to 16 often united at the base, their midribs decurrent to the next node forming so many ribs or angles to the internode; the scales of each node alternating with those of the nodes immediately below and above, so that when the internodes are very short (as in the inflorescences), then the bracts, axillary flowers, &c., are superposed in twice as many series as there are parts of each whorl. Male spikes terminating deciduous branchlets, or almost sessile along the permanent branches, the female cones usually sessile or only shortly pedunculate, but in both sexes there are always 1, 2 or more barren internodes and sheaths below the flowering ones. The number of parts of each whorl, whether on the branches, branchlets, spikes, or cones, are the same in the same plant, or rarely fewer on the weaker branches and branchlets than on the stronger ones. Anthers and style-branches usually purple or red, the latter elegantly fringing the female flower-cones.

The Order consists but of a single genus, chiefly Australian, but extending also over tropical Asia from East Africa to the Indian Archipelago and South Pacific Islands.

1. CASUARINA, Linn.

(Pendent branchlets resembling the feathers of the Cassowary.)

Character and distribution the same as those of the Order.

SECT. I. *Leiopitys*.—Whorl 7-16-merous, rarely 6-merous. Cone-valves usually prominent, thickened and keeled or angled on the back or with a short broad and smooth dorsal protuberance.

Whorls usually 10-12-merous (varying 9 to 16). Cone-valves thickened into a dorsal angle or keel.

Branches terete. Male-spikes not exceeding lin. Cones about ½ in. diameter, the cones villous on the back . . . . . 1. *C. glauca*.

Whorls usually 7-merous (varying 6 to 8). Cone-valves usually with a short transverse dorsal appendage sometimes very short or obsolete. Male spikes cylindrical imbricate. Cones nearly globular, the valves pubescent on the back . . . . . 2. *C. equisetifolia*.

Male-spikes moniliform. Cone usually oblong or small, the valves glabrous. Branchlets very slender.

Cones ¾ in. diameter or more, usually oblong . . . . . 3. *C. suberosa*

- Cones not above 4 lines diameter, globular . . . . . 4. *C. Cunninghamiana*.  
 Cones, 9 to 11 lines, almost globular. Bark thready . . . . . 5. *C. inophloia*.  
 Shrub (always?) diœcious. Cone-valves with the dorsal protuberance  
 short and smooth . . . . . 6. *C. distyla*.

SECT. 2. **Trachypitys**.—Whorls 4-5-merous, rarely 6-merous. Cone-valves rarely prominent beyond the thick broad obtuse dorsal protuberances, which are very rugose or divided into tubercles (nearly smooth in *C. Decaisneana*.)

Male-spikes and branchlets slender.

Cones more or less villous.

Sheath-teeth very short. Cone-valves slightly protruding beyond several small dorsal tubercles.

Branchlets nearly terete. Sheath-teeth of the male spikes scarcely acute . . . . . 7. *C. torulosa*.

Sheath-teeth 1 to 3 lines long. Cone-valves not exceeding the single large dorsal tubercle . . . . . 8. *C. Decaisneana*.

1. **C. glauca** (glaucous), *Sieb. in Spreng. Syst.* iii. 803; *Benth. Fl. Austr.* vi. 196. Swamp Oak. "Billa," Stradbroke Island, *Watkins*. "Woongul," St. George, *Wedd*. A tree, often attaining a considerable size. Whorls usually 10 to 12-merous, but the parts varying from 9 to 16, the sheath-teeth short on the deciduous branchlets, more acuminate on the permanent branches. Male spikes rather dense,  $\frac{1}{2}$  to 1 in. long, the sheath-teeth sometimes ciliate. Cones usually subglobose, flat-topped, rarely much above  $\frac{1}{2}$  in. diameter, the valves very prominent, often pubescent on the back, thickened into a smooth dorsal prominent angle or keel. In some forms, including Sieber's typical specimens, the cones are smaller, with very numerous rather smaller valves very regularly arranged.—*Miq. Rev. Cas.* 76, t. 11, and in *DC. Prod.* xvi. ii. 334; *C. torulosa*, *Miq. Rev. Cas.* 75, t. 11 B, but not of *Ait*.

Hab.: Brisbane River, Moreton Bay, and between Mackenzie and Suttor Rivers, *F. v. Mueller*; Rockhampton, *O'Shanesy*.

Wood of a red colour, beautifully marked, close-grained, hard and tough; useful in cabinet work; used for shingles and staves.—*Bailey's Cat. Ql. Woods*, No. 401.

The variety with cones resembling those of *C. equisetifolia* mentioned by *Benth. Fl. Austr.* vi. 196, I have specimens from St. George, *J. Wedd*, but they are not complete enough for describing.

2. **C. equisetifolia** (Equisetum-leaved), *Forst. Char. Gen.* 103, t. 52; *Benth. Fl. Austr.* vi. 197. A tree attaining a large size, the principal branches elongated and spreading or ascending, the smaller ones often pendulous, glabrous or tomentose when young. Whorls usually 7-merous, but the parts varying from 6 to 8. Sheath-teeth short and acute or sometimes fine-pointed on the persistent branches, the internodes rarely exceeding  $\frac{1}{2}$  in. the ribs rather prominent. Flowers diœcious, male spikes about  $\frac{3}{4}$  in. long, terminating slender deciduous branchlets, the sheaths of the spikes closely imbricate. Fruit-cones very shortly pedunculate on the persistent branches, globular, usually about  $\frac{1}{2}$  in. diameter, the valves protruding about 1 line, broadly ovate, obtuse, pubescent outside, without any or with a very obscure dorsal protuberance at the base.—*Miq. Rev. Cas.* 43, t. 5, and in *DC. Prod.* xvi. ii. 338, with the several (non-Australian) synonyms there given.

Hab.: Islands of the Gulf of Carpentaria, *Henne*; Northumberland Islands, *R. Brown*; Cape Bedford and Islands off Cape Flattery, *F. v. Mueller*; Entrance Island, Endeavour Straits, *Leichhardt*; Percy Islands, *Walter*; Rockingham and Edgecombe Bays, *Dallachy*; Port Denison, *Fitzalan*.

Wood of a dark-colour, coarse-grained, but nicely marked.—*Bailey's Cat. Ql. Woods*, No. 401A. Var. *incana*. "Wunna Wunnarumpin," Stradbroke Islands, *Watkins*. Young shoots very tomentose. *C. incana*, *A. Cunn. Herb*.

Hab.: Islands and coastal lands.

Wood of a light-brown colour, prettily marked, close-grained and very tough.—*Bailey's Cat. Ql. Woods*, No. 402.

The species is widely spread over East India and the Archipelago.



3. **C. suberosa** (corky), *Ott. and Dietr.*; *Miq. Rev. Cas.* 54, t. 6, and in *DC. Prod.* xvii. ii. 337; *Benth. Fl. Austr.* vi. 127. A tree of 30 to 40ft., the specimens closely resembling those of *C. equisetifolia*, the whorls similarly 7-merous or the parts varying from 6 to 8, and often monœcious like that species. Branches seldom if ever corky, the branchlets usually slender and quite glabrous. Male spikes much more slender and interrupted, the short sheaths not overlapping those next above. Fruit-cones more frequently tending to become ovoid or oblong, truncate at both ends, the valves more prominent, glabrous or nearly so, with usually a short broad thick but almost scale-like transverse dorsal protuberance at the base rarely extending nearly to the apex of the valve.—*Hook. f. Fl. Tasm.* i. 348, t. 96; *C. leptoclada*, *Miq. Rev. Cas.* 41, t. 4, and in *DC. Prod.* xvi. ii. 339; *C. masti*, *F. v. M.* in *Miq. Stirp. Nov. Holl.* Muell. 2.

*Hab.*: Percy Island, *A. Cunningham*, *Denham*; Brisbane River and Moreton Island, *F. v. Mueller*; Stradbroke Island, *Fraser*; Ipswich, *Nernst*; Rockhampton, *O'Shanesy*; Rockingham Bay, *Dalichy*; Cape York, *W. Hill*.

Wood dark-brown, prettily marked, coarse in grain, hard and tough; used for bullock-yokes and hurdles. In New South Wales used for mauls, shingles, staves, etc.—*Bailey's Cat. Ql. Woods*, No. 403.

4. **C. Cunninghamiana** (after *A. Cunningham*), *Miq. Rev. Cas.* 56, t. 6, and in *DC. Prod.* xvi. ii. 335; *Benth. Fl. Austr.* vi. 198. A tree with slender branches, closely resembling *C. equisetifolia* and *C. suberosa* in the aspect of the specimens and number of parts of the whorls, and possibly a variety of one or the other, but the fruiting-cones are much smaller, scarcely exceeding 4 lines in diameter, globular, very regular, with prominent valves. Male spikes (in *Herb. R. Brown*) slender like those of *C. suberosa* but more dense.

*Hab.*: Woods of the London Exhibition, 1862, *Hill*, n. 9; Gilbert River, *Daintree*; an inland scrub tree.

Wood dark-coloured, close grained and prettily marked —*Bailey's Cat. Ql. Woods*, No. 404.

5. **C. inophloia** (thready-bark), *F. v. M. and Bail. in Melb. Chemist and Druggist*, April, 1882. A small tree with a loose fibrous bark, disintegrating in long, narrow, flat, particles. Branchlets very thin, slightly streaked, very slightly downy. Whorls 7 to 9-merous, the sheath-teeth acute. Male and female inflorescence resembling that of *C. suberosa* having the same long slender male spikes and rich purplish-red, female heads. Cones, 9 to 11 lines long, 7 to 8 lines broad, on peduncles of about 6 lines, almost globular, depressed at the top, axis densely beset with straight pale-brown hairs; bracts obliterated; bracteolar valves of the fruitlets rather small, semi-ovate, nearly blunt, shortly exerted, enlarged by a very thick dorsal rather angular appendage, and of nearly as much protrusion as that of the valves themselves; appendages and valves very slightly downy; nutlets (when young) pale, the terminating membrane (then) about as long as the nucleus.

*Hab.*: Generally met with on sandy poor spots in the southern parts of the colony.

Probably the species spoken of by *Dr. Leichardt* under the name of *C. villosa*, and seen by him on Robinson's Creek at Expedition Range, *Journ. to Port Essington*, page 49.

Wood very beautiful, of a reddish colour but with numerous dark-marks; the grain close, a very desirable wood for cabinet-work.—*Bailey's Cat. Ql. Woods*, No. 405.

6. **C. distyla** (styles two), *Vent. Jard. Cels.* t. 62; *Benth. Fl. Austr.* vi. 198. A diœcious shrub, usually only 2 or 3ft. high, with erect or spreading branches, but in favourable situations attaining the size of a small tree, the branches glabrous or more or less pubescent. Whorls usually 7-merous, but the parts varying from 6 to 8, the teeth short. Male spikes on deciduous branchlets of 1 to 3in. or almost sessile on the persistent branches, 1 to 1½ or rarely 2in. long, more or less moniliform, the sheaths not overlapping and the teeth not at all or scarcely acuminate. Fruit-cones sessile or nearly so, oblong, from under ¾ to above 1in. long, the broad very obtuse almost truncate valves slightly prominent

though considerably longer than the dorsal protuberance, which is broad entire and smooth.—Miq. Rev. Cas. 57, t. 7; Hook. f. Fl. Tasm. i. 348; *C. stricta*, Miq. in DC. Prod. xvi. ii. 336, not of Aiton; *C. Muelleriana*, Miq. in Ned. Kruidk. Arch. iv. 99; *C. rigida*, Miq. in DC. Prod. xvi. ii. 337, as to the Tasmanian specimens.

Hab.: Macpherson's Range, *H. Tryon*.

7. ***C. torulosa*** (slightly uneven), *Ait. Hort. Kew.* iii. 320; *Benth. Fl. Austr.* vi. 200. Forest Oak. "Boorooda," Brisbane, *Petrie*. Koondeeba, Stradbroke Island, *Watkins*. "Porotha," Bundaberg, *Keys*. "Gournah," Taromeo, *Shirley*. A small tree, dicecious or sometimes monœcious, with more slender branchlets than any other species except some forms of *C. suberosa*, the ribs scarcely prominent. Whorls 4-merous, the sheath-teeth very short. Male spikes very slender,  $\frac{1}{2}$  to lin. long, terminating deciduous branchlets, compact although the short sheaths scarcely overlap. Cones nearly globular but flat-topped, about  $\frac{3}{4}$  in. diameter, the valves very woody, broad, slightly protruding, villous on the dorsal protuberance divided into numerous small nearly equal tubercles.—Miq. in DC. Prod. xvi. ii. 341, but not of his Rev. Cas; *C. tenuissima*, Sieb. in Spreng. Syst. iii. 804, Miq. Rev. Cas. 29, t. 4.

Hab.: Brisbane River, Moreton Bay and Burnett River, *F. v. Mueller*; Stradbroke Island, *Fraser*; Berseker Range, *O'Shanesy* (with very corky bark); Rockhampton, *Thozet*; Rockingham Bay, *Dallachy*; Mount Elliott, *Fitzalan*.

Wood of a red colour, very nicely marked, close in the grain and hard; used for bullock-yokes.—*Bailey's Cat. Ql. Woods*, No. 406.

8. ***C. Decaisneana*** (after J. Decaisne), *F. v. M. Fragm.* i. 61; *Benth. Fl. Austr.* vi. 200. A tree of 30 to 40ft., the branches terete, rigid, scarcely ribbed, the internodes above  $\frac{1}{2}$  in. long. Whorls 4-merous, the sheath-teeth somewhat paleaceous, lanceolate, fine-pointed, 1 to 2 lines long, or on the young permanent branches often 3 lines, erect and never recurved. Male spikes unknown. Cones ovoid, very shortly pedunculate,  $1\frac{1}{2}$  in. long and 1 in. diameter, very woody, tomentose-villous, the thick valves not protruding beyond the broad thick undivided dorsal tubercles.—Miq. in DC. Prod. xvi. ii. 340.

Hab.: On the border of South Australia, *F. v. M.*

## ORDER CXXI. CUPULIFERÆ.

Flowers monœcious. Males in spikes or catkins. Perianth of 1 or several usually unequal scales, segments or lobes. Stamens 1 or more, with or without a central rudimentary pistil; filaments slender; anthers 2-celled. Female flowers solitary or few together, surrounded by scales or bracts either remaining free or more frequently united in an entire or lobed involucre often enclosing the fruits, and sometimes growing out into setæ or prickles. Perianth-tube adnate to the ovary, the limb usually 6-toothed. Ovary inferior, 1-celled or more or less perfectly 3 or more celled. Styles as many as cells, simple, stigmatic in the upper portion. Ovules 1 or 2 in each cell, erect or pendulous. Fruit consisting of one or more nuts placed upon, or more or less enclosed in, the usually enlarged persistent involucre. Seeds usually solitary in each nut, without albumen. Embryo various, the radicle usually superior. Trees or shrubs. Leaves alternate, penniveined, with or without stipules. Male catkins usually falling off entire.

The Order is almost limited to the northern hemisphere in the New as well as the Old World.

## 1. FAGUS, Linn.

(So called from *phago* to eat; because the nuts were used as food in the early ages.)

Male flowers in globular pendulous catkins within small scales, falling off very early, or rarely solitary. Perianths shortly stalked within each catkin-scale campanulate, 4 to 6-lobed, containing 8 to 16 stamens, with protruding filaments. Female catkins globular, almost sessile, linear, with numerous closely-packed filiform inner scales, the scales, all empty except the innermost and forming an involucre round 2 to 4 sessile flowers in the centre of the catkin. Perianth-limb of 4 or 5 short lobes. Ovary 3-celled, with 2 pendulous ovules in each cell. Styles 3. Nuts 2 to 4, angled or winged, enclosed in a hard prickly involucre, composed of the combined scales of the catkin, and opening in 4 valves.—Trees or rarely shrubs. Leaves alternate, coriaceous, penniveined, frequently plicate and toothed. Stipules usually deciduous. Male catkins usually in the lower axils, the females in the upper ones.

1. **F. Moorei** (after C. Moore), *F. v. M. Fragm.* v. 109; *Benth. Fl. Austr.* vi. 211. A tree attaining the height of 150ft. Leaves 1 to 2in. long on the barren shoots,  $\frac{3}{4}$  to lin. on the flowering branches, ovate or ovate-lanceolate, crenate, acute or a few only of the lowest obtuse, flat and coriaceous. Male catkins in the lower axils on short recurved peduncles. Involucre irregularly 8 to 12-lobed, and mostly splitting. Stamens about 20. Female catkins in the upper axils on erect short peduncles, ovoid, glandular, containing 3 flowers each. Ovary of the 2 outer flowers 3-angled and 3-winged, of the inner flower flattened and 2-winged. Fruiting involucre about 5 lines long.—*F. Carronii*, C. Moore.

Hab.: On the high mountains towards Tamrookam. *R. Collins.*

## ORDER CXXII. CERATOPHYLLÆ.

Flowers minute, axillary, sessile. Male solitary; perianth of 6 to 12 narrow subvalvate 2-fid segments. Stamens 20 to 30, filaments very short; anthers erect, extrorse, connective at the top, truncate or 2-toothed. Female perianth like the male. Ovary sessile, ovoid, 1-celled; style subulate, stigmatic on one side; ovule solitary, pendulous, orthotropous. Fruit a small coriaceous ovoid or ellipsoid somewhat compressed nut terminating in an elongated subulate style, and with a styliform spur projecting from above the base on either side. Seed exalbuminous; embryo straight, cotyledons thick, radicle very short, inferior, plumule many leaved.—Submerged monœcious slender fragile branching herbs. Leaves whorled, dichotomously cleft into filiform toothletted lobes. Stipules none.

Consists of one very variable species.

## 1. CERATOPHYLLUM, Linn.

(The leaf-divisions horn-like.)

Characters of the Order.

1. **C. demersum** (under water), *Linn.*; *DC. Prod.* iii. 73; *Benth. Fl. Austr.* ii. 491. A glabrous perennial floating like the submerged species of *Myriophyllum*, and the leaves whorled in the same manner, but dichotomously, not pinnately, divided in linear segments, either fine and subulate or rather broader and denticulate. Flowers small, sessile in the axils. Anthers of the males oblong, mucronate. Fruit in the Australian specimens ovoid, slightly com-

pressed 2 to 3 lines long, more or less covered with minute tubercles, the margin not winged, but bearing below the middle 2 to 4 reflexed prickles, very variable in length.—*C. submersum*, Linn. DC. l.c.

Hab.: Southern localities, common in most still waters.

### ORDER CXXIII. CONIFERÆ.

Flowers monœcious or diœcious, the males in deciduous catkins, the females in cones or solitary, all without any perianth. Male catkins consisting of several usually numerous scale-like stamens, opposite and decussate, or in alternating whorls, or in dense spires imbricated round a common axis, each stamen consisting of a connective more or less contracted into a stipes at the base and dilated at the apex; anther-cells 2 or more, adnate to the stipes or pendulous from under the scale-like apex, opening longitudinally in 2 valves. Female cones consisting either of opposite verticillate or spirally arranged imbricate scales, with 12 or more erect or inflexed naked orthotropous or anatropous ovules (erect or recurved pistil according to some theorists) within each scale; or of a fleshy cup or receptacle with 1 or 2 exserted ovules (or pistils). Fruit (or syncarp according to some) the more or less enlarged and hardened or succulent cone. Seeds (or fruits) often winged; testa (or pericarp) hard crustaceous or membranous; albumen fleshy; embryo in the axis, straight; with two or more cotyledons; radicle terete, often attached by a folded thread.—Trees or shrubs often resinous, the wood without medullary rays or vascular tissue proper; wood-cells studded with disks. Leaves sometimes reduced to small scales, opposite-whorled or spirally arranged or in genera not Australian alternate, and sometimes clustered 2 to 5 together in membranous sheaths. Male catkins solitary or clustered, terminal or rarely axillary, female cones usually lateral on short-peduncles or terminating reduced branchlets.

An extensive Order spread over nearly the whole globe, especially in the northern hemisphere, but within the tropics chiefly confined to mountainous regions. Of the four Queensland genera *Podocarpus*, extends northwards to Japan and to the West Indies, and with *Araucaria* is in South America. *Agathis* is in New Zealand and the Archipelago. *Callitris* extends to New Caledonia.

A.—Ovules erect.

TRIBE I. **Cupressinæ**.—Scales of the female cone opposite in several series. Ovules usually 2 or more on each scale. Leaves very short or subulate.

Leaves or scales in whorls of 3 or 4. Ovules numerous within each scale . . . 1. CALLITRIS.

B.—Ovules reversed:

TRIBE II. **Podocarpeæ**.—Scales of the female cone very few, spirally crowded, often fleshy. Ovale 1 or 2 under each scale.

Leaves alternate or opposite, usually distichous or flat, with a prominent midrib.

Ovules exserted from an oblong fleshy receptacle . . . . . 2. PODOCARPUS.

TRIBE III. **Araucariæ**.—Scales of female cone many, spirally arranged in several series, bract and ovuliferous scale confluent as one scale.

Leaves (rarely reduced to scales) spiral or scattered. Cone-scales flat, hardened at the apex. Seeds compressed, the outer integument appressed, often winged.

Male amenta dense, cylindrical. Anther-cells more than 5. Cones large.

Ovules 1 to each scale.

Seeds oblong, free from the scales, winged on one side . . . . . 3. AGATHIS.

Seeds obovate-oblong, adnate to the scale at the base, not winged . . . 4. ARAUCARIA.

#### 1. CALLITRIS, Vent.

(Supposed by some to be altered from *Kallistos*, most beautiful, by others from the scale-like leaves being arranged in threes.)

(Frenela, *Mirb.*, partly; *Leichhardtia*, *Sheph.*; *Octoclinis*, *F. v. M.*)

Flowers monœcious. Male amenta cylindrical oblong or ovoid, the stamens in whorls of 3 or rarely 4, imbricate in twice as many vertical rows, the scale-like

apex ovate orbicular or slightly peltate; anther-cells 2 to 4. Female amenta of 6 rarely 8 scales, more or less distinctly arranged at the time of flowering in 2 whorls without any enlarged outer empty scales. Ovules (or carpels) several within each scale, in 3 vertical series, sessile and erect. Fruiting-cone globular ovoid or pyramidal, the 6 rarely 8 scales enlarged and hardened, shortly united at the base, apparently engaged in a single whorl, and opening in as many valves, either all equal and strictly valvate, or three alternate ones smaller and sometimes overlapping the others on the margin. Fertile seeds usually few only in each cone, compressed, with a hardened integument, the margins produced into 2 unequal wings or rarely only 1 wing developed, or very rarely a third wing also prominent on one face, the abortive seeds mostly enlarged and very flat with winged margins; in some species there is a more or less prominent central columella usually 3-angular or 3-lobed, and sometimes apparently formed of abortive ovules. Cotyledons 2, rarely 3.—Trees or shrubs, with slender terete or 3 or rarely 4-angled branches. Leaves in whorls of 3 rarely 4, those of the young plants sometimes acicular though short, but generally reduced to minute acute scales, the decurrent midribs forming the angles of internodes as in *Casuarina*. Male amenta usually small, solitary or clustered at the ends of the branches, and rarely a few lateral ones. Female cones on short thick peduncles or branchlets, solitary or clustered, ripening usually the second year, and sometimes persisting many years after the seeds have fallen.

Australian species endemic.

In the Flora Australiensis the two species here given as *Callitris columellaris*, F. v. M. and *C. verrucosa*, R. Br. are placed as varieties of *C. robusta*, R. Br. Baron von Mueller in his publications gives specific rank to them but allows *C. robusta* to lapse. From a strictly botanical point of view I should be inclined to reduce the whole of the Queensland representatives of the genus to three species with varieties; but I consider the plan here adopted will be found to be the most convenient.

- Fruit-cones angular, the junction of the valves prominent. Cones pyramidal, acuminate, about 1in. long, 6 to 8-valved. Columella short, decurrent at the base and forked at the base of the larger valves. Leaves of young trees more or less acicular . . . . . 1 *C. Macleayana*.
- Fruit-cone globular, strictly valvate, the junction of the valves neither prominent nor furrowed, the smaller valves usually bearing minute dorsal points. Columella 3-angled, scarcely the height of the smaller valves. Internodes of this and the two following with very obtuse ribs. Cone-valves with the dorsal points absent or greatly reduced. Columella rather slender and bluntly angular and often nearly the height of the smaller valves . . . . . 2 *C. robusta*.
- Fruit-cones verrucose or rugose outside. Columella broadly angular almost 3-winged, scarcely as high as the smaller valves . . . . . 3 *C. columellaris*.
- Internodes angular. Cone-valves with minute dorsal points. Columella very short pyramidal the angles gibbous at the base . . . . . 4 *C. verrucosa*.
- Fruit-cones globular or oblong, more or less furrowed at the junction of the valves, the three smaller valves often slightly overlapping the others. Cones globular, the inner larger valves dilated at the apex, with the dorsal point near the centre. Columella shorter than the smaller valves, bearing 3 thick broadly divaricate wings . . . . . 5 *C. Muelleri*.
- Cones ovoid or oblong, the inner larger valves not much dilated, with the small dorsal point near the end. Columella like the last or taller, and the wings somewhat obscure . . . . . 6 *C. cupressiformis*.
- Cones ovoid or oblong, the inner larger valves not much dilated, with the small dorsal point near the end. Columella like the last or taller, and the wings somewhat obscure . . . . . 7 *C. calcarata*.

1. **C. Macleayana** (after Sir William Macleay), *F. v. M. in Rep. Burd. Exp.* Stringy-bark Pine. A tall tree, trunk 2ft. diameter, branches spreading. Leaves on the young trees in whorls of 4 or even more, rigid spreading linear-triquetrous, pungent-pointed, 2 to 4 lines, those on the branchlets of the old trees reduced to appressed teeth or scales and always in whorls of 3; the branchlets very numerous, slender, the angles of the internodes very prominent. Male amenta 2 to 4 lines long (*Benth*), unknown in *C. Parlatorei*, F. v. M. Fruit-cones sessile or on short thick peduncles, ovoid-pyramidal, acuminate, very thick at

the base,  $1\frac{1}{4}$  in. high, the base  $1\frac{1}{4}$  in. diameter, valves usually 6, said to be sometimes 8, 3 large, 3 somewhat smaller, with a dorsal point near the end, smooth and glossy inside and smoothish outside, with prominent angles at the junction of the valves. Columella short, spreading at the base and forked around the large valves of the cone. Seed including wing about 7 lines long, solitary, decurrent nearly to the base of seed.—*Octoclinis Macleayana*, F. v. M. in Trans. Phil. Inst. Vict. ii. 22, with a plate; *Leichhardtia Macleayana*, Sheph. Cat. Pl. Cult. Syd. 1851, 15; *Frenela Macleayana*, Parlat. in DC. Prod. xvi. ii. 446; Benth. Fl. Austr. vi. 235; and *F. Parlatoresi*, F. v. M. Fragm. v. 186; Benth. l.c.; Parlat. in DC. Prod. xvi. ii. 447; *Callitris Parlatoresi*, F. v. M. Fragm. v. 186.

Hab.: Found on ranges from the border of New South Wales to Trinity Bay.

Wood fragrant, of a light straw colour, close-grained, soft and easily worked; suitable for cabinet work and joinery.—*Bailey's Cat. Ql. Woods*, No. 407.

2. **C. robusta** (robust), *R. Br.*; *Benth Fl. Austr.* vi. 237. Cypress Pine. A tree of considerable size, often exceeding 90ft., sometimes reduced to a tall shrub, the crowded branchlets short and erect, often slender, the internodes terete or with very obtuse angles, the scales or teeth small and acute. Male amenta solitary or in threes, 2 to 4 lines long, slender and loose. Fruit-cones solitary or few together, nearly globular, and usually about 1 in. diameter, neither angled nor furrowed, the valves 6, alternately about  $\frac{1}{2}$  shorter, strictly valvate, smooth or more or less wrinkled on the back, with minute dorsal point on the smaller valves. Seeds usually 2-winged, the central columella nearly the height of the smaller valves.

Hab.: This is the species most frequently met with inland.

Wood fragrant, varies much as to colour from a light to a dark brown, with often pinkish longitudinal streaks, often full of beautiful markings, very durable; in use for piles and sheathing of boats, as it resists to a great degree the attacks of the teredo; an excellent cabinet-wood.—*Bailey's Cat. Ql. Woods*, No. 408.

3. **C. columellaris** (central columella prominent), *F. v. M. Fragm.* v. 198. "Pooragri," Brisbane, "Coolooli," Wide Bay, *Pettigrew*. A tree often exceeding 90ft. in height, or sometimes short with a dense wide spreading head. Branchlets slender the internodes with very obtuse angles, the scales or teeth small and acute. Male amenta 3 to 5, usually slender, 3 lines long,  $\frac{1}{2}$  line diameter. Fruit-cones solitary or few together nearly globular,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. in diameter, valves 6, unequal, the dorsal point absent or speck-like, central. Columella nearly as high as the valves, triquetrous, sometimes tapering upwards but not always. Seeds usually 2-winged.—*Frenela microcarpa*, A. Cunn. Herb. (Benth), *F. Moorei*, Parlat. in DC. Prod. xvi. ii. 449; *F. robusta*, var. *microcarpa*, Benth. Fl. Austr. vi. 237.

Hab.: Moreton Island, *C. Moore*; Frasers Island, *Hon. Miss Lovell*; Walsh River, *T. Barclay-Millar*; Yandilla, *F. Struwer*; Dawson River, *Dr. Joseph Bancroft*.

Wood of a dark colour, close-grained, fragrant, and durable; used for piles of wharves, sheathing of boats, resisting attacks of the teredo; also an excellent cabinet-wood.—*Bailey's Cat. Ql. Woods*, No. 408a.

4. **C. verrucosa** (warted), *R. Br. in Mein. du Mus. Par.* xiii. 74. A tall erect usually glaucous tree, the habit and branchlets the same as *C. robusta*. Male amenta minute, 3 to 5 in a cluster. Fruit-cones globular, about  $\frac{3}{4}$  in. diameter more or less verrucose or rugose on the back, neither angled nor furrowed. Columella about as high as the smaller valves, broadly angled almost 3-winged.—*Frenela verrucosa*, A. Cunn.; *F. robusta* var. *verrucosa*, Benth. Fl. Austr. vi. 237.

Hab.: An inland species often conspicuous from its glaucous colour.

5. **C. Muelleri** (after Baron von Mueller), *Benth. and Hook. Gen. Pl.* iii. 424. A tree attaining 20 to 30ft., internodes angular. Male amenta minute usually 3 together, branches stout. Fruit-cones like those of *C. robusta*, globular,

$\frac{3}{4}$  to lin. diameter, neither angled nor furrowed, the valves 6, very thick, strictly valvate, rugose outside, with a minute dorsal point below the summit, the smaller valves about half the breadth of the larger ones though not very much shorter. Columella very short pyramidal, the angles gibbous at the base.—*Frenela Muelleri*, Parlat.; Benth. Fl. Austr. vi. 237; *F. fruticosa*, A. Cunn. Herb., but probably not *Callitris fruticosa*, R. Br.; Parlat. in DC. Prod. xvi. ii. 450.

Hab.: Inland southern localities.

6. **C. cupressiformis** (the cone cypress-like), Vent. "Brorogorre," Stradbroke Island, *Watkins*. A tree 20 to 25ft. high or sometimes double that height, the branches rather slender, often drooping, angular when young. Male amenta solitary or 3 together, small or loose. Fruit-cones often clustered on short branches, globular, not exceeding  $\frac{1}{2}$  in. diameter in the typical forms; valves 6, alternately smaller, the larger ones dilated into a broadly rhomboidal apex with a short conical protuberance about the centre and usually rugose, the alternate ones much shorter, with a broad base and slightly overlapping the others on the margin, at least when young, the unopen cone furrowed at the junctions. Columella shorter than the smaller valves with thick, broad divaricate wings. Seeds 2-winged, the breadth of the wings exceedingly variable.—*Callitris rhomboidea*, R. Br. in Rich. Conif. 47, t. 18; *Frenela Ventenatii*, Mirb. in Mem. Mus. Par. xiii. 74; *Thuya australis*, Poir. Dict. Suppl. v. 302; *Cupressus australis*, Desf. Cat. Hort. Par. ed. 3, 355, not of Persoon; *Frenela australis*, Endl. Syn. Conif. 37, not of Brown; *Callitris arenosa*, Sweet. Hort. Brit. 473; *Frenela arenosa*, A. Cunn.; Endl. Syn. Conif. 38; Parlat. in DC. Prod. xvi. ii. 451; *F. triquetra*, Spach, Suit. Buff. xi. 345; Endl. Syn. Conif. 36; *F. attenuata*, A. Cunn. Herb.; *F. rhomboidea*, Endl. Syn. Conif.; Benth. Fl. Austr. vi. 237; Parlat. in DC. Prod. xvi. ii. 447; Hook. f. Fl. Tasm. i. 352.

Hab.: Moreton Island, *F. v. Mueller*; Stradbroke Island, and several southern localities inland.

Wood of a light colour, close-grained and durable. A good cabinet work.—*Bailey's Cat. Ql. Woods*, No. 408c.

7. **C. calcarata** (spurred), R. Br. *Mirb. in Mem. Mus. Par. xiii. 74*. A tree of 60 to 100ft., closely resembling *C. cupressiformis*, as to its angular branchlets and small scales or teeth, except in the young plant which has sometimes acicular leaves like those of *C. Macleayana*. Male amenta usually solitary, short and compact. Fruit-cones usually clustered on short branches and of the size of those of *C. cupressiformis*, about  $\frac{1}{2}$  in. diameter, the 3 larger valves but little or not at all dilated upwards, the dorsal point very near the end, smooth or scarcely rugose, the three smaller ones usually much narrower and often slightly overlapping, and the cone furrowed at the junctions before it opens. Seeds varying in the breadth of the wings.—*Frenela fruticosa*, Endl. Syn. Conif. 36 (*Parlatore*); *F. pyramidalis*, A. Cunn.; Sweet. Hort. Brit. 473; *F. calcarata*, A. Cunn.; *F. Endlicheri*, Parlat. in DC. Prod. xvi. ii. 449; Benth. Fl. Austr. vi. 238.

Hab.: Wide Bay, *Bidwill*; Mount Perry, *J. Keys*.

Wood of a light colour, fine in the grain and prettily marked; a useful wood for joinery as well as cabinet-making.—*Bailey's Cat. Ql. Woods*, No. 408d.

Yields a transparent fragrant resin somewhat resembling the Sandarac of commerce, could be used as a varnish.—*Lauterer*.

## 2. PODOCARPUS, L'Her.

(Referring to the fleshy foot-stalk of fruit.)

Flowers dioecious or rarely monœcious. Male amenta cylindrical. Stamens numerous, slightly contracted at the base, the scale-like apices closely imbricate; anther-cells 2. Female amenta of 2 to 4 bracts or scales more or less succulent

and united with the rhachis in an oblong receptacle, unequally 2 or 4-toothed at the apex. Ovules 1 or 2, exserted, reversed and adnate to an erect stipe from within the larger teeth or bracts of the receptacle. Seeds drupaceous, the nucleus enclosed in a double integument, the outer one succulent, the inner one long. Embryo with 2 short cotyledons and an inferior radicle.—Trees or shrubs. Leaves alternate or rarely opposite, usually distichous and flat, with a prominent midrib. Buds scaly. Amenta axillary or terminal, solitary or several together, sessile or shortly racemose.

The genus is dispersed over the tropical and subtropical regions of the Old World, from South Africa and New Zealand to Japan, and over the whole of South America. The Australian species are all endemic.—*Benth.*

1. ***P. elata*** (tall), *R. Br.*; *Mirb. in Mem. Mus. Par.* xiii. 75; *Benth. Fl. Austr.* vi. 247. She Pine. "Kidneywallum," Mooloolah, *Pettigrew*. "Daalgaal," Barron River, *E. Cowley*. A tree of 50 to 100ft. Leaves oblong-linear or broadly linear-lanceolate, very variable in size,  $1\frac{1}{2}$  to 2in. long and  $\frac{1}{2}$ in. wide and quite straight, or 3 to 6in. long and 4 to 6 lines broad, straight or slightly falcate, the midrib prominent, the petiole very short. Male amenta clustered 2 or 3 together, sessile, 1 to  $1\frac{1}{2}$ in. long, surrounded by several short scales or bracts. Female peduncles 2 to 3 lines long, solitary in the axils of the lower leaves or more frequently of small bracts at the base of the year's branches. Fruiting receptacle oblong, 6 to 12 lines long, with usually only one seed, ovoid or globular, 4 to 6 lines diameter.—*Parlat. in DC. Prod.* xvi. ii. 517; *P. ensifolia*, *R. Br.*; *Mirb. l.c.*; *Parlat. l.c.*; *P. falcata*, *A. Cunn. Herb.*

Hab.: Coastal scrubs.

Wood of a light-yellow colour, close in the grain, strong and durable; used for piles and boat-sheathing, as it fairly resists the attacks of the teredo; excellent for spars and masts of vessels.—*Bailey's Cat. Ql. Woods*, No. 409.

2. ***P. pedunculata*** (male amenta pedunculate), *Bail. Ql. Ag. Jl. Oct.* 1899. Black Pine. "Chupolla," Atherton, *Roth*. A tall tree with very dark bark. Leaves oblong-linear or linear-lanceolate, resembling those of *P. elata*, *R. Br.*; only those of the young plants usually much longer; those on the old trees indistinguishable from that species. Male amenta usually 3, sessile at the end of a peduncle, shorter, and the basal scales or bracts absent or not prominent as in *P. elata*, *R. Br.* Fruit crimson about the size of a pigeon's egg, solitary or in pairs, on the top of an angular rather slender peduncle. Peduncle about  $1\frac{1}{4}$ in. long, near the end of the branchlets, pedicels narrow angular only a few lines long.

Hab.: Herberton District, *J. F. Bailey*.

This species somewhat resembles in the male amenta *P. amara*, Blume, a species of Java,

### 3. AGATHIS, Salisb.

(Referring to the flowers being clustered).

(*Dammara*, *Rumph.*)

Flowers diœcious, the amenta sessile or nearly so. Male amenta axillary or lateral, cylindrical, surrounded by a few imbricate scales at the base; stamens numerous, in close spires, the imbricate scale-like apices thick, clavate or orbicular and slightly incurved. Anther-cells 5 to 16, cylindrical, pendulous, in 1 or 2 transverse rows. Female amenta, lateral or terminal, the scales numerous, with 1 reversed ovule within each. Fruit-cones large, ovoid-globular, the scales closely imbricate, deciduous, flattened, very broadly cuneate, the margins more or less attenuated into wings, the apex slightly thickened, coriaceous or scarcely



woody. Seeds oblong or cuneate, free, flattened, truncate or emarginate at the end, one margin produced into a horizontal erect or decurved wing.—Trees with spirally arranged flat leaves.

Besides the Australian species which are endemic, there are one from East India and the Archipelago, one from New Zealand, and two or perhaps three from New Caledonia.

Leaves ovate-lanceolate, 2 to 4in. long. Fruiting-cones 4 to 5in. long, 2½ to 3½in. broad. Scales broad as long . . . . . 1. *A. robusta*.  
 Leaves much smaller never lanceolate. Fruiting-cones small and narrow  
 Scales numerous . . . . . 2. *A. Palmerstoni*.

1. **A. robusta** (sturdy), *C. Moore*; *F. v. M. in Trans. Pharm. Soc. Vict.* ii. 174. Dundathu Pine. Queensland Kauri Pine. A tree, attaining a height of nearly 150ft., the branches nearly verticillate. Leaves ovate-lanceolate or oblong-lanceolate, shortly acuminate or almost obtuse, rounded or tapering at the base and contracted into a very short petiole, 2 to 3 or rarely 4in. long, rigidly coriaceous, very finely striate. Male amenta about 1½in. long, sessile within a few broad orbicular or reniform bracts of about 2 lines diameter. Fruit-cones ovoid-globular, about 5in. long and 3½in. diameter, the scales as broad as long, the lateral wings more or less indented on each side at the base so as to leave marginal flexed auricles. Seeds nearly ½in. long, truncate or emarginate at the apex, one angle sometimes produced into a short broad point, the other into an oblong erect wing as long as the seed itself.—*Parlat. in DC. Prod.* vi. ii. 375; *Dammara robusta*, *C. Moore*; *Benth. Fl. Austr.* vi. 214.

Hab.: Scattered through the dense forest country near Wide Bay, *Bidwill*; *Frasers Island, W. Hill*.

Wood of a light-yellow colour, close-grained, soft, and easy to work; largely used by joiners and cabinet-makers.—*Bailey's Cat. Ql. Woods*, No. 410.

Leaves sometimes infested with the blight-fungus *Sphaerella dammaræ*, *B. and Br.*  
 Analysis of resin, according to *Lauterer*: Volatile oil, 84; Resin soluble in chloroform 6.8; Resin insoluble in chloroform, 84.2.

2. **A. Palmerstoni** (after *Christie Palmerston*), *F. v. M. Vict. Nat.*, June, 1891. "Togoi," *Barron River, J. F. Bailey*. A large tall tree. Branchlets angular. Leaves smaller than in *A. robusta*, narrow-elliptic, gradually narrowed into a very short petiole, blunt, somewhat oblique, rather pale on underside. Male amenta ellipsoid-cylindric, solitary. Fruit cones oval, the scales very numerous, broader than long, almost fan-shaped, narrowly thickened at the summit. *Mueller* further says of this species, that it differs from *A. robusta* in that its leaves are never lanceolate, are much smaller, narrower, and always obtuse. The cones, he says, are much smaller and narrower, the scales more numerous than in any other species, its nearest ally the above author considers to be *A. Moorei*, of New Caledonia.

Hab.: *Mt. Bartle Frere Christie Palmerston*; *Mulgrave River, Stephen Johnston*; *Barron River, J. F. Bailey*.

4. ARAUCARIA, Juss.

(Vernacular name of a species in Chili.)

Flowers diœcious or rarely monœcious, the amenta terminal. Male amenta cylindrical; stamens numerous, spirally imbricated, contracted at the base, with an ovate or lanceolate incurved scale-like apex; anther-cells 6 to 20, in 2 rows. Females with a single reflexed ovule within each scale. Fruit-cones large, ovoid or globular, the scales very numerous, closely imbricate, the margins usually attenuated into wings at the base, the apex thickened and woody, with a raised transverse line often produced into a lanceolate or pungent point. Seeds flattened, obovoid-oblong, not winged, adnate to the scale at the base, free at the apex. Embryo with 2 cotyledons, sometimes deeply divided so as to appear to be 4.—Trees often very lofty, the branches almost verticillate. Leaves in close

spires, flat or on sterile branches vertically compressed, short and rigidly acicular or lanceolate and longer, pungent-pointed or rarely obtuse, with a prominent midrib. Fruit-cones in some species attaining a very large size.

The genus ranges over extratropical and subtropical South America, New Caledonia and some of the South Pacific Islands. The Australian species are both endemic.

Leaves rigidly acicular, 2 to 6 lines long. Fruit-cones about 4in. long . . . 1. *A. Cunninghamii*.  
Leaves lanceolate,  $\frac{3}{4}$  to 1 $\frac{1}{2}$ in. long. Fruit-cones 9 to 12in. long . . . . . 2. *A. Bidwilli*.

1. **A. Cunninghamii** (after A. Cunningham), *Ait. in Sweet. Hort. Brit.* 475; *Benth. Fl. Austr.* vi. 243. Moreton Bay Pine. Hoop Pine. "Koonya," Bundaberg, *Keys*. "Thookooroo," Forest Hill, *Macartney*. "Goonem," Taromeo, *Shirley*. "Cumburtu," Brisbane. "Coonam," Wide Bay, *Pettigrew*. A tree with a pyramidal or somewhat flattened head, attaining in some situations 150 to 200ft., in others remaining much smaller. Leaves crowded in dense spires, rigidly acicular and very acute, those of the barren branches often spreading, straight, vertically compressed, with the dorsal rib decurrent and  $\frac{1}{4}$  to  $\frac{1}{2}$ in. long, those of the flowering branches from a broad adnate base triquetrous or lanceolate, incurved and rather shorter. Male amenta sessile, cylindrical, very dense, 2 to 3in. long and 3 to 4 lines diameter, the scale-like apex of the stamens ovate-rhomboid and acute. Fruit-cones ovoid, about 4in. long and 3in. diameter, the scales (including their marginal wings) broadly cuneate, the broad hard apex terminating in a lanceolate spreading or recurved rigid point.—*Parlat. in DC. Prod.* xvi. ii. 372.

Hab.: Port Bowen, *R. Brown*; Brisbane River, Rockhampton, Burdekin River, *Fitzalan*, and many other localities.

Wood straw-coloured, strong and durable, used extensively for flooring and lining boards in housebuilding, also by the cabinet-makers. This wood is often very prettily marked; it is said that it lasts well for the bottoms of punts when kept constantly wet.—*Bailey's Cat. Ql. Woods*, No. 411.

2. **A. Bidwilli** (after J. C. Bidwill), *Hook. Lond. Journ. Bot.* ii. 503, t. 18; *Benth. Fl. Austr.* vi. 243. "Bunya Bunya." "Bahnyel," Nanango, *Shirley*. A tree, attaining from 100 to 150ft. in height, with a remarkably stout trunk and smooth bark, the branches usually in whorls of about 16, crowded at the top of the tree. Leaves in crowded spires, lanceolate and about  $\frac{3}{4}$  to 1 $\frac{1}{2}$ in. long on some barren branches, ovate-lanceolate and  $\frac{1}{2}$ in. long on the flowering branches, smooth and shining, of a pale colour when dry, with a broad midrib prominent underneath. Male amenta very dense, appearing sessile in some of the upper axils from the shortness of the flowering branchlets, 2 to 3in. long and 4 to 5 lines diameter, the imbricate scale-like apices of the stamens triangular, acute, about 1 line broad. Fruit cones erect on the topmost branches, ovoid-globose, 9 to 12in. long and 9in. diameter, the scales loosely imbricate, about 4in. long and 3in. broad, tapering towards their winged base, the terminal points recurved and spinescent. Seeds obovate, 2 to 2 $\frac{1}{2}$ in. long and 1in. broad.—*Parlat. in DC. Prod.* xvi. ii. 371.

Hab.: Brisbane Range, N.W. of Moreton Bay, *J. C. Bidwill*; between Cleveland and Rockingham Bays, *W. Hill*; Condamine, Dawson, and Burnett Rivers, *Leichhardt*.

Wood light in colour, often very prettily marked, is strong, durable, and easily worked; in use by joiners and cabinet-makers for various kinds of work.—*Bailey's Cat. Ql. Woods*, No. 412.

## ORDER CXXIV. CYCADACEÆ.

Flowers unisexual, without any perianth. Male flowers forming catkins or cones consisting of numerous spirally arranged imbricated scales (or stamens), more or less cuneate, bearing on the concealed portion of their under surface numerous sessile or rarely stipitate anther-cells, each opening in 2 valves; the upper imbricate and exposed part of the scales hardened and often much thickened, the apex truncate or more or less produced into an incurved or

recurved point or lanceolate appendix. Female cones consisting of numerous scales, imbricate at least when young, either with one pendulous ovule (or carpel) on each side of the thickened and hardened apex, or with 3 or more erect ovules (or carpels) in marginal notches below the flattened acuminate and usually dentate or pinnatifid apex. Fruiting-cone enlarged and either remaining imbricate with 2 pendulous seeds to each scale, or the scales with marginal seeds spreading as the central shoot is developed within the cone. Drupes or nuts with a thick or hard outer coating or integument and a fleshy albumen, in a central cavity of which the straight embryo is suspended by a long folded cord. Cotyledons 2, undivided.—Palm-like plants, with a thick globose and underground or erect and cylindrical woody stem, simple or rarely slightly branched, marked with the scales or bases of the old leaves. Leaves forming a crown at the apex of the stem, once or twice pinnate. Cones sessile or very shortly pedunculate within the crown of leaves.

The order extends over tropical America, subtropical and southern Africa, and tropical Asia. Of the three Australian genera one is also in Asia and Africa, the other two are endemic.

Most, if not all, the plants of this Order met with in Queensland, are considered to possess more or less of a poisonous principle, which is said to become inert or expelled by heat, and a considerable number of cattle die year after year from browsing upon the foliage, more particularly in periods of drought. The disease thus engendered is known under the name of "Rickets" and the chief symptoms are, according to Dr. Thos. L. Bancroft:—Loss of proper control over the movements of the hind limbs, which cause the animal to exhibit symptoms of paralysis (paraplegia) more or less distinct. Cattle of every description, take the disease, but young stock in poor condition are more subject to it. The doctor further states that affected animals may improve but seem never to recover completely.

- Leaves simply pinnate. Pinnæ linear, with a prominent midrib. Female scales elongated, woolly, with 2 or more erect ovules on each side in marginal notches . . . . . 1. CYCAS.
- Leaves simply pinnate. Pinnæ linear, with several longitudinal scarcely prominent nerves. Female scales with 1 pendulous ovule on each side under the thickened acuminate apex . . . . . 2. MACROZAMIA.
- Leaves doubly pinnate. Pinnules obliquely ovate or broadly falcate, with scarcely prominent veins. Cones of *Macrozamia*, but the apex of the scales truncate . . . . . 3. BOWENIA.

1. CYCAS, Linn.

(The Greek name for a palm).

Male cones oblong-ovoid or globular, the scales cuneate, hard, the thickened apex more or less produced into a straight or incurved point. Female cones at first globular, but opening out by the growth of the central shoot, the scales elongated, tomentose or woolly, flat, bearing on each margin 2 to 5 ovules, erect in distant notches, the apex of the scale dilated acuminate and toothed or pinnatifid, the scales at first loosely imbricate, at length spreading or recurved. Drupes large, erect. Leaves simply pinnate, the pinnæ numerous, linear, with a prominent midrib, circinnate in veneration.

The genus extends over the Indo-Australian region, reaching Madagascar and the east coast of Africa to the westward and Japan to the northward. The Australian species are believed to be endemic, but the distinctive characters are very insufficiently known.

- Leaves nearly straight, the lower leaflets often represented by small prickle-like spines. Fructiferous scales pointed bearing 6 to 8 drupes . . . . . 1. *C. media*.
- Leaves somewhat flexuous. Fructiferous scales blunt bearing 4 drupes . . . . . 2. *C. Kennedyana*.
- Leaves simply curved, the lower leaflets represented by distant spines. Fructiferous scales with elongated narrow points. Drupes 2 . . . . . 3. *C. Normanbyana*.
- Leaves with the lower leaflets reduced to short teeth. Fructiferous scales rhomboid-lanceolate at the upper end and bearing 2 drupes . . . . . 4. *C. Cairnsiana*.

1. **C. media** (medium), *R. Br. Prod.*, 348; *Benth. Fl. Austr.* vi. 249. "Kammama," Atherton, *Roth.* "Ma-ra," Bloomfield River, *Roth.* "Bodell," Cairns, *Nugent.* "Nijar," Cape Grafton, *Roth.* "Baveu," Rockhampton, *Thozet.* "Kimalo," Tully River, *Roth.* "Ba-dur," Cooktown, *Roth.* Trunk sometimes

attaining 8 to 10ft. sometimes twice that height, rarely branched at the top. Leaves 2 to 4ft. long or even more, the pinnæ very numerous, straight or falcate, obtuse or pungent-pointed, flat or slightly concave above when young, prominently keeled underneath, the margins often at length recurved, mostly slightly decurrent on the rachis, slightly glabrous or densely pubescent when young, the longer ones varying from 3 to 8 inches, the lower ones shorter and more contracted at the base, the lowest passing into small prickles which are sometimes very few or scarcely any, sometimes continued almost to the base of the petiole. Cones variable in size. The males about 5 or 6in. long and nearly the same in diameter. Drupes 1 to 1½in. long, glabrous, usually 6 on each scale.

Hab.: Burnett and Dawson Rivers, *F. v. Mueller*; Cape Upstart, *Burdekin Expedition*; Rockingham Bay and Mount Elliott, *Dallachy*; Rockhampton, *Thozet*. Common in tropical localities.

Nuts roasted and left on the ashes all day; shells broken next day on stone, the "inside" made into flour and left in dilly bag in running stream for another 24 hours before being eaten. —*Roth*.

2. **C. Kennedyana** (after Sir Arthur Kennedy, G.C.M.G.), *F. v. M. Chem. and Drugg. Melb. Vic.* Trunk tall. Leaves very numerous; petioles elongated, nearly glabrous, on their upper part armed with a few spines; rachis slightly curved, somewhat flexuous, leaflets about 100 on each side, broad-linear, nearly flat, acute and somewhat pungent, rather glaucous on the underside, shining, glabrous on both sides; all segments, but particularly those towards the summit, decurrent; the lowest nearly half as long as the middle segments, and not gradually abbreviated into mere spines. Male cone rather large, oval-ellipsoid, the antheriferous portion of its scales narrowly wedge-shaped, about three times as long as the deltoid, *truncated*, completely velvet-downy, entirely straight and never pointed terminal dilatation; bare upper side of the antheriferous portion of the scales quite glabrous. Anther-cells extending to the base of the scales, not grouped by any empty space into 2 areas. Female cone very large; stipes of the scales moderately elongated, and as well as their rachis velvet-downy; drupes always 4, nearly globular and perfectly glabrous.

Hab.: In the Normanby Ranges, near Port Denison; *Eugene Fitzalan*.

3. **C. Normanbyana** (after the Marquis of Normanby, G.C.M.G.), *F. v. M. Fragm.* viii. 169. Curly Pine-Palm. Trunk 6 to 10ft. or sometimes higher. Leaves 3 to 5ft. long, petiole bearing distant spines (abortive leaflets). Rachis tetragonous near the base, the upper portion semiterete, leaflets numerous, thin-coriaceous, opposite, shiny-green on the upper side, about 8 lines long at the middle of the leaf, acute, about 3 lines broad. Male cones about 1ft. long, scales very numerous, all fertile the centre ones about ½in. long, the anthers densely crowded, ⅔ line long, tawny, cells oblique-ovate; pollen-grains light-yellow. Scales of the female cones bearing 2 orange-coloured roundish fruits from 1 to 1½in. long.

Hab.: Mountains about the mouth of the Burdekin, *E. Fitzalan*.

4. **C. Cairnsiana** (after Sir Wm. Cairns, K.C.M.G.), *F. v. M. Fragm.* x. 63, 121. Trunk about 15ft. high with a diameter at base of about 1½ft. Leaves about 5 feet long, glaucescent, petiole slightly pubescent, leaflets linear with recurved margins, those of the centre of the leaf about 7in. long and 2 lines broad. Male cone narrow, scales about 1in. long and 4 lines broad, rusty-hoary beneath, point subulate, anther-cells minute. Scales of female cones, in the upper part rhomboid-lanceolate bearing 2 ovate-globose shiny-brown drupes 1½in. long.

Hab.: Newcastle Range, *W. E. Armit*.

2. MACROZAMIA, Miq.

(Long-Zamia.)

Cones of both sexes ovoid oblong or cylindrical, or the females rarely nearly globular, the scales hard, more or less thickened at the apex, with an erect spreading or rarely recurved point, either broad and short or elongated and narrow. Scales of the females with one pendulous ovule and seed on each side. —Trunk and leaves of *Cycas*, except that the pinnæ have no midrib, but are more or less distinctly striate, especially on the under side, with several parallel equal veins, the whole leaf occasionally slightly twisted in some species, but not constantly so in any one.

The genus is limited to Australia, and there represents the South African *Encephalartos*, with which F. v. Mueller reunites it. The latter genus has, however, a much more rigid habit and very obtuse or truncate cone-scales, which, together with the geographical distribution seems to warrant the following Miquel and A. de Candolle, in maintaining the two genera as distinct. Still less does it seem advisable again to reduce these Old World forms to the American genus *Zamia*, characterized by the articulate attachment of the pinnæ as well as by the cones.

Scale spines erect.

Stems seldom raised above the ground.

- Leaves 3ft. long; pinnæ not reaching to the base. Petioles and rhachis flat. Female cones oblong about  $\frac{3}{4}$ ft. long . . . . . 1. *M. platyrhachis*.
- Leaves 2ft. long spirally twisted; pinnæ not reaching to the base and very narrow. Female cones conical about 5 lines long . . . . . 2. *M. Paulo-Guilielmi*.

Stems sometimes slightly raised above the ground.

- Leaves slightly twisted, 2 to 5ft. long, lowest pinnæ distant from the base. Female cone 6 to 8in. long . . . . . 3. *M. spiralis*.
- Leaves 6 or more ft. long, nearly straight; pinnæ reaching to the base where they become spine-like. Female cones 8 to 16in. long . . . . . 4. *M. Miquelii*.
- Leaves about 5ft. long; the lower pinnæ not abbreviated to spines but only slightly shorter leaving a petiole like in *M. spiralis*. Female cones 8 to 16in. long . . . . . 5. *M. mountperriensis*.
- Leaves 7 to 8ft. long, pinnæ not reaching within  $1\frac{1}{2}$ ft. of the base. Female cones 9 to 10in. long . . . . . 6. *M. Douglasii*.

Stems tall.

- Leaves greyish very rigid, 7 to 10ft. long; pinnæ reaching to the base where they are shorter and spine-like. Female cones 2 to 3ft. long . . . . . 7. *M. Moorei*.

Scales recurved.

Stems tall.

- Leaves 7 to 10ft. long angular at the base; pinnæ  $\frac{1}{2}$ in. broad. Female cones  $1\frac{1}{2}$  to 2ft. long. Scale point obtuse or lanceolate . . . . . 8. *M. Denisonii*.
- Leaves 7ft. long, enlarged at the base of petiole. Female cone 2ft. long. Scale point blunt, or somewhat lobed . . . . . 9. *M. Hopei*.

1. **M. platyrhachis** (leaf-rhachis broad), *Bail. Ql. Agri. Journ.* iii. 356. Seems not to form stems above the ground; the underground stem oval, resembling a somewhat large Swede turnip, about 1ft. long with a circumference of 2 feet near the centre, smoothly imbricated by the thin bases of former leaves. Leaves probably about 12 in the crown, glabrous or when young very thinly pulverulent, falcate, about 3ft. long of which the petiole occupies about 6 or 8in.; no woolly substance at their base. Petiole and rhachis flat on the upper, convex on the underside, the broadest part about 6 lines. Pinnæ or segments attached along the thin edge of the rhachis, and slightly decurrent without any callosity, about 23 on each side of the rhachis, the lowest ones often the longer, measuring about 15in. long and  $\frac{3}{4}$ in. wide, very coriaceous, curved, erect; longitudinal nerves numerous and prominent; apex obtusely acuminate. Scapes 3 on the only plant (male) to hand, 6 to 9in. high, bearing cylindrical cones 3 to 4in. long, 1in. diameter. Scales triangular at the top, terminating in erect slender spines of about 5 lines. Female cone (only one received)  $6\frac{1}{2}$ in. long, oblong, turgid,  $1\frac{1}{2}$ in. across the top; spine erect, flat, narrowing to a sharp point, those

at the top of cone  $\frac{1}{2}$  ft. long; transverse ridges very prominent and acute. Seeds oblong, bluntly angular about 1 in. long, covered with a reddish brown integument.

Hab.: Range near Planet Downs, *H. C. Brock-Hollinshead*, who states that this species does not cause rickets in stock.

2. **M. Paulo-Guilielmi** (after H.R.S. Prince Paul William, of Wurtenburg), *F. v. M. Fragm.* i. 86; *Benth. Fl. Austr.* vi. 251. Stems seldom if ever at all raised above the ground, but, like all this genus, forming a deep yam-like rhizome or stem beneath the surface. Leaves about 6 to 20, including the short portion (or petiole) without pinnæ, about 2 feet long, more or less spirally twisted; petioles 4 to 5 in. long and 3 or 4 lines broad, the base broader with thin scarios edges and very woolly, the upper surface as well as the rhachis flat, but rounded on the under surface. Pinnæ very numerous, often 100 on each side of the flat rhachis, narrow-linear, falcate, with from 3 to 5 rather prominent ribs on the under side, 4 to 5 in. long, 1 to  $1\frac{1}{2}$  line broad, the apex often with 2 or 3 short teeth, the white callous base often prominent. Scapes woolly, surrounded at the base with linear woolly prophylla of about 1 in. long. Male cones conical, 3 or 4 in. long and about  $1\frac{1}{2}$  in. diameter in the centre. Scales about  $\frac{3}{4}$  in. wide and  $\frac{1}{2}$  in. deep, the lower ones with a very small central point, the upper ones with points 2 or 3 lines long and slightly recurved and pungent; anthers small. Female cones conical, glabrous or with a few short silky hairs, about 5 in. long and 3 broad at the base. Scales about 1 to  $1\frac{1}{2}$  in. broad and  $\frac{3}{4}$  in. deep, with a very prominent transverse ridge which forms in the centre an erect spine of about 1 in. long and not more than 1 line broad. Seeds angular, 1 in. diameter, covered by a fleshy golden-yellow integument.—*Encephalartos, Paulo-Guilielmi*, *F. v. M.* in *Trans. Pharm. Soc. Vict.* ii. 91.

Hab.: Near Stanthorpe, and at Tinana Creek, Maryborough. The leaflets of these are narrower than on the Stanthorpe plants. Maranoa, *W. Hill*; Wide Bay, *Leichhardt*; Mackenzie River, *Mrs. Cobham*.

3. **M. spiralis** (spiral), *Miq. Monogr. Cycad.* 36 t. 4, 5; *Benth. Fl. Austr.* vi. 251. Stems seldom if ever formed above the surface but forming long underground stems or rhizomes, the crown of leaves few, or on old plants in favoured localities sometimes as many as 50. Leaves more or less spirally twisted 2 to 4 or at times 5 ft. long, while young covered by a loose wool, the broad expanded base bearing a dense coating of a mouse-coloured wool, the petiole or portion of the rhachis without pinnæ nearly terete and from 1 to  $1\frac{1}{2}$  ft. long. Pinnæ erecto-patent, glossy and flexuose, 30 to 50 on each side of the rhachis, with seldom any abbreviated ones at the base, 6 to 13 in. long and 2 to 5 lines broad, the underside prominently striate, the white callosity at the base very prominent, the apex pungent, only toothed on very young plants. Scapes about 1 ft. high, slightly woolly. Male cones cylindrical, 6 in. or more long,  $1\frac{1}{2}$  in. in diameter, the central spine of scale reduced to a pungent point in the lower part of cone, but lengthening out in the upper portions to nearly  $\frac{1}{2}$  in. long. Anthers small and very numerous. Female cones more or less woolly, 6 to 8 in. long and about 3 to  $3\frac{1}{2}$  in. in diameter. Scales about  $\frac{3}{4}$  in. deep and  $1\frac{1}{2}$  in. wide, the transverse lines forming a sharp ridge running into an erect, lanceolate, flat, central spine of from  $\frac{1}{4}$  to 2 in. in length. Seeds covered with a reddish integument about 1 in. long and nearly as broad.—*Zamia spiralis*, *R. Br. Prod*; *Encephalartos spiralis*, *Lehm.* *Pugill.* vii. 13.

Hab.: About Brisbane.

4. **M. Miquelii** (after F. A. Miquel), *F. v. M.*; *A. DC. Prod.* xvi. ii. 535; *Benth. Fl. Austr.* vi. 253. "Banga," Rockhampton, *Thozet*. Stems seldom formed above the ground, but very thick under the surface, bearing a fine crown of from 80 to over 100 leaves. Leaves 6 or more feet long, more or

less falcate, bearing approximate pinnæ throughout their whole length, but those on the lower portion abbreviated to short spines; the rhachis somewhat angular or the upper side flat, the immediate expanded base bearing more or less wool. Pinnæ of a rather thin texture, the longest about 16 inches long and 3 or 4 lines broad, the upper ones gradually shorter, and those of the lower part of the leaf short and spine-like, all finely striated, the callosity at the base white or reddish, and the apex pungent. Scapes often long. Male cones cylindrical, 6 to 10 inches long, 1 to 1½ in. diameter, the apex of the scales without points except in the upper portion; anthers densely covering the whole under surface of the scale. Female cones more or less cylindrical, 6 to 10 in. long and 3 to 5 in. diameter, the apex of scale rhomboidal, about 1 in. deep and 1½ in. wide, the transverse sharp ridge forming in the centre an ascending lanceolate point, short in the lower part of the cone, but often 1 to nearly 2 in. long near the summit. Seeds covered with a reddish integument, about 1 in. long and nearly as broad. —*Encephalartos Miquelii*, F. v. M. Fragm. ii. 38.

Hab.: Taylor's Range near Brisbane, and from there to Rockhampton.

According to Thozet the seeds are baked for about half-an-hour under ashes; the outside covers and the stones are then broken and the kernels divided and put into a dilly-bay and placed in a stream, where they remain 6 or 8 days before they are fit for eating.

5. **M. mountperriensis** (of Mount Perry), *Bail. 1st Suppl. Syn. Ql. Fl.* 50. "Tchalli," *Keys*. Stems seldom formed above the ground, but at times producing one 6 to 9 in. high; the crown of leaves averaging about 80, the male plants being noticed to produce the greatest number and finest leaves. Leaves above 5 ft. long, including the petiole or lower portion without pinnæ, which is from 16 to 18 in.; the immediate base swollen and clothed by a dense mouse-coloured wool; petiole somewhat angular, the rhachis with a raised ridge throughout between the 2 rows of pinnæ. Leaves nearly straight, not curved or twisted, of a deep-green. Pinnæ about 50 on each side, the lower ones not abbreviated to spines, only slightly shorter; larger pinnæ about 10 in. long and 4 lines broad, the 10 or 12 longitudinal veins prominent on the under side, point attenuated and pungent, the white callosity at the base more or less prominent. Scapes about 1 ft. long, and frequently surrounded at the base by numerous, densely woolly, linear-lanceolate prophylla of about 5 in. long and 2 to 4 lines broad. Male cone cylindrical, about 1 ft. long and 1½ in. diameter, the scales with very short points except those of the apex of the cone; anthers densely covering the under surface of the scale. Female cone cylindrical, 8 to 16 in. long, 3½ to 4 in. diameter, the somewhat swollen scales about 1 in. deep by 1½ broad, with a very prominent, sharp, transverse ridge which in the centre forms an erect spine of from 1 to 2 in. of a flat linear-lanceolate shape. Seeds covered by a deep orange-coloured integument about 1 in. long and nearly as broad.

Hab.: Mount Perry, *James Keys*.

6. **M. Douglasii** (after Hon. John Douglas), *W. Hill et F. v. M.* "Coobine," Fraser's Island. Stems usually nearly all buried in the sand, but sometimes forming above ground to the height of 2 or 3 feet. Leaves 50 or more in a crown, 7 to 8 feet long, of a deep-green colour, the rhachis somewhat angular and sulcate, the portion without pinnæ (petiole) about 2 ft. long, the expanded base copiously woolly. Pinnæ about 160, the central ones 12 to 14 in. long and 5 lines broad, tapering to sharp points, the callosity at the base white but not large, often only the 2 lowest abbreviated, texture rather thin. Scapes about 16 in. long, woolly and somewhat angular, bearing several long, linear woolly prophylla, which are closely appressed or adnate to the scape. Male cone not examined. Female cones glabrous, 9 to 16 in. long, 4 or 5 in. diameter

Scales 1 to  $1\frac{1}{4}$  in. deep and 2 to  $2\frac{1}{2}$  in. broad, the transverse line often developed into a thin wing, with only a minute central point to those in the lower part of the cone, then gradually increasing in length to nearly  $\frac{1}{2}$  in. long in the upper part; immediately below this point is a prominent depression. Seeds covered with a reddish integument about  $1\frac{1}{4}$  in. long.—*Encephalartos Douglasii*, F. v. M. Cens. Austr. Plants.

Hab.: Frazer's Island.

7. **M. Moorei** (after C. Moore, the late Director of the Syd. Bot. Gard.), *F. v. M.* Stems 10 to 20ft. high and  $1\frac{1}{2}$  to 2 feet in diameter. Leaves glabrous, numerous, rigid, 7 to 10ft. long, the rhachis angular, clothed to the base with pungent-pointed approximate pinnæ. Pinnæ about 50 on each side of the rhachis, attached to the edge of the flattish upper surface, about 12in. long and 5 lines wide, those at the summit usually narrow, and the basal ones much abbreviated, all finely nerved. Scapes  $1\frac{1}{2}$  to 2ft. high. Male cone cylindrical, about 12in. long and 2 to  $2\frac{1}{2}$  in. in diameter, the scales about from 3 to 5 lines across the top, with an erect central point about 5 lines long on those of the upper part of the cone but much shorter on those near the base. Female cone 2 to 3ft. long with a diameter of about 12in. Scales 2 to  $2\frac{1}{2}$  inches across the top, the transverse ridge almost wing-like and forming in the centre a lanceolate erect spine, 1 to  $1\frac{1}{2}$  in. long and 4 to 5 lines broad. Seeds about  $1\frac{1}{4}$  in. long, the integuments reddish.—*Encephalartos Moorei*, F. v. M. Cens. Austr. Plants,

Hab.: About Springsure.

8. **M. Denisonii** (after Sir William Denison), *C. Moore et F. v. M.* Stems 18 to 20ft. high and about 18in. in diameter. Leaves having a more reddish purple hue than others of the genus, 7 to 10 feet long, angular at the base, and more or less tomentose. Pinnæ 8 to 18in. long and about  $\frac{1}{4}$  in. broad below the middle, the parallel veins rather obscure, slightly contracted at the base, and inserted longitudinally along the centre of the upper surface of the rhachis. Male cones 10 to 15in. long, 4 to 6in. in diameter; the apex of the scales 1 to  $1\frac{1}{2}$  in. broad, very thick, and produced into a short, triangular, or lanceolate almost obtuse point. Female cones  $1\frac{1}{2}$  to 2ft. long, conical, 1ft. in diameter at the base, 6 inches at the top; scales shorter and broader than in the males, the apex tomentose-pubescent, but often 2in. broad, tapering into a short and very obtuse or rather longer and lanceolate recurved point. Seeds very oblique, about 2in. long and 1in. broad.—C. Moore's Paper to Roy. Soc. N.S.W.; *M. Denisonii*, F. v. M. Fragm. i. 41, 243. *Encephalartos Denisonii*, F. v. M. Journ. Pharm. Soc. Vict. ii. 90, probably, but in the Fl. Austr. there is some confusion of species under the name *M. Perowskiana*; Miq. *Catakidozamia Macleayi*, Hill.

Hab.: Tambourine Mountain and other localities of South Queensland.

9. **M. Hopei** (after Captain L. Hope), *W. Hill*. "Arumba." Cairns, *Nugent*: Stems thick, erect, 20 to 60ft. high. Leaves 7ft or more long, slightly puberulent on the rhachis and petioles, or a portion without pinnæ, which is about 2ft. long with an enlarged woolly base. Pinnæ about 80 on each side of rhachis, falcate, thick, and glossy, 8 to 12in. long and  $\frac{1}{2}$  to 1in. broad, apex acuminate but not pungent, the base slightly contracted and inserted longitudinally on the upper surface of the rhachis, with the lower margin decurrent, the longitudinal veins parallel and numerous but not prominent. Prophyllus with a close woolly base tapering into an erect triangular beak of about 2in. long. Scape stout, about  $1\frac{1}{2}$  ft. long. Male cones not examined. Female cones tomentose, about 2ft. long and from 8 to 10in. diameter. Scales 2 to 3in. wide and about 1in. deep, the edges thin and wavy, terminating in a blunt



or more or less lobed reflexed apex. Seeds 2 to 2½ in. long and 1 to 1½ in. wide, angular, covered by a brownish coloured integument.—*Catakidozamia Hopei*, Hill, Gard. Chron. (1865).

Hab: Daintree and Johnstone Rivers.

Leaflets sometimes infested with the blight-fungus *Sphæria macrozamiæ*, B. and Br.

### 3. BOWENIA, Hook.

(After Sir G. T. Bowen, first Governor of Queensland.)

Male cones oblong-cylindrical; females globular, the scales broad at the apex, rather thick, truncate, the females with one pendulous ovule and seed on each side.—Trunk of *Macrozamia*. Leaves bipinnate, with long petioles and rhachis, the pinnules petiolulate, broad, oblique, without any midrib, the margins entire or serrated.

The genus is limited to the single Australian species, differing from *Macrozamia* only in foliage and in the absence of the point to the cone-scales.

1. **B. spectabilis** (showy), *Hook. Bot. Mag. t. 5398; Benth. Fl. Austr. vi. 254.* "Jul-bin," Mt. Cook, *Roth*; "Ja-yur," Cape Grafton, *Iloth.* "Chir-roo," Cairns, *Nugent.* Trunk thick, scarcely raised above the ground, marked with the scars of the old leaves, the whole plant glabrous. Leaves attaining in outline a length of 3 or 4 ft. and spreading to at least half that breadth, loosely bipinnate, the primary pinnae clustered 3 to 5 together a little below the middle of the common petiole or rhachis, with one or 2 distant ones on each side higher up, the rhachis nearly terete, each pinna often a foot long or more, bearing 9 to 20 segments ovate or ovate-lanceolate, oblique or falcate acuminate, tapering into a short petiole, marked with numerous parallel scarcely prominent veins, 2 to 4 in. long. Cones very shortly pedunculate, the males 1½ to 2 in. long, ¾ to 1 in. diameter; fruiting females nearly globular, 3 to 4 in. diameter, the scales with a narrow base between the seeds expanded into a broad thick truncate apex which appears somewhat fleshy in the unopened cone, but when ripe and dry is hard, not so thick, and fully 1 in. broad.—F. v. M. *Fragm. v. 171; A. DC. Prod. xvi. ii. 534.*

Hab: Endeavour River, *A. Cunningham*; Rockingham Bay, *W. Hill, Dallachy.*

Var. *serrata.* Segments serrate.

Hab: Maryvale, Rockhampton, *A. Thozet.*

## ORDER CXXV. HYDROCHARIDEÆ.

Flowers mostly unisexual. Perianth of 3 or 6 segments, either all petal-like or the three outer ones herbaceous and usually smaller, with a tube adherent to the ovary in the females, without any tube in the males. Stamens 3 to 12 or rarely more. Anthers 2-celled. Ovary inferior, either 1-celled with 3 parietal placentæ or more or less perfectly divided into 3, 6 or 9 cells. Styles 3, 6 or 9, with entire or 2-cleft stigmas. Ovules numerous, ascending or pendulous, orthotropous or anatropous, attached to placentas lining the walls or dissepiments of the ovary. Fruit indehiscent, membranous or fleshy, ripening under water. Seeds several or many, without albumen. Embryo straight, the plumule more or less lateral, the radicle next the hilum.—Aquatic herbs, entirely submerged or the lamina of the leaves floating. Leaves undivided. Flowers enclosed when young in a spathe, either of 1 to 3 leaves or tubular and 2 or 3-lobed, the males 1, 2 or more in the spathe, the females solitary.

The Order has a wide range over the tropical and temperate regions both of the New and the Old World.

SERIES 1. **Glycydræ.**—*Freshwater herbs.*

TRIBE I. **Hydrilleæ.**—*Stem branching, leafy. Spathes small, sessile.*

Leaves whorled. Perianth double. Ovules anatropous . . . . . 1. HYDRILLA.

TRIBE II. **Vallisneriæ**.—*Stemless, or with stolons only. Leaves sessile, long and narrow. Spathes on long scapes.*

- Flowers unisexual. Perianth single . . . . . 2. VALLISNERIA.
- Flowers uni or bi-sexual. Perianth double . . . . . 3. BLYXA.

TRIBE III. **Stratioteæ**.—*Stemless or with a creeping rootstock. Spathes pedunculate. Perianth double. Leaves various.*

- Flowers unisexual. Male spathes 2 to 3-fid. Ovary not beaked . . . . . 4. HYDROCHARIS.
- Flowers unisexual, solitary. Fruit winged . . . . . 5. OTTELIA.

SERIES 2. **Marinæ**.—*Saltwater herbs.*

TRIBE IV. **Thalassicæ**.—*Spathes 2-leaved. Ovary beaked.*

- Male spathes many-fid. Perianth double . . . . . 6. ENHALUS.
- Male spathes 1-fid. Perianth single . . . . . 7. HALOPHILA.

1. **HYDRILLA**, Rich.

(From its appearing curled in water.)

Flowers dicecious, both sexes solitary in a short tubular spathe. Male perianth shortly pedunculate, the outer segments ovate and green, three inner ones oblong-linear and petal-like. Stamens 3, with reniform anthers. Female perianth with a long filiform tube above the ovary, the segments all petal-like and less unequal than in the males. Style elongated, with 3 filiform stigmas. Ovary 1-celled, with 3 parietal placentas. Fruit cylindrical, linear, with few seeds.—Submerged herbs with branching stems and short verticillate leaves. Spathes sessile in the axils.

The genus is restricted by Caspary to the single species common in still and slowly running waters of the tropical and temperate regions of the Old World, the Australian form being the typical one originally described from India.—*Benth.*

1. **H. verticillata** (verticillate), *Casp. in Monatsber. Akad. Berl.* 1857; *Benth. Fl. Austr.* vi. 259. Stems leafy throughout, much branched and floating under water in large masses. Leaves all in whorls of 4 to 8, except a single small sheathing one at the base of each branch and a pair only next above it, all oblong-lanceolate or broadly linear, 2 to 4 lines long and serrulate. Female spathes sessile and solitary, shorter than the leaves, the perianth-tube  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, the outer perianth-segments nearly  $1\frac{1}{2}$  line long, the inner ones shorter and narrower. Fruit linear, with few seeds.—*Serpicula verticillata*, Linn. f. Suppl. 416; Roxb. Corom. Pl. t. 164; *Hydrilla ovalifolia*, Rich. in Mem. Inst. Fr. 1811, 76, t. 2; *Udora australis*, F. v. M. Second Gen. Rep. 16.

Hab.: Water-holes near Rockhampton, *Bowman, O'Shanesy*; near Herbert River, *Dallachy*; Mount Elliott, *Fitzalan*; Brisbane River.

2. **VALLISNERIA**, Linn.

(After Antonio Vallisneri.)

Flowers dicecious. Males minute and very numerous in an ovoid-globular 3-lobed spathe. Perianth-segments 3. Stamens 1 to 3; anthers with 2 globular cells. Female flowers solitary and sessile in a narrow tubular 3-toothed spathe. Perianth-tube not produced above the ovary; segments 3. Staminodia (or inner perianth-segments?) 3, small, bifid, alternating with the perianth-segments. Stigmas 3, broad, 2-dentate or bifid. Ovary narrow, with 3 parietal placentas. Fruit narrow-cylindrical, enclosed in the spathe. Seeds numerous, cylindrical.—Submerged herbs, the leaves and peduncles tufted at the bottom of the water, the leaves very long, without any lamina.

- Leaves with often a long portion floating, strap-like . . . . . 1. *V. spiralis*.
- Leaves very narrow like fine grass, submerged . . . . . 2. *V. gracilis*.
- Stems leafy exceeding 18in. in length . . . . . 3. *V. caulescens*.

The genus is generally distributed over the tropical and temperate regions of the New as well as the Old World, of the Queensland species one is most common over the whole area, the other two are endemic.

1. **V. spiralis** (spiral), *Linn. Sp. Pl.* 1441; *Benth. Fl. Austr.* vi. 259. Leaves with often a long portion floating or entirely submerged, very long and narrow when the water is deep, short in shallow water, obtuse or acute and more or less serrulate at the end with minute teeth, or sometimes perhaps quite entire. Male spathes about 3 lines long, on a peduncle usually short, but breaks off and enables the flower to float to the surface and fecundate the female. Flowers minute, apparently forming an ovoid or globular head not quite so long as the spathe, but the pedicels really 3 or 4 times as long as the minute perianth. Female spathe usually about  $\frac{1}{2}$  in. long, very narrow, on a spirally coiled filiform peduncle, which unfolds so as to carry the flower to the surface till after fecundation, when it contracts and brings the ovary down to the bottom to mature. Perianth very small but larger than in the males. Fruiting spathe only slightly enlarged.—*Rich. Mem. Inst. Fr.* 1811, t. 3; *Reichb. Ic. Fl. Germ.* t. 60; *Hook. f. Fl. Tasm.* ii. 37; *V. spiralis* and *V. nana*, *R. Br. Prod.* 345.

Hab.: Burnett River, *F. v. Mueller*; between Cleveland and Rockingham Bays, *W. Hill*; Fitzroy river, *O'Shanesy*, several feet long; common in the rivers north and south.

2. **V. gracilis** (slender), *Bail. 3rd. Suppl. Syn. Ql. Fl.* 70. Stems slender, creeping in the mud. Leaves about 7 or 8 to a plant, very narrow like fine grass, 3 to 5 in. long and about  $\frac{1}{2}$ -line broad, the sheathing base short, tapering to filiform points, all submerged, no portion floating on the surface of the water. Male flowers minute; female flowers on very fine filiform spirally twisted stalks; perianth of 3 ovate entire segments; stigmas 3.

Hab.: Still waters, or at the edge of the running waters of the Mulgrave River.

The above is from note made on the spot, and having but a common lens I could not fully describe the flowers.

3. **V. caulescens** (stemmed), *Bail. et F. v. M. 2nd Suppl. Syn. Ql. Fl.* 56. Stems submerged, leafy, lengthening to 18 inches or more, resembling a *Potamogeton*. Leaves numerous, linear, obtuse, from  $1\frac{1}{2}$  to 3 in. long and about  $\frac{1}{2}$  in. broad. The few specimens collected show 4 to 3 spathes in the axils of the lower leaves; in the upper axils, however, they are solitary, and all sessile. Calyx-tube under the lobes gradually contracted.

Hab.: Found in the M. Lagoon, about 60 miles west of Normanton, by *Dr. Thos. L. Bancroft*.

### 3. BLYXA, Thou.

Flowers usually diœcious. Males several, protruding when open from a tubular 2-toothed spathe. Perianth-segments all linear, the 3 outer ones green, the 3 inner longer and petal-like. Stamens 8 or 9; anthers linear. Female flowers solitary in the sheath, the ovary sessile; perianth-tube above the ovary long and filiform, the segments as in the males or narrower. Style exerted, with 3 linear stigmas. Ovary narrow, with parietal placentas. Fruit narrow, enclosed in the spathe. Seeds many.—Submerged herbs, the leaves long and grass-like without laminæ, acute and entire, tufted with the peduncles at the bottom of the water.

Besides the Australian species, which is spread over tropical Asia, there is another from the Mascarene Islands.

1. **B. Roxburghii** (after *Dr. Roxburgh*), *Rich. in. Mem. Inst. Fr.* 1811, 77, t. 5; *Benth. Fl. Austr.* vi. 258. Leaves entirely submerged, long and narrow like those of *Vallisneria spiralis* but more acute and not serrulate. Spathes both male and female on long slender peduncles, the males about  $1\frac{1}{2}$  to 2 in. long, containing several flowers, but usually only 1 to 3 protrude at the same time, on pedicels several lines longer than the spathe. Outer perianth-segments about  $2\frac{1}{2}$  lines long, the inner twice as long. Stamens about 8, the filaments short, the

linear anthers not exceeding the outer perianth-segments. Female spathe usually longer and more slender than the male, the ovary much shorter, but the perianth-tube projecting above  $\frac{1}{2}$  in. from the spathe, the segments narrower than in the males. Fruit narrow, entirely enclosed in the spathe, varying from 1 to 2 in., the seeds not very numerous.—*Vallisneria octandra*, Roxb. Pl. Corom. ii. 34, t. 165; *Blyxa octandra*, Planch. Mss.; Thw. Enum. Pl. Ceyl. 332.

Hab.: Water-holes Rockingham Bay and Burdekin River, *Dallachy*, and many of the northern waters.

#### 4. HYDROCHARIS, Linn.

(A graceful water plant).

Flowers diœcious. Males 2 or 3 together in a spathe of 2 bracts. Outer segments of the perianth green, inner ones larger and petal-like. Stamens usually 9 with anthers, and 3 barren filaments, the filaments united in pairs. Female flowers solitary and pedicellate within the spathe. Ovary and fruit 6-celled. Styles 6, each with 2 stigmatic branches.—Stems floating, with tufts of radical leaves and peduncles. Leaves bearing a cordate lamina.

The genus is limited to a single species spread over Europe and the temperate regions of Asia, the Australian specimens presenting no apparent difference.

1. **H. morsus-ranæ** (from the English name "Frog-bit"), *Linn. Spec. Pl.* 1466; *Benth. Fl. Austr.* vi. 256. Stems floating, resembling the runners of creeping plants, with floating tufts of radical leaves peduncles and submerged roots. Leaves on long petioles expanded into a sheath at the base, orbicular, entire, cordate at the base, but less deeply so in the Australian than in the European specimens, rather thick, 1 to 2 in. diameter. Male spathes  $\frac{1}{2}$  to 1 in. long, on peduncles of about the same length, the flowers shortly exerted. Inner perianth-segments white, 4 or 5 lines long, outer ones about half as long and green, all very broad. Stamens united in six pairs, the pairs opposite the outer segments with both filaments bearing anthers, those opposite the inner segments with the inner filament barren. Anther-cells bordering a broad connective. Female spathe sessile, the flower on a rather long pedicel enlarged at the top into an inferior ovary, the perianth nearly the same as in the males. Fruit ovoid, somewhat fleshy, under  $\frac{1}{2}$  in. long.—L. C. Rich. in Mem. Inst. Fr. 1811, t. 9; Reichb. Ic. Fl. Germ. t. 62.

Hab: The still waters about the Brisbane River; Wide Bay, *Bidwill*.

#### 5. OTTELIA, Pers.

(*Damasonium*, *Schreb.*, not of *Juss.*)

Flowers hermaphrodite, solitary and sessile within a tubular 2-lobed spathe. Outer perianth-segments green, inner ones larger and petal-like. Stamens 6 or more; anthers linear. Styles or stigmas 6, 2-lobed. Ovary and fruit more or less completely 6-celled, with numerous ovules and seeds.—Submerged herbs, the radical leaves and peduncles in tufts at the bottom of the water. Leaves mostly or all bearing an oblong ovate or broad-cordate lamina.

The genus is spread over tropical Asia and Africa with one American species. Of the two Australian species, one is the common Indian one, the other apparently endemic.

Leaf-lamina broadly cordate. Spathe winged . . . . . 1. *O. alismoides*.  
 Leaf-lamina ovate or oblong. Spathe not winged, firm, the outer perianth-segments protruding and persistent on the fruit . . . . . 2. *O. ovalifolia*.

1. **O. alismoides** (*Alisma*-like), *Pers. Syn. Pl.* i. 400; *Benth. Fl. Austr.* vi. 257. Leaves on long petioles dilated and tufted at the bottom of the water, the lamina submerged or floating, orbicular-cordate and about 6 in. diameter, Peduncles usually long. Spathe ovoid-oblong, nearly  $1\frac{1}{2}$  in. long, shortly 2-lobed at the top, and bearing 5 or 6 longitudinal herbaceous wings, 2 or 3 of them 1 to

2 lines broad, the others usually narrower. Ovary and fruit about the length of the spathe. Outer perianth-segments green, oblong-lanceolate, 4 to 5 lines long; inner ones white, veined, under lin. diameter. Stamens 6 to 9.—L. C. Rich. in Mem. Inst. Fr. 1811, t. 7; *Stratiotes alismoides*, Linn. Spec. 754; *Damasonium indicum*, Willd. Sp. Pl. ii. 276; Roxb. Corom. Pl. t. 185; Bot. Mag. t. 1201.

Hab.: Creeks in the neighbourhood of Rockhampton, Bowman, O'Shanesy, Watson; Kennedy District, *Daintree*.

The species is widely dispersed over East India.

2. **O. ovalifolia** (leaves oval), L. C. Rich. in Mem. Inst. Fr. 1811, 78; Benth. Fl. Austr. vi. 257. Habit of *O. alismoides*, but the leaf-lamina usually floating, ovate or oblong, 2 to 4 in. long when perfect, obtuse, rounded at the base and not at all or scarcely cordate. Peduncles sometimes very short sometimes above 1 ft. long, varying probably according to the depth of the water. Spathe almost coriaceous, about  $1\frac{1}{4}$  in. long, either quite smooth or with 2 or 3 slightly prominent longitudinal nerves, but not winged. Outer perianth-segments green,  $\frac{3}{4}$  to lin. long; inner ones pale yellow,  $1\frac{1}{2}$  to 2 in. diameter in the only perfect specimens examined. Stamens 9 to 15.—*Damasonium ovalifolium*, R. Br. Prod. 344; *D. cygnorum*, Planch. in Ann. Sc. Nat. ser. 3, xi. 82.

Hab.: Rockhampton, Bowman, Thozet; Mount Elliott, Fitzalan; Brisbane River.

## 6. ENHALUS, Rich.

Male flowers many, minute, enclosed in a short compressed, subsessile, 2-leaved spathe, at length escaping and floating; segments of perianth broadly elliptic; stamens 3, anthers subsessile, oblong; pistillode none. Female flowers much larger, solitary, sessile in a long spathe, scape spiral; outer segments oblong, imbricate; inner ones longer, linear, subvalvate, wrinkled. Staminodes none; ovary ovoid with 6 papillose ridges, long-beaked, almost 6-celled; styles 6, bipartite, branches slender, fimbriate; ovules few on each placenta, anatropous. Fruit ovoid, beaked, indehiscent, deliquescent, spathe persistent, placentas nearly meeting in the centre, spongy. Seeds few, large, conoid, testa mucilaginous; plumula many-leaved.—A submerged marine monœcious or diœcious herb; rootstock crinite with the remains of old leaves. Leaves narrowly linear, enclosed in twos or threes in a basal sheath.—Hook. in Fl. Brit. Ind. v. 663.

1. **E. Kœnigii** (after —. Kœnig), Rich. in Mem. Inst.; Fl. Brit. Ind. v. 663. "Wa-pan," Cape Bedford, Roth. Rootstock extensively creeping in sand. Leaves 2 to 3 feet long by  $\frac{1}{2}$  to  $\frac{3}{4}$  in. wide, margins thickened, tip rounded denticulate. Spathes 2 in. long, strigose. Ovary with papillose margins. Fruit raised to the surface for ripening.—Griff. Ic. Pl. Asiat. t. 249 and 250; Rumph. Herb. Amboin. vi. 191, t. 75, f. 2.

Hab.: Cape Bedford, Roth. A shore plant of the Malay Peninsula, Ceylon and other parts. Fruit, after being roasted, eaten.—Roth.

## 7. HALOPHILA, Thou.

(From being found in the sea.)

Flowers unisexual, solitary within a pair of herbaceous bracts. Male flower: Perianth of 3 segments. Anthers 3, sessile, alternating with the segments: erect, 2-celled, the cells opening outwards; pollen confervoid. Female flower: Perianth none. Ovary single, tapering into a filiform style with a short stigma either entire or divided into 3 to 5 filiform segments. Ovules several, erect, attached to the sides of the cavity. Fruit membranous, opening irregularly. Seeds nearly globular, with a thin testa, rather loose. Embryo erect with a thick radicular base nearly the shape of the seed, with a distinct plumula and an involute or spiral cotyledonous end both nearly immersed in a terminal groove.

—Submerged marine herbs. Leaves in pairs apparently opposite, sessile or petiolate, the petioles frequently enclosed at the base in 2 broad scarious white or hyaline scales. Floral bracts axillary, sessile or the males pedicellate.

The genus is confined to the Indian and West Pacific Ocean and Mediterranean sea. Of the two Queensland species one is widely dispersed over the shores of the Indian and Pacific Oceans, the other is endemic.

- Leaves on long petioles with an ovate or oblong entire lamina . . . . . 1. *H. ovalis*.  
 Leaves sessile or nearly so, broadly linear, rounded and ciliate-toothed at the end . . . . . 2. *H. spinulosa*.

1. ***H. ovalis*** (oval), *Hook. Fl. Tasm.* ii. 45; *Benth. Fl. Austr.* vii. 182. Stems creeping and rooting under water, emitting at each node 2 broad thin colourless hyaline scales 2 or 3 lines diameter, and within them a pair of leaves with long slender petioles and a herbaceous lamina varying from oval and under  $\frac{1}{2}$  in. long to oblong-elliptical and 2 to  $2\frac{1}{2}$  in. long, very thin, penniveined with a broad central nerve and very fine oblique lateral veins, the margins quite entire. Involucres or double spathes enclosing the flowers ovate, sessile within the scales. Male flowers on pedicels emerging from the involucre, females sessile within it.—*Caulinia ovalis*, R. Br. Prod. 339; *Halophila ovata*, Gaudich. in Freyc. Voy. Bot. t. 40, f. 1; F. v. M. Fragm. viii. 219; *Diplanthera*, Griff. Ic. Pl. Asiat. t. 161, c. f. 2.

Hab.: Common on the coast at about low water mark.

2. ***H. spinulosa*** (spiny), *Benth. Fl. Austr.* vii. 183. Stems slender, submerged, with simple branches of 3 to 6 in. long. Leaves opposite, distichous sessile, broadly linear or almost spatulate, rounded at the end and bordered by small acute teeth or cilia,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long and about 2 to  $3\frac{1}{2}$  lines broad, 3-nerved, without any scales or sheathing stipules at the base, but the margins on the lower side dilated into a semi-oval appendage folded over the lamina. Male flowers unknown. Female within a pair of small herbaceous bracts sessile in the axils. Capsule solitary, ovate, about 2 or  $2\frac{1}{2}$  lines long, apparently bursting irregularly. Seeds several, rather more than  $\frac{1}{4}$  line diameter. Embryo almost globular, the plumula and the narrow cotyledonous end curved over it, both enclosed in a cavity at the top of the embryo.—*Caulinia spinulosa*, R. Br. Prod. 339.

Hab.: Port Denison, *Kilner*; Coral reefs, Albany Island, *F. v. M.*; Cape York, *Mosley*.

## ORDER CXXVI. BURMANNIACÆ.

Flowers hermaphrodite, regular. Perianth superior, persistent, tubular or campanulate, usually 6-lobed, the three inner lobes often smaller or sometimes wanting. Stamens 3 or 6, inserted in the tube and shorter than the perianth. Anthers 2-celled. Ovary inferior, 3-celled or with 3 parietal placentas, the ovules very numerous. Style single, with 3 short branches stigmatic at the clavate or dilated ends. Fruit a capsule opening in loculicidal slits or valves. Seeds minute, the embryo apparently homogeneous.—Herbs often slender. Leaves entire, radical or nearly so, rarely alternate along the stem, sometimes all reduced to scales. Flowers terminal, solitary or several along a 2-branched rarely 3-branched rhachis, centrifugally developed, each flower opposite to a small often minute bract.

A small Order, usually frequenting swamps or wet places or decaying vegetable soils, common to the New and the Old World. The Queensland genus has the general range of the Order.

1. BURMANNIA, Lind.

(After J. Burmann.)

(*Gonyanthes*, *Miers.*)

Perianth tubular, 3-winged or 3-angled, the three inner lobes smaller or wanting. Anthers 3, sessile or nearly so, below the inner perianth lobes, the cells short, separated by a broad connective, opening transversely, with a small crested appendage behind each cell. Ovary 3-celled. Capsule opening between the dissepiments.—Herbs with radical leaves or all the leaves rarely reduced to scales. Flowers sessile or pedicellate along the branches of a forked cyme, reduced sometimes to a single flower.

The genus is common to the New and the Old World. One and probably both the Australian species have a wide range over East India and the Archipelago.—*Benth.*

Radical leaves lanceolate. Flowers several in a once-forked cyme. Perianth at least twice as long as broad . . . . . 1. *B. disticha*.

Leaves linear-setaceous, very small. Flowers solitary or few. Perianth with the wings as broad as long . . . . . 2. *B. juncea*.

1. **B. disticha** (2-rowed), *Linn. Spec.* 411; *Benth. Fl. Austr.* vi. 397. Stems simple or scarcely branched, erect, glabrous, attaining 1 to 2ft. Leaves chiefly radical, sessile, sheathing at the base, lanceolate, acute, spreading all under 1in. in most specimens, 2 to 2½in. long in luxuriant ones; a few along the stem sometimes similar to the radical ones but smaller and more erect, or more frequently reduced to sheathing scales. Flowers green more or less tinged with blue, or in the Australian specimens more frequently of a deep blue, in a once-forked cyme, sometimes very compact sometimes each branch 1 to 2in. long. Bracts shorter than the flower. Perianth including the wings about ½in. long, and scarcely ¼in. broad, the 3 outer lobes ovate, concave, not half so long as the tube, the dorsal wings commencing about the middle of the lobes, truncate or rounded at the top, and continued along the tube to the base of the ovary, tapering into the short pedicel; inner lobes of the perianth oblong-linear, from half as long to nearly as long as the outer ones. Anthers immediately under the inner lobes, the cells small, separated by a prominent connective—the dorsal appendages nearly as long as the cells. Capsule usually occupying about half the length of the perianth, but sometimes continued higher up, opening at the top between the ridges with a disposition to split transversely as observed by Thwaites.—*Roxb. Corom. Pl. t.* 242; *B. distachya*, *R. Br. Prod.* 265.

*Hab.*: Abundant in the southern coastal swamps.

2. **B. juncea** (Rush-like), *Soland. in R. Br. Prod.* 265; *Benth. Fl. Austr.* vi. 397. Stems very slender, almost filiform, 6in. to near 1ft. high. Leaves few at the base of the stem, linear filiform, ¼ to ½in. long, and sometimes one or two smaller ones higher up, but the stem usually with only a few small distant scales. Flowers sometimes only one at the end of the stem, sometimes in a once-forked cyme with 2 to 4 on each branch, all on short slender pedicels. Perianth including the wings about 3 lines long and quite as broad when in fruit, the outer lobes broad and only ¾ line long, the inner lobes very minute in the flower examined, the dorsal wings rounded at both ends. Anthers at a little distance below the inner lobes. Ovary and capsule occupying about half the length of the tube, the capsule usually opening by a transversely oblique fissure.

*Hab.*: Endeavour River, *Banks and Solander.*

## ORDER CXXVII. ORCHIDÆ.

Flowers hermaphrodite. Perianth superior, irregular or rarely regular, of 6 petal-like or green segments, all free or variously united; 3 outer ones called *sepals* all similar and erect or spreading, or the *dorsal* one (next to the main axis unless the flower is reversed by a twist of the ovary) more concave or otherwise different from the 2 *lateral* ones (lower ones unless the flower is reversed), which are always similar to each other; 2 inner segments called *petals*, similar to each other, one on each side of the dorsal sepal, and sometimes connivent or connate within it into a *galea*, sometimes similar to the lateral sepals, or different from all the sepals; the sixth segment or third petal called the *labellum*, different from all the others (except in *Thelymitra* and *Apostasia*), inserted between the lateral sepals at the base of the column, and exceedingly varied in size, shape, lobes, calli, fringe, or other appendages. In the centre of the flower or somewhat under the dorsal sepal is the *column*, consisting of the combined andrœcium and pistil; at the apex attached to the dorsal margin is usually one anther, erect incumbent or adnate to the apex of the column or to the back of the stigma, with 2 cells on its inner face or almost marginal. In the genus *Cypripedium* which is not Australian, and in *Apostasia*, there are two lateral perfect anthers. Pollen either waxy granular or mealy, usually more or less distinctly collected into 1, 2, or 4 pairs of pollen masses, either oblong or tapering to the upper end, free or attached by their narrow end, either directly or by a linear or filiform *caudicle*, to a gland on the rostellum or apex of the stigma, or sessile on that apex without a gland. In front of the column either at or near its apex or lower down is a concave or rarely convex viscid stigma, the upper margin often produced into an erect appendage called the *rostellum* sometimes very short, sometimes as long as or longer than the anther; each side of the column towards the front shows a longitudinal angle, often expanded in the whole or part of its length into a wing, sometimes continued behind the anther into a hood over it, or expanded into two auricles or appendages (sometimes described as staminodia) one on each side between the stigma and the anther, sometimes continued into a basal projection of the column or even continuous with raised lines on the labellum, or in *Thelymitra* the two wings shortly joined in front of the column, or in *Apostasia*, the style normally cylindrical with a terminal stigma. Ovary inferior, 1-celled or with 3 parietal placentæ, or in *Apostasia* perfectly 3-celled with innumerable ovules. Fruit capsular, opening in 3 valves or longitudinal slits, or very rarely succulent and indehiscent. Seeds minute, fusiform or rarely winged, resembling fine sawdust. Embryo a solid, apparently homogeneous body.—Herbs usually perennial, either *terrestrial* with underground rhizomes creeping or producing annually renewed tubers or thick clustered fibres, or *epiphytical* with creeping rhizomes and (often fleshy) fibrous roots adhering to the surface of rocks or trunks or branches of trees. Leaves either alternate and sheathing at the base and sometimes distichous, on flowering stems which when epiphytical are sometimes thickened into *pseudo-bulbs*, or in radical tufts at the base of the flowering stems or in tufts or on pseudo-bulbs distinct from the flowering ones, entire or very rarely lobed (see *Acianthus*). Flowering stems scapes or peduncles annually renewed, either proceeding directly from the rhizomes or axillary on perennial leafy stems or pseudo-bulbs, bearing usually one or more scarious or membranous sheathing scales, either without any leaves, or when leafy 1 or 2 sheathing scales below the leaves and often 1 or more above them. Flowers either solitary and terminal or 2 or more in a terminal raceme or spike, either simple or branching into a panicle, each flower sessile or more frequently pedicellate within a bract, but without bracteoles on the pedicel.

The Order is one of the most natural and sharply defined, as well as the most numerous amongst Monocotyledons and abundantly distributed over the whole globe, rare only in some high Alpine or extreme Arctic and Antarctic regions.



TRIBE I. **Epidendrea**.—Anther 1, opercular, usually deciduous, cells parallel distinct. Pollen-masses waxy, 1 to 4 in each cell, free, or those of each cell held together at the base by a viscid appendage, not attached by their bases or by a caudicle to the rostellum (in some Calogynæ the long bases of the pollen-masses resemble caudicles).

SUBTRIBE 1. **Malaxæ** and (**Liparidæ**, Gen. Pl.)—Stems simple leafy, rarely leafless, with often a pseudo-bulbous base. Inflorescence terminal. Flowers small or minute. Anther erect or inclined, usually persistent, not incumbent. Pollen-masses 4 (or 8), subequal, close together, usually free (without a viscid appendage).

- Epiphytes. Leaves distichous, fleshy, laterally compressed, nerveless.
- Flowers very minute in cylindrical spikes or racemes. Column very short . . . . . 1. OBERONIA.
- Terrestrial. Leaves membranous, base sheathing. Flowers small. Column very short . . . . . 2. MICROSTYLIS.
- Terrestrial or epiphytic. Leaves membranous or coriaceous, base sheathing. Flowers small or medium-sized. Column long . . . . . 3. LIPARIS.

SUBTRIBE 2. **Dendrobicæ**.—Inflorescence terminal, lateral, or on a leafless scape. Pollen-masses 4, rarely 2, 1-seriate, parallel, no appendage (except in *Osyricera*.)

- Labellum with a broad erect base usually expanded into lateral lobes. Stems or pseudo-bulbs bearing both leaves and peduncles (except the sect. *Rhizobium*) . . . . . 4. DENDROBIUM.
- Labellum distinctly unguiculate, not lobed. Leaves (on pseudo-bulbs) and peduncles from distinct nodes of the rhizome . . . . . 5. BULBOPHYLLUM.
- Flowers umbellate. Lateral sepals longer than the dorsal, placed under the mobile lip or connate . . . . . 6. CIRRHOPETALUM.
- Sepals subequal, lateral ones connate far up. Labellum ventricose near the base. Anther with appendage . . . . . 7. OSYRICERA.

SUBTRIBE 3. **Eriæ**.—Inflorescence lateral, or on a leafless scape. Pollen-masses 8, subequal, appendage none or obscure.

- Peduncles from 1 to many-flowered, axillary or subterminal or on a leafy stem or on a pseudo-bulb. Column short, produced into a foot. Habit very various . . . . . 8. ERIA.
- Peduncles lateral or from a leafless rootstock, flowers minute. Column very short, produced into a foot. Stem short, leaves distichous . . . . . 9. PHREATIA.
- Scape distinct from 1 to 2-leaved pseudo-bulb. Sepals spreading. Column elongated, foot none. Capsule erect or nodding. Leaves elongate plaited . . . . . 10. SPATHOGLOTTIS.

SUBTRIBE 4. **Bleticæ**.—Inflorescence usually lateral. Pollen-masses 8, usually in 2 series, parallel, ascending, connected by a glandular appendage.

- Flowers large racemous. Sepals free. Labellum spurred, lateral lobes embracing the long column which is not produced into a foot. Leaves often large plaited . . . . . 11. PHAIUS.

SUBTRIBE 5. **Cælogynæ**.—Inflorescence terminal. Pollen-masses 8 or 4, subequal, connected by viscus or an appendage (in *Calanthe*, the pollen-masses are appendaged, but the appendage is an undeveloped portion of the pollen itself, and is not derived from the rostellum.)

- Pseudo-bulbs 2-leaved, solitary or superposed. Labellum saccate. Column short, broadly 2-winged; pollen-masses 4. Peduncle sheathed . . . . . 12. PHOLIDOTA.
- Terrestrial herbs. Leaves plicate, produced after the racemose flowers. Labellum usually spurred, claw connate into a tube with the column . . . . . 13. CALANTHE.

TRIBE II. **Vandæ**.—Anther 1; posticous, opercular, resting on the rostellum, cells usually confluent. Pollen-masses waxy, usually 2 or 4 in superposed pairs, attached singly or in pairs to a gland or process of the rostellum which is carried away with them when they are removed.

SUBTRIBE 1. **Eulophicæ**.—Leaves on pseudo-bulbs, plaited and nerved. Scape leafy or not. Labellum spurred.

- Scape usually leafless. Petals like the dorsal sepal. Labellum gibbous or saccate, rarely spurred. Gland of the rostellum usually produced into a stipes . . . . . 14. EULOPHIA.

SUBTRIBE 2. **Cymbidicæ**.—Leaves on pseudo-bulbs, plaited and nerved. Scape leafy or leafless. Labellum not spurred. Column not produced into a foot.

- Sepals and petals subequal, spreading. Lobes of the labellum embracing the unwinged column. Pollen-masses with a transverse granular appendage. Leafy stems short, pseudo-bulbous . . . . . 15. CYMBIDIUM.

- Sepals and petals erecto-patent, subequal. Labellum sessile, broad from the base, ventricose, erect, almost complicate. Stems short, leafy, and leafless scapes arising from a stout subtuberous rootstock . . . . . 16. GEODORUM.
- Sepals and petals spreading. Pollen-masses after removal attached to 2 distinct stipes. Stems leafy or leafless. Pseudo-bulbs none . . . . . 17. DIPODIUM.
- SUBTRIBE 3. Sarcanthea.**—*Stems without pseudo-bulbs, rooting. Leaves distichous (rarely none) not plaited. Peduncle lateral or axillary.*
- Sepals and petals not spreading widely. Labellum not jointed at the base usually larger than the sepals. Stipes of the pollen-masses oval-flat. Leaves terete; flowers in short spikes . . . . . 18. LUISIA.
- Labellum shortly incumbent or adnate to the base of the column, blade fleshy, top often inflexed, gibbous or shortly spurred. Stipes of the pollen-masses linear or oblong. Flowers usually small, racemose . . . . . 19. SARCOCHILUS.
- Spur of the labellum almost closed with a callus or lamella. Flowers small, crowded in simple or branched racemes . . . . . 20. CLEISOSTOMA.
- Sepals spreading; lateral connate at the base of the claw of the labellum and together with it forming a spur. Labellum broadly 2 or 3-lobed often fimbriate. Stipes of the pollen-masses strap-shaped. Flowers small, in simple or branched racemes . . . . . 21. ORNITHOCHILUS.
- Sepals connivent or subpatent, bases often connate. Pollen-masses 4, distinct; stipes short. Dwarf herbs, leafless or few-leaved. Flowers minute . . . . . 22. TÆNIOPHYLLUM.
- TRIBE III. Neottia.**—*Stem not bulbous (roots often bulbous). Anther 1, posticous, operculate or erect and persistent; cells distinct, parallel. Pollen granular or powdery or in small masses.*
- SUBTRIBE 1. Vanillea.**—*Stems tall erect or climbing, often branched. Racemes or panicles terminal or terminal and axillary. Anther suboperculate, incumbent on a short rostellum.*
- Climbers. Leaves none or on flowerless branches. Sepals spreading or broadly concave. Labellum broad, concave, loosely investing the column . . . . . 23. GALEOLA.
- SUBTRIBE 2. Corymba.**—*Stem tall, sometimes branched. Leaves broad. Racemes or panicles terminal. Anthers erect, parallel to the erect rostellum.*
- Sepals and petals narrow, cohering in a tube. Labellum linear, column elongate. Flowers in a loose panicle . . . . . 24. CORYMBIS.
- SUBTRIBE 3. Spiranthea.**—*Stem simple. Roots usually thick tuberlike fibres. Leaves membranous or wanting. Anthers erect or inclined forward, parallel to the elongate rostellum.*
- Claw of the labellum long, spreading, fimbriate; blade 2-lobed, clinandrium cupular. Leaves subradical, ovate, often coloured . . . . . 25. ANÆCTOCHILUS.
- Dorsal sepal and petals together forming a hood; lateral and column decurrent on the ovary or spike, lax or dense-fid, often secund or spiral . . . . . 26. SPIRANTHES.
- Stem with 2 opposite or subopposite leaves, Sepals and petals free, spreading . . . . . 27. LISTERA.
- Sepals free. Labellum sessile, erect, entire. Clinandrium cup-shaped . . . . . 28. GOODYERA.
- Sepals free or connate below. Labellum at the base more or less adnate to the column, entire or with 2 spreading lobes . . . . . 29. HETÆRIA.
- SUBTRIBE 4. Diuridea.**—*Stem simple, erect from an underground tuber. Anther erect or inclined forward; rostellum usually short.*
- Flowers racemose. Sepals petals and labellum all alike and spreading. Column-wings connected at the base in front . . . . . 30. THELYMITRA.
- Flowers racemose. Lateral sepals narrow-linear and long, the dorsal embracing the column at the base, erect and open at the end . . . . . 31. DIURIS.
- Flowers racemose, reversed. Sepals usually narrow. Labellum undivided. Labellum dilated and enclosing the column at the base. Leaves flat. Flowers large. No caudicle . . . . . 32. CRYPTOSTYLIS.
- Labellum contracted or clawed rarely gibbous at the base. Leaves terete. Flowers often small. Caudicle linear . . . . . 33. PRASOPHYLLUM.
- Flowers spicate small and green. not reversed. Labellum entire or 2-lobed. Lateral lobes of the column very small. Leaves terete. No caudicle . . . . . 34. MICROTIS.
- Column short. Labellum tubular, erect under the hood-shaped dorsal sepal, with or without a reflexed lamina, lateral sepals and petals very narrow or minute. Small plants with 1 broad leaf and 1 large flower . . . . . 35. CORYSANTHES.
- Column elongate (longer than the anther) semiterete or longitudinally winged. Stems simple, with 1 rarely 2 or 3 or no leaves. Rhizome with annually renewed tubers.

- Labellum unguiculate, the lamina peltate or produced beyond its insertion into a basal appendage.
- Dorsal sepal hoodshaped. Lateral sepals united at the base. Column semiterete with an oblong stigma about the middle and 2-hatchet shaped wings above it. Labellum with a basal appendage . . . . . 36. PTEROSTYLIS.  
Sepals and petals free.
- Labellum rather broadly peltate. Column with a broad petal-like wing its whole length . . . . . 37. CALEANA.
- Labellum hammer-shaped. Column with 1 or 2 pairs of narrow auricles . . . . . 38. DRACEA.
- Labellum-lamina sessile or not produced beyond its insertion on the claw.
- One ovate cordate leaf. Lateral sepals narrow. Petals short. Labellum undivided without fringes or erect calli, but two adnate ones at the base . . . . . 39. ACIANTHUS.
- One ovate or lanceolate leaf. Lateral sepals oblong, stipitate. Labellum-lamina or middle lobe very convex and villous . . . . . 40. ERIOPHILUS.
- One broad leaf. Lateral sepals and petals very narrow and spreading. Labellum with 2 adnate calli at the base continued in raised lines. Column winged . . . . . 41. CYRTOSTYLIS.
- One linear or oblong leaf. Lateral sepals as broad as or broader than the petals. Labellum with raised calli or fringes variously arranged. Column winged . . . . . 42. CALADENIA.
- One oblong or lanceolate leaf. Sepals and petals nearly equal, petal-like and spreading. Labellum without calli or fringes except 1 or 2 linear clavate processes erect against the column . . . . . 43. GLOSSOLIA.
- Flowers racemose. Sepals broad and petal-like. Dorsal sepal concave, petals much smaller. Labellum densely fringed on the surface . . . . . 44. CALOPHILUS.
- Two oblong leaves. Lateral sepals narrower than the petals. Labellum with raised calli or fringes. Column winged . . . . . 45. CHILOGLOTTIS.

SUBTRIBE 5. **Arethuseæ**.—*Stem simple, erect from an underground tuber. Anthers opercular, incumbent or suberect.*

- Sepals erect or spreading. Labellum undivided or 3-lobed. Column elongate, not winged. Flowering stem leafy, or leafless with the leaf produced afterwards . . . . . 46. POGONIA.
- Sepals and petals united into a ventricose 5-lobed tube. Labellum undivided. Leafless herbs . . . . . 47. GASTRODIA.
- Sepals narrow, free. Labellum concave, saccate or shortly spurred at the base. Column short. Leafless herbs . . . . . 48. EPIPOGUM.

TRIBE IV. **Ophrydeæ**.—*Anther 1, posticous, erect, inclined or reflexed. Cells parallel or diverging, adnate to the column and often continuous with the rostellum. Pollen-masses 1, rarely 2 in each cell, granular, produced into short caudicles attached to a gland or to the rostellum. Terrestrial herbs.*

SUBTRIBE 1. **Habenariæ**.—*Anther erect. Pollen-masses with their glands naked or partially included in a groove or fold of the rostellum.*

- Labellum spurred. Sepals equalling or exceeding the petals. Flowers spicate or racemose. Rostellum not elongated . . . . . 49. HABENARIA.

TRIBE V. **Cypripediæ**.—*Anthers 2, one on each side of the rostellum, sessile or stipitate. Anther posticous. Pollen granular. Terrestrial herbs.*

- Sepals, petals and labellum all similar. Anthers 2. Ovary 3-celled. Stem leafy. Panicles axillary . . . . . 50. APOSTASIA.

1. OBERONIA, Lindl.

(After Oberon, King of the Fairies).

Sepals free, nearly equal and erect, or the dorsal one smaller and reflexed. Petals narrower or shorter than the sepals. Labellum sessile, concave, entire or variously divided, often cushion-like or keeled at the base and usually embracing the column. Column very short, terete, contracted at the base, the apex with angular margins. Anther terminal, lid-like. Pollen masses 4, waxy, closely contiguous in pairs and often falling away in one mass, sometimes oblique and unequal.—Epiphytical plants with very short or, in species not Australian,

elongated stems, not usually thickened into pseudo-bulbs. Leaves distichous, equitant. Flowers very small, in terminal pedunculate dense racemes, the pedicels short, the bracts small.

The genus is spread over tropical Asia and the Indian Archipelago, extending westward to the Mascarene Islands, and eastward to the South Pacific. Of the three Queensland species one has a wide range over East India and the Archipelago, the others appear to be endemic.

Racemes as long as or longer than the leaves. Bracts ovate, fringed-ciliate.

Flowers yellow	1. <i>O. iridifolia</i> .
Racemes several times longer than the leaves. Bracts lanceolate, fine-pointed, entire. Flowers orange	2. <i>O. palmicola</i> .
Racemes slightly longer than the leaves. Bracts transparent. Flowers whitish	3. <i>O. pusilla</i> .

1. ***O. iridifolia*** (Iris-leaved), *Lindl. Gen. and Sp. Orch.* 15, and *Pol. Orchid.; Benth. Fl. Austr.* vi. 274. Leafy stems very short and thick, rarely lengthening to 1 in. Leaves 3 to 7, sometimes none of them exceeding 3 in., in other specimens above 6 in. long and rather broad. Racemes as long as or longer than the leaves, rather dense but very slender when in flower, the minute flowers more or less distinctly collected in closely approximate whorls. Bracts ovate, scarious, mostly denticulate. Pedicels at length  $\frac{3}{4}$  line long. Labellum broad, more or less fringed at least at the base and often 2-lobed at the end, about  $\frac{1}{2}$  line long. Sepals smaller. Capsule  $1\frac{1}{2}$  to 2 lines long, prominently angled.—*Malaxis iridifolia*, Reichb. f. in Walp. Ann. vi. 208; Fitzg. Austr. Orch. ii. pt. 3.

Hab: A very common plant north and south; also in East India and Archipelago.

2. ***O. palmicola*** (found on palms), *F. v. M. Fragm.* ii. 24; *Benth. Fl. Austr.* vi. 274. A small almost stemless species. Leaves 5 to 7, lanceolate, 1 to 2 in. long. Racemes very slender, 2 to 4 in. long, the minute flowers very numerous, clustered in distant whorls. Bracts as long as the flowers, lanceolate with fine points and often ciliate. Sepals and petals about  $\frac{1}{4}$  line long, lanceolate, acute, the petals narrower than the sepals. Labellum about as long as the sepals, with 2 broad lateral lobes, the middle lobe rhomboidal, rather broader than long. Fruiting pedicels  $\frac{1}{2}$  line long. Capsule nearly 1 line.—*Malaxis palmicola*, F. v. M. Fragm. vii. 30; *Oberonia Titania*, Lindl. F. v. M. in 2nd Cens. Austr. Pl. 185; Fitzg. Austr. Orch. ii. pt. 3.

Hab.: A very common plant, by no means confined to any particular tree.

3. ***O. pusilla*** (weak), *Bail. 3rd Suppl. Syn. Ql. Fl.* 71. A delicate small, light-green plant. Leaves slightly distichous, about 4 or 5 to a plant, semi-cylindric, foveolate, fleshy, not exceeding 1 in. in length and about 1 line thick. Racemes slightly longer than the leaves, bearing about 12 minute flowers, each subtended by a transparent bract. Fruit white, globular, 1 line diameter.

Hab.: Thickly studding the bark of a *Myrtus* on Bellenden-Ker, at about 4,000 feet.

## 2. MICROSTYLIS, Nutt.

(Style small.)

Sepals spreading or recurved. Petals slender, as long as sepals. Labellum adnate to the base of the column, usually flat, sides often produced upwards beyond the column as broad or long auricles. Column very short, with short spreading arms; anther subterminal, pollen-masses 4.—Terrestrial or epiphytic, pseudo-bulbous or not. Leaves 1 or more, continuous with the sheath. Flowers small in terminal racemes, resupinate.

Found in temperate and tropical regions.

1. ***M. congesta*** (crowded), *Reichb. f. in Hook. Fl. Brit. Ind.* v. 683. Stems stout, 4 to 8 in. high, tuberous at the base. Leaves about 5, 3 to 7 in. long,  $1\frac{1}{2}$  to  $2\frac{1}{2}$  in. broad, obtuse at the base, apex acute, sessile or petiolate. Peduncle

with raceme 2 to 8 in. long, bracts shorter than the very short pedicels. Flowers minute, yellowish, pale-brown or purplish. Sepals  $1\frac{1}{2}$  to 2 lines long. Labellum subquadrately ovate concave with a fold under the column and a 3-lobed apex. Ovary trigonous and grooved. Pollen-masses free, oblique-ovate. Capsule about 4 lines long, oblong.—*M. Bernaysii*, F. v. M. Fragm. xi. 21.

Hab.: Northern ranges.

3. LIPARIS, Rich. .

(In allusion to the soft surface of the leaves of some species).

(*Sturmia*, *Endl.*)

Sepals and petals all free and spreading, equal and similar or the petals and dorsal sepal narrower. Labellum shortly embracing or united with the column at the base, erect or ascending, entire. Column elongated, incurved, the apex winged. Anther terminal, lid-like. Pollen masses 4, waxy, obovoid, equal in pairs in the two cells, which are sometimes not closely contiguous.—Terrestrial or epiphytcal plants, the stems sometimes thickened at the base into small pseudo-bulbs. Leaves at or near the base of the stem. Flowers greenish-yellow white or faintly tinged with red, in a terminal pedunculate raceme.

The genus is widely spread over the tropical and subtropical regions of the Old World, with one northern species found in both hemispheres. The Australian species are, as far as known, all endemic.

Sepals all narrow and nearly equal.

Sepals 6 lines long. Labellum rhomboid. Flowers whitish . . . . . 1. *L. Nugentæ*.

Sepals and petals  $3\frac{1}{2}$  to 5 lines long. Labellum broadly oblong.

Flowers white . . . . . 2. *L. reflexa*.

Flowers yellow . . . . . 3. *L. cuneilabris*.

Sepals and petals 3 lines long. Labellum broadly obovate-cuneate . . . . . 4. *L. calogynoides*.

Sepals and petals 3 lines long. Labellum longer than the other segments, ending in 2 truncate lobes with an apiculate gland in the sinus . . . . . 5. *L. mowbulana*.

Lateral sepals broadly oblong, falcate. Dorsal sepal and petals longer, narrow-linear. Labellum broadly oblong . . . . . 6. *L. habenarina*.

Capsule erect, elongated, pyriform . . . . . 7. *L. Simmondsii*.

1. **L. Nugentæ** (after Mrs. L. J. Nugent), *Bail. Bot. Bull.* xiv. with plate. Epiphyte. Rhizome creeping, producing scape-like stems with the lower part covered with equitant leaves, but ultimately thickens into compressed, deep-green pseudo-bulbs,  $2\frac{1}{2}$  in. high and 1 in. broad, bearing usually 2 linear leaves of from 8 to 12 in. long and 1 in. broad, sharply keeled and showing on each side of the midrib 1 or 2 well-marked longitudinal nerves, sheathing base short, apex somewhat abruptly acuminate; the pseudo-bulb always bearing on its crown the remains of the old peduncle. Rhachis of flower raceme quadrangular, number of flowers about 9. Bracts fugacious, very narrow. Pedicels 8 lines long. Sepals about 6 lines long and scarcely a line broad, linear, with revolute margins, the petals still narrower but quite as long, all reflexed and somewhat curled, pale cream-coloured, no markings or veins visible. Labellum somewhat rhomboid when flattened out, erect to about the height of the column, or about half its length, then suddenly recurved, widening at the bend and almost forming a tooth on either side, otherwise margins entire, apex obtuse-apiculate; disk with 2 thickened ridges stained a deep orange-colour, but scarcely raised into plates except quite at the base. Column white incurved, 3 lines long, base rather broad, upper part slightly expanding into wings. Anther small, flat apiculate in front like the rostellum; pollen-masses pale.

Hab.: Mountain range near Cairns, *L. J. Nugent*.

2. **L. reflexa** (reflexed), *Linll. Bot. Reg.* under n. 882; *Benth. Fl. Austr.* vi. 272. Stems from a shortly creeping rhizome, thickened at the base, the whole plant including the raceme varying from 3 or 4 in. to nearly 1 ft. high when luxuriant. Leaves almost distichous, the 2 or 3 lower ones reduced to acute

sheathing scales, 1 to 3 upper ones oblong-lanceolate, 3 to 5 in. long and about  $\frac{1}{2}$  in. broad, with a short sheathing base, those of the barren pseudo-bulbs longer and contracted into a long sheathing base. Flowers yellowish-white in loose racemes. Bracts lanceolate-subulate or subulate. Pedicels with the ovary 4 to 5 lines long. Buds falcate. Sepals and petals 4 to nearly 5 lines long, the sepals narrow-lanceolate, the petals linear. Labellum about as long as the sepals, the erect base embracing the base of the column but free from it, the lamina broadly oblong, concave, the margins slightly undulate and dilated at the base into 2 auricles or short lateral lobes embracing the apex of the column, the apex obtuse or refuse and sometimes denticulate-ciliate, the disk with 2 more or less marked longitudinal raised lines. Column narrow, incurved, about half as long as the sepals, the margins slightly dilated at the top into membranous wings.—Reichb. f. Beitr. 46; *Cymbidium reflexum*, R. Br. Prod. 331; *Sturmia reflexa*, F. v. M. Fragm. ii. 72, iii. 165.

Hab.: Southern localities.

3. ***L. cuneilabris*** (labellum wedge-shaped), *F. v. M. Fragm.* iv. 164; *Benth. Fl. Austr.* vi. 273. Habit stature and loose racemes of rather large flowers of *L. reflexa*, but the flowers said to be yellow. Leaves more acute and tapering than in that species. Bracts shorter. Buds rather longer and narrower. Labellum shaped as in *L. reflexa*, of which this is probably a variety.—*Sturmia angustilabris*, F. v. M. l.c.

Hab.: Rockingham Bay, *Dallachy*; Mourilyan Harbour, *J. W. R. Stuart*.

4. ***L. cœlogynoides*** (Cœlogyne-like), *F. v. M. Fragm.* ii. 71; *Benth. Fl. Austr.* vi. 273. Habit nearly of *L. reflexa*, but the leaves more rigid and acute and those of the flowering stems more contracted at the base. Racemes much more slender than in *L. reflexa*, and the flowers smaller, the peduncle and rachis flattened and almost winged in the specimens (possibly from pressure in drying?). Bracts lanceolate, acuminate. Ovary and pedicels about 3 lines long. Flowers (white?), very delicate. Sepals and petals linear, about 3 lines long, the petals about half as broad as the sepals. Labellum as long as the petals, the short base embracing the column, the lamina broadly obovate-cuneate, the broad end slightly denticulate. Column half as long as the sepals, narrow, incurved, 2-winged at the top.—*Sturmia cœlogynoides*, F. v. M. l.c.

Hab.: Toowoomba, *F. v. Mueller*.

5. ***L. mowbulana*** (aboriginal name of its habitat), *Bail. Ql. Agri. Journ.* ii. 197, *Pl.* xvi. Pseudo-bulbs almost globose in outline, or somewhat irregular-angular,  $\frac{1}{2}$  in. or rather more in diameter, the old ones depressed; bearing 1 or 2 linear-lanceolate, recurved leaves, from 2 to  $3\frac{1}{2}$  in. long, and 3 to 4 lines broad, tapering from above the middle to the base, apiculate at the apex, longitudinal nerves usually 3 on each side of the midrib. Raceme half as long again as the leaves, the peduncle portion flattened. Flowers white, about 5. Bracts lanceolate, half as long as the pedicel. Pedicels with the ovary very slender 3 lines long. Sepals and petals about 3 lines long, all narrow, but the latter only half the width of the former. Labellum longer than the other segments, the lower half erect and loosely embracing the column, the upper half erecto-patent, cuneate in outline, ending in two truncate somewhat jagged lobes, with an apiculate gland in the sinus. No disk plates or calli. Column slightly shorter than the sepals, winged half-way up, then contracted and more or less abruptly incurved and expanding again under the anther on either side of the stigma. Anther yellow.

Hab.: Mowbulan or Bunya Mountain, *J. F. Bailey*; forming dense masses on the tree trunks.

6. ***L. habenarina*** (Habenaria-like), *F. v. M. Fragm.* iv. 131; *Benth. Fl. Austr.* vi. 273. Habit and foliage nearly of *L. reflexa*, but taller, often above 1 ft. high. Leaves several, tapering at both ends, mostly acute,  $\frac{1}{2}$  to 1 in. broad,

very few of them reduced to sheathing scales. Racemes long and rigid. Pedicels short, erect or spreading, the flowers much smaller than in *J. reflexa*. Bracts short. Lateral sepals about 2 lines long, broadly oblong-falcate, obtuse; dorsal sepal and petals linear, about 3 lines long, the petals still narrower than the sepal. Labellum as long as the lateral segments, recurved from the middle, broadly oblong, shortly embracing and adnate to the column at the base, obtuse or retuse, the disk with 2 small prominent callosities. Anther-cells at some distance from each other in the anther-case.—*Sturnia habendarina*, F. v. M. l.c.

Hab.: Rockingham Bay, *Dallachy*.

Very closely allied to the *L. ferruginea*, Lindl. in Gard. Chron. 1848, 55, from Borneo and Malacca, and perhaps a variety; but that species has a dark brown labellum showing its colour in the dried state, and from a note in Herb. Lindley, has no calli on the disk, whilst the *L. habendarina* has the labellum of the same pale yellow as the rest of the flower.—*Benth.*

**7. L. Simmondsii** (after J. H. Simmonds), *Bail. Bot. Bull.* 3. Stems arising from an almost globose rhizome of 1 to 1½ in. in diameter, erect terete, about 3 or 4 in. high, diameter about ¼ in., green, not wholly covered by the sheathing bracts, of which latter there are about 4, prominently striated, the keel more so than the rest and elongated into a subulate point. Leaves usually 2, ovate-acuminate, unequal sided, 5 to 7-nerved, petiolate, about 3 in. long. Peduncle and raceme terminal erect, about 10 in. Flowers not seen. Capsules elongated, erect, pyriform, about 1 in. long on pedicels of about 4 lines.

Hab.: On sandy land bordering swamps, Eudlo Creek, *Field Naturalists*, March, 1891.

This plant is probably nearly allied to *Liparis atropurpurea*, Lindl. The flowers, however, are wanted to prove its affinity.

**4. DENDROBIUM, Swartz.**

(From *dendron*, a tree, and *bios*, life.)

Sepals nearly equal in length, the lateral ones very obliquely dilated at the base and connate with a projection from the base of the column into a pouch or spur. Petals usually nearly the length of the upper sepal or rather longer. Labellum articulate at the end of or (in species not Australian) shortly connate with the basal projection of the column, concave at the base, with the margins gradually expanded into 2 lateral lobes usually embracing the top of the column, and a central terminal lobe usually spreading or recurved, or the lateral and terminal lobes confluent in an entire concave or spreading lamina, the disk usually bearing longitudinal raised plaits. Column not very long, winged or toothed at the top. Anther terminal, lid-like. Pollen-masses 4, in collateral pairs, usually equal and free or slightly coherent.—Rhizome tufted or creeping on trees or rocks; stems elongated and branching or simple and thick, sometimes reduced to short pseudo-bulbs, and usually bearing both leaves and racemes or 1-flowered peduncles. Flowers often rather large and showy, rarely very small.

A large genus ranging over the warmer regions of both the New and the Old World.

**SECT. I. Dendrocoryne.**—Stems simple elongated or short and sometimes thickened into oblong pseudo-bulbs, bearing 2 or more flat or channelled leaves at or near the end, the lower part with scarious thin sheathing scales which usually soon wear away, leaving annular scars. Racemes 1 to 3, apparently terminal or nearly so (owing to the arrest of the terminal shoot) or only in the upper axils.

Stems obovate, broader than the sepals. Peduncles often long. Flowers pink, lilac or white, usually very showy. Basal pouch of the flower forming a double spur.

Stems usually slender. Leaves lanceolate. Petals ¾ to 1½ in. broad.

Labellum middle-lobe very broad and obtuse . . . . . 1. *D. bigibbum*.

Stems somewhat stout. Leaves broadly lanceolate. Petals broadly-cuneate or obovate. Labellum middle-lobe blunt-triangular, longer than broad, slightly undulate . . . . . 2. *D. superbians*.

Stems stout. Leaves broad emarginate, thick coriaceous . . . . . 3. *D. Fitzgeraldii*.

- Stems stout. Leaves broad emarginate. Petals about 1½ in. long, obtuse-cuneate, sometimes curled. Labellum middle-lobe small, obtuse, emarginate, margins undulate . . . . . 4. *D. Toffii*.
- Stems somewhat stout. Leaves broadly lanceolate. Petals linear-oblong, 1½ in. long, much undulate. Labellum middle-lobe small, broadly-lanceolate or oblong . . . . . 5. *D. undulatum*.
- Stems more or less fusiform. Leaves narrow thick, 4 to 6 in. long, acuminate. Petals twisted, narrower but similar to the sepals. Labellum middle-lobe triangular, acute . . . . . 6. *D. Johannis*.
- Stems thick, nearly straight or curved, of nearly even thickness. Leaves flat, broad, thick coriaceous. Petals and sepals equal, some exceeding lin. long. Labellum middle-lobe broad as long . . . . . 7. *D. speciosum*.
- Stems fusiform, about 1ft. long. Leaves oblong acuminate, thin coriaceous. Petals and sepals equal, 8 to 10 lines long, 2 to 2½ lines broad, the petals narrower. Labellum middle-lobe truncate and very short . . . . . 8. *D. fusiforme*.
- Stems slender, with a bulbiform base. Leaves 3 to 5 in. long, ¾ to 1½ in broad, emarginate, subcoriaceous. Petals 6 to 8 lines long, narrow. Labellum middle-lobe apiculate . . . . . 9. *D. delicatum*.
- Stems slender in the lower half, prominently 4-angular above. Leaves few, broadly lanceolate, subcoriaceous about 4 in. long. Petals much shorter than the sepals, linear-filiform, slightly dilated at base. Labellum middle-lobe rather large and almost rhomboid . . . . . 10. *D. tetragonum*.
- Stems short terete, thin, erect. Leaves ovate-oblong, few. Petals and sepals narrow-linear, about lin. long. Labellum middle-lobe undulate, recurved . . . . . 11. *D. æmulum*.
- Stems 3 to 7 in. high, terete or furrowed about 5 lines diameter at top. Leaves linear-lanceolate 2 in. long. Petals about 4 lines. Labellum middle-lobe somewhat reniform, the margins curved upwards . . . . . 12. *D. Bairdianum*.
- Stems slender with a bulbiform base. Leaves lanceolate about 4 in. long. Petals about 4 lines long, narrow lanceolate. Labellum middle-lobe very broad . . . . . 13. *D. Kingianum*.
- Stems 1 to 2ft. high, slender. Leaves subcoriaceous, 4 to 6 in. long, lanceolate, obscurely bifid, infolded at the base. Petals linear-oblong. Labellum middle-lobe reniform . . . . . 14. *D. gracilicaule*.
- Stems slender about 1ft. high. Leaves lanceolate few 3 to 4 in. long 1 in. broad. Petals about 5 lines long. Labellum middle-lobe cordate, densely tomentose . . . . . 15. *D. Adæ*.
- Stems 6 to 18 in. long. Leaves lanceolate, 1 to 2 in. long. Labellum tomentose with fringed undulate margins, lateral lobes scarcely any . . . . . 16. *D. Stuartii*.
- Stems rather slender, about 18 in. high. Leaves lanceolate, 2 to 4 in. long, erecto-patent. Flowers yellow. Petals obovate-oblong, very short: Labellum middle-lobe twice as broad as long . . . . . 17. *D. agrostophyllum*.
- Stems very slender, often leafy throughout. Leaves 2½ to 4½ in. long, 2½ to 3½ lines broad. Petals and sepals similar, tapering to thread-like points. Labellum middle-lobe linear-subulate, disk yellow . . . . . 18. *D. Baileyi*.
- Stems slender tufted 1 to 4ft. high, leafy throughout. Leaves linear-lanceolate, 3 in. long. Petals and sepals with long thread-like points. Labellum middle-lobe bordered by a dark-purple fringe . . . . . 19. *D. Keffordii*.
- Stems thick forming elongated cones. Leaves rigid, narrow-lanceolate almost semi-cylindrical. Petals longer than the sepals narrowed towards the base. Labellum middle-lobe nearly orbicular . . . . . 20. *D. canaliculatum*.
- SECT. II. *Pedilonium*.**—Stems tufted, long, terete, simple, stout or slender, erect or pedulous, leafy. Leaves distichous, oblong or lanceolate, coriaceous or submembranous, persistent or deciduous. Flowers medium-sized, pink or yellow, rarely white, in short leaf opposed often dense-flowered secund racemes, or in corymbs or tufts, rarely solitary; spur stout and often very long, equalling or longer than the short triangular sepals. Labellum usually very long and narrow, clawed, with often a small lamella callus or spur on the claw near the base.
- Stems stout, 2ft. or more high, prominently furrowed. Leaves oblong or lanceolate about 4 in. long. Petals small. Labellum with a long claw, expanding and hood-shaped at the apex . . . . . 21. *D. Smillie*.
- Stems much thinner than the last. Leaves acute and unequally bidentate at the apex. Apex of labellum 3-angular . . . . . 22. *D. ophioglossum*.



SECT. III. **Monophyllæa.**—Stems tufted, creeping or pendulous, usually terminating in a single leaf with 1 or 2 or a raceme of several flowers at its base.

- Rhizome creeping. Stems short, thick, erect, corrugated. Leaves usually solitary, oblong, about 4in. long. Flowers yellow in racemes as long as the leaves . . . . . 23. *D. monophyllum.*
- Rhizome creeping. Stems short conical ½in. high. Leaves 2 often twisted, linear-oblong, emarginate, lin. long. Raceme pendulous, 3½in. long. Flowers greenish-yellow . . . . . 24. *D. Schneiderei.*
- Stems slender tufted, erect, about 4in. high. Leaves solitary about 2in. long, emarginate. Flowers white. Ovary hispid, glabrous in the variety . . . . . 25. *D. hispidum.*

SECT. IV. **Rhizobium.**—Rhizomes or stems creeping or elongating and pendulous, with scarious sheathing scales. Leaves solitary in the axils of the scales, either sessile on a broad disk or on a very short turbinate protuberance. Racemes usually few-flowered.

- Rhizome creeping, stems rigid elongate. Leaves oblong, fleshy, tuberculate resembling minute cucumbers. Flowers streaked with red. Labellum middle-lobe ovate-acuminate . . . . . 26. *D. cucumerinum.*
- Leaves flat, coriaceous very acute. Sepals lanceolate, about 5 lines long without the spur . . . . . 27. *D. pugioniforme.*
- Leaves very thick and fleshy not sulcate. Sepals oblong, about 3 lines long, lateral ones deltoid. Labellum thick, the middle lobe oblong . . . . . 28. *D. rigidum.*
- Leaves thick oblong, 1 to 2in. long, often 2 sulcate and wrinkled. Flowers in racemes of 3 to 4in. Segments narrow linear-lanceolate . . . . . 29. *D. linguiforme.*

SECT. V. **Strongyle.**—Stems branched, usually slender. Leaves distant, terete, sometimes more or less sulcate. Racemes of few flowers or sometimes solitary.

- Flowers in racem's. Sepals and petals narrow, lin. or more long. Spur 2 or 3 lines long. Labellum middle-lobe recurved, long acuminate, the lower half undulate . . . . . 30. *D. teretifolium.*
- Stems erect, then branching and very slender and drooping. Leaves 2-formed, lower ones twice as large as the upper. Flowers solitary . . . . . 31. *D. Beckleri.*
- Stems slender, branching. Leaves slender, somewhat bluntly 4-angled. Flowers in pairs on a short peduncle. Sepals 5, petals 3-ribbed . . . . . 32. *D. Mortii.*
- Stems slender branching slightly drooping. Leaves slightly sulcate. Labellum middle-lobe broadly reniforme . . . . . 33. *D. Bowmanii.*

SECT. ?

- Rhizome creeping, stems terete, finger-like, 2 to 4in. long. Leaves terminal, 1 or 2, lanceolate, 5in. long, lin. broad. Racemes 2 to 3in. long, hoary, bearing nearly sessile purplish flowers . . . . . 34. *D. ericoides.*

1. **D. bigibbum** (referring to the double spur or chin), *Lindl. in Part. Fl. Gard.* iii. 25, f. 245; *Benth. Fl. Austr.* vi. 277. "Zula," Batavia River, *Roth.* Stems 6 to 18in. long, slightly contracted towards the base, bearing in the upper part 3 or 4 lanceolate leaves of 3 or 4in., and in the older plants swollen at the base in a short pseudo-bulb. Raceme apparently terminal on a peduncle of 6 to 8in., with 3 to 10 flowers of a deep lilac on pedicels of ¾ to lin. Sepals ovate or ovate-lanceolate, acute, 9 to 10 lines long and about 5 lines broad in most specimens, the lateral ones produced with the basal projection of the column into an obtuse pouch with a conical straight or curved obtuse spur on the lower side forming a double spur. Petals broadly obovate almost orbicular, fully ¾in. broad. Labellum rather shorter than the sepals, with the large lateral lobes forming a very broad base, the middle lobe at least as broad as long, very obtuse or refuse and not so long as the broad base, the disk with 3 to 5 raised longitudinal lines fringed or crested from the middle upwards.—*Bot. Mag.* t. 4898; *Fitzg. Orch.* ii. pt. 5.

Hab.: Mount Adolphus, Torres Straits, *Thomson*; one or other variety is met with northward from Cooktown.

Strips of yellow cortex of any of the varieties is used for ornamenting wommera handles and for intertwining into the men's belts.—*Roth*, l. c.

*Var. album*. This variety is very rare, but differs in nowise from the typical form except in its pure white flowers.

*Var. albomarginatum*. Segments having a white margin.

*Var. phalaenopsis*. Stems, leaves and peduncles the same as in other varieties of this species. Racemes of 3 or more large flowers, the sepals and petals of a heliotrope colour, the labellum especially towards the base a rich mauve. Flowers distant, pedicels white  $1\frac{1}{2}$  in. long. Sepals oblong,  $1\frac{1}{2}$  in. long. 7 lines broad, minutely apiculate, the lateral ones forming but a very short upper basal projection, the spur 4 lines long, compressed, scarcely a line in diameter. Petals rhomboid,  $1\frac{1}{2}$  in. broad, tapering at the base to a short claw. Labellum more than three parts the length of the sepals, the middle lobe occupying about half its length, very obtuse and over  $\frac{1}{2}$  in. broad, the lateral lobes curving round and enclosing the column, the disk with an oblong cushion-like mass, which with the aid of a lens is found to be formed of several irregular rows of tooth-like processes. Column very short, the side wings reaching to the top or above the anther.—Including *D. b. var. macranthum*, *Bail. Bot. Bull. x.*; *D. phalaenopsis*, *Fitzg., Austr. Orch. i. 7.*

*Forma. venosum*. This form only differs in having the perianth-segments prominently veined.

2. **D. superbians** (stately appearance), *G. Reichb. Gard. Chron. 516 (1876)*. Stems 2 to 4 ft. high, somewhat tapering towards the top, and often contracted at the base. Leaves broadly-lanceolate 3 to 4 in. or sometimes more long, thin-coriaceous. Peduncles slender, nodding bearing a raceme of 9 or more showy flowers 2 in. or more in diameter. Bracts lanceolate, setaceous. Sepals reflexed, undulate, purplish-lilac on the face with a white border, the back rosy with darker coloured veins. Spur conical the additional one prominent in the bud. Petals purplish-lilac, broadly cuneate or obovate. Labellum 3-lobed, lateral ones blunt rhomboid minutely toothed at the anterior part, overlapping the column, middle lobe blunt-triangular, longer than broad, slightly undulate. Disk calli divided into 2 or 3 rows of strong teeth forming one dense mass with 4-furrows, colour amethyst-purple brighter than the other part of the labellum, the base whitish-yellow. Column purplish on the back, whitish in front, with rows of purplish spots at the base. Anthers white.

*Hab.*: Islands of Torres Straits.

3. **D. Fitzgeraldi** (after R. D. Fitzgerald), *F. v. M. in Melb. Chem. June 1884* (only a brief notice). Stems tall and leafy, often more than 2 ft. high, corrugated and marked with purple lines and bulbiform at the immediate base. Leaves lanceolate, 4 to 5 in. long and 1 in. broad, curved and twisted. Racemes long slender and pendulous, bearing numerous showy flowers of a purplish colour. Sepals petals and labellum often very wavy,  $1\frac{1}{4}$  in. long and of a whitish colour outside and on the edge. Spur slender and prominent. Labellum with the lateral lobes not undulate, broad and rounded at the upper end and there coloured, middle lobe  $\frac{2}{3}$  the length of the lateral ones, and much undulate and recurved. Disk plates 5, prominently crested at their upper ends. Column wings ending in coloured points above the anther.—*D. superbians*, *Fitzg. Austr. Orch. ii. Pt. 1.*

*Hab.*: Islands of Torres Straits.

I have no specimen, and there does not seem to have ever been a description published. The above is from Mr. Fitzgerald's excellent plate, where it is given as *D. superbians*, *Reichb.*

4. **D. Tofftii** (after G. Tofft), *Bail. 3rd Suppt. Syn. Ql. Fl. 71*. Resembling *D. undulatum*, the stems attaining to 4 or 5 ft. in height, swollen above the base, all more or less compressed, and prominently marked with purple ribs. Leaves broadly ovate and emarginate similar to those of *D. undulatum*. Racemes several, proceeding from the upper part of the stem, about 15 in. long, including the rather long peduncle, which latter bears about 3 distant, obtuse, closely sheathing, scarious bracts, besides several which are crowded at immediate base. Pedicels attaining  $1\frac{1}{2}$  in. Sepals attaining  $1\frac{1}{2}$  in., nearly white, more or less recurved above the

middle, obtuse, the dorsal one 4 or 5 lines broad at the base, the lateral ones broader, extending down and covering the rather pointed straight spur formed from the base of the column and labellum. Petals about as long as the sepals obtuse, narrower, and tapering much towards the base, faintly lined with violet, and frequently but not always curled. Labellum about the same length as the other segments but much broader, the lateral lobes erect, stained with violet, and marked by violet-coloured forked veins, embracing the column, middle-lobe small and scarcely separated from the others, obtuse, emarginate, or sometimes apiculate, the margins undulate; the disk with 3 strong dark violet-coloured plates with entire margins ending abruptly at the base of the middle-lobe. Column of medium length, violet stained at the base, more or less arched, with thick wings. Anthers flat, not prominent; pollen-masses coherent.

Hab.: Creek off the Johnstone River, *A. G. Tofft*.

This superb species approaches *D. undulatum* in habit and form of leaves. The stems, however, are much more compressed, and the flowers are very different in both form and colour. In the dark-coloured ribs of the stem it resembles *D. Johannis*.

5. **D. undulatum** (undulate), *R. Br. Prod.* 332; *Benth. Fl. Austr.* vi. 278. A stout species growing in large tufts and attaining with the racemes several ft., the stems often swollen in the middle. Leaves bifarious, ovate or elliptical, obtuse or emarginate, 2 to 4 in. long, flat but thick and somewhat undulate or the margins recurved. Racemes from the upper part of the stem often above 1½ ft. long, the flowers numerous, rather large, on pedicels often exceeding 1 in. Bracts lanceolate or linear-lanceolate. Sepals and petals nearly similar, spreading, linear-oblong, obtuse, very much undulate, of a dingy brown usually bordered with yellow, about 1 in. long, the short broad basal pouch ending in a short curved or straight obtuse spur. Labellum shorter than the sepals, the lateral lobes large, erect, nearly flat, the middle lobe small, broadly lanceolate or oblong, recurved and undulate; the disk with 5 raised lines or plates of a light violet colour, of which 2 more prominent especially near the base and sometimes 7 immediately below the middle lobe. Column short.—*Lindl. Gen. and Sp. Orch.* 27; *Reichb. f. in Walp. Ann.* vi. 298, *Beitr.* 47; *F. v. M. Fragm.* i. 87; *D. discolor*, *Lindl. Bot. Reg.* 1841, t. 52; *Fitzg. Austr. Orch.* ii. Pl. 3.

Hab.: Endeavour River and many other places along the coast, *Banks and Solander*, *R. Brown*, *A. Cunningham*; *Port Curtis*, *M'Gilvray*; *Curtis Island*, *Thozet*; *Rockingham Bay*, *J. Dallachy*; *Port Denison*, *E. Fitzalan*; *Cape York*, *Daemel*; *Albany Island*, *A. C. Gregory*; and *New Guinea*.

Var. *Broomfieldii*, *Fitzg. Austr. Orch.* Pt. 3, only differs in colour of flowers, which is a canary yellow, and in the more angular stem.

Hab.: Bowen.

6. **D. Johannis** (after John Veitch), *Reichb. f. in Gard. Chron.* 1865, 890; *Xen. Orch.* ii. 165; *Benth. Fl. Austr.* vi. 279. Stems tufted from a shortly creeping rhizome, always more or less fusiform above the bulbous base, usually 7 in. or more high, the internodes short and deeply corrugated the ridges purple lined. Leaves narrow, thick, 4 to 6 in. long, seldom more than ½ in. broad, tapering from the base to a sharp point, 2 to 5 to each stem, often distant. Peduncle with raceme 8 to 10 in. long, very slender and usually purplish. Bracts minute, membranous, the lower ones closely clasping the peduncle, those subtending the flowers spreading and more acuminate. Pedicels very slender about 1 in. long. The segments all more or less twisted. Sepals brown with a yellowish tint, 8 to 9 lines long, 1½ line broad, linear, obtuse at the end, marked with longitudinal darkish red lines. Petals somewhat greenish, similar to the sepals but rather darker, shorter and narrower. Labellum 3-lobed, scarcely more than half the length of the sepals; lateral lobes oblong deep-red with very oblique deeper-red veins, middle-lobe triangular, acute, sulphur-coloured. Disk with 3 prominent lines of calli continued down between

the lateral-lobes in thin plates. Column rather short, the side-wings ending in a rather broad tooth on either side of and rather above the anther. Anther-lid patelliform, the front margin densely ciliate.—Bot. Mag. t. 5540.

Hab : Cooktown and many other tropical localities.  
Flowers very fragrant.

**7. *D. speciosum*** (showy), *Sm. Exot. Bot.* i. 17, t. 10 (the flowers grossly misrepresented, Benth.); *Benth. Fl. Austr.* vi. 279. "Dhumbee," Bundaberg, *Keys*. "Tar-beri," Brisbane. Stems very thick and fleshy, 3 to 15in. high. Leaves few (2 to 5) distichous towards the apex of the stem, ovate or oblong, thick, flat or slightly undulate, 3 to 6in. long. Racemes apparently terminal, often above 1ft. long, the sheathing scales at the base of the peduncle 1 to 1½in., the bracts very small, ovate or lanceolate. Flowers numerous, rather large, pale yellow, on pedicels of 1 to 2in. Sepals and petals nearly equal, erect or slightly open, usually incurved, ¾ to 1in. long, lanceolate but varying in breadth, the lateral ones incurved, forming with the basal projection of the column a short broad pouch. Labellum considerably shorter than the sepals, nearly white spotted with purple, the lateral lobes short and broad, the middle lobe broader than long, very obtuse or retuse. Column white, often spotted with purple.—*R. Br. Prod.* 332; *Lindl. Gen. and Sp. Orch.* 87; *Reichb. f. Beitr.* 48; *Bot. Mag. t.* 3074; *Bot. Reg. t.* 1610.

Hab.: On mountain tops of Bellenden-Ker and other ranges in the north.  
The aboriginal name usually applied to var. *Hillii*.

Var. *Hillii*, *F. v. M.—D. Hillii*. *Hook. Bot. Mag. t.* 5621. Stems stout, 3 or more feet high. Leaves very coriaceous, 1ft. or more long. Racemes 1½ to 2ft. long with the short peduncle. Flowers very numerous, usually white, turning to yellow. Pedicels 1½in. long, slender. Sepals and petals equal, about 1in. long. Labellum short, about 4 lines long, bordered inside and the middle-lobe outside with purple, base of column and disk plate orange-yellow.

Hab.: The common form in Queensland.

Leaves sometimes infested with the fungus-blight *Diplodena dendrobii*, *C. and M.*

Forma. *Bancroftianum*, *H. G. Rehb. f.* Plant with the robust habit of *D. speciosum*, var. *Hillii*, but segments of flower longer and narrower. Labellum of a light sulphur-colour with a few minute atoms of purple at the base, and the keel dark-yellow.—*From Gard. Chron.* 18th June, 1881.

Hab.: Supposed to be a northern form.

Forma. *grandiflorum*, *Bail. Bot. Bull.* xiv. This variety has a more vigorous habit than *D. speciosum*, var. *Hillii*; the leaves often over 1ft. long and near ¾ft. broad. The distinction, however, is mostly in the flowers, which are of a deep yellow from first expanding until they decay. Sepals 1½in. long, and 3 lines broad. Petals 1½ line broad. Labellum very obtuse and barred throughout with purple.

Hab.: Eumundi, North Coast Railway Line.

Var. *curricule*, *Bail. Bot. Bull.* xiv. Stems curved, some almost into a half-circle, compressed, 9 to 12in. long, the broad diameter often attaining 1½in. Leaves very coriaceous-oblong, the end somewhat pointed, about 5in. long, 2in. broad, often concave. Peduncle with raceme 9 or 10in long, bearing numerous cream coloured flowers; bracts of the peduncle exceeding 1in. long, cymbiform, quite coriaceous. Pedicels 1in. long. Sepals 6 or 7 lines long, 3 lines broad, thick, linear, curving outwards. Petals linear, about as long as the sepals, thick, curving outwards, 1 to 1½ line broad. Labellum, the lateral lobes loosely embracing the very short column, the column in its natural position about ¾ the length of the other segments, thick coriaceous, lateral lobes longer than broad, middle lobe broad as long, slightly apiculate. Disk bearing a thick ridge, all parts of the labellum marked with thick purple bars, and the base of column and labellum orange stained. Column short, spur broad, anther small, pollen-masses light-coloured.

Hab.: Lady Elliott's Island, *W. Soutter*.

Var. *nitidum*, *Bail., Proc. Roy. Soc. Ql.* i. Stems numerous, 1½ to 2ft. high, often not more than ½in diameter, usually when old shining, fluted, with 3 to 5 lanceolate leaves at the summit. Leaves prominently pitted on the upper face, coriaceous, 6 to 7in. long, 1½ to 2in. broad. Racemes 6 to 8in. long, bearing from 24 to 30 white flowers. Sepals and petals nearly equal, 6 to 7 lines long, and about 2 lines broad. Labellum short, the lateral lobes marked with short purple lines at the base, middle-lobe all yellowish-white, apiculate, longitudinal plates yellow. Spur very short.

Hab : Tropical Queensland.

8. **D. fusiforme** (spindle-shaped), *Bail. Proc. Linn. Soc. of N.S.W.* ii. 277. Stems dark-coloured, seldom exceeding 12in. in height, quite fusiform, deeply corrugated, sometimes swelling again at the immediate base. Leaves 2 to 7 near the summit of the stems, ovate-oblong, acuminate, more or less undulate, thin coriaceous. Peduncle with raceme 6 to 10in. long, slender. Bracts of peduncle obtuse, closely sheathing, those subtending the flowers minute spreading, brown. Flowers numerous, very fragrant, white or cream-coloured. Sepals and petals equal, 8 to 10 lines long, sepals 2 to  $2\frac{1}{2}$  lines broad, the petals narrower. Labellum about 3 lines, marked on the inside with purple lines but mostly on the lateral lobes, the middle lobe very short, truncate, twice as broad as long, disk plates and base of column on the inside orange-coloured, speckled with purple. Column short.—*D. speciosum* var. *fusiforme*, in *Syn. Ql. Fl.* 509.

Hab.: Common on the trees of the northern coastal scrubs; Herberton, *J. F. Bailey*.

9. **D. delicatum** (delicate), *Bail. (as a var. of D. speciosum) in Proc. Roy. Soc. of Ql.* i. Stems numerous, often forming large patches on rocks, &c., slender in the upper part but often much enlarged at the base. Leaves 3 or 4 at the top of stem, 3 to 5in. long,  $\frac{3}{4}$  to  $1\frac{1}{4}$ in. broad, the apex obtuse or emarginate, the texture rather thin. Racemes 1 or 2 from 7 to 8in. long, with 8 or 9 distant, fragrant, white flowers. Sepals 6 to 8 lines. Petals thinner and narrower than the sepals but about the same length; spur rather long and curved. Labellum delicate white speckled with purple, the middle lobe very short, apiculate, longitudinal plates yellow, column white.

Hab.: Main Range, near Toowoomba, *Benj. Crow*.

10. **D. tetragonum** (4-angled), *A. Cunn. in Bot. Reg.* 1839, *Misc.* 33; *Benth. Fl. Austr.* vi. 279. "Dhungong," Bundaberg, *Keys*. Stems from a creeping or tufted rhizome numerous, forming small pseudo-bulbs at the base, from 1 or 2in. to above 1ft. long, very prominently 4-angled, rather slender in the lower portion, thickened above the middle or near the apex. Leaves 2 or 3 near the summit of the stem, oblong or broadly lanceolate, acute, 2 to 4in. long. Racemes above the leaves 1 or 2, short and loose, bearing each only 1 to 4 yellowish green flowers bordered with brownish red on pedicels of  $\frac{1}{2}$  to 1in. Bracts small and narrow. The dorsal sepal linear-lanceolate, the lateral ones from a broad triangular base of  $\frac{1}{2}$ in. suddenly contracted into a linear almost filiform point of 1 to nearly  $1\frac{1}{2}$ in. the basal spur ascending, thick and very obtuse,  $2\frac{1}{2}$  lines long. Petals yellow much shorter than the sepals, linear-filiform with a slightly dilated lanceolate base. Labellum nearly  $\frac{1}{2}$ in. long, pale yellow streaked with narrow bands of crimson, the lateral lobes broad and prominent, the middle one larger, almost rhomboidal, shortly and acutely acuminate. Disk with 3 raised lines or narrow plates scarcely undulate, the central one more raised and alone continued on the base of the middle lobe.—*Lindl. Bot. Reg.* 1841, *Misc.* 2; *Bot. Mag.* t. 5956; *F. v. M. Fragm.* i. 82.

Hab.: Islands of Moreton Bay, *A. Cunningham*, *F. Mueller*; Rockhampton, *Bozman*, *O'Shanesy*; Rockingham Bay, *Dallachy*. Common in most coastal scrubs.

Size and colouring of flowers very variable but I have not found this constant enough to name varieties.

11. **D. æmulum** (a rival), *Il. Br. Prod.* 333; *Benth. Fl. Austr.* vi. 280. Stems terete, often thin, sometimes tapering into a long thin base with a small pseudo-bulb as in *D. tetragonum*. Leaves 2 or 3 near the summit, ovate or oblong. Racemes 1 to 3 at the end between the leaves, 2 or 3in. long, the rachis slender, the bracts small and lanceolate. Flowers rarely above 6 in the raceme, on slender pedicels of  $\frac{1}{2}$ in. or less. Sepals narrow lanceolate, almost linear, often nearly 1in. long, striate, the basal pouch or spur short and broad, turned upwards. Sepals and petals narrow-linear, about 1in. long, white, fading

away to a rosy pink. Labellum scarcely above  $\frac{1}{2}$  in. long, contracted into a claw at the base, the lateral lobes broad short and acute, the middle lobe recurved, ovate, undulate, with a small scarcely acute point; the disk with 3 raised lines or plates between the lateral lobes merging into a single broad high much undulate tomentose yellow crested one, extending to the end of the middle lobe. Capsule elongate-pyriform, about lin. long, 3-furrowed, green.—Lindl. Gen. and Sp. Orch. 87; Reichb. f. Beitr. 49; F. v. M. Fragm. i. 213; Bot. Mag. t. 2906 (incorrect as to stem); Fitzg. Austr. i. Pt. 2.

Hab.: From the Tweed to Barron River. Often on stems of *Tristania conferta* (the Brisbane Box tree).

12. **D. Bairdianum** (after J. C. Baird), *Bail. 1st Suppt. to Syn. Ql. Fl.* Stems from a shortly creeping rhizome, 3 to 7 inches high, terete or furrowed, and slightly constricted at the nodes, attenuated towards the base, the upper part thickening to nearly  $\frac{3}{4}$  in. diameter. Leaves (only seen on a young growth) linear-lanceolate, about 2 in. long and a  $\frac{1}{2}$  in. broad, keeled and prominently striate, the apex obliquely emarginate. Racemes erect on the old leafless stems, 2 inches long, bearing 3 flowers. Bracts small, lanceolate. Pedicels  $\frac{3}{4}$  in. long. Sepals ovate, about 5 lines long, yellowish-green, the two lateral ones partly connate, and forming with the base of the column a blunt spur. Petals of the same colour, but shorter and thinner in texture than the sepals. Labellum rather longer than the other segments, thick, the lateral lobes oblong and of a dark-purplish colour, the middle lobe somewhat reniform with the sides curved upwards, marked with dark-purple veins; disk white, with 2 raised plates which end at the base of the middle lobe. Column short, purple in front, wings narrow, Anther-lid small.

Hab.: Between Herberton and Mourilyan Harbour, *J. W. R. Stuart*. This species is allied to *D. emulum* and *D. Kingianum*, but quite distinct from either.

13. **D. Kingianum** (after Capt. King), *Bidw. in Lindl. Bot. Reg. 1844, Misc. 11, 1845, t. 61; Benth. Fl. Austr. vi. 280*. Stems usually 3 to 9 in. high, striate with prominent angles, thickened at the base. Leaves at the summit of the stem 3 to 5, lanceolate or oblong-lanceolate, acute, 3 to 4 in. long. Racemes within or above the leaves 1 to 3, longer than the leaves. Flowers from a reddish purple to nearly white with a Heliotrope fragrance. Pedicels  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long. Bracts very small. Sepals broadly lanceolate, the lower ones much falcate, 4 lines long in some specimens, fully 5 in others. Petals about as long but narrower. Spur conical, slightly incurved about 3 lines long. Labellum not much shorter than the sepals, not undulate, the lateral lobes very prominent, almost oblong, obtuse, the middle lobe scarcely longer, but very broad, almost reniform, the disk with 3 raised lines or plates extending to the base of the middle lobe, but not beyond.—Bot. Mag. t. 4527; F. v. M. Fragm. iii. 60.

Hab.: Moreton Bay, *Bidwill*; Glass House Mountains, *J. F. Bailey*; other southern localities.

Var. *pallidum*, *Bail., Proc. Roy. Soc. Ql. i.* The clustered stems weaker than the typical form, often densely matted together and thus forming large patches on the rocks. Stems 2 to 9 in. high, the base enlarged in pseudo-bulbs. Leaves of a thin texture, 2 to 3 in. long, about  $\frac{1}{2}$  in. broad near the base, and tapering towards the apex. Racemes slightly longer than the leaves, bearing 3 or 4 pale lilac-stained flowers.

Hab.: Main Range, *Benj. Crow*.

Var. *Silcockii*, (after P. Silcock) *Bail.* Stem and leaves firm as in the typical form. Flowers pure white except the labellum and of thick substance. Pedicels white,  $\frac{3}{4}$  in. long. Ovary green, 2 lines long. Dorsal sepal 5 lines long, 3 lines broad, cymbiform, lateral ones broad, falcate, from point to point 7 lines, quite enclosing the elongated base of the column (spur). Petals long as dorsal sepal but not so broad, incurved and meeting over the column. Labellum about as long as the sepals, lateral lobes spreading, pointed at the ends and reaching above the column, marked with lilac lines, middle lobe broadly cordate, apiculate, lilac lined with white. The disk bearing 3 thick ridges ending in points at the base of the middle lobe. Column thick and short. Anther-lid ciliate in front. Pollen-masses amber-coloured.

Hab.: Towards the Tweed River, *P. Silcock*.

14. **D. gracilicaule** (stems slender), *F. v. M. Fragm.* i. 179; *Benth. Fl. Austr.* vi. 281. "Cheebal," Barron River, *J. F. Bailey*. Stems numerous, 1 to 2ft. high, slender, cylindrical, sometimes slightly thickened at the base, more or less clothed with membranous sheaths. Leaves thin coriaceous, several crowded near the summit of the stems, sessile, 4 to 6in. long, lanceolate, infolded at the base, the tip obscurely bifid. Peduncle including the nodding raceme about 4in. long. Bracts small. Pedicels slender,  $\frac{1}{2}$ in. long. Flowers often crowded from 6 to 10, all yellow or more or less marked on back of sepals and petals with irregular-shaped reddish or brownish spots, but the colouring very irregular on the same plant. Dorsal sepal oblong incurved, lateral ones falcate oblong-lanceolate. Petals linear-oblong; spur curved, rather broad. Labellum rather shorter than the other segments, lateral lobes erect, the middle lobe reniform, with usually 3 longitudinal plates on the disk between the lateral lobes.—*Bot. Mag.* 7042; *D. elongatum*, A. Cunn. in *Bot. Reg.* 1839, Misc. 33, *Lindl. l.c.* 1841, 21, but not of *Lindl.*, *Gen. et Sp. Orch.* 77; *D. brisbanense*, *Reichb. f.* in *Walp. Ann.* vi. 299; not *D. gracilicaule*, *Kranzlin* in *Plantæ Hellwigianæ*, 187 (1894); *D. jonesii*, A. B. Rendle in *Journ. of Bot.* xxxix. 197.

Hab.: Common in the scrubs both north and south of Brisbane.

The slight differences in the form and colouring of the flowers I find insufficient for separating into varieties or forms.

15. **D. Adæ** (after Mrs. J. W. R. Stuart), *Bail. Proc. Roy. Soc. Ql.* i. Stems about 1ft. long, slender, furrowed, bearing at their summit about 3 lanceolate leaves 3 or 4in. long, 1in. broad, keeled underneath and rather thin in texture. Racemes terminal, 1 to 3in. long, with 2 to 4 highly fragrant white flowers. Bracts small, lanceolate. Pedicels about  $\frac{1}{2}$ in. long. Sepals or outer segments about  $\frac{1}{2}$ in. long, somewhat ovate, the lateral ones slightly falcate, spur short and curved. Petals or inner segments shorter and narrower than the sepals. Labellum shorter than the other segments; lateral lobes glabrous and faintly marked with purple bars, middle lobe cordate and densely tomentose, 3 close raised lines along the disk reaching to the base of the middle lobe. Column white. Anther-lid white. Pollen-masses rather small, pale yellow.

Hab.: Herberston.

16. **D. Stuartii** (after J. W. R. Stuart), *Bail. Proc. Roy. Soc. Ql.* i. Stems slender, prominently striate, 6 to 18in. long, leafy. Leaves lanceolate, 1 or 2in. long. Racemes short, axillary, usually 3-flowered. Outer and inner segments about  $\frac{1}{2}$ in. long, yellowish-green; spur about 3 lines long, straight. Labellum tomentose, with fringed undulate edges, the disk-plates not prominent, obtuse-ovate,  $\frac{3}{4}$ in. long; lateral lobes none or scarcely any; veins red, forked, crossed by two longitudinal ones. Column short, white, the narrow wings edged with purple. Flowers fragrant.—*Fitzg. Austr. Orch.* ii. Pt. 3.

Hab.: Herberston.

17. **D. agrostophyllum** (leaves grass-like), *F. v. M. Fragm.* viii. 23; *Benth. Fl. Austr.* vi. 281. Stems deeply furrowed, slender and rather distant upon an elongated creeping rhizome, from 1 to 2ft. high, leafy from the middle upwards. Leaves lanceolate, erecto-patent, rather thin, 2 to 4in. long. Racemes axillary and distant from the top of the stem, the rhachis not 1in. long. Flowers few, more or less yellow, segments of thin texture, on pedicels of about  $\frac{3}{4}$ in. Dorsal sepal oblong, 4 lines long and about 2 lines broad, the lateral ones much broader. Petals obovate-oblong, shorter and narrower than the sepals and the nerves less prominent. Labellum sessile, nearly 5 lines long and broad and almost square, the lateral lobes obliquely rhomboidal, separated by a narrow sinus from the middle lobe, which is more than twice as broad as long; the disk with

2 raised plates along the centre below the middle or what might be termed one, as they are united at the top thus forming an elongated loop. Column short.—Fitzg. Austr. Orch. ii., Pt. 3.

Hab.: Rockingham Bay, *J. Dallachy*; Cairns, *E. Fitzalan* and *L. J. Nugent*; Mount Alexander, *H. Tryon*.

18. **D. Baileyi** (after F. M. Bailey), *F. v. M. Fragm.* viii. 173. Stems terete slender, the upper portion 1 to  $1\frac{1}{2}$  line thick and leafy. Leaves grass-like,  $2\frac{1}{2}$  to  $4\frac{1}{2}$  in. long,  $2\frac{1}{2}$  to  $3\frac{1}{2}$  lines broad, petiole cylindric. Flowers solitary, lateral; bracts almost cucullate about  $1\frac{1}{2}$  line long. Sepals and petals about  $\frac{1}{2}$  in. long, and at the base  $1\frac{1}{2}$  line broad, tapering to thread-like points. Labellum slightly shorter than the sepals, glabrous, lateral lobes semi-ovate, middle-lobe almost ovate, the margins glandular-fimbriolate point long linear-subulate; disk yellow and turgid, neither cristulate nor glandular. Column  $2\frac{1}{2}$  lines long, apex semiterete minutely toothed at the top.

Hab.: Ranges about Rockingham Bay, *F. M. Bailey*.

19. **D. Keffordii** (after W. R. Kefford), *Bail. Proc. Roy. Soc. Ql.* i. Stems slender and very numerous in large masses, 1 to 4 ft. high, often leafy throughout. Leaves linear-lanceolate, the apex rather obtuse, 3 in. long, about 3 lines broad near the base, texture thin, the sheathing base striate. Racemes lateral, numerous, shorter than the leaves and mostly 2-flowered. Flowers yellowish, speckled with purple, on pedicels of about 4 lines. Sepals tapering from a broad base into filiform points, about 1 in. long; the petals of the same form but shorter than the sepals; spur short. Labellum 3 or 4 lines long, the middle lobe bordered by a dark-purple fringe, the point elongated and recurved. Disk yellow with 2 lines of rather prominent calli. Column slender.

Hab.: Johnstone River. This species is nearly allied to *D. Baileyi*, *F. v. M.*

20. **D. canaliculatum** (channelled), *R. Br. Prod.* 333; *Benth. Fl. Austr.* vi. 282. Stems or pseudo-bulbs usually rather thick from 1 to 4 in. high. Leaves at the summit 2 to 6, linear, thick, almost semicylindrical but grooved on the upper side, 4 to 8 in. long, often 3 lines broad at the base but tapering to the end. Racemes in the upper axils often a foot long including the peduncle, but flowering only in the upper portion, the rachis slender, the sheathing scales of the peduncle small, the bracts still smaller. Pedicels slender,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Sepals and petals linear, white tipped with yellow, the sepals 5 or 6 lines long, the lateral ones slightly falcate, and produced at the base with the basal projection of the column into a conical spur. Petals rather longer than the sepals and contracted at the base. Labellum about  $\frac{2}{3}$  the length of the sepals, with 3 lobes of a rich mauve colour, the lateral ones prominent and obtuse, the middle one nearly orbicular or rather broader than long, with a short point, the disk with 3 prominently raised lines or plates, much undulate between the lateral lobes and ending on the middle lobe in richly coloured nearly orbicular lamina.—Lindl. Gen. and Sp. Orch. 91; Reichb. F. Beitr. 49; *F. v. M. Fragm.* iii. 126; *D. Tattonianum*, Batem. in Gard. Chron. 1865, 890; Bot. Mag. t. 5537; Fitzg. Austr. Orch. i. Pt. 3.

Hab.: Endeavour River, *Banks and Solander*; Rockingham Bay, *Dallachy*; Pioneer River, and other coastal scrubs.

Flowers very fragrant, the colouring and marking very variable.

21. **D. Smillieæ** (after Mrs. E. J. Smillie), *F. v. M. Fragm.* vi. 94; *Benth. Fl. Austr.* vi. 282. Stems 1 to  $2\frac{1}{2}$  ft. long, thick, very prominently angled and furrowed, some of the specimens marked only with the annular scars of the scarios sheathing scales, others with the short persistent sheaths



of fallen leaves. Leaves oblong or lanceolate, 2 to 4 in. long. Racemes from the uppermost nodes 2 to 3 in. long, the flowers crimson tipped with green, crowded almost from the base on pedicels of 3 to 6 lines. Bracts very small. Sepals ovate-lanceolate, not 3 lines long without the spur, which is 4 or 5 lines long, straight, somewhat dilated towards the end and very obtuse. Petals rather smaller than the sepals. Labellum with a long broad claw, expanded at the apex into a concave complicate almost hood-shaped lamina, shorter than the sepals, broader than long, entire or broadly and shortly 2-lobed. Pollen-masses of the genus, closely cohering in pairs. Capsule waxy-white, 1 in. long prominently corrugated.—*Calandria Smillia*, Fitzg. Austr. Orch. i., Pt. 7.

Hab.: Found in most of the tropical scrubs.

22. **D. ophioglossum** (snake's tongue), *H. G. Reichb. Journ. Linn. Soc.* xv. 113. Stems as thick as a goose-quill. Leaves thin coriaceous, oblong-lanceolate, towards the apex acute and unequally bidentate. Racemes many-flowered, two-thirds the length of the leaves. Bracts 3-angular, minute. Dorsal sepal acute oblong, lateral ones within the cylindric spur towards the apex constricted and curved. Labellum linear, apex 3-angular, broad, points obtuse. Column 3-dentate, lateral teeth rhomboid, the third 3-angular.

Hab.: Cape York, — *Moseley* of the Challenger Expedition.

23. **D. monophyllum** (single-leaved), *F. v. M. Fragm.* i. 189; *Benth. Fl. Austr.* vi. 282. Stems from a creeping rhizome numerous, erect, thick, narrow-conical, 1 to 4 in. long, with very prominent ribs and furrows, at least when dry. Leaf terminal, oblong or lanceolate, flat, 2 to 4 in. long. Raceme also solitary and terminal, about as long as the leaf, with 2 or 3 or more yellow flowers on pedicels of 3 or 4 lines. Bracts minute. Sepals broadly lanceolate, acute, about 3 lines long, besides the broad obtuse spur about 2 lines long and slightly curved upwards. Petals as long as the sepals but narrower especially at the base. Labellum deep yellow, nearly as long as the sepals, the lateral lobes small, the middle one broadly triangular or almost rhomboidal and obtuse; the disk without raised lines below the lobes, but 1 or 3 raised calli between the lateral lobes, sometimes produced into short undulating raised lines or plates on the middle lobe.—*D. tortile*, *A. Cunn.* in *Lindl. Bot. Reg.* 1839, Misc. 33, name only, not *D. tortile*, *Lindl.* from Moulmein.; *Fitzg. Austr. Orch.* i. Pt. 6.

Hab.: Brisbane River, Moreton Bay, *A. Cunningham*, *W. Hill*; Glasshouse Mountains, *Beyerley*. Common on trees and rocks north and south.

24. **D. Schneideræ** (after Mrs. H. Schneider), *Bail. Occasional Pap. on Ql. Fl. No. 1*, p. 7. Stems or pseudo-bulbs rather dense, arising from a slender creeping rhizome, short-conical, about 6 lines long and 4 lines in diameter, of a brownish colour and prominently ribbed. Leaves terminal, and, so far as observed, always 2, often twisted, linear-oblong and unevenly emarginate, length less than 1 in., width about 3 lines. Racemes filiform, terminal, pendulous, 3½ in. long, bearing about 10 small greenish-yellow flowers; bracts minute, lanceolate. Pedicel with calyx-tube under 2 lines long, the latter bluntly ribbed. Segments of flower broadly ovate, incurved, the outer about 2 lines, the inner ones rather smaller; the outer edged by a red line which is not always observable on the inner segments; the spur much curved upwards and rather large for the size of the flower. Labellum about 2 lines long, the lateral lobes ending in a dark-coloured point beyond the middle lobe which is almost wanting, or is very short and truncate. The disk thick, forming, with the abbreviated middle-lobe, a cushion-like patch. Column short, the upper part around the stigma marked by a red somewhat horseshoe-like line. Anther-lid white; pollen-masses pale-yellow.

Hab.: Darlington Range, *H. Schneider*.

Allied to *D. monophyllum*, differing, however, sufficiently to rank as a distinct species.

25. **D. hispidum** (hispid), *A. Rich. Sert. Astrol.* 13, t. 5; *Benth. Fl. Austr.* vi. 283. A dwarf plant forming dense tufts. Stems slender, only a few inches high, often several in a cluster, formed of only 2 or 3 internodes with membranous scarios sheaths. Leaf terminal, oblong or lanceolate, prominently keeled underneath, 1 to 2in. long. Pedicels at the base of the leaf 1 or 2, slender, 1 to 2 lines long. Ovary densely muricate with bristly processes. Sepals ovate, obtuse, about  $1\frac{1}{2}$  line long besides the spur which is about as long as the free part, the dorsal sepal rather narrower. Petals linear, as long as the sepals. Labellum as long as the sepals, the lateral lobes rather broad, the middle lobe at least as broad as long, with raised wrinkles on its surface but no raised lines on the disk between the lateral lobes; spur long. Capsule echinate, ovoid or globular, about 3 lines diameter.—*F. v. Muell. Fragm.* vii. 30.

Hab.: On trees, Rockingham Bay, *Dallachy*; and other northern localities.

Var. *Taylori*, (after Norman Taylor). Rhizome creeping, much matted and clothed with the torn old sheaths. Stems numerous, erect, 2 or 3in. high, 1 line thick, bluntly ribbed and bearing at the summit a single leaf and 1 or more flowers. Leaf about 2 inches long and about 4 lines broad, prominently keeled underneath, oblong, emarginate. Pedicel at the base of leaf about 6 lines long, curved and supported by a scarios ribbed bract about 3 lines long and 1 line broad. Outer segments 2 or 3 lines long, the dorsal one narrower than the lateral ones; inner segments narrower and incurved, all white; spur short and broad. Labellum thick, middle lobe cordate, about 1 line broad, glandular, transversely furrowed, orange-coloured. Column prominent the narrow wings ending at the top in sharp incurved points. Anther-lid purple.—*Bulbophyllum Taylori*, *F. v. M. Fragm.* viii. 150; *Dendrobium unifloros*, *Bail. Proc. Roy. Soc. Ql.* vi.; *D. Taylori*, *Fitzg. Austr. Orch.* ii. Pt. 3.

Hab.: Herberton; Bloomfield River, *Norman Taylor*.

26. **D. cucumerinum** (Cucumber-like), *Lindl. Bot. Reg.* 1842, *Misc.* 58; 1843, t. 37; *Benth. Fl. Austr.* vi. 283. Gherkin Orchid. A creeping species, stems rigid, elongating, with prominent ribs and furrows and annular scars of the sheathing scales. Leaves oblong, fleshy, above 1in. long, marked with longitudinal raised tuberculate ribs and assuming the aspect of a little cucumber. Racemes about 6 lines long bearing usually 4 flowers. Pedicels about  $\frac{1}{2}$ in. long. Sepals and petals yellowish-white, streaked with a reddish-purple, about  $\frac{3}{4}$ in. long; lateral sepals twisted, the dorsal one like the petals flat, all recurved. Spur short and conical. Labellum shorter than the sepals, the lateral lobes prominent, almost acute, the middle lobe ovate, shortly acuminate, much recurved, with undulate-cripsed margins, white spotted with reddish-purple; the disk with 3 or 5 longitudinal raised plates, even between the lateral lobes, much undulate on the middle lobe, all of a brown colour. Column rather broad. Stigma deeply sunk, the sides not forming teeth at the top. Anther-lid somewhat flat, truncate in front, bearing on the back a purple spot on either side. Pollen-masses pyriform, amber coloured.—*Bot. Mag.* t. 4619; *F. v. Muell. Fragm.* iii. 59; *Fitz. Austr. Orch.* i., Pt. 6.

Hab.: Southern ranges.

27. **D. pugioniforme** (dagger-formed), *A. Cunn. in Lin. Bot. Reg.* 1839, *Misc.* 33; *Benth. Fl. Austr.* vi. 284. Stems or rhizomes long pendulous from the thick branches of mountain trees, rather slender, much-branched, rooting at the nodes and covered when young by the scarios sheathing scales. Leaves articulate on a very short turbinate protuberance in the axils of the scales, ovate or ovate-lanceolate, tapering into a rigid point, flat but thick and rigid when dry, with the veins scarcely visible,  $\frac{3}{4}$  to nearly 2in. long. Racemes short and few-flowered. Sepals lanceolate, about 5 lines long without the spur, which is straight, obtuse, about 3 lines long. Petals linear, as long as the sepals. Labellum nearly as long as the sepals, rather narrow to above the middle, then expanded into a broadly ovate-triangular acute recurved lamina,

very much undulate but scarcely 3-lobed; the disk with 3 raised lines or plates, even on the claw, much undulate on the lamina.—*D. pungentifolium*, F. v. M. *Fragm.* i. 189.

Hab.: Mount Lindsay, *W. Hill*; Bunya Mountains and other southern ranges.

28. **D. rigidum** (rigid), *R. Br. Prod.* 333; *Benth. Fl. Austr.* vi. 284. Stems very numerous forming dense thick masses, arising from slender shortly creeping rhizomes, often a ft. or more long and pendulous, the young shoots covered by the membranous scarios sheathing scales. Leaves sessile on a broad base as in *D. linguiforme*, and similarly very thick fleshy and nerveless, mostly 1 to 1½ but sometimes 3in. long, oblong and almost acute. Flowers most frequently solitary, on peduncles of about 2 lines, clothed with coloured bracts, pedicels 3 lines long with 2 minute bracts at the base. Dorsal sepal ovate 3 lines long, acute, the lateral ones about as long and deltoid, all of a dull-white and covered with very minute dots, the apex of each red and bearing on the back a minute point. Petals linear, as long as the sepals but narrower. Labellum long as the sepals, 3-lobed, lateral lobes pointed at the upper end, bordered with deep-red, middle lobe oblong, as long as the lateral ones and broadly bordered by the same deep red colour except at the apex, where it is yellowish like the whole length of the disk. Disk ribs 3 not crested and rather distant from each other and not prominent. Column broad red on the edge ending in points on either side of the anther. Anther lid ovate, greenish, with a line of white tomentum in front, pollen-masses amber colour. Stigma deeply sunk in the column.—*Lindl. Gen. and Sp. Orch.* 85; *Fitzg. Austr. Orch.* i. Pt. 4.

Hab.: Endeavour River, *Banks and Solander*.

The species is met with at the Daintrees and a few other northern localities.

29. **D. linguiforme** (tongue-shaped), *Swartz. in K. Akad. Stockh. N. Handl.* 1800, 247; *Benth. Fl. Austr.* vi. 284. Stems or rhizomes closely creeping and rooting at the nodes, rather thick and fleshy, the membranous scarios sheathing scales completely covering the young shoots. Leaves articulate on broad circular scars or scarcely raised disks at the axils of the sheaths, ovate or oblong, from under 1 to 2in. long, but very thick and fleshy. Racemes from the rhizomes 2 or 4in. long, with a slender rachis, bearing from 6 or even fewer to above 20 flowers on filiform pedicels of 3 to 5 lines. Bracts minute and scale-like. Sepals narrow linear-lanceolate, 7 to 10 lines long, the pouch or spur short broad and turned upwards. Petals narrow-linear, about the length of the sepals. Labellum under 3 lines long, much contracted at the base, the lateral lobes rather broad, prominent and obtuse, the middle lobe longer, narrow-ovate, obtuse, the disk with 3 very prominent raised lines or plates, even between the lateral lobes, all three produced and much undulate on the middle lobe. Capsule oval-oblong, about ½in. long.—*Sm. Exot. Bot.* i. 19 t. 11; *R. Br. Prod.* 333; *Lindl. Gen. and Sp. Orch.* 85; *Reichb. f. Beitr.* 51; *Bot. Mag.* 5249.

Hab.: Near Brisbane, *Dallachy*; Moreton Bay, *W. Hill*. Stems of trees and common on rocks.

*Vari. Nugentii.* This species differs considerably in the form and size of its tongue-like thick leaves, but until I received Mr. Nugent's specimens I had not observed any marked variation in the flowers. These, however, at first sight strike one as being distinct, and differ from the more commonly known plant in the following particulars:—Smaller flowers, shorter pedicels. Sepals scarcely exceeding 4 lines in length; white, except sometimes a tinge of yellow near the pouch. Petals longer than the sepals. Labellum not half the length of the other segments, the lateral lobes being of a lilac colour; in other respects this northern plant agrees with the normal form.

Hab.: Fungella Range, *L. J. Nugent*.

30. **D. teretifolium** (leaves terete), *R. Br. Prod.* 333; *Benth. Fl. Austr.* vi. 285. Pencil orchid. Stems clustered on a creeping rhizome, 2 to 3ft. long, terete, divaricately branched. Leaves few, terminating the branches or clasping

the stem, from 3in. to 1ft. long in the typical form and 1 to 2 lines thick, straight or curved. Racemes lateral, very loose, with few white flowers on almost filiform peduncles of  $\frac{1}{2}$  to 1in. Sepals linear-subulate, above 1in. long, the lateral ones dilated at the base into a conical obtuse spur of 2 to 3 lines. Petals linear-filiform, as long as or slightly longer than the sepals. Labellum about half as long as the sepals, lanceolate, canaliculate, acuminate and recurved, the lateral lobes very small, the disk dotted with red and bearing 3 undulate raised lines or plates. Column dotted with red.—Lindl. Gen. and Sp. Orch. 91; F. v. M. Fragm. i. 89; Reichb. f. Beitr. 51; Endl. Iconogr. t. 99; Bot. Mag. t. 4711; *D. calamiforme*, Lodd. in Lindl. Bot. Reg. 1841, Misc. 9.

Hab.: Rockhampton, *O'Shanesy, Bowman*; very common both north and south.

Var. *Fairfaxii*, F. v. M., in Sydney Mail. Sept. 21, 1872, 360, with a woodcut. Habit of typical form. Leaves 1 to 2ft. long, diameter 3 to 4 lines. Racemes with the short peduncle about 3in. Flowers 6 to 12, white fragrant. Sepals and petals equal, narrow-acuminate about 15 lines long. Labellum when opened out nearly the length of the sepals, but usually recurved or curled, the lateral lobes straight somewhat pointed at the upper end, middle lobe long acuminate, the lower half being wavy. Disk plates 3, rather distant between the lateral lobes. Column short speckled with purple. Anther-lid smooth on top, front margin tomentose. Pollen-masses amber-coloured.

Hab.: On trees, northern scrubs.

Var. *aureum*. Branches long, slender, drooping. Leaves 1 to 1½ft. long, with a diameter of from 1 to 1½ line. Flowers about 5 or 6 in a raceme, of a deep golden yellow, except at the base of each segment and the spur, which is of a more or less deep purple. Sepals and petals very narrow, about 1½in. long. Labellum about the same length, the middle lobe elongated into a long filiform point; plates of disk 3, undulate, purple; lateral lobes short, the margins not undulate on the edges. Column short, wings white. Anther-lid rosy-pink.

Hab.: Killarney, *J. F. Bailey*.

31. **D. Beckleri** (after Dr. Beckler), *F. v. M. Fragm.* v. 95. Stems from a creeping rhizome often elongated as in *D. teretifolium*, but the branches not so divaricate. Leaves terminal or distant, lower ones erect, 3 to 6in. long, and 3 or 5 lines in diameter, tapering upwards 9-sulcate; the upper ones much thinner and often 2-sulcate. Flowers solitary on a slender flexuose peduncle with a rather long scarious bract at the base. Sepals and petals nearly equal greenish-yellow, very narrow, tapering from the base, about 9 lines long, the bases of the segments marked by dark-purple longitudinal lines, spur rather long and narrow. Labellum about the length of the other petals, but much recurved, the lateral lobes straight; faintly lined on the back with longitudinal purple lines, middle lobe tapering to a sharp point, the lower half frilled and edged with purple. Disk with 3 green crenate rather thick plates. Column short.—Fitzg. Austr. Orch. 1. pt. 7.

Hab.: Very common on trees of the southern mountain ranges.

32. **D. Mortii** (after T. S. Mort), *F. v. M. Fragm.* 1, 214; *Benth. Fl. Austr.* vi. 286. Stems very slender and much branched. Leaves slender 2 to 5in. long, somewhat 4-angled, the angles irregular and blunt. Peduncles short, bearing 2 pedicellate, small flowers. Pedicels filiform  $\frac{1}{2}$ in. long. Sepals 5 lines, petals 4 lines long, lanceolate the petals narrower than the sepals and 3-ribbed, the sepals 5-ribbed. Spur 3 lines long, slightly curved, slender, appearing ribbed by the enclosing bases of the lateral sepals. Labellum nearly as long as the sepals, upper half with frilled margins middle lobe small truncate, apiculate. Disk plates 3, frilled in the upper half. Column not half the length of the sepals. Capsule oblong about  $\frac{1}{2}$ in. long, prominently ribbed.

Hab.: Very plentiful in southern localities.

33. **D. Bowmanii** (after E. Bowman), *Benth. Fl. Austr.* vi. 286. Stems elongated and branched, more slender than in *D. teretifolium*, but not so much as in *D. Mortii*. Leaves slightly sulcate like the slender ones of *D. Beckleri*, 2 to 4in. long. Flowers generally solitary, on slender pedicels not above

6 lines long. Sepals about 6 lines long obtuse apiculate lanceolate as in *D. Beckleri*. Petals rather narrower. Labellum nearly as long as the sepals, the lateral lobes broad, the middle lobe broadly reniform, undulate crisped and slightly notched, the disk with longitudinal undulate raised lines or plates. Capsule about 8 lines long, ribbed.

Hab.: On trees and rocks, Rodd's Bay, A. Cunningham; Berseker Range and Fort Cooper, Bowman; Bowen.

34. *D. eriaoides* (Eria-like), *Bail. 2nd. Suppl. Syn. Pl. Fl.* 56. Forming large masses on the stems of trees; rhizome creeping, giving origin to numerous terete, finger-like, erect stems, from 2 to 4 in. long and about  $\frac{1}{2}$  in. diameter, more or less clothed by striated sheathing scales (the bases of abortive leaves), bearing at the summit 1 or 2 lanceolate leaves often slightly spirally twisted, about 5 in. long and 1 in. broad at the middle; the midrib sharp on the underside, with 3 or 4 more or less prominent longitudinal nerves on either side; the apex deeply emarginate, and the base tapering to a rather long petiole. Racemes 2 or 3 in. long, hoary, erect, lateral, bearing from 6 to 9 small, hoary, dingy-purplish flowers, sessile or very nearly so. Bracts subtending each flower, small, obtuse, scarious, and 1 or more similar ones below the flowers. Calyx-tube with 6 prominent purplish ribs. Lateral sepals 3-nerved, their oblique bases forming a short blunt spur, dorsal one obtuse. Petals smaller, 3-nerved, sub-glabrous. Labellum of 3 almost equal lobes, with 3 longitudinal nerves, the 2 outer ones supplying secondary veins to the lateral lobes; middle lobe ovate-obtuse, white; lateral lobes oblique, obtuse, glandular, purplish, closely clasping the column. Column short; anther lid white, cordate. The flowers minutely punctate with white dots.

Hab.: Johnstone River, Dr. Thos. L. Bancroft

The pollen-masses correspond both in form and number with those of *Dendrobium*, but the general aspect of the plant is so unlike that of any of this genus with which I am acquainted that its final inclusion under *Dendrobium* is a matter of uncertainty.

### 5. BULBOPHYLLUM, Thou.

(Referring to the swollen bulb-like base of leaf).

Sepals erect, free, acuminate, nearly equal, the lateral ones obliquely dilated at the base and connate with the basal projection of the column into a pouch or spur. Petals usually much smaller than the sepals. Labellum articulate at the end of the basal projection of the column, usually entire and contracted into a claw. Column very short produced below its insertion, the apex with 2 teeth or horns in front. Anther terminal, lid-like. Pollen masses 4, connate or cohering in pairs, without any gland or caudicle.—Herbs with a creeping rhizome usually covered with thin scarious sheathing scales. Leaves solitary or 2 together on small pseudo-bulbs. Racemes on 1-flowered peduncles issuing, like the pseudo-bulbs, from the axils of the sheathing scales of the rhizome.

The genus is spread over the tropical and subtropical regions of the Old World.

Leaves flat, coriaceous, about 4 in. long and $1\frac{1}{2}$ in. broad. Flowers exceeding 1 in. in diameter, spotted, solitary on a long slender pedicel . . . . .	1. <i>B. Baileyi</i> .
Leaves flat somewhat thick, about 4 in. long, 4 lines broad. Flowers solitary on filiform peduncles 1 to $1\frac{1}{2}$ in. long, yellow . . . . .	2. <i>B. nematopodum</i> .
Leaves thin, flat, linear $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long, a few recurved, $1\frac{1}{2}$ to 2 lines broad. Flowers yellow, solitary, on a filiform peduncle . . . . .	3. <i>B. radicans</i> .
Leaves from nearly globular to ellipsoid, 2 to 10 lines long, fleshy. Flowers solitary on peduncles a few lines long, whitish with red lines.	4. <i>B. lichenastrum</i> .
Leaves light-green, fleshy, channelled above, convex beneath, 1 to 2 in. long. Flowers solitary, white except the labellum . . . . .	5. <i>B. Shepherdii</i> .
Leaves $\frac{3}{4}$ to 1 in. long, deeply channelled, fleshy. Flowers solitary. Sepals $2\frac{1}{2}$ lines long, tipped with orange . . . . .	6. <i>B. intermedium</i> .
Leaves oblong, fleshy, 2 to 3 in. long, often $\frac{1}{2}$ in. broad. Flowers often crowded, deep-orange, very small . . . . .	7. <i>B. aurantiacum</i> .

- Leaves oval, 4 to 6 lines long, fleshy. Flowers solitary. Scapes about 4 lines long. Sepals greenish-yellow, margined with a purple line . . . . . 8. *B. Boukettæ*.  
 Leaves flat, thin, lanceolate,  $\frac{1}{2}$  to 1 $\frac{1}{2}$ in. long. Flowers 2 to 4 racemose on filiform peduncles, whitish . . . . . 9. *B. exiguum*.  
 Leaves very minute often wanting on the fleshy lenticular pseudo-bulbs. Flowers red in the bud, the open flowers striped with red . . . . . 10. *B. minutissimum*.  
 Leaves almost cymbiform, rugose, 3 to 4 lines long, fleshy. Flowers yellowish-white. Petals membranous. Labellum middle-lobe yellow . . . . . 11. *B. Toressæ*.  
 Leaves 1 to 1 $\frac{1}{2}$ in. long,  $\frac{1}{4}$ in. thick, wrinkled with foveolar dots. Flowers 4 lines long. Sepals pale-pink, 5-nerved. Petals 1-nerved . . . . . 12. *B. Prenticei*.  
 Leaves oblong, recurved,  $\frac{3}{4}$  to 1in. long, 3 lines broad. Raceme including very short peduncle, 2in. long. Bracts near the flowers cordate. Flowers mottled with purple . . . . . 13. *B. bracteatum*.  
 Leaves narrow-oblong, 1 $\frac{1}{2}$  to 3in. long. Racemes with peduncles 5 to 6in. long. Flowers greenish-white tinged with pink, secund. Labellum purple . . . . . 14. *B. Elise*.  
 Leaves oblong, 3 to 6in. long, 1in. broad. Scape slender, 2 $\frac{1}{2}$ in. long. Flowers dull-yellow, spotted with red-brown. Sepals 10 lines long, 4 lines broad. Petals smaller . . . . . 15. *B. punctatum*.

1. **B. Baileyi** (after F. M. Bailey), *F. v. M. Fragm.* ix. 5. Rhizome creeping, often forming large dense masses of several feet in length and breadth on the stems and branches of the tropical trees. Pseudo-bulbs of a single articulation short and angular. Leaves about 4in. long, often exceeding 1in. broad, thick coriaceous, channelled, tapering to a short petiole. Peduncle short covered by membranous bracts. Pedicel about 2in. long. Dorsal sepal lanceolate, about 8 lines long, lateral ones falcate, lanceolate, spotted with purple on the outside, white on the inside. Petals shorter and narrower but spotted like the sepals. Labellum linguiform, thick obtuse, arched, spotted, about 3 lines long, channelled below. Column thick, the sidewings toothed at the top. Capsule about 1 $\frac{1}{2}$ in. long, prominently ribbed.—Fitzg. Austr. Orch. ii. Pt. 5.

Hab.: Tropical coastal scrubs.

2. **B. nematopodum** (peduncles thread-like), *F. v. M. Fragm.* viii. 30; *Benth. Fl. Austr.* vi. 287. Creeping rhizomes apparently short and dense. Pseudo-bulbs closely imbricate, oblong-conical, about  $\frac{1}{2}$ in. long. Leaves solitary, linear-lanceolate, flat but thick and succulent, 3 to 5in. long, 3 to 5 lines broad, attenuate towards the base without any prominent midrib. Flowers on filiform peduncles of 1 to 1 $\frac{1}{2}$ in. slightly thickened at the base, very narrow and acute, yellow, the sepals about 4 lines long, the dorsal one rather shorter than the lateral ones; petals linear-subulate, about 1 line long. Labellum scarcely 1 $\frac{1}{2}$  line long, abruptly contracted into a short claw, the lamina nearly hastate. Column very short, with two narrow erect teeth.

Hab.: Rockingham Bay, *Dallachy*.

3. **B. radicans** (rooting), *Bail. Ql. Agric. Journ.* i. Pt. 1. Stems elongated, sometimes to the length of several inches, clothed with scarios, striate, torn sheathing scales, and long wiry roots. Pseudo-bulbs narrow-cuneate, mostly hidden by the stem-scales. Leaves linear 1 $\frac{1}{2}$  to 2 $\frac{1}{2}$ in. long, 2 to 2 $\frac{1}{2}$  lines broad, tapering at the base, the apex with a minute recurved point, texture thin, veins obscure. Peduncles 3 or 4 lines long, filiform, bearing 2 or more loose, scarios, somewhat obtuse sheathing bracts. Flowers yellow, calyx-tube slender, 1 $\frac{1}{4}$  line long. Sepals broad-lanceolate, the points acute, 1 $\frac{1}{2}$  line long, longitudinal veins 3 to 5. Petals narrow-lanceolate with only a central vein, hyaline and scarcely half as long as the sepals. Labellum thick, nearly as long as the sepals, expanding into side-lobes in the lower half, attached by a short claw to the basal projection of the column, disk-plates 2. Column-wings ending in rather long incurved threads. Pollen-masses oval, golden-yellow.

Hab.: Range near Cairns, *L. J. Nugent*.

This species is nearly allied to *B. nematopodum*, *F. v. M.*, and it is probable that the specimens mentioned in my report of the Bellenden-Ker Expedition in 1889 as *B. nematopodum*, which were not bearing flowers at the time, belonged to this new species.

4. **B. lichenastrum** (lichen-like), *F. v. M. Fragm.* vii. 60; *Benth. Fl. Austr.* vi. 287. Creeping rhizomes forming very dense patches. Pseudo-bulbs reduced to a small scarcely prominent circular disk, surrounded by the long fringed remains of the scarious sheath. Leaves thick, fleshy, from almost globular to narrow-ellipsoid, 2 to 10 lines long. Flowers very small, dingy-white with red lines, solitary on peduncles or scapes 2 to 3 lines long, with 1 or 2 scarious sheaths at their base and articulate below the flower. Sepals broadly-ovate, about 1 line long, besides the spur, which is broad, obtuse,  $1\frac{1}{2}$  line long. Petals lanceolate, very much narrower, but not much shorter than the sepals. Labellum orange-coloured, from the end of the basal projection of the column, with a narrow channelled erect claw, the lamina rather thick, obovate-oblong, obtuse, recurved, nearly as long as the sepals.

Hab.: On rocks, Seaview Range, Rockingham Bay, *Dallachy*; on the branches of tall trees, ranges near Cairns.

5. **B. Shepherdii** (after T. Shepherd), *F. v. M. Fragm.* iii. 40; *Benth. Fl. Austr.* vi. 288. Creeping rhizomes not very intricate, but extending to a considerable breadth, the scarious sheathing scales very conspicuous. Pseudo-bulbs narrow, 2 to 3 lines long. Leaves light-green, solitary, linear, very thick and fleshy, channelled above, convex underneath but not keeled, 1 to 2 in. long. peduncles 1-flowered, filiform, 2 to 4 lines long, usually with 1 or 2 sheathing scales at the base and 1 similar bract distant from them under the flowers. Flowers white. Sepals about 2 lines long, the lateral ones with a broadly ovate base adnate to the projection of the column and abruptly contracted upwards into a narrow point; dorsal sepal broadly lanceolate at the base and more gradually tapering into the point. Petals ovate-triangular, scarcely above  $\frac{1}{2}$  line long. Labellum shorter than the sepals, lanceolate, recurved, channelled above, contracted into a slender claw. Column with 2 subulate teeth.—*Dendrobium Shepherdii*, *F. v. M. Fragm.* i. 190; *B. Schillerianum*, Reichb. f. in *Otto, Hamb. Gartenz.* 1860, 423 referred by him to *B. Shepherdii*, in *Xen. Orchid.* ii. 166 and *Beitr.* 52, *Fitzg. Austr. Orch.* i. Pt. 5.

Hab.: Southern localities.

6. **B. intermedium** (name suggested by its position being intermediate between *B. Shepherdii* and *B. aurantiacum*), *Bail. Bot. Bull.* xiv. 12. Rhizome creeping, forming straggling patches upon the branches of trees. Pseudo-bulbs oblong,  $1\frac{1}{2}$  to 2 lines long. Leaves  $\frac{3}{4}$  to 1 in. long, thick, deeply channelled above, convex underneath. Peduncle 1-flowered, 3 lines, or with the ovary, which is fluted,  $4\frac{1}{2}$  lines long. Bracts thin, scarious, 2 or more at the base and another subtending the flower. Sepals  $2\frac{1}{2}$  lines long, points orange-yellow, subulate, smooth; thin, fluted, and swelling out at the base, thus giving to the flower-bud a grape-seed form, lateral sepals adnate to the basal projection of the column. Petals oblong, deeply emarginate, hyaline, about  $\frac{1}{3}$  the length of the sepals. Labellum claw incurved upon the reddish-brown elongated end of the column, the lamina reddish-brown; prominently recurved oftentimes forming a circle, margins revolute, disk bearing 1 or 2 somewhat thick raised lines along the centre. The erect portion of the column very short, white, with 2 subulate teeth. Anther and pollen-masses pale-coloured.

Hab.: The above description was drawn up from specimens taken off a plant growing on one of the posts of the Bowen Park bushhouse, and which Mr. W. Soutter, the late manager, informed me had been received from Hinchinbrook Island, March, 1891.

7. **B. aurantiacum** (orange-coloured), *F. v. M. Fragm.* iii. 39; *Benth. Fl. Austr.* vi. 288. Creeping but the rhizomes often hanging loose from the bark of trees. Pseudo-bulbs small and ovoid. Leaves oblong or oblong-linear, thick, contracted at the base,  $1\frac{1}{2}$  to 3 in. long and often  $\frac{1}{2}$  in. broad.

Peduncles 1-flowered, rarely 2 lines long, covered by the loose scarious sheathing bracts which, although only 2 or 3, overlap each other. Flowers crowded, deep-orange coloured, showing a decided angle or spur at the end of the basal projection of the column.—*Dendrobium aurantiacum*, F. v. M. *Fragm.* vii. 98.

Hab.: Moreton Bay, *W. Hill*; on trees and rocks about Rockhampton, *Bowman*, *O'Shanesy*.

8. **B. Bowkettæ** (after Miss Bowkett), *Bail., Proc. Roy. Soc., Ql. i.* Rhizome creeping, forming dense patches. Pseudo-bulbs oval-oblong, compressed bluntly ribbed, 3 to 5 lines long, 2 to 2½ broad. Leaves solitary on the pseudo-bulb, thick, dark-green, ovate to suborbicular, 4 to 6 lines long. Flowers solitary on scapes of about 4 lines long, articulate about the middle, just above a minute obtuse sheathing bract. Sepals about 2 lines long, greenish-yellow, bordered by a purple line, and having 3 purple lines down the centre, the spur short. Petals about half the length of the sepals, and with only 1 central purple line. Labellum linear, thick, long as the petals, purple with a yellowish tip. Column short, the front teeth erect, exceeding the anther lid.

Hab.: Herberton.

9. **B. exiguum** (little), *F. v. M. Fragm.* ii. 72; *Benth. Fl. Austr.* vi. 288. Creeping rhizomes sometimes forming dense masses, sometimes elongated in single threads with distant pseudo-bulbs. Pseudo-bulbs ovoid or nearly globular, fleshy angular and furrowed when fresh, very deeply rugose when dry, 2 to 3 lines diameter. Leaves solitary on the pseudo-bulbs, oblong-linear or lanceolate, contracted at the base, ½ to 1½ in. long, the margins recurved, the midrib prominent underneath. Peduncles filiform, 1 to 2 in. long, bearing 2 to 4 flowers on short filiform pedicels. Sepals lanceolate, 2½ lines long, the lateral ones dilated at the base into a short broad pouch. Petals scarcely half as long as the sepals. Labellum nearly as long as the sepals, linear, thick and channelled, tapering and slightly recurved towards the end.—*Dendrobium exiguum*, F. v. M. *Fragm.* v. 95, *Fitzg. Austr. Orch.* ii. Pt. 5.

Hab.: Not uncommon north and south.

Var. *Dallachyi*. Pseudo-bulbs rather larger and more ovoid. Flowers white, the sepals and labellum rather broader and the petals rather larger.

Hab.: Rockingham Bay, *Dallachy*.

10. **B. minutissimum** (very small), *F. v. M. Fragm.* xi. 53. Stems creeping very dense. Pseudo-bulbs orbicular, flattened, diameter from 1 to 2 lines, bearing at the apex a solitary minute lanceolate leaf. Flowers very small more or less rosy-red on tuberculose peduncles. Sepals marked with 3 deep-red lines. Petals almost white with 1 central red line. Labellum red, entire, oval-oblong, curved and thickened at the end. Column short, the base much elongated. Pollen-masses 2. Capsule oval, hairy.—*Fitzg. Austr. Orch.* ii. pt. 2.

Hab.: On trunks of trees in southern localities.

Mr. R. D. Fitzgerald in his illustrated work on the Australian Orchids states that this minute species was first met in 1849, by Archdeacon King at a spot which at the present day is nearly the centre of Sydney.

11. **B. Toressæ** (after Miss Toressa Meston), *Bail. 3rd. Suppl. Syn. Ql. Fl.* 72. A small plant with creeping rhizome adhering close to the rocks by roots from the underside, extending to 2 or 3 in. in length, often forming radiating patches. The upper surface closely covered by distichous, closely sessile, ovate-lanceolate, rugose leaves, which are so concave on the upper face as to be somewhat cymbiform, 3 or 4 lines long, with a single nearly sessile flower nestling at the base. Flowers yellowish-white, subtended by a prominent scarious bract; sepals broad and about 2 lines long, the lateral ones forming a short blunt, almost truncate spur. Petals white, of delicate texture, and nearly



the length of the sepals. Labellum of equal length with the other segments, 3-lobed, lateral lobes dotted with purple, very short; middle lobe blunt and thick, bright-yellow; column short and, for the size of the flower, prominently winged.

Hab.: On the shady rocks, Whelanian Pools; in flower in June and July.

12. **B. Prenticei** (after Dr. Chas. Prentice), *F. v. M. South. Sci. Rec.* 1881, p. 173. Rhizome creeping, its scales soon bursting into shreds, ellipsoid or narrow-cylindrical, blunt, 1 to 1½ in. long, ¼ in. thick, faintly wrinkled, with foveolar dots, the irregular pseudo-bulbs very short. Flowers 4 lines long. Sepals pale-pink towards the base, 5-nerved. Petals 1-nerved. Labellum yellow, cuneate at the base, lobeless. Column very short, the wings ending in a tooth at the side of the anther. Capsule about 4 lines long, oblique-obovate attenuated at the base.

Hab.: Bellenden-Ker Range.

13. **B. bracteatum** (bracteate), *Bail. Bot. Bull.* iv. 17. Rhizome shortly creeping. Pseudo-bulbs glossy, depressed-globular, 3 or 4 lines diameter, crowded upon the rhizome, wrinkled, and ribbed with from 6 to 8 prominent wavy angles. Leaves solitary, oblanceolate or oblong, recurved, ¾ to 1 in. long, about 3 lines broad in the centre, coriaceous, deep-green; midrib prominent and the 2 or 3 longitudinal veins on each side more or less so. Raceme including the very short peduncle about 2 in. long; bracts on peduncle narrow-linear, those at the top so close as to form an involucre to the base of the raceme; bracts of raceme cordate-acuminate, about 1½ line long, the upper ones subtending the flowers smaller, the rhachis and bracts glaucous or hoary white. Flowers including the pedicels about 3 lines long, mottled of a dull-purple; pedicels striate, scarcely exceeding the subtending bract. Lateral and dorsal sepals mottled purple with light-coloured margins, broad-lanceolate, 3-nerved, the petals 1-nerved, narrow-linear, shorter than the sepals and of a paler colour, erect on each side of the column. Labellum very short, thick and linguiform, buff on the upper, nearly black on the under surface and glossy, claw elastic and as long as the lamina, 3-nerved below the articulation; column very short; anther-lid rotund, nearly white; pollen-masses golden-yellow (in the flower dissected I found only 2 globular pollen-masses).

Hab.: Numminbah, Upper Nerang, *H. Schneider*; Killarney, *Joseph Wedd.*

Mr. R. D. Fitzgerald, to whom I sent after making the above description my only specimen that he might figure it in his illustrated monograph of the Australian orchids, wrote me that he thought it identical with his then lately described *Adelopetalum bracteatum*; but according to his diagnosis of that genus (a copy of which he kindly sent me) the flowers are apetalous, while in my plant it will be seen I had described these organs. With regard to the pollen-masses being reduced to 2, Mr. Bentham mentions this being the case at times in plants of the genus *Bulbophyllum*. As, however, I think the two plants may prove identical, I use the same word for the specific name, leaving botanists to adopt whichever genus they think fit.

14. **B. Elisæ** (after Elisa Kern), *F. v. M. Fragm.* vi. 120; *Benth. Fl. Austr.* vi. 289. Rhizome shortly creeping. Pseudo-bulbs ovoid, very deeply wrinkled and furrowed, usually about ½ in. long. Leaves solitary, narrow-oblong, contracted at the base, 1½ to 3 in. long, the midrib prominent underneath. Racemes including the peduncle 5 to 6 in. high. Flowers numerous, greenish or white tinged with pink, all turned to one side, on pedicels of 1½ to 3 lines. Bracts small and narrow. Lateral sepals linear-lanceolate, ½ to ¾ in. long, the oblique base adnate to the basal projection of the column forming a short pouch; dorsal sepal not half so long as the lateral ones; petals still shorter, ovate-lanceolate. Labellum purple, about 2 lines long, with a very short broad concave claw, the lamina erect or spreading, oblong, thick and fleshy, grooved on the upper surface. Column short, with 2 prominent teeth.—*Cirrhopetalum Elisæ*, *F. v. M. Fragm.* vi. 120, t. 57; *Fitzg. Austr. Orch.* ii. Pt. 1.

Hab.: On the high southern ranges.

15. **B. punctatum** (dotted), *Fitzg. in Brit. Journ. Bot.* xxi. 205. Rhizome creeping, closely jointed, clothed with long hairs. Pseudo-bulbs conical, less or sometimes more than 1 in. long, and a little less broad, deeply ribbed and furrowed. Leaves oblong, 3 to 6 in. long and about 1 in. broad. Scape rather slender, about 2½ in. high, with a small sheathing acute bract at the base. Flower dull-yellow spotted with red-brown. Sepals lanceolate, thick, about 10 lines long, 4 lines broad. Petals lanceolate, thick, about 8 lines long, 3 lines broad. Labellum 3 lines long, thick, channelled at the base, contracted in the centre, blunt, curved, articulate on the basal projection of the column. Column short, with 2 prominent teeth.

. Hab.: Cape York, *R. D. Fitzgerald*.

### 6. CIRRHOPETALUM, Linl.

(From the Greek *kirros*, tawny, and *petalon*, petal).

Sepals free ringent, the lateral ones acuminate, drawn out at the base, adnate to the column, much longer than the upper one. Petals short, apiculate. Labellum entire, articulated with base of column. Column small, drawn out at the base, and furnished with 2 petaloid horns at top. Anthers 2-celled. Pollen-masses 4; 2 inner ones smaller. Flowers often whorled.

Species chiefly Indian and Malayan.

1. **C. clavigerum** (club-bearing), *Fitzg., in Brit. Journ. Bot.* xxi. 204. Rhizome creeping in joints of about 3 or 4 lines, covered with long hairs especially round the pseudo-bulbs, forming dense masses. Pseudo-bulbs conical, from 6 to 18 lines long and from 5 to 12 lines broad, deeply ribbed and furrowed. Leaves thick, oblong, petiolate, from 3 to 6 in. long and about 1½ in. broad. Scape 6 to 8 in. long, slender; bracts lanceolate, herbaceous. Flowers 6 or 7 in a horizontal half-circle on pedicels of 10 lines with small acute bracts at their base. Dorsal sepal acute, dull-yellow, spotted in parts with purple, about 4 lines long and broad, terminated in a clavate hair, about 4 lines long. Lateral sepals ligulate united from about a quarter of their length nearly to the ends, about 1½ in. long, 3 lines broad, acute, yellowish. Petals lanceolate, ciliate, purplish. Labellum thick, ligulate, much curved, articulate on the basal projection of the column. Wings of column recurved at the anther, acute.—*R. D. Fitzg., l.c.*

Hab.: Cape York, *R. D. Fitzgerald, l.c.*

### 7. OSYRICERA, Blume.

Sepals patent, nearly equal, the lateral ones united to the tip. Petals much smaller. Labellum articulated at the foot of the column, shorter than the sepals, at the base ventricose almost saccate near the base, entire, lamina with reflexed margins or very convexed, both sides glandulose. Column erect, semiterete, the apex furnished with membranous bi- or tri-fid wings or projections, narrowed into a short foot. Anther terminal, operculate, incumbent, convex, 2-celled, the anterior surface suborbicular, glandulose, with appendage. Pollen-masses 2, waxy, solitary in each cell, ovoid, without appendage, free.—Epiphytic herbs, with 1-leaved pseudo-bulbs. Leaves linear-lanceolate. Scape erect from the rhizome; spike terminal, flowers purplish.—*Benth. and Hook. Gen. Pl.* iii. 505.

The genus is closely allied to *Bulbophyllum*, differing in the form of labellum and anther appendage.

1. **O. purpurascens** (purplish), *Deane, Fitzg. Austr. Orch.* ii. pt. 5. Rhizome creeping, forming dense matted patches. Pseudo-bulbs about 1 line long, often so close together as to give a moniliform appearance to the rhizome, the scarios scales prominent. Leaves 5 to 12 lines long, deep-green, thick and

chanelled above, the back convex, attached to the pseudo-bulb by a short stalk. Peduncles erect, filiform, 6 to 12 lines long, with several white scarios bracts at the base and close under the flower. Flowers solitary, purplish. Sepals about 2 lines long, striate, with 3 to 7 dark lines, broad, lanceolate, obtuse, or the dorsal one emarginate, pouch or spur short. Petals about  $1\frac{1}{4}$  line long, 1-nerved, narrow, lanceolate, with elongated points and glandular-ciliate margins. Labellum clawed, 2 lines long, dark-purple, lanceolate with fringed margins, 2-lobed at the base and a raised rib along the centre. Column white, short, the prominent wings ending in elongated points. Capsule oblong-ribbed, about 3 lines long and  $1\frac{1}{2}$  line diameter.—*Bulbophyllum purpurascens*, Bail. Proc. Roy. Soc. Ql. i. 88.

Hab.: On rocks, Herberton, *J. W. R. Stuart*; Bellenden-Ker Range, and many other tropical localities.

8. ERIA, Lindl.

(From the Greek, alluding to the wooliness of the flowers.)

Sepals free (very rarely connate), adnate to the elongate foot of the column, and with it forming a short or long spur. Labellum sessile on the foot of the column and incumbent (sometimes mobile). Anther imperfectly 4 or 8-celled; pollen-masses normally 8, pyriform or broadly obovoid, attached in fours by narrow bases to a viscus. Epiphytes of various habits. Flowers never large or bright-coloured.

Species most numerous in tropical Asia.

- .Stems stout, 2 to 8in. high. Leaves about as long as the stems. Flowers nearly lin. in diameter in dense furfuraceous racemes 3 to 6in. long . . . . . 1. *E. Fitzalani*.
- .Stems slender, 1 to 2ft. high. Leaves distichous,  $1\frac{1}{2}$ in. long, oblong emarginate. Flowers glabrous, small in axillary racemes of about 4 lines, whitish . . . . . 2. *E. australiensis*.

1. **E. Fitzalani** (after E. Fitzalan), *F. r. M. in Sou. Sci. Rec.* ii. 252. Pseudo-bulbous stems sometimes stout and attaining the length of 8in. but usually shorter and ovate-conical, several to a plant, brownish coloured. Leaves lanceolate, the nerves about 9. Peduncles scarcely longer than the stem. Racemes furfuraceous, flowers numerous. Bracts ovate-lanceolate, pedicel with ovary longer than the flower. Dorsal sepal lanceolate, lateral ones deltoid. Petals nearly linear, cream coloured inside. Labellum long as the sepals membranous, glabrous, narrowing towards the base, marked with 3 thin lines, summit quadrate-ovate. Pollen-masses lenticular, attached in 2 bundles.

Hab.: On trees in many of the tropical scrubs.

2. **E. australiensis** (Australian), *Bail. No. 1 Occasional Pap. on (Pl. Flora*. Stems in dense clusters, slender, terete, from 1 to 2ft. high, often leafy throughout or the lower half closely covered by the scarios bases of fallen leaves. Leaves distichous, glossy, oblong and prominently emarginate, about  $1\frac{1}{2}$ in. long and  $\frac{3}{4}$ in. broad, the keel sharp, the midrib extending beyond the margin in the sinus in the form of a small bristle. Racemes axillary or lateral, numerous, about 3 or 4 lines long, the persistent bracts ovate-lanceolate  $1\frac{1}{2}$  line long, the calyx-tube about the same length. Flowers glabrous, small, greenish-white, 3 to 6 in the raceme; segments similar or the petals the smaller, ovate, about 1 line long; spur short and blunt. Labellum white marked by faint lines, broadly ovate, strongly recurved, the disk without plates or calli. Column very short and broad, anther-lid sharply conical. Pollen masses claviform, bright-yellow. Capsule bluntly-ribbed and somewhat compressed, probably about  $1\frac{1}{2}$ in. long when ripe, but not quite ripe on the plants examined.

Hab.: Johnstone River, *T. L. Bancroft*.

9. PHREATIA, Lindl.

(Plexaure, Endl.)

Sepals nearly equal, erect or connivent, the lateral ones dilated at the base and adnate to the basal projection of the column, forming a short pouch. Petals usually smaller than the sepals. Labellum articulate on the basal projection of the column, contracted and concave at the base, the lamina spreading and entire. Column very short, shortly produced at the base, the membranous margin of the apex entire. Anther lid-like, 2-celled. Pollen-masses 8, waxy, slightly cohering by a viscid substance.—Epiphytical herbs, with short leafy stems sometimes thickened into pseudo-bulbs. Leaves flat or canaliculate, distichous, their persistent bases loosely imbricate. Flowers usually minute, on exceedingly short pedicels, in axillary racemes.

The genus is spread over the Indian Archipelago and the South Sea Islands. The only Australian species is also found in Norfolk Island.

1. **P. limenophylax**, Reichb. f. in *Bonplandia* 1857, 54 (partly); *Benth. Fl. Austr.* vi. 290. A dwarf plant, the very short stem covered by the persistent bases of the leaves. Leaves linear, thick, and semi-terete, channelled on the upper side, 1 to 2 in. long, the dilated base 3 or 4 lines broad. Flowers very minute, yellow, rather crowded and almost sessile, in axillary racemes about as long as the leaves. Sepals about  $\frac{1}{4}$  line long, rather broad, acute, the petals rather smaller and narrower. Labellum nearly as long as the sepals, very concave at the base, the lamina spreading, ovate-rhomboidal, entire, the disk with a longitudinal raised line not extending on the lamina. Pollen-masses 8, fusiform, minute. Capsule almost sessile or very shortly pedicellate, ovoid-oblong, about 1 line long.—*Plexaure limenophylax*, Endl. *Prod. Fl. Norf.* 30; *Oberonia crassiuscula*, F. v. M. *Herb.*; *Fria limenophylax*, Reichb. f. *Xen. Orch.* ii. 97, t. 130.

Hab.: On the stems of trees, Rockingham Bay, *Dallachy*.  
The species is also in Norfolk Island.

10. SPATHOGLOTTIS, Blume.

(Spathe tongue-shaped).

Sepals and petals nearly equal, free, spreading. Labellum articulate at the base of the column, concave or saccate at the base, deeply 3-lobed, the middle lobe contracted at the base and bearing prominent tubercles or calli. Column erect, free, more or less dilated or 2-winged upwards. Anthers terminal, lid-like, 2-celled. Pollen-masses 8, of which 4 usually smaller, waxy, with very short separate caudicles without any common gland.—Terrestrial herbs with subterraneous tuberous rhizomes. Leaves usually long, plicate and strongly ribbed. Racemes on erect scapes, leafless except sheathing scales. Bracts usually rather large.

The genus is dispersed over tropical Asia.

Leaves 2 to 3 ft. long and often more than 1½ in. broad. Labellum bearing 3 large calli . . . . .	1. <i>S. Pauline</i> .
Leaves seldom exceeding 2 ft. long and about 9 lines broad. Labellum bearing 2 large calli . . . . .	2. <i>S. Soutteriana</i> .

1. **S. Paulinæ** (after Miss Pauline Richmond), *F. v. M. Fragm.* vi. 95; *Benth. Fl. Austr.* vi. 304. Pseudo-bulbs rather small. Leaves lanceolate, acuminate, 2 to 3 ft. long, tapering into a long petiole, plicate and strongly ribbed. Scapes attaining 3 or 4 ft. bearing an elongating raceme of purplish flowers. Bracts lanceolate, about ½ in. long; pedicels about 1 in. Sepals and petals about 5 lines long. Labellum about as long, very short and concave below the lobes, the lateral lobes linear-oblong, slightly spatulate and incurved,

the middle lobe scarcely longer, obovate, obtuse or emarginate, contracted much below the middle, with 3 large prominent calli immediately above the lateral lobes, hairy around and immediately above the calli. Column incurved, not much shorter than the sepals, slightly dilated upwards.—*Bletia Paulina*, F. v. M. l.c.; Fitzg. Austr. Orch. i. pt. 6.

Hab.: Rockingham Bay, *Dallachy*.

2. **S. Soutteriana** (after William Soutter), *Bail. Proc. Roy. Soc. Ql. xi.* Leaves crowning the pseudo-bulbs 6 or 7, the outer one without lamina, the others increasing in length until the centre one attains a length (including the rather long petiole) of  $1\frac{1}{2}$  or 2ft. width, at broadest part about  $\frac{3}{4}$ in., but usually less, tapering to fine points, and to the petioles, and prominently marked by numerous rib-like nerves. Scape slender; raceme about 3in. long, bearing 8 or 9 light purple flowers. Bracts lanceolate 7 or 8 lines long, pedicels about 1in. long. Sepals and petals about 5 lines long. Labellum  $\frac{3}{4}$  the length of the other segments of the perianth, articulate to the base of the column close to the lateral lobes, which are oblong or slightly spatulate, and somewhat incurved, and on the disk between them at the upper end 2 large, thick, erect, rather spreading glabrous calli; middle lobe with a rather long claw, expanding into a somewhat flabelliform blade; the claw with densely woolly margins. Column much incurved, dilated upwards, presenting, with the anther, an almost hooded appearance.

Hab.: Stony Creek, Cairns-Herberton Railway line, *L. J. Nugent*; Kamerunga, *E. Cowley*.

## 11. PHAIUS, Lour.

(Alluding to the beauty of the flowers.)

Sepals and petals nearly equal, free, spreading. Labellum broad, produced into a spur at the base, erect and convolute round the column, entire or 3-lobed and more or less spreading at the top. Column semi-cylindrical, elongated. Anther lid-like. Pollen-masses 8, nearly equal or 4 shorter, waxy, attached to the branches of a dichotomous caudicle, but no gland.—Terrestrial herbs, the leafy stems short and thickened into pseudo-bulbs or almost stemless. Leaves large. Scapes radical, tall, erect, leafless except sheathing scales imbricate at the base, distant on the stem and passing into the bracts. Flowers large and showy.

The genus is spread over tropical and subtropical Asia.

1. **P. grandifolius** (leaves large), *Lour.*; *Lindl. Gen. and Sp. Orch.* 126; *Benth. Fl. Austr.* vi. 304. Stems tufted, usually thickened into short pseudo-bulbs at the base, bearing 2 or 3 oblong or ovate-lanceolate leaves often above 1ft. long, narrowed into a long petiole. Scapes radical, 2 to 4ft. high, bearing a loose raceme of large showy flowers. Sepals and petals broadly lanceolate,  $1\frac{3}{4}$  to near 2in. long, white outside, cinnamon-brown inside. Labellum nearly as long as the sepals, very broadly obovate, broadly and very obtusely 3-lobed, or notched or shortly acute in the centre, the margins undulate-crisped, white and shaded or streaked with crimson, loosely encircling the column at its base, the spur short narrow and usually curved. Column nearly  $\frac{3}{4}$ in. long.—*Bletia Tankervilleæ*, R. Br. in *Bot. Mag.* t. 1924; *Phaius australis*, F. v. M. *Fragm.* i. 42; *P. leucophæus*, F. v. M. *Fragm.* iv. 163; *P. Carroni*, F. v. M. *Pl. Burdek. Exped.* 19; *Fitzg. Austr. Orch.* ii. Pt. 5.

Hab.: Moreton Bay and Island, *A. Cunningham*, *M'Gillivray*; Rockingham Bay, *A. Cunningham*, *Dallachy*; Lady Elliott's Island, *Burdekin Expedition*; in coastal scrubs along the whole coast.

Var. *Bernaysii*. Only to be distinguished from typical plant by the colour of the flower of a pale-yellow inside, the labellum also yellow edged with white. The spur of the labellum rather straighter than in the common species, but sometimes curved in the cultivated plants.—*P. Blumei*, var. *Bernaysii*, Reichb. f. in Bot. Mag. t. 6032; Reichb. f. in Gard. Chron. 1873, 361; Benth. Fl. Austr. vi. 305.

Hab.: Moreton Bay, *Bernays*.

Forma *Idæ*. This has a broader labellum more than the half of which is white.

In flower September, 1897, in Mr. E. Grimley's garden, Brisbane.

Hab.: Stradbroke Island.

Forma *Soutteri*. In colouring the flowers of this form are similar to those of the typical plants, the change is in the following parts:—The wings of the column are greatly enlarged and overlap each other on the face of the labellum, and end in a kind of spur at the base, the outer margin is very wavy in which and also in the colouring they resemble a second labellum, their attachment to the column varies, sometimes being attached to the whole length sometimes only about half the length. The column like that of var. *Bernaysii*, shows a tendency to become triandrous. The same plants have been proved to produce these so called double flower year after year, with also the perfect flowers.

Hab.: Islands of Moreton Bay, *W. Soutter*.

## 12. PHOLIDOTA, Lindl.

(Bracts ear-like).

Flowers subglobose. Sepals nearly equal, free. Petals smaller. Labellum sessile at the base of the column, concave or almost saccate at the base, entire or 3-lobed, the lateral lobes erect, the middle lobe recurved. Column erect, somewhat hood-shaped at the top and winged in front. Anther terminal, lid-like, 2-celled, the valves almost transverse. Pollen-masses 4, waxy, globular, without any caudicle.—Epiphytical herbs, the rhizome usually shortly creeping, bearing short flowering stems or pseudo-bulbs, with a single terminal leaf. Flowers rather small, in terminal pedunculate racemes usually recurved. Bracts often rather broad and imbricate in the young raceme.

The genus is spread over East India and the Archipelago, the only Australian species ranging over the greater part of the area of the genus.

1. *P. imbricata* (imbricate), *Lindl. in Hook. Exot. Fl. ii. t. 138; Gen. and Sp. Orch. 36; Benth. Fl. Austr. vi. 290.* "Jarra-ronga-ronga," Johnstone River, *W. C. Harding*. Stems short, with a few sheathing scales and a single leaf, the older stems thickened into pseudo-bulbs. Leaf broadly lanceolate or oblong, acuminate, contracted and convolute at the base, prominently ribbed, often above 1ft. long. Peduncle long and slender from within the convolute base of the leaf, the flowering part at length recurved and 6in. long or more. Bracts broadly ovate, obtuse or almost acute, 4 to 5 lines long, complicate and imbricate at first, spreading from the flexuose rhachis when the flowers are out. Pedicels about 3 lines long. Sepals ovate-lanceolate, about 3 lines; petals rather smaller. Labellum about as long as the sepals, the concave almost globular part erect, bordered by the short broad lateral lobes, the middle lobe broader than long, the margin undulate and more or less distinctly 3-lobed. Column about  $1\frac{1}{2}$  line long, the margins winged upwards. Capsule obovate, about  $\frac{1}{2}$ in. long.—*Bot. Reg. t. 1213; Wight. Ic. t. 907; F. v. M. Fragm. iv. 163; Fitzg. Austr. Orch. ii. Pt. 4.*

Hab.: Very common on the stems of trees in the tropical scrubs.

This species is common in E. India and the Archipelago, the Australian specimens differing slightly in the rather larger bracts.

## 13. CALANTHE, R. Br.

(From the Greek—literally "pretty flower.")

Sepals and petals nearly equal, free, spreading, the lateral sepals sometimes shortly adnate to the labellum at the base. Labellum connate at the base with the column in a sort of cup, usually produced into a spur at the base, the

lamina spreading, lobed or undivided, the disk with several tubercles or callosities opposite the anther. Column erect, the margins connate with the labellum, the rostellum usually rostrate. Anther lid-like. Pollen-masses 8, tapering to the base and there affixed to a divisible gland.—Terrestrial herbs, stemless or nearly so. Leaves large, plicate, usually in tufts of 2 or 3. Scapes in the axils of the outer leaves tall, erect, and many-flowered. Flowers often showy, white or lilac.

The genus is dispersed over tropical Asia and the Islands of the Pacific, with one Mexican species; the only Australian species extends over the Archipelago and the East Indian Peninsula.

1. **C. veratrifolia** (leaves *Veratrum*-like), *R. Br. in Bot. Reg. under n. 573*; *Benth. Fl. Austr. vi. 305*. Rhizome shortly creeping, with tufts of 2 or 3 leaves, sometimes forming a very short stem or pseudo-bulb at the base. Leaves 1 to 2ft. long, ovate-lanceolate, plicate undulate and strongly ribbed, tapering into a petiole which is again dilated at the base. Scapes usually in the axil of the outer leaf, 2 to 4ft. high, the flowers rather crowded near the summit. Pedicels spreading,  $\frac{1}{2}$  to 1in. long, recurved after flowering. Sepals and petals white, obovate-oblong, nearly 5 lines long, the petals usually broader and more contracted at the base than the sepals. Labellum much longer, the spur slender,  $\frac{3}{4}$ in. long and usually pubescent, the lamina 3-lobed with the middle lobe deeply bifid, the 4 lobes oblong and sometimes nearly equal, but variable in breadth as well as in the relative depth to which they are divided, the callosities of the disk yellow. Capsule obovoid-oblong, about  $1\frac{1}{2}$ in. long.—*Bot. Reg. t. 720*; *Bot. Mag. t. 2615*; *Fitzg. Austr. Orch. i. Pt. 4*.

Hab.: Rockingham Bay, *Dallachy*; Brisbane River, Moreton Bay, *F. v. Mueller*; very common in coastal scrubs.

14. **EULOPHIA**, R. Br.

(Alluding to the handsome crested labellum.)

Sepals and petals nearly equal, spreading, free or the lateral sepals adnate to the short basal projection of the column. Labellum inserted at the base of the column or its projection but free from it, produced at the base into a short pouch or spur, the lamina 3-lobed or rarely undivided, the disk usually marked with cristate or bearded veins. Column semi-terete, with the front angles acute or winged. Pollen-masses 4 in pairs, or 2 and bifid, waxy, attached to a short linear caudicle on a transverse gland.—Terrestrial herbs, with short stems. Leaves distichous, plicate, or sometimes those of the flowering stems reduced to sheathing scales. Racemes terminal or on radical scapes.

The genus is spread over tropical and subtropical Asia and Africa. The Australian species are endemic.

Stems leafy. Leaves 2, narrow grass-like on long petioles. Labellum veins branched, starting from 3 or 4 raised ribs on the disk; middle-lobe broader than long . . . . . 1. *E. agrostophylla*.

Leafless herbs.  
Labellum strongly and darkly veined, the middle-lobe much broader than long . . . . . 2. *E. venosa*.  
Labellum finely veined, the middle as long as broad . . . . . 3. *E. Fitzalani*.

1. **E. agrostophylla** (leaves grass-like), *Bail. Proc. Roy. Soc. Ql. xi*. Rhizome of irregular form, resembling a ginger rhizome, thick, fleshy, whitish, stained here and there with purple, attaining a length of 4in. and a breadth of  $1\frac{1}{2}$ in. Leaf bearing stem slender, compressed, about 2 lines broad, with 2 long sheathing scales which cover the lower 4 or 5in., and then 2 grass-like leaves on long petioles, together attaining a length of 2ft. but not over 7 lines broad at the widest part, prominently ribbed, 3 of these much more prominent than the others. Scape 2ft. high, slender; the sheathing scales near the base about 1in.

long, with narrow lanceolate points, the upper ones without the sheathing base, and passing into long narrow bracts like those subtending the flowers; the raceme or flower-bearing portion about 4 or 5 in. Bract  $\frac{1}{2}$  in. long, or a little shorter than the slender pedicel. Spur very prominent in the bud. Sepals narrow-lanceolate, appearing in the dry flowers to have subulate points,  $4\frac{1}{2}$  lines long, 3-ribbed. Petals shorter and broader than the sepals, almost apiculate, 3-ribbed with branching veinlets. Labellum long as the petals of 3 blunt lobes, the middle one broader than long, the lateral ones occupying half the length of the labellum, all prominently marked by numerous branching veins which start from 3 or 4 strong raised ribs on the disk, margins slightly undulate. Column about half as long as the sepals, the dorsal lobe bearing the anther as in *E. venosa*—rather long and ovate. Pollen-masses 2, nearly globular. Capsule oval, about the size of a small gooseberry, and prominently ribbed.

Hab : On sandy land, in shady localities of the Mackay district, *L. J. Nugent*.

2. ***E. venosa*** (straight veined), *Reichb. f. in Herb. Lindl.*; *Benth. Fl. Austr.* vi. 300. An erect leafless herb, with the habit of *Dipodium punctatum*, the sheathing scales imbricate at the base of the stem, the upper ones distant, passing into narrow bracts, often as long as the pedicel and ovary. Flowers several in a terminal raceme, whitish with deep red veins. Sepals broadly lanceolate, 6 to 8 lines long, marked with longitudinal somewhat anastomosing veins, the lateral ones attached to the short basal projection of the column. Petals rather shorter and broader, almost obovate-oblong. Labellum rather longer than the sepals, the spur short, the lateral lobes ovate, strongly veined, the middle lobe twice as long and very much broader than long, almost reniform, elegantly veined, the disk with two longitudinal glabrous raised lines or plates between the lobes, shortly prolonged on the middle lobe which has besides 3 or more short undulate raised lines or plates. Column half as long as the sepals, the dorsal lobe bearing the anther rather long and ovate.—*Dipodium venosum*, *F. v. Muell. Fragm.* i. 61.

Hab.: Rockingham Bay, *Dallachy*; Port Mackay, *Nernst*.

3. ***E. Fitzalanii*** (after *E. Fitzalan*), *F. v. M. Fragm.* viii. 30; *Benth. Fl. Austr.* vi. 300. Habit apparently that of *E. venosa*, the single specimen leafless, nearly 1 ft. high, with a sheathing bract near the base about  $1\frac{1}{2}$  in. long, the bracts subtending the pedicels reaching to the top of the ovary. The sepals narrow-lanceolate, striate, acuminate-acute, about 7 lines long, the lateral ones attached at the base to the projection of the column. Petals scarcely broader but rather shorter and more obtuse, the veins slightly anastomosing. Labellum as long as the petals, the basal spur short but longer than in *E. venosa*, the veins branching but not so dark and strong as in *E. venosa*, lateral lobes not halfway up and not very prominent; middle lobe large but scarcely broader than long, the margins much undulate and very obtuse; the disk with 4 slightly raised lines quite entire between the lateral lobes, crisped or fringed and extending to about half the length of the middle lobe. Column not half so long as the sepals. Pollen-masses 2, depressed globular.

Hab : Mount Dryander, *Fitzalan*.

## 15. CYMBIDIUM, Swartz.

(Alluding to the hollow boat-shaped form of labellum.)

Sepals and petals nearly equal, free, spreading. Labellum sessile, free, articulate on the base of the column, or very shortly adnate to it, concave, entire, or 3-lobed. Column erect or slightly incurved, semi-terete, sometimes narrowly winged. Anther lid-like, very concave, more or less 2-celled. Pollen-masses 2, usually 2-lobed (4 united in pairs), sessile on a somewhat triangular gland.—Plants usually epiphytical. Stems often short and slightly swollen into pseudo-



bulbs. Leaves elongated, keeled, striate. Flowers not small, in loose racemes pedunculate in the lower axils, the peduncle often long with sheathing rigid scales at the base. Bracts usually small.

The genus, as at present understood, comprises tropical and subtropical species, both of the New and the Old World, but chiefly from the latter. The Australian species appear to be all endemic.

- Labellum 3-lobed glabrous except the 2 longitudinal crests . . . . . 1. *C. Hillii*.
- Labellum 3-lobed with 2 longitudinal raised pubescent or fringed plates on the disk . . . . . 2. *C. canaliculatum*.
- Labellum 3-lobed without longitudinal plates. Leaves very long and mostly lin. broad . . . . . 3. *C. albuciflorum*.
- Labellum undivided without longitudinal plates . . . . . 4. *C. suave*.

1. **C. Hillii** (after Walter Hill), *F. v. M. in Regel's Gartenf.* 138. (1879); *Fragn.* xi. 88. In many characters this species agrees with *C. canaliculatum*. The leaves, however, are of thinner consistency, prominently 3-nerved, broad-linear. Racemes of few flowers; bracts somewhat long. Sepals oblong-lanceolate, acute, slightly longer than the petals. Labellum 3-lobed, glabrous, bicristulate, the middle lobe nearly three times as long as broad.

Hab.: Mulgrave ranges, on Eucalypt tree, *Walter Hill*.

2. **C. canaliculatum** (channelled), *R. Br. Prod.* 331; *Benth. Fl. Austr.* vi. 302. Leaf-stems or pseudo-bulbs usually 2 to 4 in. long. Leaves elongated, narrow, keeled, channelled above, striate, the upper ones often 6 in. to 1 ft. long or even more, the lower ones short. Racemes from the lower axils often 1 ft. long including the peduncle, the sheathing scales at the base rather rigid, the bracts small and spreading. Pedicels  $\frac{1}{2}$  to 1 in. long. Sepals and petals oblong or lanceolate, 5 to 7 lines long. Labellum rather shorter than the sepals, distinctly 3-lobed, the lateral lobes decurrent along the claw, the middle lobe broadly ovate or almost rhomboidal, as long as the lower part, papillose on the upper surface; the disk between the lateral lobes with 2 longitudinal raised lines or plates slightly pubescent or shortly fringed. Column about as long as the lateral lobes, slightly incurved, with 2 narrow longitudinal wings.—*Lindl. Gen. and Sp. Orch.* 161; *Bot. Mag. t.* 5851; *Reichb. f. Beitr.* 45; *C. Sparkesii*, A. B. Rendle in *Journ. of Bot.* xxxvi. 221 and xxxix. 197; and C. Leai in *Journ. of Bot.* xxxvi. 221.

Hab.: Broadsound, *R. Brown*; Cape York, (*Botanical Magazine*); Herbert's Creek, *Bowman*; Cape River, *Fitzalan*; Burnett, *Haly*; Cooper's Creek, *F. v. M.*; also on the tropical forest trees.

The form of the flowers slightly, and the colouring considerably, differ in plants growing in different localities of this widely-spread species, but I have not seen distinction enough to separate them into named varieties

In some the flowers are brown with green margins others yellow blotched with red and the labellum dull-white spotted with red as noticed by Mr. Bentham.

3. **C. albuciflorum** (flowers like those of *Albuca*), *F. v. M. Fragn.* i. 188; *Benth. Fl. Austr.* vi. 303. "Dampy-ampy," Port Curtis; "Bungkiam," Tully River, *Roth*. Stems or pseudo-bulbs often 1 ft. long. Leaves attaining 2 ft. or more and often 1 in. broad, keeled underneath, channelled above, and striate. Racemes including the peduncle 1 to 2 ft. long, axillary, with sheathing scales at their base. Bracts small, at length spreading or reflexed. Pedicels rather rigid,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Sepals and petals greenish yellow, about 5 lines long, rather brown outside, more obtuse than in *C. canaliculatum*, the sepals broadly oblong, the petals rather narrower. Labellum nearly as long as the sepals, red at the base, yellowish above, 3-lobed as in *C. canaliculatum* but without the longitudinal plates of that species, of a rather thicker consistence and not quite so broad. Column with a prominent angle in front, the apex truncate.

Hab.: Moreton Bay, *W. Hill*; Rockingham Bay, *Dallachy*; Mount Dryander, *Fitzalan*. Very abundant.

Pseudo-bulb chewed for dysentery.—*Roth*.

4. **C. suave** (sweet scented), *R. Br. Prod.* 331; *Benth. Fl. Austr.* vi. 303. Stems usually slender, more densely covered with the imbricate strongly striate bases of the leaves than the two preceding species, and these bases often split up into fibres. Leaves narrow, often above 1ft. long, keeled and strongly striate. Racemes rather more dense than in *C. canaliculatum*, the sheathing scales at the base of the peduncle more rigid and leaf-like, the flowers rather smaller, green blotched with red. Sepals and petals scarcely 5 lines long, rather acute. Labellum narrower than in *C. canaliculatum*, especially towards the base, undivided or obscurely sinuate 3-lobed, the disk without longitudinal plates but thickened along the centre. Column with 2 narrow wings. Capsule ovoid-globular, scarcely 1in. long.—*Lindl. Gen. and Sp. Orch.* 164; *F. v. Muell. Fragm.* i. 187; *Reichb. f. Beitr.* 46.

Hab.: Moreton Bay, *C. Stuart*; Rockhampton, *O'Shanesy*.

This is the species usually found on forest Eucalypts in various localities.

## 16. GEODORUM, Jacks.

(Referring to the flowers being near the earth.)

Sepals and petals nearly equal, free, erect. Labellum erect, sessile at the base of the column but free from it, broad, concave and slightly saccate at the base, entirely or scarcely lobed. Column short, erect, semiterete. Anther terminal, lid-like, very concave. Pollen-masses 2, 2-lobed, waxy, attached to a very short caudicle on a transverse gland.—Terrestrial herbs with a short creeping rhizome. Leafy stems short, sometimes pseudo-bulbous at the base. Leaves rather large, plicate and strongly-ribbed, the lower ones reduced to membranous sheathing scales. Scapes from the base of the leafy stem, leafless except the sheathing scales, terminating in a rather dense usually recurved raceme.

The genus extends over East Indian and the Archipelago.

1. **G. pictum** (painted), *Lindl. Gen. and Sp. Orch.* 175; *Benth. Fl. Austr.* vi. 299. Leafy stems a few inches high, terminating in 2 or 3 ovate-lanceolate leaves of 4 to 8in., tapering at both ends. Scapes from the axil of a membranous scale close to the base of the leafy stem, shorter or perhaps sometimes longer than the leaves, bearing membranous sheathing scales, several rather large at the base of the scape, distant higher up. Flowers pink, rather numerous in a terminal raceme, reflexed only after the flowers have begun to expand. Pedicels short. Bracts linear, white. Sepals and petals oblong, 4 to 5 lines long. Labellum broadly ovate, darkly veined, obtuse and emarginate or very shortly 2-lobed at the end, the margin somewhat undulate, the disk saccate at the base with 2 double raised lines or plates more or less marked at the base often evanescent upwards or confluent into 2 single ones and terminating into a toothed or entire transverse callus below the end of the labellum. Column short, the margin winged. Pollen-masses ovoid-globular, waxy, 2-lobed.—*F. v. M. Fragm.* iii. 24; *Reichb. Beitr.* 46; *Cymbidium pictum*, *R. Br. Prod.* 331.

Hab.: Moreton Bay, *Bernays*; Rockhampton, *O'Shanesy*, *Thozet*; Cleveland Bay, *Bowman*; Wide Bay, *Bidwill*; Rockingham Bay, *Dallachy*; Port Denison, *Fitzalan*; Taylor's range, *F. M. B.*

## 17. DIPODIUM, R. Br.

(From *Dis*, two, *pous*, a foot.)

(*Leopardanthus*, *Blume*; *Wailesia*, *Lindl.*)

Sepals and petals nearly equal, free, spreading. Labellum sessile, erect, adnate to the column at its base and then gibbous or produced into a very short pouch, the lamina 3-lobed, the lateral lobes narrow, the middle lobe longer, oblong-ovate or rhomboidal, with a hairy or pubescent patch near the end.

Column erect, semicylindrical, the membranous margin variously sinuate or toothed. Anther lid-like. Pollen-masses 2, deeply 2-lobed (or 4 in pairs), lateral, attached to separate caudicles proceeding from a rather large gland.—Terrestrial herbs, the leafy stems when present simple with distichous leaves. Racemes on long, leafless scapes or long erect axillary peduncles, with sheathing scales imbricate at the base of the scape or peduncle, the upper distant ones passing into small bracts. Flowers rather large, often spotted.

Besides the two Australian species which appear to be endemic, there are a few from New Caledonia, the Eastern Archipelago, and East India.

No leaves. Scales not numerous, loosely imbricate at the base of the scapes 1. *D. punctatum*.  
Stems with linear-lanceolate leaves. Peduncles axillary . . . . . 2. *D. ensifolium*.

1. ***D. punctatum*** (punctate), *R. Br. Prod.* 331; *Benth. Fl. Austr.* vi. 301. A leafless plant with thick, fibrous roots and erect stem attaining with the racemes 1 to 2ft., the sheathing scales few and loosely imbricate and obtuse at the base, distant higher up. Flowers rather large, more or less red and usually but not always spotted with purple, in a terminal raceme sometimes very short sometimes occupying a third of the stem. Sepals and petals oblong-lanceolate, 6 to 8 lines long. Labellum as long or rather longer, the basal pouch or gibbosity very short; lateral lobes below the middle narrow and erect; middle lobe twice as long, obovate-oblong; disk with 2 raised lines very prominent and glabrous at the base, pubescent upwards and ending sometimes in tufts or pubescent scales, the middle lobe with one broad pubescent line or patch. Column half as long as the sepals, the inner face pubescent. Pollen-masses 2, deeply 2-lobed, laterally attached below the subulate ends of the caudicles.—*Hook. f. Fl. Tasm.* ii. 32, t. 127; *Bot. Reg.* t. 1980; *Reichb. f. Beitr.* 45; *Dendrobium punctatum*, *Sm. Exot. Bot.* i, 21, t. 12.

Hab.: Often met with in various localities both north and south.

Var. *Hamiltonianum*, *D. Hamiltonianum*, *Bail. Prod. of L. Soc. N.S.W.* vi. 140. Habit of the typical form. Flowers often larger, 20 to 30in. each raceme; rich-yellow spotted or barred with red. Sepals and petals oblong, about 8 lines long, the labellum longer, the lateral lobes erect, middle lobe oblong, pink, with 2 raised lines on the disk.

Hab.: Islands of Moreton Bay, Somerset, and Stanthorpe.

Var. *album*, 3rd. *Suppl. Syn. Ql. Fl.* 73. Flowers a pure white the only distinction.

Hab.: Cleveland, *W. R. Kefford*.

2. ***D. ensifolium*** (sword-shaped leaves), *F. v. M. Fragm.* v. 42; *Benth. Fl. Austr.* vi. 301. Stems leafy from a few inches to above 1ft. high without the racemes. Leaves distichous, complicate or canaliculate, linear-lanceolate, acute, strongly keeled and usually prominently ribbed on each side, 3 to 6in. long, the persistent truncate base usually rather long. Racemes with the peduncle often above 1ft. long, sometimes appearing at first terminal, and usually only 1 or 2 on the same stem, but really always axillary. Sheathing scales small, distant, with a few imbricate ones at the base of the peduncle. Pedicels with the ovary about  $\frac{1}{2}$ in. long. Sepals and petals pink and spotted, 6 to 8 lines long, the sepals oblong-lanceolate, the petals rather broader and more contracted at the base. Labellum about the length of the sepals, scarcely gibbous at the base but shortly connate with the column as in other species, the lateral lobes placed much below the middle, linear or linear-spathulate, incurved, the middle lobe about twice as long, broadly rhomboidal; the disk with 2 pubescent lines between the lateral lobes confluent into 1 at the base of the middle lobe, and a dense patch of scaly hairs at the end of it. Column not half the length of the sepals, pubescent in front. Pollen-masses 2-lobed, the 2 caudicles long and slender.

Hab.: Rockhampton Bay, *Dallachy*.

18. *LUISIA*, Gaudich.

(After Don Luis de Torres.)

Sepals subequal or the decurved dorsal smaller. Petals often longer, narrower. Labellum sessile on the base of the column, base flat concave or saccate. Column very short, truncate. Anther 2-celled; pollen-masses 2, subglobose, seated on a replicate short strap. Capsule narrow, erect. Tufted epiphytes. Stems terete, rigid, sheathed, pseudo-bulbs none. Leaves elongate, terete, obtuse. Flowers drooping, small, spicate on a short or very short stout erect axillary rhachis. Bracts very short, thick, imbricating, persistent.

Species few mostly belonging to tropical Asia.

1. *L. teretifolia* (leaves terete), Gaudich. *Bst. Freyc. Voy.* 427, t. 37; Hook. *Fl. Brit. Ind.* vi. 22. Stems from 6 to over 12in. long, often stout. Leaves 4 to 6in. long, cylindrical. Peduncles very short; flowers small, few, crowded; lower bracts truncate, upper deltoid; lateral sepals subacute. Keel winged. Petals linear-oblong, obtuse, hardly longer than the sepals, about 2 or 3 lines long. Labellum but slightly incised, the lower part nearly quadrangular. Column very short. Capsule 9 to 18 lines long.—Blume *Rumph.* iii. t. 194, f. 3, t. 1970.

Hab.: Goode Island.

19. *SARCOCHILUS*, Br.

(Lip fleshy.)

*Thrixspermum*, *Laur*; *Gunnia*, *Lindl.*

Sepals and petals nearly equal, free, spreading, the lateral sepals often more or less dilated at the base and adnate to the basal projection of the column. Labellum articulate at the end of the basal projection of the column without any spur at its base, 3-lobed, the lateral lobes rather large, the terminal one (in the Australian species) very short or tooth-like or cushion-like, with a solid fleshy dorsal protuberance at its base sometimes elongated oblong or conical, sometimes very short; the disk between the lateral lobes with prominent callosities. Column short, erect, produced at the base. Anther terminal, lid-like. Pollen-masses 4 in pairs on a somewhat flattened caudicle.—Epiphytical herbs. Stems short, either covered with the prominent persistent truncate bases of the leaves or leafless. Leaves flat and often falcate, or narrow-linear, or none. Racemes axillary. Bracts small. Capsules usually linear or narrow-oblong.

The genus is spread over East India and the Archipelago, but the Australian ones appear to be all endemic.

On rocks forming thick masses.

Stems stout, 3 to 4in. long. Leaves fleshy, 5 to 6in. long,  $\frac{1}{2}$  to  $\frac{3}{4}$ in.

.. broad, the apex unequal sided. Peduncles and rhachis stout; flowers numerous white with red centre; middle-lobe of labellum minute . . .

Epiphyte. Stem nearly 2ft. long; roots strong, long and wiry. Leaves 3 to 8in. long, 1 to nearly 2in. broad. Peduncle with raceme 1ft. long flat, flowers on the margins, pedicels slender. Sepals 6 lines long ending in filiform points. Labellum middle-lobe subulate. Capsule about 5in. long, beaked . . . . .

Leaves oblong, lanceolate or falcate. Middle lobe of the labellum short and toothlike, glabrous.

Lateral sepals adnate to the base only of the projection of the column which represents a claw to the labellum.

Sepals and petals narrow-linear, subulate-acuminate, 1 to over  $1\frac{1}{2}$ in. long. Roots very rough . . . . .

Sepals and petals oblong, 6 to 7 lines long . . . . .

Lateral sepals adnate to the whole of the projection of the column.

Sepals (5 to 6 lines) twice as long as the labellum.

Sepals and petals oval-oblong . . . . .

Sepals and petals linear-oblong . . . . .

Sepals (about 5 lines) but little longer than the labellum . . . . .

1. *S. Hartmannii*.

2. *S. platystachys*.

3. *S. divitiflorus*.

4. *S. falcatus*.

5. *S. Fitzgeraldi*.

6. *S. olivaceus*.

7. *S. parviflorus*.





*Sarrochilus Hartmanni*, F. v. M.  
Gov. P. P. Nichols, Orange, Basque, etc.

Leaves narrow-linear or none. Middle lobe of the labellum broad or cushion-like and densely covered with a white pubescence.

Leaves linear. Lateral sepals adnate to the whole of the projection of the column.

Sepals nearly 3 lines long. Lateral lobes of the labellum much longer than the middle lobe and the dorsal protuberance. On rocks . . . 8. *S. Ceciliae*.

Sepals about 1½ line. Lateral lobes of the labellum shorter than the broad middle lobe and the spurlike dorsal protuberance. On stems of trees . . . 9. *S. Hillii*.

No leaves. Lateral sepals (about 2 lines) adnate only to the base of the projection of the column which represents a claw to the labellum.

Roots very flat and thin . . . 10. *S. phyllorhizus*.

1. **S. Hartmannii** (after C. H. Hartmann), *F. v. M. Fragm.* viii. 248. Stems numerous, stout, 2 to 4in. high, clothed with the strongly ribbed bases of the old leaves. Leaves almost fleshy, 4 to 7in. long, about ¾in. broad, the apex very shortly obliquely emarginate. Peduncles erect, stout, and often longer than the leaves, bearing from 12 to 14 flowers. Pedicels about ½in. long. Sepals oblong, about 4 lines long, narrowed and red-spotted towards the base. Petals ovate, about 3 lines long, spotted like the sepals. Labellum short, with a band of red across the front, lateral lobes rhomboid-ovate middle lobe conical, small, yellowish, spur obtuse. The large gland on the disk deeply cut to half its length, the small gland at the base also more deeply cut. Column spotted with red. Pollen-masses pyriform.—*S. rubricentrum*, Fitzg. Austr. Orch. ii. Pt. 1.

Hab.: On rocks Southern ranges.

2. **S. platystachys** (broad spike), *Bail. 1st Suppl. Syn. Ql. Fl.* 56. Plant epiphytal, with flattened stems extending to nearly 2ft. in length, well furnished throughout with leaves, flower-racemes, and roots. Leaves deep-green, oblong, 3 to 8in. long and from 1 to nearly 2in. broad. Racemes axillary on flattened peduncles of 4 or 5in., with an empty bract near the base and 1 or 2 higher up; raceme about 8in. long, flat, with a row on either edge of obtuse, imbricated, slightly falcate bracts which subtend the delicate flowers. Flowers on slender pedicels. Segments about 6 lines long, forming at their base a blunt spur similar to that in a *Dendrobium* flower, from which they taper to filiform points. Labellum 3-lobed, the lateral lobes broad and wavy with a small curved calus on the disk between them, middle lobe subulate. Column very short, white, winged; anther-lid ovate. Capsule erect, with numerous fine ribs, about 5in. long, ending in a prominent beak.

Hab.: Johnstone River, *Dr. T. L. Bancroft*.

The flowers are described from a few dry ones found on the live plants; they appear to be of a yellow and pink.

3. **S. divitiflorus** (flowers rich looking), *F. Muell. Herb.*; *Benth. Fl. Austr.* vi. 292. Stems a few inches long, flat, clothed with the bases of old leaves; roots flattened upon the branches or stems of the supporting plants, of a dark colour and rough like a rasp. Leaves oblong, 3 to 4in. long and nearly 1in. broad, flat with prominent nerves. Scapes or peduncle about 6 to 18in. long, flowering from below the middle, with a few empty sheathing scales or bracts below the inflorescence. Flowers from few to 60, on short pedicels, the subtending bracts ovate, 1 to 1½ lines long. Sepals and petals very narrow, tapering into a filiform point, 1 to over 1½in. long, spangled with pale yellow white and dark blotches near the base, the lateral sepals narrow-lanceolate towards the base, but without any prominent spur or point. Labellum with a narrow claw of about 1 line, the lamina with an erect central saccate lobe of about 1 line, the lateral lobes twice as long, oblong, obtuse, clasping the very short column. Pollen-masses 2 on a short caudicle, the pollen somewhat mealy.—Fitzg. Austr. Orch. i. Pt. 3.

Hab.: Brisbane scrubs.

4. **S. falcatus** (falcate), *R. Br. Prod.* 332; *Benth. Fl. Austr.* vi. 293. Stems rarely above 2 or 3 in. high, rather stout, covered by the rigid loosely imbricate sheathing bases of the leaves. Leaves oblong, often falcate, 2 to 4 in. long and  $\frac{1}{4}$  to  $\frac{1}{2}$  in. broad. Peduncles in the lower axils scarcely exceeding the leaves and sometimes shorter. Flowers usually 3 or 4, distant, white. Bracts ovate, about 2 lines long. Pedicels and ovary about  $\frac{1}{2}$  in. Sepals and petals nearly equal, oblong, obtuse, 6 to 7 lines long, the lateral sepals adnate to the base only of the basal projection of the column which forms a canaliculate claw to the labellum of about  $1\frac{1}{2}$  lines. Labellum ascending from the end of it, the lateral lobes large, ovate, the middle lobe very short broad and almost scale-like or scarcely prominent, with a thick fleshy dorsal protuberance or solid spur; the disk with a transverse 2-lobed scale or callus between the lateral lobes. Column short, with 2 very prominent acuminate angles. Capsules linear, sometimes 3 in. long.—*Lindl. Gen. and Sp. Orch.* 142; *Bot. Reg. t.* 1832; *F. Muell. Fragm.* vii. 97; *Thriasperrum falcatum*, *Reichb. f. Beitr.* 46; *Fitzg. Austr. Orch. i.* Pt. 5.

Hab.: On trees of the southern ranges.

Var. *montanus*. Stem very short and covered by the bases of old leaves. Leaves about 2 or 3 in. long, slightly falcate. Racemes drooping, bearing a few rather large nearly white flowers; segments ovate, deeply marked in the bud by a purple line, incurved so as to form in the expanded flower a cup. Labellum striped and spotted with red, this differs from *S. falcatus* in its shorter and thicker protuberance, broader and shorter wings, not meeting and overlapping, and its shorter and broader middle lobe. Capsule 3 or 4 in. long and rather thick.—*S. montanus*, *Fitzg. Austr. Orch. i.* Pt. 5.

Hab.: Main Range, *C. H. Hartmann* and others.

5. **S. Fitzgeraldi** (after R. D. Fitzgerald), *F. Muell. Fragm.* vii. 115; *Benth. Fl. Austr.* vi. 293. Stem foliage and general aspect of *S. falcatus*, the leaves from 3 to 6 in. long. Racemes with the peduncle 6 in. to 1 ft. long, the flowers of the size of those of *S. falcatus*, "snowy white spotted with rich lake or maroon." Bracts small, pedicels  $\frac{1}{2}$  in. long or rather more. Sepals and petals nearly equal, contracted at the base, 5 to 6 lines long, the lateral sepals adnate to the whole of the basal projection of the column as in *S. olivaceus*, but the projection shorter and broader than in that species. Labellum not half the length of the sepals, the lateral lobes ovate, falcate, scarcely  $1\frac{1}{2}$  lines long, the middle lobe scarcely prominent, the solid dorsal protuberance short and obtuse; disk with a large very prominent callus between the lateral lobes and a smaller one just within the small middle lobe.—*Fitzg. Austr. Orch. i.* Pt. 3.

Hab.: Southern localities, rare.

6. **S. olivaceus** (colour of flower), *Lindl. Bot. Reg.* 1839; *Misc.* 32; *Benth. Fl. Austr.* vi. 293. Stems covered with the prominent bases of the leaves as in *S. falcatus*, but generally shorter, under 1 in. long. Leaves oblong, often falcate, 2 to 3 in. long, apparently thinner than in *S. falcatus*. Racemes loose, of 2 or 3 flowers, the rachis flexuose, not exceeding the leaves. Bracts very small. Sepals and petals of a dull pale purple or yellowish brown, 5 to 6 lines long linear-oblong, much contracted below the middle, the lateral sepals dilated at the base and adnate to the whole of the basal projection of the column. Labellum white streaked with red, almost sessile, about half as long as the sepals, the lateral lobes oblong-falcate, the middle lobe very short and orbicular, the dorsal solid protuberance ovoid-conical, obtuse; the disk with several very prominent irregular calli between the lateral lobes. Column short with a long basal projection. Capsule narrow.—*F. v. Muell. Fragm.* vii. 97; *S. dilatatus*, *F. v. Muell. Fragm.* i. 191; *Thriasperrum olivaceum* and *T. dilatatum*, *Reichb. f. Xen. Orchid.* ii. 122; *Fitzg. Austr. Orch. i.*, Pt. 5.

Hab.: Rockingham Bay, *Dallachy*; Moreton Bay, *W. Hill*. Common on the stems of trees bordering the southern scrubs.



*Gunnia picta*, Lindl. Bot. Reg. 1838, Misc. 45 (*Sarcophilus pictus*, Reichb. f. in Walp. Ann. vi. 501; *Thriasperrnum pictum*, Reichb. f. Xen. Orch. ii. 122), from Sydney, Hort. Loddiges, or from Brisbane (Reichb. f.), does not appear to me to differ from *S. olivaceus*. The calli of the labellum in this as in *S. parviflorus* vary from specimen to specimen.—Benth.

7. **S. parviflorus** (flowers small), Lindl. Bot. Reg. 1838, Misc. 34; Benth. Fl. Austr. vi. 294. Habit entirely that of the smaller specimens of *L. olivaceus*, the short stems covered with the prominent bases of the fallen leaves. Leaves rather thin, narrow-oblong or falcate, 2 to 3 or rarely 4 in. long. Scapes as long as or rather longer than the leaves, bearing 3 to 6 pale yellowish-green flowers, on pedicels of 2 to 3 lines. Sepals narrow-oblong, 4 to 5 lines long, besides the narrow base of the lateral ones adnate to the projection of the column. Petals rather shorter than the sepals. Labellum nearly sessile at the end of the basal projection of the column, white, more or less tinted with yellow, and spotted or streaked with red, the lateral lobes ovate-oblong often nearly as long as the sepals, the middle lobe very small, the dorsal protuberance or solid spur thickly conical or obovoid, at least half as long as the lateral lobes; the disk with several irregular very prominent calli between the lobes. Capsule linear.—*Gunnia australis*, Lindl. Bot. Reg. under n. 1699; Hook. f. Fl. Tasm. ii. 33, t. 128; *Sarcophilus Barklyanus*, F. v. Muell. Fragm. i. 89; *S. Gunnii*, F. v. Muell. l.c. 90; *S. australis*, Reichb. f. in Walp. Ann. vi. 501; *Thriasperrnum parviflorum* and *T. australe*, Reichb. f. Xen. Orch. ii. 122; Fitzg. Austr. Orch. i., Pt. 3.

Hab.: In southern localities, rare.

8. **S. Ceciliæ** (after Cecilia V. van Maseyk), F. v. M. Fragm. v. 42, t. 42; Benth. Fl. Austr. vi. 294. Stems erect, slender, 3 to 6 in. high. Leaves linear or narrowly linear-lanceolate, thick, 2 to 3 in. long. Peduncles with racemes slender, erect, numerous, 3 to 6 in. long, bearing above the middle a number of small shortly pedicellate pink flowers. Lateral sepals almost ovate, nearly 3 lines long, adnate to the rather long basal projection of the column; dorsal sepal of the same length but narrower; petals still narrower. Labellum much shorter than the sepals, the lateral lobes oblong-falcate, the middle lobe very much shorter, thick and woolly-villous on the surface; the dorsal protuberance or solid spur broad, obtuse, half as long as the lateral lobes; the disk with several calli, more or less adnate to the lateral lobes.—*Thriasperrnum Ceciliæ*, Reichb. f. Beitr. 71.

Hab.: Rockingham Bay, *Dallachy*; Cleveland Bay, *Bowman*. Common on the rocks of mountainous ranges of the north and south.

9. **S. Hillii** (after Walter Hill), F. v. M. Fragm. ii. 94, vii. 98; Benth. Fl. Austr. vi. 295. Stems very short. Leaves few, narrow-linear, rather thick, 1 to 3 in. long. Racemes very slender, shorter or scarcely longer than the leaves, with a number of very small white flowers very fragrant and shortly pedicellate. Sepals ovate-oblong, scarcely  $1\frac{1}{2}$  lines long; petals the same length, but narrower. Labellum about 1 line long, sessile on the very short basal projection of the column, the lateral lobes short, almost acute, the middle lobe rather longer, broader than long, retuse, thickly covered on the surface with white wool; the dorsal protuberance or solid spur narrow-conical, longer than the lateral lobes; the disk with several prominent calli.—*Dendrobium Hillii*, F. v. Muell. Fragm. i. 88, ii. 94; *Thriasperrnum Hillii*, Reichb. f. Beitr. 71; Fitzg. Austr. Orch. i., Pt. 3.

Hab.: Brisbane River, Moreton Bay, *W. Hill*; Rockhampton, *Thozet*, *O'Shanesy*; Mount Perry, *Jas. Keys*; Toowoomba, *P. Silcock*.

10. **S. phyllorhizus** (roots leaf-like), F. v. M. Fragm. v. 201; Benth. Fl. Austr. vi. 295. Apparently stemless and leafless, the irregularly flattened greenish roots spreading from the very short stock and sometimes assuming

almost the aspect of leaves. Scapes slender, erect, almost filiform, 3 to 6 in. high, bearing several small flowers on very short filiform pedicels. Sepals and petals obovate or obovate-oblong, about 2 lines long, the lateral sepals as in *S. falcatus* adnate to the base only of the columnar projection, which forms a linear claw to the labellum almost half as long as the sepals. Labellum sessile at the end of this projection or claw, the lateral lobes small, narrow-oblong, clavate, purple; the middle lobe very short and obtuse, almost globular and densely white-woolly on the inner surface as in *S. Ceciliae* and *S. Hillii*; the dorsal protuberance very short.—*Thriasperrum phyllorhizum*, Reichb. f. Beitr. 71.

Hab.: Cape York, *M'Gillivray*, *Daemel*; Fitzroy Island, *F. v. Mueller*; Johnstone River, *Dr. T. L. Bancroft*; Hammond Island, *Bail*.

20. CLEISOSTOMA, Blume.

(From *kleio*, to close, and *stoma*, a mouth; mouth of the spur closed.)

Sepals and petals nearly equal, free, spreading, the lateral sepals sometimes adnate to a basal projection of the column. Labellum inserted at the base of the column or of its basal projection but free from it, with a pouch or spur at its base, undivided inside but with a reflexed or horizontal scale or appendage inside at the orifice, the lamina 3-lobed, the middle lobe usually short and broad, the lateral ones falcate or narrow. Column short, with 2 teeth or lobes at the apex in front. Anther lid-like; pollen-masses 4 in pairs, attached to a somewhat flattened caudicle.—Herbs with the habit of *Sarcochilus* or of *Saccolabium*, the stems short or elongated. Leaves more or less distichous, leaving short sheathing persistent bases. Flowers small, in axillary racemes, the spur of the labellum rather long in the Australian species.

- The genus extends over East India and the Archipelago; the Australian species are endemic.
- Leaves 2 to 3 in. long, linear-oblong. Racemes slender, often shorter than the leaves. Sepals about 2 lines long. Labellum middle-lobe very short, obtuse, fleshy, concave . . . . . 1. *C. tridentatum*.
  - Leaves 1 to 1½ in. long, lanceolate. Racemes rather longer than the leaves. Sepals scarcely 1 line long. Labellum middle-lobe roundish with inflexed margins . . . . . 2. *C. Armitii*.
  - Leaves 1 to 2 in. long, linear-lanceolate. Racemes spike-like, often longer than the leaves. Sepals 1 line long. Labellum middle-lobe saccate, with a membranous scale in front . . . . . 3. *C. Nugentii*.
  - Leaves 1½ in. long, linear-oblong. Racemes shorter than the leaves. Sepals 3 lines long. Labellum densely woolly, middle-lobe minute, truncate . . . . . 4. *C. congestum*.
  - Leaves 2 to 3 in. long, ovate to linear-lanceolate. Racemes 3 to 4 in. long. Sepals 2 lines long. Labellum middle-lobe almost conical . . . . . 5. *C. brevilabre*.
  - Leaves 4 to 6 in. long, broad linear-oblong. Spike rigid, shorter than the leaves. Sepals 2½ lines long. Labellum middle-lobe orbicular . . . . . 6. *C. Macphersonii*.
  - Leaves 4 to 6 in. long, lin. broad, apex obtuse. Racemes 6 to 9 in. long. Sepals about 4 lines long. Labellum middle lobe short, appendage within the pouch horn-like . . . . . 7. *C. Keffordii*.

1. **C. tridentatum** (3-toothed), *Lincl. Bot. Reg.* 1838, *Misc.* 33; *Benth. Fl. Austr.* vi. 296. Stems often elongated, rather slender, the persistent bases of the leaves much less prominent than in the *Sarcochili*. Leaves mostly 2 to 3 in. long, linear-oblong or falcate. Racemes slender, flexuose, shorter than the leaves. Bracts very small. Flowers very small, shortly pedicellate. Sepals and petals oblong-lanceolate, about 2 lines long, the dorsal sepal rather broader, the lateral ones and the petals slightly falcate, the lateral sepals adnate to the very short basal projection of the column. Labellum nearly as long as the sepals; spur rather long, deflexed, with a deflexed ciliate membrane inside, on the side next the lamina of the labellum; lateral lobes spreading, falcate and acute; middle lobe very short, obtuse, fleshy, concave. Column exceedingly short, the margin deeply membranous, with 2 anterior narrow teeth. Capsule

narrow, 1 to 1½ in. long.—*Saccolabium calcaratum*, F. v. Muell. Fragm. i. 192; *Sarcophilus calcaratus*, F. v. Muell. Fragm. ii. 181, vii. 98; *Sarcophilus tridentatus*, Reichb. f. in Walp. Ann. vi. 500; Fitzg. Austr. Orch. i., Pt. 5.

Hab.: In most scrubs.

2. **C. Armitii** (after W. E. Armit), *F. v. M. Fragm.* ix. 49. Plant small. Leaves lanceolate, slightly oblique, 1½ to 2½ in. long, 3 to 6 lines broad. Racemes with the short peduncle about 3 in. long. Bracts deltoid, scarcely 1 line long. Sepals scarcely 1 line long, oblong, membranous, narrowed towards the base. Petals roundish, sometimes a little acuminate. Labellum lateral lobes ovate, middle-lobe roundish with inflexed margins. Spur almost 1 line long. Column very short.—*Sarcophilus Armitii*, F. v. M. Fragm. ix. 49.

Hab.: Lake Lucie, *W. E. Armit*; Burdekin River.

3. **C. Nugentii** (after L. J. Nugent), *Bail., Proc. Roy. Soc. Ql.* xi. Stems short, covered by the prominently ribbed bases of fallen leaves, live leaves 2 or 3, distichous, linear-lanceolate, 1 to 2 in. long, and from 3 to 6 lines broad, sharply keeled, the longitudinal nerves only seen in the dry or partially dry state; all much blotched with deep-red or purple on the specimens examined. Racemes spike-like, erect, often longer than the leaves. Bracts small but the lower empty one rather larger than those subtending the flower, and somewhat spreading or recurved. Flowers small, numerous, on very short pedicels. Sepals somewhat spatulate, 1 line long, incurved, greenish towards the tips, the lateral ones adnate to the basal projection of the column. Petals shorter and broader than the sepals, with thick midrib but no longitudinal veins, greenish and incurved. Labellum white, as long as the petals, the basal pouch not quite so broad but as long as the rest of the labellum, with no internal appendage; the lateral lobes very short with coloured margins, embracing the column; scale in front of the saccate end or middle lobe membranous. Column short, with broad green, ciliate wings. Anther-lid purple. Pollen-masses 2, nearly spherical; caudicle bipartite. Capsule not seen.

Hab.: Black Gin's Leap, a mountain about 16 miles north of Mackay, *L. J. Nugent*.

In some respects this plant resembles an *Ornithochilus*, and probably upon further examination it may have to be placed in that genus.

4. **C. congestum** (crowded), *Bail., Proc. Roy. Soc. Ql.* xi. Stems short, the longest seen under 2 in. long, the lower part covered by a ribbed scariosus bases of fallen leaves. Leaves 2 to 5 straight, linear-oblong, obtuse-acuminate, base more or less cuneate, the longest about 1½ in. long and about 3 lines broad, the veins in the live leaf obscure from the coriaceous nature of the leaf, but both the longitudinal ribs and cross veinlets plainly visible in the dried specimens. Peduncle usually shorter than the leaves, with 1 or 2 scariosus sheathing bracts at the base, and 1 or 2 or none between these and those subtending the flowers. Flowers cream-coloured, crowded at the apex forming a head but opening one at a time. Bracts broad, fleshy, pointed, segments of flowers all incurved, resembling those of some of our small-flowered *Dendrobiums*. Pedicels 3 lines long. Sepals broad-lanceolate about 3 lines long. Petals narrow-linear shorter than the sepals. Labellum long as the sepals, the lateral lobes long and broad, the middle lobe reduced to a truncate end to the labellum, the whole upper surface covered with a dense short white wool, the central scale broad with ciliate margins and recurved coloured point. Spur broad, obtuse, stained with yellow and red, plate at orifice transverse. Column white, semiterete, scarcely one-third the length of the sepals. Pollen-masses oval, yellow. Capsule slender, 2½ in. long.

5. **C. brevilabre** (lip short), *F. v. M. Fragm.* xi. 87. Stems elongated clothed with the sheath of old leaves and sending out filiform roots. Leaves from ovate to narrow-lanceolate, 2 to 3 in. long,  $\frac{1}{2}$  to 1 in. broad, nervato-striate. Racemes 3 to 4 in. long the peduncle somewhat short. Bracts deltoid about 1 line long. Pedicel with ovary about 3 lines. Sepals about 2 lines long slightly falcate. Petals rather shorter than the sepals. Labellum fleshy, lateral lobes  $\frac{1}{2}$  line high, semi-orbicular. Middle lobe almost conical. Spur 3 lines long. Column very short.

Hab.: Mt. Dryander, *E. Fitzalan*.

6. **C. Macphersoni** (after the Hon. J. A. Macpherson), *F. Muell. Herb.; Benth. Fl. Austr.* vi. 297. Stems short, covered with the very prominent bases of the leaves. Leaves 4 to 6 in. long and at least 1 in. broad, the veins not prominent except the midrib, which forms an acute keel underneath. Spikes rigid, not longer than the leaves, the flowers rather numerous sessile, reddish. Sepals and petals rather thick, about  $2\frac{1}{2}$  lines long, all nearly equal. Column not produced at the base. Labellum sessile, the spur oblong, obtuse, rather dilated beyond the middle,  $1\frac{1}{2}$  lines long, closed at the orifice by a large ovate plate close under the column; lamina short and broad, the middle lobe orbicular, about  $1\frac{1}{4}$  lines diameter, the lateral lobes shorter, falcate and narrow. Capsule oblong, strongly ribbed.—*Saccolabium Macphersonii*, *F. Muell. Fragm.* vii. 96.

Hab.: Rockingham Bay, *Dallachy*; not uncommon in tropical scrubs.

This has much the aspect of a small-flowered *Sarcanthus*, but the spur is not divided inside.

7. **C. Keffordii** (after W. R. Kefford), *Bail., in Rep. Ql. Accli. Soc., April*, 1884. Stems elongated several feet, 3 or 4 lines thick, emitting strong, wiry distant roots. Leaves coriaceous, 4 to 6 in. long, about 1 in. broad, the apex very obtuse, contracted at the base, the sheathing base strongly ribbed. Keel acute, and 3 or 4 more or less prominent veins on either side. Racemes lateral, flexuose, 6 to 9 in. long, 3 or 4 closely appressed obtuse bracts below the flowers. Flowers 16 to 20, yellowish-white on pedicels of about 5 lines. Outer segments or sepals, and the inner ones or petals, about 4 lines long and 2 lines broad, somewhat reflexed. Labellum with pouch about the length of the other segments, slipper-shaped, the lateral lobes white, with a boss-like gland in the centre of each on the inner side; middle-lobe short; appendage within the pouch hornlike, glabrous. Column white, the wings joining in front and forming a prominent beak.—*Fitzg. Austr. Orch.* ii. 21.

Hab.: Johnstone River, *W. R. Kefford*.

## 21. ORNITHOCHILUS, *Wall.*

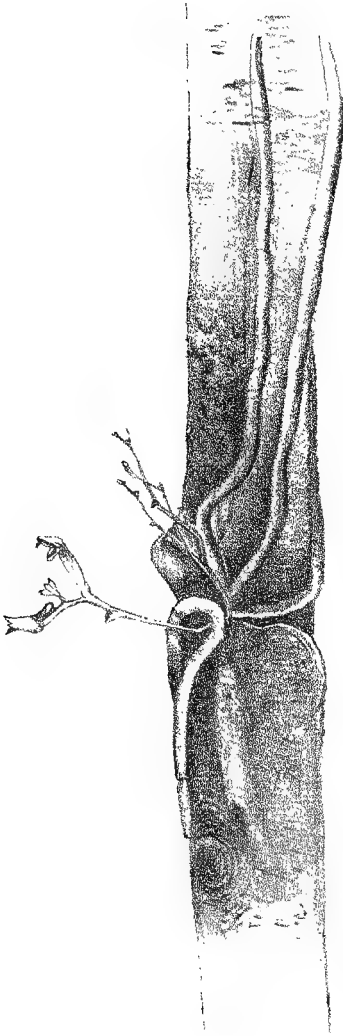
(The lips of some species like the bill of a bird.)

Sepals spreading, subequal, lateral obliquely obovate. Petals linear. Labellum much larger than the sepals, clawed, lateral lobes subquadrate, middle lobe clawed, inflexed lobulate and fimbriate, with a velvety flap over the mouth of the short incurved spur, which is distant from the base. Column short, foot often wanting, rostellum forcipate. Anther low 2-celled, pollen-masses 2, subglobose or oblong, grooved, caudicle obtuneate. Epiphytes. Stem very short, leaves few, broad, flat. Racemes lateral, flowers small.

Species few, the Australian one endemic.

1. **O. Hillii** (after Walter Hill), *Benth. Journ. Linn. Soc.* xviii. 334. Stems rigid, flexuose, several inches long, covered with the prominent deeply striate bases of the leaves. Leaves distichous, rigid, with prominent nerves, mostly 3 to 5 in. long and  $\frac{3}{4}$  to 1 in. broad. Racemes usually about the length of the leaf, the flowers numerous and small on very short pedicels. Sepals and petals, oblong-





*Taeniophyllum Muelleri*, Lindl.

linear, not quite 2 lines long, the lateral ones adnate to the short basal projection of the column, falcate as well as the petals, the dorsal one rather long and incurved, all dotted with red. Labellum nearly as long as the sepals, the basal pouch short and broad without any internal appendage, the lamina concave or embracing the column, about as broad as long, truncate, almost without a middle lobe, the angles (or lateral lobes) shortly acuminate and somewhat incurved, the disk with an erect conical tooth or callosity immediately above the pouch but not reflexed into it.—*Saccolabium Hillii*, F. v. M. Fragm. i. 192; Benth. Fl. Austr. vi. 298.

Hab.: Common on trees in the southern scrubs.

22. TÆNIOPHYLLUM, Blume.

(Leaves of some species linear, ribbon-like.)

Sepals and petals nearly equal, erect or connivent, connate at the base. Labellum adnate to the column at the base and produced into a short spur or pouch, entire or shortly 2-lobed. Column very short, erect, with 2 teeth in front. Anther terminal, lid-like. Pollen-masses 4 in 2 pairs, with a short slender caudicle. Gland minute.—Epiphytical herbs, almost stemless and leafless or with a tuft of linear leaves. Flowers minute, in small slender racemes.

The genus has but few species and besides Australia is met with in India, Malaya and the Pacific Islands; the Australian species is probably endemic.

1. **T. Muelleri** (after Baron Mueller), *Lindl. Herb.*; *Benth. Fl. Austr.* vi. 291. Stems leafless, scarcely above  $\frac{1}{2}$  line long, emitting long linear wavy roots, and 2 or 3 filiform scapes of about  $\frac{1}{4}$  in. Bracts minute. Flowers 2 or 3 on exceedingly short pedicels, and the whole flower under 1 line long. Sepals and petals united to about the middle, the petals rather narrower than the sepals. Labellum linear, as long as the sepals and shortly 2-lobed at the end, with a minute tooth between the lobes, the basal pouch or spur obtuse, about  $\frac{1}{4}$  line long.—*Sarcochilus Baileyi*, F. v. M. Herb.

Hab.: On trees southern localities.

23. GALEOLA, Lour.

(With a small helmet.)

(*Erythrorchis*, Blume; *Ledgeria*, F. v. M.)

Sepals and petals nearly equal in length, connivent or open, the dorsal sepal incurved, the petals narrower. Labellum, sessile, broad, incurved round the column, the lateral lobes very short and erect or obsolete, the middle lobe short and broad, undulate-cripsed, the disk with 2 raised longitudinal lines, the intervening space pubescent or glabrous. Column elongated, erect, not at all or scarcely winged. Anther lid-like, incumbent, with a broad flat or convex dorsal appendage, 2-celled. Pollen granular-farinaceous or almost waxy, in 2 deeply 2-lobed distinct masses, without any caudicle or gland.—Leafless epiphytes or saprophytes, sometimes climbing to a great extent, the branches flexuose. Flowers in terminal usually pendulous panicles. Bracts at the base of the branches and panicles small or large, but always concave and half-stem-clasping.

Besides Australia these plants are met with in India, Java, the Indian Archipelago and New Caledonia.

Bracts scarcely  $\frac{1}{2}$  in. long. Labellum pubescent inside between the raised lines which end in a transverse callus. Pollen almost waxy . . . 1. *G. cassythoides*.  
 Bracts 1 to 2 in. long. Labellum glabrous between the raised lines which converge into one, the lamina on each side marked with diverging lines fringed with small linear hairs . . . . . 2. *G. foliata*.

1. **G. cassythoides** (Cassytha-like). *Reichb. f. Xen. Orchid.* ii. 277; *Benth. Fl. Austr.* vi. 307. Stems leafless, of a chocolate-brown colour, climbing to a great length and closely adhering to the stems of trees, throwing out adventitious

rootlets at the nodes opposite the bracts, terminating in long pendulous panicles. Flowers of a brownish or golden yellow, in short racemes or branches of the panicle, quite glabrous and smooth. Bracts at the base of the pedicels and branches ovate-lanceolate, acute, 1 to 2 lines long and those of the flowerless stems scarcely 3 lines. Pedicels and ovary 3 to 4 lines. Sepals 6 or more lines long, oblong-lanceolate, the dorsal one incurved, the lateral ones slightly falcate; petals as long as the sepals but linear. Labellum white, with transverse coloured bands, scarcely so long as the sepals, sessile, very broad, erect, concave, almost convolute, obscurely 3-lobed, the lateral lobes or obtuse angles short, erect and entire, the middle lobe very short and broad, spreading, undulate-crenate; disk of the erect part with 2 raised longitudinal lines separated by a broad pubescent centre and ending in a transverse callus, the lamina or middle lobe pubescent on the surface at the base and bearing sometimes irregular undulate calli. Anther with a large broad convex or almost hood-like dorsal appendage, 2-celled in front; pollen-masses 2, without caudicles, deeply 2-lobed, but the lobes closely approximate and the consistence almost as waxy as in *Dendrobium*.—Fitzg. Austr. Orch. i., Pt. 3; *Dendrobium cassythoides*, A. Cunn. in Lindl. Bot. Reg. under n. 1828; *Ledgeria aphylla*, F. v. Muell. Fragm. i. 239, ii. 167; *Erythrorchis aphylla*, F. v. Muell. Fragm. ii. 167.

Hab.: Southern localities inland and coastal.

2. **G. foliata** (scales leaf-like), *F. v. M. Fragm.* viii. 31; *Benth. Fl. Austr.* vi. 307. Climbing habit the same as that of *G. cassythoides*, but much more robust and higher, the panicle or flowering portion of the plant very much larger, and the bracts subtending the branches often 1 to 2 in. long, but retaining the ovate-lanceolate shape, the broad stem-clasping base, and with the colour and consistence of bracts rather than that of true leaves. Sepals and petals lanceolate, 1 or more inches long, the petals much narrower than the sepals. Labellum broadly obovate, more contracted at the base than in *G. cassythoides*, the erect part broadly cuneate, with two raised lines along the centre but glabrous between them, the two lines converging into a single one on the lamina, this lamina or upper spreading portion of the labellum very broad, the margins undulate-crenate, the surface of the whole labellum on each side of the smooth centre fringed with several lines of small linear calli rather than hairs, the lines transverse on the claw, longitudinal or diverging on the lamina, strongly scented like wild bee honey. Anthers with the broad dorsal appendage of *G. cassythoides* but flatter, and the pollen distinctly granular, in two masses deeply divided into somewhat distant oblong lobes, giving the mass somewhat of a horseshoe shape. Capsule 7 to 8 in. long. Seed winged.—*G. Ledgerii*, Fitzg. Austr. ii., Pt. 2; *Ledgeria foliata*, or *Erythrorchis foliata*, F. v. Muell. Fragm. ii. 167.

Hab.: Not uncommon in the coastal scrubs both north and south; about old rotten stumps of trees.

## 24. CORYMBIS, Thou.

(Flowers in corymbose panicles.)

(*Corymborchis*, *Thou.*)

Sepals and petals nearly equal, linear and dilated above the middle, all spreading or the dorsal one more erect. Labellum about as long, narrow, channelled, dilated at the end into a short recurved lamina, the disk with two longitudinal raised lines. Column elongated, terete, clavate at the end, with two erect lateral lobes, the stigma and rostellum acuminate, as long as the anther. Anther erect behind the stigma, acuminate, 2-celled; pollen granular,



in 2 masses attached by a caudicle to a peltate gland.—Tall terrestrial herbs, with a fibrous rhizome. Leaves large, strongly ribbed. Flowers in short axillary somewhat corymbose panicles, the column persistent on the capsule.

The genus extends over tropical Asia and Africa, and appears also to be represented in Brazil. The Australian species extends over the Indian Archipelago and into East India.

1. **C. veratrifolia** (Veratrum-leaved), *Reichb. f. in Flora* 1865, 184; *Benth. Fl. Austr.* vi. 311. Stems erect or somewhat climbing, attaining 2 to 4 feet. Leaves distichous, oblong-elliptical, acuminate, 6 to 10in. long and 2 to 3 broad, very strongly ribbed, tapering into a rather short sheathing petiole. Flowers white, in spreading axillary panicles not half so long as the leaves, erect and almost sessile along its spreading branches. Bracts linear-lanceolate, rarely  $\frac{1}{2}$ in. long. Sepals and petals nearly  $\frac{3}{4}$ in. long, the dorsal one rather broader at the base than the others, more erect and concave. Labellum rather longer than the sepals, broadly lanceolate, concave, about 2 lines broad, with entire margins, slightly dilated at the end into short broad acute crisped lamina; the disk with 2 long raised lines, curving outwards on the lamina and ending in small callosities. Column at the time of flowering as long as the sepals, and not elongated afterwards, persisting on the capsule after the sepals and petals have fallen. Capsule narrow oblong about 1in. long strongly ribbed.—*Corymborchis veratrifolia*, Blume, *Orchid.* 125, t. 42, 43.

Hab.: Found in most of the northern coastal scrubs.

## 25. ANECTOCHILUS, Blume.

(*Anoiktos*, open, and *cheilos*, a lip.)

Sepals free, dorsal smaller and forming a hood with the narrow acuminate petals, lateral spreading. Labellum adnate to the base of the column, contracted into an entire toothed or pectinate claw beyond the saccate spurred base, and having 2 rarely 4 terminal wing-like lobes; spur exerted beyond the bases of the sepals, and with 2 calli within. Column short, appendaged in front, stigmatic lobes lateral; anther 2-celled; pollen-masses narrowed into short or long caudicles.—Terrestrial herbs. Stems below, creeping. Leaves petiolate, ovate or lanceolate. Flowers in glandular pubescent spikes.

Species Indian and Malayan.

Leafy short specimens of what will most probably prove a species of the above genus have been sent me from the Trinity Bay Ranges.

## 26. SPIRANTHES, Rich.

(From *speira*, a spire, and *anthos*, a flower.)

Dorsal sepal and petals erect, connivent or slightly coherent in an upper lip or galea, or the ends alone spreading. Lateral sepals free and more spreading, all nearly equal. Labellum sessile or nearly so, embracing the column by its broad base, undivided, often dilated at the end, the disk with 2 tubercles at the base. Column short, with a small erect appendage or lobe on each side. Anther erect; pollen-masses 4, granular or mealy, sessile on a gland. Rostellum short, bifid.—Terrestrial herbs, with oblong underground tubers or thick clustered fibres. Flowers small, spirally arranged in a terminal spike. Stems leafy, or sometimes at the time of flowering with sheathing scales only.

A considerable genus generally diffused over the temperate and tropical regions of the globe; the only Australian species has a wide range over Asia and a part of Europe.

1. **S. australis** (Australian), *Lindl. Gen. and Sp. Orch.* 464; *Benth. Fl. Austr.* 314. Rhizome short, with a cluster of thick fibres or oblong tubers. Stems glabrous below the inflorescence, 6in. to above 1ft. high. Lower leaves

linear or narrow-lanceolate, varying in length from  $1\frac{1}{2}$  to 4 in. as well as in breadth, the upper ones reduced to sheathing scales. Spike spiral, very dense or rather loose. Flowers sessile, generally pink with a white labellum; bracts usually about as long as the ovary, the rhachis ovary and sometimes the perianths pubescent. Sepals and petals varying from  $1\frac{1}{2}$  to 2 lines in length, the lips spreading, the lateral sepals obscurely dilated near the base but not saccate. Labellum as long as the sepals, the broad base quite sessile or sometimes appearing raised on a very short claw with a tubercle on each side, concave, often slightly contracted above the column, then expanded into a short broad undulate-erisped or almost fringed lamina. Anther scarcely acuminate but much longer than the rostellum.—Wight. Ic. t. 1724; Hook. f. Fl. Tasm. ii. 15; Reichb. Ic. Fl. Germ. t. 476; *Neottia australis*, R. Br. Prod. 319; Fitzg. Austr. Orch. i. Pt. 2.

Hab.: Very common amongst grass, especially in southern localities.

### 27. *LISTERA*, R. Br.

(After Dr. Martin Lister.)

Sepals and petals subequal, free, spreading or reflexed. Labellum pendulous from the base of the column, usually longer than the sepals, narrow, entire or 2-fid. Column usually stout; rostellum terminal. Anther inclined forward, cells 2 contiguous; pollen-masses 2, usually 2-partite, pendulous from the gland of the rostellum. Terrestrial erect 2-leaved herbs, with fibrous roots from a short rootstock. Leaves broad subopposite. Flowers rather small racemose.

Species few, found in the mountains of Europe, Asia and America.

1. ***L. amplexicaulis*** (leaves amplexicaul) *Bail.* Plant terrestrial or growing in masses of decayed epiphytes on the stems of trees. Stems 4 to 6 in. high, arising from globose or oblong tubers of from  $\frac{1}{4}$  to  $\frac{1}{2}$  in. diameter, with a small apiculate sheathing scale-like leaf at the immediate base, from which the stem is naked for about 2 in., where there is a broad, deeply, palmately variously lobed sessile bract or leaf about 1 in. in diameter, which surrounds the stem with its lobed lamina in an amplexicaul manner; sometimes there is a second smaller but similar leaf a little higher up the stem. The rest of the stem is occupied by a spike-like raceme of small greenish-white flowers, each subtended by a cordate-acuminate bract, pedicels with ovary about 3 or 4 lines long. Sepals and petals very narrow-linear almost filiform, about 2 lines long. Labellum somewhat reflexed, shorter than the petals, cuneate oblong, slightly cordate at the base, the end sharply 3-toothed or lobed, the central tooth longer than the others, disk with two thick glabrous ridges. Column very narrow, incurved, nearly as long as the labellum. Anther small, of a rather bright reddish brown.—*Microstylis amplexicaulis*, *Bail. Bot. Bull.* 3.

Hab.: On the ground and in decayed epiphytes. Scrubs of Eudlo Creek, *Field Naturalists*, March, 1891.

I have only seen the few specimens from which the above description was given but have removed it from *Microstylis* because I think when better specimens are available that the plant will likely prove a *Listera*, as in general appearance it approaches that genus.

### 28. *GOODYERA*, R. Br.

(After John Goodyer.)

Dorsal sepal and petals erect connivent and often connate; lateral sepals as long, spreading. Labellum sessile, embracing the column and sometimes adnate to it at the base, concave or almost saccate, undivided, often fringed or hairy inside at the base but without appendages. Column short, the stigma very concave or pouch-like, and connected with the anthers by lateral membranes, forming a second pouch between the rostellum and the anther, the rostellum

entire and lanceolate or divided into two lobes. Anthers erect. Pollen-masses granular, attached to long caudicles.—Terrestrial herbs, with a creeping rhizome and weak ascending leafy stems. Flowers in terminal spikes, loose in the Australian species, dense and one-sided in the typical northern ones.

The genus is generally distributed over the tropical and temperate regions of the Old World. Of the two Australian species one appears identical with an Asiatic one, the other, as far as known, is endemic.—*Benth.*

Rostellum divided into 2 long linear lobes without appendages at the base.

Sepals and petals 3 to 4 lines long. . . . . 1. *G. viridiflora*.

Rostellum lanceolate, undivided, with a gland-like appendage on each side at the base. Sepals and petals  $1\frac{1}{2}$  lines long . . . . . 2. *G. polygonoides*.

1. **G. viridiflora** (flowers green), *Blume Orchid.* 41, 9 C.; *Benth. Fl. Austr.* vi. 313. Stems ascending from 6in. to 1ft. Leaves on rather long petioles, dilated at the base into a loose scarious sheath, the lamina ovate-lanceolate or ovate-oblong, acute or shortly acuminate, sometimes slightly cordate at the base,  $1\frac{1}{2}$  to 3in. long; and usually 2 or 3 empty scarious bracts above the leaves. Flowers rather distant, in a spike of 2 to 4in.; the bracts broad, membranous, subulate-acuminate, often as long as the ovary. Dorsal sepal and petals 3 to 4 lines long, the petals broader and more obtuse than the sepal, and usually cohering to it; lateral sepals obliquely lanceolate. Labellum as long as the sepals, broadly ovate, very concave, rather copiously fringed inside with short cilia near the base. Rostellum divided into linear-lanceolate erect lobes as long as the long acuminate anther, stigma pouch-like, almost truncate.—*Neottia viridiflora*, *Blume Bijdr.* 408; *Lindl. Gen. and Sp. Orch.* 494; *Georchis coriata*, *Lindl. Gen. and Sp. Orch.* 496; *Georchis viridiflora*, *F. v. Muell. Fragm.* viii. 29.

Hab. Rockingham Bay, *Dallachy*.

2. **G. polygonoides** (Polygonum-like), *F. v. M. Fragm.* viii. 29; *Benth. Fl. Austr.* vi. 313. Stems from a creeping rhizome ascending, about 8in. long including the raceme. Leaves petiolate above the loose scarious sheath, oblong-lanceolate,  $1\frac{1}{2}$  to 3in. long. Spikes with peduncles 9in. high, pubescent, the flowers small on a long ovary attenuate upwards. Bracts lanceolate, about as long as the ovary. Sepals and petals about  $1\frac{1}{2}$  lines long, ovate or ovate-lanceolate, the sepals acute, the petals thin and adnate to the dorsal sepal. Labellum not very broad, acutely acuminate, rather longer than the sepals, very concave, without hairs or appendages inside. Column short, the stigma membranous, large concave and undulate, but not pouch-like. Rostellum lanceolate, undivided, with an almost gland-like appendage on each side at the base on the margin of the membrane connecting the stigma and anther. Capsule ovate,  $\frac{1}{2}$ in. long.

Hab.: Rockingham Bay, *Dallachy*; Daintree River, *E. Fitzalan*; Bellenden Ker and other ranges in the tropics.

## 29. HETÆRIA, *Blume*.

(From its being near to *Goodyera*.)

(*Ramphidia*, *Lindl.*)

Flowers reversed. Lateral sepals erect, broader at the base, forming a hood over the labellum; dorsal sepal and petals reflexed. Labellum erect, sessile, undivided, concave. Column very short, with a narrow appendage on each side connecting the base of the anther and stigma into a cup. Anther erect. Pollen-masses granular. Rostellum bifid, as long as the anther.—Terrestrial herbs, with a creeping rhizome and ascending leafy stem. Flowers small, in a slender terminal point.

The genus is spread over East India and the Archipelago, the only Australian species having nearly the range of the genus.

1. **H. tenuis** (thin), *Benth. in Journ. Linn. Soc.* xviii. 345. Stem weak including the peduncle about 12 or 15in. long, leafy lower portion about 5in. long, arising from a rootstock of thick woolly roots. Leaves  $1\frac{1}{2}$  to 3in. long, elliptic-oblong to ovate-lanceolate the petiole portion between the lamina and sheath flat developing into a very loose sheath; peduncle about 7in. long bearing 2 bracts loose and scarious, clothed with woolly hairs, the terminal spike about 3in. long, the bracts almost subulate, and with the rachis, ovaries and perianths woolly-hairy. Lateral sepals rather broad, about  $1\frac{1}{2}$  line long. Labellum scarcely if at all connate with the column, nearly as long as the lateral sepals, broadly oblong, very concave, very obtuse, the margins and end inflexed, entire or slightly crisped. Anther and rostellum about equal in length and half as long as the labellum.—*Ramphidia tenuis*, Lindl. in *Journ. Linn. Soc.* i. 182; *Benth. Fl. Austr.* vi. 312.

Hab.: Mackay, Rockingham Bay, *J. Dallachy*; Barron River, *E. Cowley*; Bellenden-Ker Range.

### 30. THELYMITRA, Forst.

(Alluding to the hooded column.)

Sepals and petals all nearly equal and spreading. Labellum similar to the sepals and petals and spreading with them. Column erect, rather short, very broadly winged, the wings either reaching to the base of the anther with an erect usually thick entire lateral lobe or appendage on each side of it, or dilated at the end and united behind the anther, sometimes extended into a broad lobed hood over it, the lateral lobes often penicillate or crested, the wings below the anther embracing the column but open in front except at the base where they are united and sometimes are produced into a short tooth between the labellum and column. Anther erect or bent forward between the lateral lobes or under the hood; the cells distinct, the connective produced into a broad appendage sometimes elongated and entire or shortly bifid; pollen-masses granular, without any or with a very small caudicle.—Terrestrial herbs, glabrous or very rarely pubescent on the leaf-sheaths, with ovoid underground tubers. Leaf solitary, usually with a rather long sheath, the lamina linear, lanceolate or rarely almost ovate, often rather thick, but not terete; empty bracts 1 or 2 along the stem. Flowers usually several in a terminal raceme, sometimes reduced to 1 or 2, blue purple red or yellow, occasionally with white varieties.

Species of this genus are met with in New Zealand, New Caledonia, and the Indian Archipelago, but principally in Australia. It is remarkable for the labellum perfectly resembling and taking its place as one of the petals, and quite detached from the column, from which it is separated by the annular base of the wing.—*Benth.*

SECT. 1. **Cucullaria**.—Column-wing produced behind and beyond the anther into a broad hood over it, variously lobed or fringed at the top.

Hood with the 2 extreme lateral lobes penicillate (bearing a tuft of cilia).

Flowers usually blue or purple.

Hood with 3 short denticulate or fringed lobes between the penicillate ones and shorter than them.

Middle lobe of the hood crested on the back . . . . . 1. *T. ixioides*.

Hood with 1 entire or bifid lobe between the penicillate ones, usually longer than them, broad and concave.

Hood smooth on the back, leaf linear.

Plant usually slender, with narrow leaves. Middle lobe of the hood scarcely notched and entire . . . . . 2. *T. longifolia*.

1. **T. ixioides** (*Ixia*-like), *Sw. in K. Akad. Stockh. Handl.* 1800, 228, t. 3 L, and in *Schrad. Neu. Journ.* 58, t. 1 L; *Benth. Fl. Austr.* vi. 317. Stem usually above 1ft. high, with 1 long linear or linear-lanceolate flat or channelled leaf, and 1 or 2 shorter ones, and several flowers pedicellate in a raceme of 4 to 6in.,

but like several other species very variable in stature and number of flowers, sometimes slender with 1 or 2 flowers. Sepals petals and labellum elliptical-oblong, 9 to 10 lines long in the common variety, smaller in others. Column about 2 lines long, the broad wing extending behind and beyond the anther, shortly adnate to it at the base, and forming a broad hood over it with 2 lateral lobes at the angles shortly linear erect and bearing a dense tuft of white cilia, and 3 rather shorter lobes between them, all truncate and denticulate, and the central one with a crest of several rows of dorsal calli. Anther produced into an incurved point much longer than the rostellum.—Sm. Exot. Bot. i. 55, t. 29; R. Br. Prod. 314; Lindl. Gen. and Sp. Orch. 522; Hook. f. Fl. Tasm. ii. 6, t. 103 B; Reichb. f. Beitr. 7; *T. iridioides*, Sieb. and *T. juncifolia*, Lindl. l.c.; *T. lilacina*, F. v. Muell., referred by Lindl. in Linnæa xxvi. 242 to *T. canaliculata*; Fitzg. Austr. Orch. ii., Pt. 3.

Hab.: Not uncommon but most frequently met with on the ranges.

2. **T. longifolia** (leaves long), *Forst. Char. Gen.* 98, t. 49; *Benth. Fl. Austr.* vi. 319. Stature and foliage varying more even than that of *T. irioides*. What we may consider as the typical form is rather tall, with a long narrow leaf and a raceme of several rather large flowers, some northern specimens are tall and vigorous with broader leaves, the colour varies from blue to lilac or pink. Column-wing produced behind and over the anther into a broad hood, usually conspicuous for its dark colour, the 2 extreme lateral lobes penicillate as in *T. irioides*, but bent forward and shorter than the broad centre, which is entire emarginate or shortly 2-lobed with the margin entire and smooth.—*T. Forsteri*, Sw. in K. Akad. Stockh. Handl. 1800, 288, and in Schrad. N. Journ. i. 57; Lindl. Gen. and Sp. Orch. 520; *T. nuda*, R. Br. Prod. 314, Lindl. l.c.; Hook. f. Fl. Tasm. ii. v. t. 103 A; Reichb. f. Beitr. 8; *T. pauciflora*, R. Br. l.c. Reichb. f. l.c.; *T. arenaria* and *T. versicolor*, Lindl. l.c. 519, 520; *T. graminea*, Lindl. Sw. Riv. App. 49, Gen. and Sp. Orch. 521; Fitzg. Austr. Orch. i., Pt. 6.

Hab.: Endeavour River, *Banks and Solander*; Port Bowen, *R. Brown*; Archer's station, Moreton Bay, *Leichhardt*; Rockingham Bay, *Dallachy*; Armidale, *Perrot*; also from the *Burdekin Expedition*. Generally found on tops of the tropical ranges.

### 31. DIURIS, Sm.

(From *dis*, two, *ouros*, a tail.)

Dorsal sepal erect, rather broad, closely embracing the column at the base, the upper part open; lateral sepals narrow-linear, almost herbaceous, parallel or sometimes crossed, spreading or deflexed; petals longer than the dorsal sepal, ovate-elliptical or oblong, on slender claws. Labellum usually as long as or rather longer than the dorsal sepal, deeply 3-lobed, the middle lobe much contracted at the base, with 1 or 2 longitudinal raised lines along the narrow part. Column very short, the wings produced into lateral erect lobes, but not continued behind the anther. Anther erect, often acuminate, the 2-valved cells occupying nearly the whole inner surface. Rostellum 2-fid, shorter than the anther. Pollen-masses granular or mealy, without any distinct caudicle.—Terrestrial glabrous herbs, with underground tubers. Leaves narrow, few at or near the base of the stem, with a few sheathing bracts higher up. Flowers 1, 2 or several in a terminal raceme, often rather large and conspicuous from the antenna-like green lateral sepals, the rest of the perianth yellow purple or white, in many species bright yellow with deep purple spots or blotches, the prominent petals often very spreading, whilst the shorter dorsal sepal remains close over the column; make it appear as if the petals were outside in æstivations, and they are sometimes so drawn, but in the bud the æstivation is quite normal with the sepals outside.

The genus is limited to Australia, and cannot be confounded with any other, although the species are very difficult to distinguish from dried specimens which do not show their real colours.—*Benth.*

- Labellum 3-partite (the lateral lobes divided to the base), with 2 longitudinal raised lines on the middle lobe.
- Lateral sepals usually much longer than the petals.
- Flowers white . . . . . 1. *D. alba*.  
 Flowers bluish purple . . . . . 2. *D. punctata*.  
 Flowers secund, most part yellow . . . . . 3. *D. secundiflora*.
- Lateral sepals usually scarcely longer than the petals. Flowers yellow, often spotted or blotched with purple . . . . . 4. *D. aurea*.
- Labellum 3-fid (the lateral lobes separating from above the base) with 2 longitudinal raised lines on the middle lobe.
- Raised longitudinal lines on the labellum at some distance apart.
- Lateral lobes of the labellum as long as or more than half as long as the middle lobe. Dorsal sepal usually as long as the labellum.
- Lateral sepals scarcely so long as the petals . . . . . 5. *D. maculata*.  
 Lateral lobes of the labellum less than half as long as the middle lobe.  
 Dorsal sepal usually shorter than the labellum.
- Raised longitudinal lines of the labellum pubescent . . . . . 6. *D. pedunculata*.  
 Raised longitudinal lines crenulate or cristate . . . . . 7. *D. pallens*.  
 Raised longitudinal lines glabrous and smooth . . . . . 8. *D. abbreviata*.
- Labellum 3-partite (the lateral lobes much shorter than the middle lobe, divided off from the base) with a single raised longitudinal centre not furrowed.
- Flowers yellow often with purple spots . . . . . 9. *D. sulphurea*.

1. ***D. alba*** (white), *R. Br. Prod.* 316; *Benth. Fl. Austr.* vi. 325. A rather slender species, under or above 1ft. high, exceedingly difficult in the dried state to distinguish from the small flowered specimens of *D. punctata*. Leaves usually narrower and one of them often nearly as long as the stem below the inflorescence, but sometimes all shorter. Flowers white with a few dark spots inside, the proportions and shape of the parts the same as in *D. punctata* but all smaller. Lateral sepals 1 to 1½ in. long; petals about ½ in.; dorsal sepal and labellum nearly equal in length and shorter than the petals. Lateral lobes of the column more frequently dentate than in *D. punctata*, but variable.—*Lindl. Gen. and Sp. Orch.* 509; *Reichb. f. Beitr.* 13.

Hab.: Port Bowen and Shoalwater passage, *R. Brown*; Brisbane River, Moreton Bay, *A. Cunningham*; Rockhampton and vicinity, *Bowman*, *Thozet*, *O'Shanesy*; Darling Downs, *Law*; Wide Bay, *Bidwill*; Broadsound, *Bowman*; Rockingham Bay, *Dallachy*.

2. ***D. punctata*** (punctate), *Sm. Exot. Bot.* i. 13, t. 8; *Benth. Fl. Austr.* vi. 326. Stems 1 to 2ft. high or even more. Leaves 1 or 2, linear, 3 to 13in. long, with 2 empty sheathing bracts above them. Flowers 2 to 5, blue or purplish, often dotted but not blotched like several of the yellow species (the Nerang form lilac thin making *F. v. M.*'s name *lilacina* appropriate to this form), the acuminate bracts often but not always exceeding the ovary. Dorsal sepal in the typical form broadly ovate-oblong, 7 to 8 lines long; lateral sepals deflexed, very narrow, nearly 2in. long. Petals broadly elliptical-oblong, nearly 1in. long including a claw of about 2 lines. Labellum about as long as the dorsal sepal, divided at the base into 3 lobes, the middle-lobe obovate-oblong, the lateral lobes about one-third as long, oblong-falcate, varying in breadth, entire or crenulate; disk of the middle lobe with 3 longitudinal raised lines or plates starting from the base; the 2 lateral ones ending somewhat abruptly and sometimes forming an acute tooth below the middle of the lobe, the central one not so prominent or obscure at the base, but continued further along the lamina. Lateral lobes of the column as long as the anther, lanceolate with undulate margins, more or less distinctly 1-nerved. Anther shortly acuminate, 2 lines long. Rostellum short, bifid. Wings of the column very shortly produced at the base in front, not meeting as in *Thelymitra*, but often continuous with the raised lines of the labellum.—*D. elongata*, *Sw.* in *Schrad. Neu. Journ.* i. 59; *R. Br. Prod.* 316; *Lindl. Gen. and Sp. Orch.* 509; *Reichb. f. Beitr.* 13; *D. lilacina*, *F. v. M.* in *Linnæa*, xxvi. 289.

Hab.: Nerang Creek, *H. Schneider*; North Coast Railway.

3. **D. secundiflora** (one-side flowering), *Fitzg. Austr. Orch. i. Pt. 4.* Stems 12 to 18in. high, bearing 6 to 8 flowers, usually turned more or less to one side. Leaves 1ft. or more long, linear. Lateral sepals olive-green, 2in. long. Petals with dark claws, the lamina pale-yellow. Labellum middle lobe broadly-rhomboid, lateral lobes small. Glands at base. Column wings not toothed.

Hab.: Southern localities, rare.

4. **D. aurea** (golden), *Sm. Exot. Bot. i. 15, t. 9; Benth. Fl. Austr. vi. 327.* Stems 1ft. high or more. Leaves narrow, not very long. Flowers 2 to 5, yellow or more or less blotched or tinged with brown. Petals obovate-oblong or elliptical, 6 to 8 lines long in the typical form including the claw; lateral sepals rather longer, more or less dilated above the middle; dorsal sepal shorter than the petals, broad and embracing the column at its base, the ovate upper portion more open. Labellum as long as the dorsal sepal, divided to the base, the middle lobe very broad, contracted at the base, the lateral lobes much shorter, broadly falcate, often undulate-toothed, the disk with 2 raised longitudinal plates ending usually in small teeth at or below the middle of the lamina. Lateral lobes of the column falcate, obtuse, sometimes irregularly toothed, the wings almost continuous at the base with the raised lines of the labellum.—*R. Br. Prod. 315; Lindl. Gen. and Sp. Orch. 509; F. v. Muell. Fragm. v. 172; Reichb. f. Beitr. 11; D. spatulata, Sw. in Schrad. Neu. Journ. i. 60; D. oculata, F. v. Muell. Fragm. v. 173, partly?*

Hab.: Brisbane River, Stanthorpe to the border of N.S.W.

5. **D. maculata** (spotted), *Sm. Exot. Bot. i. 57, t. 30; Benth. Fl. Austr. vi. 327.* Rather a small slender species, usually under 1ft. high. Leaves narrow. Flowers on long pedicels, yellow, much spotted or blotched with brown or purple and sometimes almost entirely dark-coloured except the yellow centre of the petals, under  $\frac{1}{2}$ in. long. Dorsal sepal erect rigid and embracing the column at the base, ovate-oblong and very open at the top; lateral sepals at length recurved, narrow, rarely exceeding the petals; petals ovate, on a long rigid dark-coloured claw. Labellum shorter than the dorsal sepal 3-lobed from above the base, the lateral lobes large and usually as long or nearly as long as the broad middle lobe, the 2 raised lines of the disk ending usually in prominent angles or teeth a little above the base of the middle lobe. Lateral lobes of the column often toothed.—*R. Br. Prod. 315; Bot. Mag. t. 3156; Lindl. Gen. and Sp. Orch. 507; Hook. f. Fl. Tasm. ii. 6, t. 104 B; Reichb. f. Beitr. 11; D. pardina and D. curvifolia, Lindl. Gen. and Sp. Orch. 507; Fitzg. Austr. Orch. i., Pt. 2.*

Hab.: Rockhampton, *Thozet*, rare; Killarney, *J. F. Bailey*.

6. **D. pedunculata** (pedunculate), *R. Br. Prod. 316; Benth. Fl. Austr. vi. 328.* Stems 6 to 9in. high. Leaves several at the base of the stem, usually about half its length, narrow-linear. Flowers 1 or 2, of a pale yellow, often with dark tinges at the base, from  $\frac{1}{2}$  to  $\frac{3}{4}$ in. long. Petals elliptical, stipitate, about the same length as the linear lateral sepals; dorsal sepal shorter, broad, embracing the column at the base, shortly open at the top. Labellum longer than the dorsal sepal, 3-lobed at about 1 line above the base, the lateral lobes curved, not broad, often somewhat toothed, about  $\frac{1}{2}$  the length of the ovate-rhomboid middle-lobe; the 2 raised longitudinal lines far apart, ending in pubescent calli at the base of the broad part of the middle lobe, the intervening pubescent centre continued more or less along the middle of the lobe.—*Lindl. Gen. and Sp. Orch. 508; Hook. f. Fl. Tasm. ii. 8, t. 105 A; F. v. Muell. Fragm. v. 173; Reichb. f. Beitr. 12; D. lanceolata, Lindl. l.c.; D. Behrii, Schlecht, Linnæa, xx. 572; Fitzg. Austr. Orch. i., Pt. 7.*

Hab.: Eight-mile Plain and many other southern localities.

This species, with the flower usually pale coloured and narrow, and easily known by the pubescence of the centre of the labellum, varies much nevertheless in the breadth of the several parts of the flower, and in the raised lines or plates of the labellum, which sometimes end in broad pubescent calli separated by the broad base of the central pubescence of the lamina, sometimes are much rounded, incurved at the end, almost meeting, the pubescent centre of the lamina very narrow. The latter form characterizes to *D. lanceolata*, Lindl.; but I have found many intermediates with slight differences in other characters variously combined.—*Benth.*

7. ***D. pallens*** (pale) *Benth. Fl. Austr.* vi. 329. A small plant, very nearly allied to *D. pedunculata*. Flowers smaller, rarely  $\frac{1}{2}$  in. long, the lateral sepals scarcely herbaceous or quite as petal-like and about as long as the petals; the dorsal sepal much shorter. Labellum as long as the petals, 3-lobed from above the base as in *D. pedunculata*, but the lateral lobes still smaller in proportion than in that species, the raised lines or plates of the disk converging and ending in a single line along the lamina, but fringed with small calli instead of being pubescent or ciliate.—*Fitzg. Austr. Orch.* ii. Pt. 3.

Hab.: Between Stanthorpe and the border of N.S.W.

8. ***D. abbreviata*** (shortened), *F. v. M. Herb*; *Benth. Fl. Austr.* vi. 329. Habit rather more of *D. maculata* than of *D. pedunculata*, to both of which this species is allied. Leaves rather narrow. Flowers pale-coloured when dry, more or less blotched, usually several in a loose raceme, the pedicels long and the rhachis often remarkably flexuose. Petals oval-oblong, on very long slender claws; lateral sepals rather longer, narrow-linear and herbaceous; dorsal sepal scarcely so long as the labellum, erect and embracing the column at the base, oval-oblong and open in the upper part. Labellum 3-lobed from above the base, the lateral lobes small, triangular or lanceolate, falcate; the middle lobe much longer, broad but much contracted at the base, the disk with 2 very prominent raised lines or plates ending a little beyond the base of the broad part of the middle lobe, quite smooth and glabrous. Lateral lobes of the column acute, entire or denticulate, the wings continuous in front with the raised lines of the labellum.—*Fitzg. Austr. Orch.* ii. Pt. 5.

Hab.: Armidale, *Perrott*; Darling Downs, *Law*.

Also a specimen from Port Bowen, marked *D. dubia*, in Herb. R. Brown, appears to be this species.—*Benth.*

9. ***D. sulphurea*** (sulphur-coloured), *R. Br. Prod.* 316; *Benth. Fl. Austr.* vi. 330. Stature and habit very much those of *D. aurea*, from which this species is difficult to distinguish without examination of the flowers. Leaves usually rather broader than in that species. Flowers 2 to 5, yellow, almost always blotched with purple at least at the base of the petals. Dorsal sepal about  $\frac{1}{2}$  in. long, embracing the column at the base, narrow ovate and open upwards, lateral sepals longer but not very long, often reflexed, petals also longer than the dorsal sepal. Labellum 3-lobed from the base as in *D. aurea*, but shorter than the dorsal sepal; lateral lobes broad, several-nerved and more or less undulate-toothed; middle lobe at least twice as long, very broad but the sides closely reflexed, the disk with a single raised line along the centre gradually dying off above the middle of the lamina. Lateral lobes of the column acute, quite entire, as long as the anther; the wings joining at the base in the front of the column and continuous with the central keel of the labellum.—*Lindl. Gen. and Sp. Orch.* 509; *Hook. f. Fl. Tasm.* ii. 7, t. 104 A; *Reichb. Beitr.* 12; *D. oculata*, *F. v. M.* in *Linnæa*, xxvi. 241.

Hab.: Eight-mile Plains near Brisbane, and between Stanthorpe and the border of N.S.W.



## 32. CRYPTOSTYLIS, R. Br.

(From *Kryptos*, concealed, and *stylos*, a column.)

Flowers reversed. Sepals and petals nearly similar, narrow linear-lanceolate, thin and membranous, convolute and appearing subulate when the flower opens, the petals usually smaller than the sepals. Labellum longer and thicker than the sepals, undivided, sessile with a broad base enclosing the column, more or less contracted above the column, extended into a narrow or broad convex or concave lamina. Column exceedingly short, the wings forming broad distinct auricles or connected into a membrane behind the anther, the margin toothed or jagged. Anther erect against the back of the stigma or bent forward over it, 2-celled, usually biconvex on the back, obtuse or shortly acuminate. Pollen-masses farinaceous.—Terrestrial glabrous herbs, with a short rhizome and thick fibres. Leaves few, radical, on rigid petioles, ovate to lanceolate. Flowering stems leafless, bearing 2 or more erect sheathing scales or empty bracts. Flowers rather large, green with a brown red or purple labellum, several in a terminal raceme. Bracts acute, membranous.

Besides the one met with in Queensland there are others in Australia, the East Indies and the Indian Archipelago. The genus is nearly allied to *Calochilus*, differing in the rhizome and foliage, and in the labellum not fringed.—*Benth.*

1. **C. longifolia** (leaves long), *li. Br. Prod.* 317; *Benth. Fl. Austr.* vi. 353. Leaves usually 2 or 4 on rather rigid petioles of 1 to 3 in. the lamina oblong or lanceolate, 2 to 4 in. long and erect. Scape 1 to 2 ft. high, bearing 2 or more distant sheathing scales of about  $\frac{1}{2}$  in. Flowers usually 3 to 6, rather distant, nearly sessile with membranous acute bracts, the ovary narrow, longer than the bract, much recurved at the end after flowering. Sepals and petals very thin and membranous, their lanceolate shape only seen in the bud for the margins are rolled inwards the moment the flowers expand; dorsal sepal usually about  $\frac{3}{4}$  in. long, the lateral sepals rather longer, the petals shorter, but all otherwise similar and acute. Labellum usually about 1 in. long, scarcely contracted above the short broad base which completely encloses the column and has no internal raised lines, the lamina broadly oblong or ovate-oblong, the sides convolute in the bud but reflexed when the flower opens exposing two raised lines forming a double keel along the centre, which commences immediately above the broad base and expands a little below the end into 2 thick prominent rounded auricles or lobes, and tapers beyond them almost to the end of the lamina which is obtuse or shortly acuminate; there are also in the middle of the labellum 1 or 2 additional short raised lines parallel to the two principal ones, the disk veined but not so strongly as in *C. erecta*. Anther bent forward, almost hood-shaped, with a small dorsal recurved point near the apex. Column-wing broad short and irregularly lobed toothed or jagged, shortly continuous behind the anther.—*Lindl. Gen. and Sp. Orch* 445; *Bauer, II. Orch. Gen. t.* 17, 18; *Endl. Iconogr. t.* 17; *Hook. f. Fl. Tasm. ii.* 9, t. 108 A; *Malaxis subulata*, *Labill. Pl. Nov. Holl. ii.* 62, t. 212; *Cryptostylis subulata*, *Reichb. f. Beitr.* 15; *Fitzg. Austr. Orch. ii. Pt.* 2.

Hab.: Not uncommon on the southern coast lands.

## 33. PRASOPHYLLUM, R. Br.

(From *Prason*, a leek, and *phyllon*, a leaf.)

Flowers reversed. Dorsal sepal lanceolate or broad, concave, usually arched over the column and sometimes adnate to it at the base; lateral sepals as long or longer, lanceolate or linear, free or more or less united; petals usually shorter but sometimes as long as the sepals, lanceolate or linear. Labellum sessile or on a short claw or claw-like basal appendage to the column, ovate-oblong or lanceolate, undivided, the margins undulate-cripsed or entire, usually erect and

concave at the base, recurved towards the end, the disk with an adnate plate sometimes broad with free margins, sometimes reduced to a central longitudinal thickening. Column very short, not winged, but with two lateral erect appendages, usually adnate on one side to the stigma. Anther 2-celled, erect behind the rostellum, which is often produced beyond it, but sometimes shorter than the anther. Pollen-masses granular, attached to a linear caudicle.—Terrestrial glabrous herbs with globular or ovoid underground tubers. Leaf solitary, usually with a long sheath, the lamina terete and sometimes long, shortly opened near the stem, or the whole leaf reduced to a small sheath with a short erect point. Flowers variously coloured, often pale or greenish yellow, several or numerous in a terminal spike, usually abruptly bent above the ovary so as to appear very spreading or reflexed.

Besides the Australian species there are others in New Zealand, one of them apparently identical with an Australian one. The habit of the genus and many of its characters are those of *Microtis*, from which it differs in the reversed flowers, the more developed lateral appendages to the column (sometimes described as staminodia), and by the elongated caudicle of the pollen-masses which in *Microtis* is very small or obsolete.

SECT. I. **Euprasophyllum**.—*Labellum sessile at the base of the column.*

- Flowers mostly above 3 lines long. Ovary elongated, narrow. Tall plants.
  - Lateral sepals connate at least in the middle
    - Labellum with a broad gibbous thickish base, the inner plate broad, prominent, scarcely reaching beyond the bend. Leaf-lamina long . . . . . 1. *P. australe*.
    - Labellum with a rather narrow but obtuse base, the inner plate broad, but commencing only about the middle. Leaf-lamina very short and erect . . . . . 2. *P. flavum*.
- Flowers mostly above 3 lines long. Ovary obovoid or oblong.
  - Lateral sepals connate, at least in the middle.
    - Labellum abruptly bent down in the middle . . . . . 3. *P. brevilabre*.
  - Lateral sepals free or very shortly connate at the base.
    - Labellum obtuse at the base or slightly contracted but not gibbous.
      - Labellum with the recurved end ovate or oblong, undulate, much broader than the thickened inner plate . . . . . 4. *P. patens*.
      - Labellum with recurved end linear-lanceolate, not much broader than the thick inner plate . . . . . 5. *P. fuscum*.

SECT. II. **Genoplesium**.—*Labellum obtuse or contracted into a claw at the base, articulate on a horizontal claw-like basal projection of the column, and usually movable. Stem slender, the leaf almost or quite reduced to a sheathing bract. Flowers very small.*

- Labellum neither fringed nor ciliate.
  - Lateral sepals broad, very gibbous at the base. Labellum broad. Rostellum as long as the anther . . . . . 6. *P. nigricans*.
  - Lateral sepals narrow, scarcely gibbous. Labellum narrow. Column shorter than the anther. Rostellum very short. Flower dark coloured, about 1 line long . . . . . 7. *P. rufum*.

1. **P. australe** (Southern), *R. Br. Prod.* 318 ; *Benth. Fl. Austr.* vi. 337. Stems often 2 to 3ft. high, the leaf-sheath occupying about half its length or even more, the lamina much shorter than the spike. Flowers striped with brown or yellowish-green in a spike of 3 to 6in. or rather more. Ovary elongated. Sepals and petals all acutely acuminate, about 4 lines long, the dorsal sepal broad and concave, the lateral sepals united in the middle, sometimes free at the base and the points always free. Labellum sessile, with a broad gibbous somewhat fleshy erect base, abruptly recurved and reflexed in the middle of its length, the margins of the recurved part undulate, the inner plate very prominent, entire or minutely crenulate, scarcely reaching beyond the bend. Anther obtuse, shorter than the rostellum. Lateral appendages of the column adnate to the stigma at the base, lanceolate-falcate, obtuse, rather longer than the rostellum, dilated and sometimes thickened on the outer margin.—*Reichb. F. Beitr.* 17 ; *P. lutescens*, *Lindl. Gen. and Sp. Orch.* 514 ; *Hook. f. Fl. Tasm.* ii. 10, t. 110 B ; *Fitzg. Austr. Orch.* ii. Pt. 1.

Hab.: Met with in a few wet south

2. **P. flavum** (yellow) *R. Br. Prod.* 318; *Benth. Fl. Austr.* vi. 337. Stems stout, attaining 2 to 3ft. the whole plant drying very dark. Leaf-sheath rather loose, the lamina rarely lin. long, erect, concave with a very short terete point. Bracts rather broad. Flower of a yellowish green. Ovary elongated. Sepals lanceolate, acute, nearly 4 lines long, the lateral ones connate the greater part of their length; petals narrower, but nearly as long. Labellum ovate-oblong, sessile, almost gibbous concave and erect at the base, recurved towards the end, broader in the middle; the inner plate commencing from about the middle, the oblique margins joining in the centre and dying away before the end of the lamina. Lateral appendages of the column adnate on one side at the base, short and broad, of a thicker texture than those of most species, 2-dentate or 2-lobed at the end.—*Lindl. Gen. and Sp. Orch.* 514; *Hook. f. Fl. Tasm.* ii. 11, t. 109 A; *Reichb. f. Beitr.* 17; *Fitzg. Austr. Orch.* i. Pt. 3.

Hab.: Between Stanthorpe and the border of N.S.W., and a few other southern localities.

3. **P. brevilabre** (labellum short), *Hook. f. Fl. Tasm.* ii. 11, t. 110 A; *Benth. Fl. Austr.* vi. 338. Allied to *P. patens* in aspect and in the size of the flowers and in the ovary. Stems mostly under 1ft. high, the leaf-sheath broad and loose, the lamina usually but not always rather short. Ovary obovoid or oblong, narrower than in *P. patens*. Dorsal sepal under 4 lines long; petals rather shorter narrow and acuminate; lateral sepals longer and broader than the dorsal one, united almost to the end. Labellum sessile, the erect part rather narrow, the oblong lamina of the length of the erect part, but abruptly reflexed against it so as to give a very short appearance to the whole labellum; the margins much undulate; the inner plate commencing from the base, nearly as broad as the erect part, and continued very shortly on to the reflexed lamina. Lateral appendages of the column adnate to the stigma rather high up, entire, the outer margin without any appendage.—*Fitzg. Austr. Orch.* ii. Pt. i.

Hab.: In some southern localities.

4. **P. patens** (spreading), *R. Br. Prod.* 318; *Benth. Fl. Austr.* vi. 339. Stems usually tall but varying from 1 to 3ft., the length of the leaf also very variable. Flowers usually larger than in *P. fuscum*, of a yellowish-green, the labellum bordered with white, but neither the size nor the shade of colour constant. Ovary obovoid or shortly oblong. Sepals lanceolate, acute or obtuse, scarcely 4 lines long, the lateral ones quite free, the petals of the same length but more obtuse and much more petal-like in consistence. Labellum as long as the petals, sessile but not gibbous at the base, the erect part not very broad, as long as the recurved or reflexed portion, which varies from ovate to oblong, or almost lanceolate, but always shows a considerable breadth of undulate margin, the inner plate not very prominent, much narrower than the labellum and scarcely extending beyond the bend or rarely reaching nearly to the end. Lateral appendages of the column adnate at the base on one side to the stigma, nearly as long as the rostellum, the outer margin without the glandular prominence, and rarely with a scarcely prominent tooth. Anther rather shorter than the rostellum.—*Lindl. Gen. and Sp. Orch.* 513; *Hook. f. Fl. Tasm.* ii. 11, t. 111; *Reichb. f. Beitr.* 19.

Hab.: Southern localities.

5. **P. fuscum** (brownish), *R. Br. Prod.* 318; *Benth. Fl. Austr.* vi. 339. A very variable species nearly allied to some forms of *P. patens*, usually rather smaller with smaller flowers, and the sepals and petals narrow and darker coloured, but the extreme forms of the two species only to be distinguished by the labellum. Spike short or long, dense or interrupted. Ovary obovoid or shortly oblong as in *P. patens*. Flowers usually drying black or very dark, rarely pale-coloured. Dorsal sepal lanceolate, concave, acuminate, about 3 lines

long in the typical form, but varying from  $2\frac{1}{2}$  to 4 lines; lateral sepals nearly as long, narrow, free or very shortly connate at the base; petals rather shorter and linear. Labellum nearly as long as the sepals, narrower than in *P. patens*, the erect part very concave, but neither gibbous at the base nor clawed, the spreading end very narrow lanceolate; the inner plate not distinct at the base, showing slightly raised margins towards the end of the erect part and thence continued to near the end of the lamina in a thick often papillose centre, leaving a very narrow plain margin or occupying the whole breadth; the breadth however of the erect part and its contraction abrupt or gradual into the narrow lamina very variable. Lateral appendages of the column obliquely ovate-oblong, entire or irregularly 2-dentate, the outer margin often dilated at the base. Anther usually as long as the rostellum, obtuse or shortly and obtusely acuminate.—Lindl. Gen. and Sp. Orch. 516; Hook. f. Fl. Tasm. ii. 12, t. 112; Reichb. f. Beitr. 18; *P. alpinum*, R. Br. Prod. 318, Lindl. l.c. 515; Hook. f. l.c. ii. 12, t. 112; Reichb. f. Beitr. 19; *P. affine* and *P. rostratum*, Lindl. l.c. 516.

Hab.: Southern localities.

6. ***P. nigricans*** (blackish), *R. Br. Prod.* 319; *Benth. Fl. Austr.* vi. 343. Stem very slender, under 6 in. high, with a single leaf or rather leafy sheathing bract very near the spike,  $\frac{1}{2}$  to  $\frac{2}{3}$  in. long, the very short point or lamina erect. Flowers very small, in a spike of  $\frac{1}{2}$  to 1 in., usually dense, and drying of a dark purple or almost black. Ovary ovoid-globular, very oblique at the top. Sepals broader than in the following species, with minute points usually tipped with a small gland, the dorsal sepal about 1 line long, broadly hood-shaped, the lateral ones broadly lanceolate,  $1\frac{1}{2}$  to  $1\frac{3}{4}$  lines long, often greener than the rest of the flower, their broad base either united under or adhering to the basal projection of the column forming a basal gibbosity but otherwise free; petals about 2 lines long, triangular-lanceolate, acute. Labellum articulate at the end of the claw-like basal projection of the column ovate or ovate-oblong, about 1 line long, almost acute, slightly contracted at the base; the inner plate thick, occupying about  $\frac{2}{3}$  of the breadth and extending to the end. Lateral appendages of the column almost as long as the petals, acutely bifid at the end. Rostellum rather long. Anther shorter, with a very short fine inflexed point difficult to see and sometimes wanting.—Lindl. Gen. and Sp. Orch. 513; Reichb. f. Beitr. 19; Fitzg. Austr. Orch. i., Pt. 5.

Hab.: Southern localities.

7. ***P. rufum*** (reddish), *R. Br. Prod.* 319; *Benth. Fl. Austr.* vi. 344. Stem slender, 6 to 8 in. high, the leaf reduced to a sheathing bract near the spike  $\frac{1}{2}$  to  $\frac{2}{3}$  in. long, the lamina short erect and subulate. Flowers the smallest in the genus, in a spike of  $\frac{1}{2}$  to  $\frac{2}{3}$  in. Ovary oblong. Sepals tipped with a small point but without the gland of *P. nigricans*, the dorsal sepal ovate, concave,  $\frac{3}{4}$  line long, the lateral ones lanceolate, quite free, 1 line long; petals lanceolate, the length of the dorsal sepal. Labellum articulate on a linear erect claw or claw-like projection of the column, narrow-lanceolate or rarely broader, recurved, not ciliate; the inner plate with raised margins occupying the greater part of its breadth. Column very short below the anther, the lateral appendages about  $\frac{1}{2}$  line long, 2-dentate or 2-fid. Anther mucronate, rather long. Stigma much shorter, with a minute rostellum.—Lindl. Gen. and Sp. Orch. 513; Reichb. f. Beitr. 20; *P. nudum*, Hook. f. Fl. N. Zel. i. 242, Fl. Tasm. ii. 14, t. 113 (partly); Fitzg. Austr. Orch. ii., Pt. 4.

Hab.: Moreton to Rockingham Ba

## 34. MICROTIS, R. Br.

(From *Mikros*, small, and *ous*, an ear.)

Dorsal sepal erect, broad, incurved, concave; lateral sepals as long or shorter, lanceolate or oblong, spreading or recurved; petals usually narrower, incurved or spreading. Labellum sessile, oblong, obtuse truncate emarginate or 2-lobed, usually callous at the base and somewhat thickened along the centre. Column very short, nearly terete, with 2 small wings or auricles behind the stigma. Anther erect, 2-celled, the connective not produced; pollen-masses granular, without any or with a minute caudicle. Stigma obtuse or with a rostrum shorter than the anther.—Terrestrial glabrous herbs, with small globular underground tubers. Leaf solitary, the lamina elongated and terete, shortly opened out near the stem and continued in a closed sheath down the stem. Flowers small, green or whitish, usually numerous in a terminal spike, and owing to a bend immediately above the ovary the perianth is often horizontal or reflexed.

The genus extends to New Zealand, New Caledonia, the Indian Archipelago, and S. China.

Dorsal sepal broad and very concave; lateral sepals recurved. Labellum entire or emarginate.

- Flowers above 1 line long. Labellum with the tubercle or callus on the disk near the end, the margin usually crisped. . . . . 1. *M. porrifolia*.  
 Flowers scarcely 1 line. Labellum entire, without any callous on the disk except at the base . . . . . 2. *M. parviflora*.

1. ***M. porrifolia*** (Leek-leaf), *Spreng. Syst.* iii. 713; *Benth. Fl. Austr.* vi. 347. Usually tall and stout, often above 1ft. high, with a long leaf and a dense spike of small green flowers, but sometimes slender with the flowers distant in a long spike. Pedicels short, subtended by small bracts. Dorsal sepal erect, broadly ovate, shortly acuminate, very concave, about  $1\frac{1}{2}$  line long; lateral sepals spreading and recurved, about 1 line long; petals shorter, erect or spreading. Labellum sessile, as long as the lateral sepals, oblong, very obtuse retuse or shortly 2-lobed, the margin crisped or crenate, the disk with 2 oblong adnate calli or short longitudinal plates at the base, and above them the centre thickened and terminating in a tubercle or raised callus below the apex. Column very short, the auricles usually less prominent than in *M. parviflora*.—Lindl. Gen. and Sp. Orch. 395; *M. Banksii*, A. Cunn. in Bot. Mag. under n. 3377; *M. unifolia*, Reichb. f. Beitr. 62; *M. rava*, R. Br. Prod. 321; Hook. f. Fl. Tasm. ii. 24; Reichb. f. Beitr. 22; *M. pulchella*, Lindl. Gen. and Sp. Orch. 395, Hook. f. Fl. Tasm. ii. 24, t. 118, not of Br.; *M. arenaria*, Lindl. l.c. 396, Hook. f. l.c.; *M. frutetorum*, Schlecht. Linnæa, xx. 568; Fitzg. Austr. Orch. ii. Pt. 1.

Hab.: Burnett River, *F. v. Mueller*; Moreton Bay, *C. Stuart*; and many other southern localities to Stanthorpe and the border of N.S.W.

The species is also in New Zealand.

2. ***M. parviflora*** (flowers small), *R. Br. Prod.* 321; *Benth. Fl. Austr.* vi. 347. A more slender species than *M. porrifolia*, the leaf and especially the sheath much narrower, the flowers smaller and less crowded in the majority of specimens although sometimes this character is reversed, as in those described by Brown, both species having varieties or races with crowded and with attenuated inflorescences. Dorsal sepal broad, obtuse, concave, scarcely above 1 line long; lateral sepals shorter, and petals still smaller. Labellum as long as the lateral sepals, oblong, obtuse, entire, the transverse callus at the base not very prominent, the disk not thickened excepting near the apex where it usually forms a papillose protuberance rather than a callus. Column with distinct auricles

between the stigma and the anther.—Lindl. Gen. and Sp. Orch. 395; Endl. Iconogr. t. 15; Bot. Mag. t. 2377; Hook. f. Fl. Tasm. ii. 25; Reichb. f. Beitr. 22; Fitzg. Austr. Orch. ii. Pt. 1.

Hab.: Port Bowen, *R. Brown*; Burnett River, *F. v. Mueller*; Rockhampton and neighbourhood, *Bowman*, *O'Shanesy*; Moreton Bay, *C. Stuart*; Stanthorpe to the border of N.S.W.

The species extend to New Caledonia, the Indian Archipelago, and S. China.

### 35. CORYSANTHES, R. Br.

(From *korys*, a helmet, and *anthos*, a flower.)

Dorsal sepal erect, very much incurved and concave, hood-shaped or contracted into a stipes; lateral sepals and petals small, linear, sometimes minute. Labellum erect under the galea, broadly tubular, the margin of the oblique orifice either shortly recurved and denticulate, or produced into a large concave denticulate or fringed lamina closely reflexed. Column short, erect, variously thickened under the stigma or winged. Anther erect, 2-celled, the outer valves large, the inner small; pollen-masses granular, without any caudicle.—Dwarf terrestrial herbs, with small underground tubers, and a single ovate-cordate orbicular or reniform leaf, with a scarious sheathing bract below it. Flower solitary, sessile within the leaf or very shortly pedicellate, with a small subtending bract usually close to the leaf.

The genus is also in New Zealand and the Indian Archipelago. The Australian species are all endemic.

Hood nearly erect. Labellum denticulate, tube long and narrow . . . . 1. *C. pruinosa*.  
Hood almost horizontal. Labellum 2-spurred at the base, tube broad . . . . 2. *C. bicalcarata*.

1. ***C. pruinosa*** (resembling the bloom upon some fruits), *R. Cunn. in N.S.W. Mag. v. i. 1833*; *F. c. M. Fragm. ix. 49*. Leaf green on both sides. Flower rather large for the size of plant, purplish, except part of the outer side of the dorsal sepals. Labellum contracted towards the base, slightly or shortly denticular fringed, its upper portion dilated, curved forward and streaked, ovary rather long. Column almost winged. Capsule slender ellipsoid.—Fitzg. Austr. Orch. i. Pt. 1.

Hab.: Given as a Queensland plant by *F. v. M.*

2. ***C. bicalcarata*** (2-spurred), *R. Br. Prod. 328*; *Benth. Fl. Austr. vi. 351*. The stem often above lin. below the leaf, the leaf orbicular-cordate, often an inch in diameter, and frequently almost transparent when dry showing besides the midrib 1 or 2 circular veins on each side connected by the transverse reticulations. Ovary long, cylindrical. Dorsal sepal very much incurved, very obtuse, not contracted at the base; lateral sepals and petals very small, linear-subulate, sometimes minute or almost obsolete. Labellum-tube broad in the upper part, incurved and concealed under the dorsal sepal, tapering at the base with 2 short narrow-conical spurs, between which are the minute lateral sepals; the orifice oblique, with a recurved convex margin or lamina. Column thick and short, the wings narrow, and a prominent gibbosity at the base between the column and labellum.—Lindl. Gen. and Sp. Orch. 394; *Corybas aconitiflorus*, *Salisb. Parad. Lond. t. 83* incorrect as to details; *Reichb. f. Beitr. 43*; *Fitzg. Austr. Orch. i., Pt. 2*.

Hab.: Brisbane River, Moreton Bay, *W. Hill*; Rockhampton, *Thozet*.

### 36. PTEROSTYLIS, R. Br.

(*Pteron*, a wing, and *stylos*, a column.)

Dorsal sepal broad, erect, incurved and very concave; petals lanceolate falcate, contracted at the base and attached to the basal projection of the column, falcate and curved under the dorsal sepal, nearly as long and forming with it an arched

or almost hood-shaped upper lip or galea; lateral sepals more or less united in an erect or recurved 2-lobed lower lip, adnate at the base to the basal projection of the column, the lobes often terminating in long points. Labellum on a short claw at the end of the basal projection of the column, moveable (irritable), the lamina linear or oblong, channelled flat or convex, produced below its insertion on the claw into an appendage either very short and obtuse or longer linear incurved and forked or penicillate at the end with a tuft or 3 or more setæ or cilia. Column elongated within the galea and curved with it, with a pair of hatchet-shaped or quadrangular wings one on each side of the rostellum and sometimes narrowly winged lower down, the base produced into a short horizontal projection. Stigma oblong on the face of the column about the middle of its length below the wings. Anther erect, the cells distinct, 2-valved. Pollen-masses granular.—Terrestrial herbs, with small underground tubers. Radical leaves ovate, in a tuft at the base of the flowering stem or in a separate tuft or at a different time of year, the stem-leaves either developed and linear or lanceolate, or reduced to scarios sheathing scales. Flowers usually green often tinged or streaked with red or brown, large and solitary, or smaller and several in a raceme on short pedicels. The bend of the petals partaking always of that of the dorsal sepal, it has been thought useless to describe them separately for each species, they are comprised with the dorsal sepal under the name of galea.

The genus is chiefly Australian.

SECT. I. **Antennæa.**—*Lower lip erect, the lobes or their points embracing the galea.*

SERIES 1. **Grandifloræ.**—*Flowers large (usually above  $\frac{3}{4}$  in. and never under  $\frac{1}{2}$  in.), solitary (or abnormally and very rarely 2). Labellum appendage linear, penicillate or with 2 or 3 bristle-like lobes at the end (the cilia very rarely and abnormally deficient.)*

Radical leaves rosulate at the base of the flowering stems. No stem-leaves except sheathing scales.

Labellum bifid at the end.

- Labellum lobes narrow. Flowers above 1 in. long . . . . . 1. *P. ophioglossa.*
- Labellum lobes short and broad. Flowers under 1 in. long . . . . . 2. *P. concinna.*

Labellum entire at the end.

Flowers 1 in. long or more. Lobes of the lower lip lanceolate with an acute sinus between them.

Flowers erect, curved only at or above the middle.

Labellum lobes obtuse. Galea slightly curved, the point oblique . . . . . 3. *P. curta.*

Labellum acuminate. Galea much curved at the middle. The point horizontal . . . . . 4. *P. acuminata.*

Flowers much curved below the middle so as to appear nodding, the point reflexed . . . . . 5. *P. nutans.*

Leaves crowded at the base of the flowering-stem, passing gradually into stem-leaves or scales.

Lower leaves reduced to scarios scales which pass into linear or lanceolate scales or leaves, the largest either subtending the pedicel or next to it.

Points of the sepals straight.

Labellum ending in a filiform point clavate at the end. Lower lip truncate between the lobes . . . . . 6. *P. grandiflora.*

Labellum tapering above the middle, acute or with a slender point. Lower lip notched or with an acute sinus between the lobes.

Leaves usually lanceolate. Flower above 1 in. long . . . . . 7. *P. reflexa.*

Labellum very obtuse. Flower under 1 in. long. Lower lip truncate between the lobes . . . . . 8. *P. obtusa.*

SERIES 2. **Parvifloræ.**—*Flowers 2 or more very rarely only 1. Labellum appendage short with 2 or 3 setæ. Stems leafless at the time of flowering, except empty sheathing bracts.*

Sepals acute or very shortly pointed. Labellum-appendage short and narrow, with 2 or 3 setæ . . . . . 9. *P. parviflora.*

SECT. II. **Catochilus**.—Lower lip reflexed from the base or recurved from the middle, the lobes short and narrow. Labellum-appendage entire and obtuse, sometimes almost obsolete.

Flowers several, under  $\frac{1}{2}$  in. long.

Leaves in a radical rosette, persistent or fading away before flowering, those of the stem reduced to scarious sheaths.

Sepals all obtuse, the lower lip shortly 2-lobed . . . . . 10. *P. mutica*.

Sepals with short or rarely long fine points, the lower lip deeply 2-lobed . . . . . 11. *P. rufa*.

Stems leafy without a radical rosette.

Leaves linear or linear-lanceolate. Column-wings nearly square . . . 12. *P. longifolia*.

Only one specimen obtained, perhaps only an abnormal growth of some of the above . . . . . 13. *P. depauperata*.

1. **P. ophioglossa** (snake's tongue), *R. Br. Prod.* 326; *Benth. Fl. Austr.* vi. 354. Leaves in a radical rosette, shortly petiolate, ovate or broadly oblong, obtuse or mucronulate,  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. long, elegantly veined, the transverse veinlets usually uniting in 2 lateral nerves on each side of the midrib. Scape 1-flowered, rarely above 6 in. high, without any or with a single empty bract near the base, the terminal pedicel subtended by a rather broad, very acute bract of 4 to 8 lines. Galea incurved, acuminate, fully  $1\frac{1}{2}$  in. long, rather broad, striate; lower lip erect, broadly cuneate, deeply 2-lobed, at least  $\frac{3}{4}$  in. long besides the long subulate points which embrace the galea. Labellum-claw flat and thin, about 1 line long, lamina oblong-linear, ending in 2 narrow lobes of about 1 line, the basal appendage linear subulate, curved upwards with a terminal tuft of setæ. Column nearly as long as the labellum, reflexed lobe of the wings oblong and obtuse, the erect lobe smaller lanceolate and acute.—*Lindl. Gen. and Sp. Orch.* 391; *Reichb. f. Beitr.* 35; *Fitzg. Austr. Orch. i. Pt.* 6.

Hab.: Port Curtis, *R. Brown*; Brisbane River, Moreton Bay, *F. v. Mueller, Fitzalan, Bailey*; common in southern localities.

2. **P. concinna** (neat), *R. Br. Prod.* 326; *Benth. Fl. Austr.* vi. 355. Nearly allied to *P. ophioglossa*, but a smaller plant. Leaves radical, under 1 in. long, ovate or broadly oblong, the petiole usually longer than in *P. ophioglossa*, the venation the same. Scape 1-flowered, usually with an empty bract at or below the middle, besides the sheathing bract at the base of the terminal pedicel. Galea broader and more incurved than in *P. ophioglossa*, and under 1 in. long; lower lip also broader and shorter, the lobes more divaricate, the long points fine or slightly clavate. Labellum rather shorter than the column, broader than in *P. ophioglossa*, the terminal lobes or teeth very short and broad. Column-wings with the erect lobe acutely acuminate and rather long.—*Lindl. Gen. and Sp. Orch.* 391; *Hook. Journ. Bot. i.* 274, t. 136; *Reichb. f. Beitr.* 34; *P. acuminata*, *Sieb. Pl. Exs. not of R. Br.*; *Fitzg. Austr. Orch. i. Pt.* 6.

Hab.: Southern localities.

The plate in *Bot. Mag. t.* 3400 appears to me rather to represent one of the long-flowered forms of *P. curta*.—*Benth.*

3. **P. curta** (curtailed), *R. Br. Prod.* 326; *Benth. Fl. Austr.* vi. 355. Leaves in a radical rosette, usually on long petioles, ovate or broadly elliptical, 5 to 9-nerved, from under 1 in. to  $1\frac{1}{2}$  in. long. Scapes 1-flowered, usually about 6 in. high, with 1, 2 or 3 long loosely sheathing empty bracts besides the one subtending the terminal pedicel. Galea erect, about  $1\frac{1}{2}$  in. long, acute but not acuminate. Lower lip cuneate, with 2 broadly lanceolate lobes, not so long as the galea and only shortly acuminate in the typical form. Labellum linear, obtuse and entire, rather longer than the column, the surface papillose, the basal appendage linear curved and penicillate. Column 7 to 8 lines long, with the basal projection rather long; wings with the lower lobe oblong and obtuse, the



upper lobe short and broad with a narrow point at the front angle.—Lindl. Gen. and Sp. Orch. 390; Hook. f. Fl. Tasm. ii. 18; Bot. Mag. t. 3086; Reichb. f. Beitr. 35; Fitzg. Austr. Orch. i. Pt. 5.

Hab.: Southern localities.

Var. ? *grandiflora*. Flowers above 2 in. long, the lobes of the lower lip ending in long points.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller*.

4. **P. acuminata** (acuminate), *R. Br. Prod.* 326; *Benth. Fl. Austr.* vi. 355. Leaves in a radical rosette, ovate or broadly elliptical and 5 or 7-nerved as in *P. curta*, some forms of which this species closely resembles. Scape 1-flowered, 6 in. to 9 in. high with 1 or rarely 2 empty sheathing bracts besides the one embracing the terminal pedicel. Galea 1 to 1½ in. long, erect but much incurved about the middle, and usually produced into a point; lower lip narrow-cuneate, contracted into a claw, the lobes lanceolate and produced into long fine points embracing the galea. Labellum oblong-linear, tapering to a point. Column with a short basal projection, lower lobe of the wings broad and obtuse, upper lobe broad and scarcely prominent, with a linear point at the front angle.—Lindl. Gen. and Sp. Orch. 391; Bot. Mag. t. 3401; Reichb. f. Beitr. 36; Fitzg. Austr. Orch. i. Pt. 5.

Hab.: Southern localities.

5. **P. nutans** (nodding), *R. Br. Prod.* 327; *Benth. Fl. Austr.* vi. 356. Leaves in a radical rosette, petiolate, ovate or elliptical, ½ to 1½ in. long. Scape 1-flowered, 6 in. to 1 ft. high, usually with a single long loosely sheathing empty bract besides the one under the terminal pedicel. Galea nearly 1 in. long, much curved near the base and again towards the end, so as to give the flower a nodding appearance, obtuse or acuminate in front; lower lip shortly and broadly cuneate, the lobes long and lanceolate, tapering into long points embracing the galea. Labellum oblong-linear, obtuse, 4 to 5 lines long, the surface smooth but sometimes minutely ciliate, the basal appendage narrow-linear, curved, penicillate. Column ¾ the length of the galea, the wings with a broadly oblong obtuse lower lobe and only a very small upper lobe or tooth, the stigma usually long and conspicuous.—Lindl. Gen. and Sp. Orch. 391; Hook. f. Fl. Tasm. ii. 18; Bot. Mag. t. 3085; Reichb. f. Beitr. 37; Fitz. Austr. Orch. i. Pt. 5.

Hab.: Brisbane River, Moreton Bay, and other southern localities.

6. **P. grandiflora** (flowers large), *R. Br. Prod.* 327; *Benth. Fl. Austr.* vi. 358. Stems slender, 1-flowered, about 6 in. high, without any radical rosette of leaves at the time of flowering. Leaves along the stem, lanceolate, acuminate, not differing from the bract subtending the terminal pedicel. Galea above 1 in. long, abruptly curved forward about the middle, the petals as well as the dorsal sepals ending in front in short points; lower lip with the entire part broadly cuneate, fully ½ in. long, truncate, leaving a very broad straight and scarcely notched sinus between the lobes, which are very shortly dilated at the base, tapering into long filiform antenna-like points embracing the galea. Labellum oblong-linear at the base, tapering into a long filiform glabrous point somewhat clavate at the end; the basal appendage linear, curved, penicillate. Column-wings with an erect linear acute lobe at the front angle, the lower lobe oblong, obtuse.—Lindl. Gen. and Sp. Orch. 387; Guillem. Ic. Pl. Austral. t. 6; Reichb. f. Beitr. 39.

Hab.: Taylor's Range to Mount Perry.

7. **P. reflexa** (reflexed), *R. Br. Prod.* 327; *Benth. Fl. Austr.* vi. 359. Stems slender, 6 to 9 in. high, glabrous or minutely scabrous-pubescent or papillose, without any rosette of radical leaves at the time of flowering. Leaves

or empty scales lanceolate, erect or slightly spreading, acuminate, under lin. long in the typical form, and none usually so long as the bract subtending the terminal pedicel, more leaf-like and longer in some varieties. Galea  $1\frac{1}{4}$  to above  $1\frac{1}{2}$  in. long, curved but not abruptly so, the petals as well as the sepal tapering into fine points; lower lip cuneate at the base, the lobes lanceolate, separated by a sinus much narrower than in *P. grandiflora*, and almost acute, tapering into long filiform points embracing the galea. Labellum more or less lanceolate and tapering towards the end into a long or short point; the basal appendage linear, curved, penicillate at the end. Column-wings with a small erect acute lobe at the front angle, the lower lobe oblong and obtuse.—Lindl. Gen. and Sp. Orch. 387; Reichb. f. Beitr. 38; *P. revoluta*, R. Br. Prod. 327; Lindl. l.c. 389; Reichb. f. l.c.; *P. scabra*, Lindl. Swan Riv. App. 53; Orch. Gen. and Sp. 388; *P. pyramidalis*, Endl. in Pl. Preiss. ii. 5, not of Lindl.; Fitzg. Austr. Orch. i., Pt. 5.

Hab.: Southern localities to Stanthorpe and the border of N.S.W.

8. ***P. obtusa*** (blunt), *R. Br. Prod.* 327; *Benth. Fl. Austr.* vi. 360. Stems slender, 1-flowered, usually about 6 in. high, without any radical leaves at the time of flowering but often from a separate branch of the rhizome a rosette of ovate 5-nerved leaves like those of *P. concinna*. Stem-leaves or bracts lanceolate, acuminate,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, not different from the uppermost bract which subtends the terminal pedicel, the lower ones reduced to sheathing scales. Galea incurved,  $\frac{3}{4}$  to near lin. long, besides the point which varies from 2 to 6 lines; lower lip with the entire part very broadly cuneate, almost truncate, 4 to 5 lines long, the lobes very divaricate separated by a broad sinus notched in the centre, tapering into long subulate antenna-like points embracing the galea. Labellum the length of the column, oblong-linear, equally broad throughout and very obtuse, the basal appendage linear, curved, penicillate, the tuft consisting usually of 2 ciliate setæ. Column-wings with a prominent tooth or linear upper lobe at the front angle, the lower lobe oblong, the stigma very prominent.—Lindl. Gen. and Sp. Orch. 389; Hook. f. Fl. Tasm. ii. 19, t. 115 C; Reichb. f. Beitr. 38; Fitzg. Austr. Orch. i., Pt. 6.

Hab.: Between Stanthorpe and the border of N.S.W.

9. ***P. parviflora*** (small flowered), *R. Br. Prod.* 327; *Benth. Fl. Austr.* vi. 361. Leaves in radical rosettes appearing at a different time of the year from the flowering-stem or if contemporaneous in a tuft by the side of it, ovate, under  $\frac{1}{2}$  in. and often only  $\frac{1}{4}$  in. long on a rather long petiole. Scape slender, 4 to 8 in. high, with 2 or 3 empty bracts or small sheathing leaves and a raceme of 2 to 5 small flowers. Galea much incurved, scarcely 5 lines long, very acute or shortly acuminate, lower lip cuneate, the entire part about 2 lines long, the lobes much incurved, the inner margin involute at the base, tapering into points variable in length but always shorter than the galea. Labellum very short, obtuse but entire, the basal appendage short and slender, terminating in a tuft of 3 setæ. Column slender, the wing from a narrow base very prominent, with a narrow point at the upper outer angle, and a broad lower lobe.—Lindl. Gen. and Sp. Orch. 389; Hook. f. Fl. Tasm. ii. 22; Reichb. f. Beitr. 40; Fitzg. Austr. Orch. i., Pt. 7.

Hab.: Islands of Moreton Bay and other southern localities.

10. ***P. mutica*** (pointless), *R. Br. Prod.* 328; *Benth. Fl. Austr.* vi. 362. Leaves in a radical rosette at the base of the flowering stem sometimes but not usually withering away at the time of the flowering, ovate, very shortly petiolate or almost sessile, mostly  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Stem 4 to 8 in. high, with 1 to 5 empty sheathing bracts, besides those subtending the pedicels, all obtuse or the upper

ones acute. Flowers 5 to 10, in a slightly spiral spike. Galea broad, much incurved, obtuse, about  $3\frac{1}{2}$  lines long; lower lip little more than 2 lines long and at least as broad, concave, reflexed, with 2 short broad obtuse lobes. Labellum on a rather long flat claw, broad, very obtuse, scarcely  $1\frac{1}{2}$  lines long, the basal lobe or appendage nearly as broad at the base, narrow, thick, obtuse and entire or emarginate at the end. Column reaching to the end of the galea; the wings broad, without any upper lobe or tooth, the lower lobe broad and obtuse.—Lindl. Gen. and Sp. Orch 390; Hook. f. Fl. Tasm. ii. 21, t. 117; Reich. f. Beitr. 42; Fitzg. Austr. Orch. i., Pt. 2.

Hab.: Brisbane River and other southern localities.

11. **P. rufa** (reddish), *R. Br. Prod.* 327; *Benth. Fl. Austr.* vi. 363. Leaves in a radical rosette at the base of the stem, but most frequently withering away before the flowering, ovate, obtuse or acute,  $\frac{1}{2}$  to 1 in. long. Stem 6 to 10 in. high, with 2 to 4 loosely sheathing rather scarious empty bracts usually acute, besides the bracts subtending the pedicels. Flowers usually 3 or 4 in a short raceme. Galea about 5 lines long, hood-shaped, produced in front into a fine point 10 lines long in the typical form, very much longer in some varieties; lower lip on a rather long basal projection of the column, reflexed from it, broadly cuneate, 3 to 4 lines long without the points, divided to the middle into broadly lanceolate lobes ending in fine points, varying in length like that of the galea. Labellum on a short claw, ovate-oblong or narrow, concave or with involute margins, scarcely  $1\frac{1}{2}$  lines long, obtuse, bordered by few or many marginal cilia rarely entirely wanting, usually 1 long one on each side near the base, the basal appendage short, thick, entire, rugose, often ciliate. Column reaching to the end of the galea, the wings broad and nearly square, with a small point at the upper front angle, the lower angle or short broad lobe often ciliate, the middle part of the column narrowly winged.—Lindl. Gen. and Sp. Orch. 390; Hook. f. Fl. Tasm. ii. 21, t. 116; Reichb. f. Beitr. 41; Fitzg. Austr. Orch. i., Pt. 2.

Hab.: Brisbane to Rockhampton near the coast and inland.

The species varies much in stature, in the persistence of the radical leaves, in the size of the flowers, and especially in the length of the sepal-points.

12. **P. longifolia** (leaves long), *R. Br. Prod.* 327; *Benth. Fl. Austr.* vi. 364. Stems rather slender, but often 1 ft. high or rather more, without any radical rosette, the lower leaves reduced to short sheathing scales, those at and above the middle of the stem linear or linear-lanceolate, acute or acuminate, from under 1 to above 2 in. long, very shortly sheathing at the base. Flowers 3 to 7 in a terminal raceme. Galea 5 to 7 lines, more or less incurved above the ovary and again abruptly curved towards the end, acute or with a short point in front; lower lip reflexed, 4 to 5 lines long, oblong, divided usually to about half its length into 2 narrow-lanceolate lobes. Labellum on a very short claw, oblong, about 3 lines long, more or less papillose on the surface, with a short obtuse or 2-toothed papillose process at the end, the basal appendage very short, obtuse and usually erect. Column-wings very broad, nearly square or slightly hatchet-shaped, the margins ciliolate or entire.—Lindl. Gen. and Sp. Orch. 388; Hook. f. Fl. Tasm. ii. 22, t. 117; Reichb. f. Beitr. 40; Fitzg. Austr. Orch. i., Pt. 1.

Hab.: Taylor's Range and other southern localities.

The species varies much in the length and breadth of the leaf, in the size of the flowers, the length of the lobes of the lower lip and the precise form of the labellum, especially of its terminal appendage.

13. **P. depauperata** (impoverished), *Bail. Bot. Bull.* iv. Tubers about the size of a small pea, often at a distance of  $1\frac{1}{2}$  in. from the leaves. Leaves radical, almost in a rosette, ovate-oblong, on conspicuous petioles, 6 or 8 lines.

long, 3 or 4 lines broad, prettily veined, the 5 longitudinal ones not more prominent than the others. Scape 1-flowered, about 3 or 4 in. high, with a single empty bract near the middle and another immediately under the flower. Segments of flower all with long filiform points altogether not exceeding 9 lines in length. Labellum shorter than the segments, claw rather short, lamina linear, point rather blunt, entire, recurved, the basal appendage linear, curved and strongly penicillate. Column stained with purple, wings with rather prominent lower lobes.

Hab.: Near Cairns, *C. J. Wild.*

### 37. CALEANA, R. Br.

(After G. Caley, a diligent collector of N.S.W. plants.)

Sepals and petals all linear, the dorsal sepal erect, the lateral sepals and petals spreading or reflexed (but the position apparently reversed by the resupination of the flower on the ovary). Labellum articulate at the base of the column or at the end of its basal projection and moveable (irritable), with a linear incurved claw, the lamina ovate or oblong, peltate, convex, entire, shorter below than above its insertion, the surface smooth or tuberculate. Column elongated, sometimes produced at the base into a linear projection, very broadly 2-winged in its whole length. Anther erect, not mucronate, the 2 cells distinct and nearly equally 2-valved. Pollen-masses granular.—Terrestrial glabrous herbs, with small underground tubers. Leaf linear lanceolate or oblong, solitary at the base of the stem which has also occasionally a small empty bract at or below the middle. Flowers 1 to 3 or rarely 4, shortly pedicellate, the subtending bracts acute. Ovary usually recurved, reversing the flower.

The genus is limited to Australia. Allied to *Drakæa*, it is readily known by the large petal-like wings of the column, forming a kind of pouch open or closed by the elastic motions of the lid-like labellum.

Claw of the labellum and lateral sepals inserted at the base of the column . . . 1. *C. major*.

Claw of the labellum and lateral sepals inserted at the end of a basal projection of the column.

Leaf narrow linear . . . . . 2. *C. minor*.

1. **C. major** (greater), *R. Br. Prod.* 329; *Benth. Fl. Austr.* vi. 365. Leaf radical, linear or narrow-lanceolate, 2 to 4 in. long. Stem often above 1 ft. high, with a single closely appressed empty sheathing bract below the middle, and 1 to 4 red flowers on very short pedicels, the subtending bracts 2 to 4 lines long. Dorsal sepal narrow-linear, rather thick, channelled, erect or incurved below the middle, often  $\frac{3}{4}$  in. long; lateral sepals narrow-linear, acuminate, reflexed (erect by the reversion of the flower) about 6 lines long; petals still narrower and shorter, erect (with reference to the floral axis). Labellum affixed to the base of the column, the claw linear, flat, incurved, about 3 lines long; lamina peltately attached, broadly ovate, fully 4 lines long and nearly as broad, shortly and broadly acuminate at each end, the upper surface smooth, the centre inflated and hollow, the cavity open on the under side. Column 4 to 5 lines long, bordered on each side from the base to the anther with a petal-like coloured wing about 3 lines broad. Stigma obscurely 2-pointed.—Lindl. *Gen. and Sp. Orch.* 429; Hook. f. *Fl. Tasm.* ii. '18, t. 107 A; Reichb. f. *Beitr.* 44; *Caley major*, Endl. *Iconogr.* t. 8; *Fitz. Austr. Orch.* i., Pt. 6.

Hab.: Brisbane River and other southern localities.

2. **C. minor** (smaller), *R. Br. Prod.* 329; *Benth. Fl. Austr.* vi. 366. Leaf radical, narrow-linear. Stem slender, about 6 in. high, without any or very rarely with a single small empty bract below the middle. Flowers 1 to 3, much smaller than in *C. major*, on longer pedicels. Sepals and petals linear, nearly

equal, 4 to 5 lines long, the dorsal one often dilated above the middle and attached as well as the petals immediately above the ovary, the lateral sepals however attached to the extremity of the basal projection of the column on each side of the stipes of the labellum, which is linear and incurved. Lamina of the labellum peltate and convex, but narrower than in *C. major*, and tuberculate on the surface, the upper lobe obtuse or shortly 2-lobed, the lower lobe or appendage very short. Column about as long as the sepals, the broad wing adnate also to the basal projection, which is at least half as long as the column itself and nearly erect whilst the column is more spreading, the whole forming a broad sac or pouch.—Lindl. Gen. and Sp. Orch. 429; Reichb. f. Beitr. 44; Fitz. Austr. Orch. i., Pt. 6.

Hab.: Between Stanthorpe and the border of N.S.W.

### 38. DRAKÆA, Lindl.

(After Miss Drake, botanical artist for the "Botanical Register.")

(Spiculæa, Lindl.; Arthrochilus, F. v. M.)

Sepals and petals linear, the dorsal sepal erect, the lateral sepals and petals spreading or reflexed. Labellum articulate at the base of the column or at the end of its basal projection and moveable (irritable), with a linear claw; the lamina narrow, peltate, convex, shorter below than above its insertion. Column elongated, narrow, wingless except 1 or 2 pairs of narrow auricles variously placed. Anther erect, not mucronate, the 2 cells distinct and nearly equally 2-valved. Pollen-masses granular. Stigma large, orbicular, sometimes mucronate.—Terrestrial glabrous herbs, with small underground tubers. Leaf solitary at or near the base of the stem, usually broad, or none at the time of flowering. Scapes with 1 to 3 empty sheathing bracts. Flowers solitary or several in a raceme, the subtending bracts small and narrow. Labellum almost hammer-shaped and very irritable. Ovary straight or recurved, more or less reversing the flower.

The genus is limited to Australia, and is nearly allied to *Caleana*.

1. **D. irritabilis** (irritable), *Reichb. Beitr.* 68; *Benth. Fl. Austr.* vi. 368. Stems 6in. to nearly 1ft. high, leaves several in a rosette, lanceolate 2 to 3in. long midrib prominent sometimes leafless at the time of flowering except 1, 2 or 3 distant empty bracts sheathing at the base but sometimes spreading and almost leaf-like at the apex. Flowers green or whitish, spotted tinged with red, 3 to 8 on pedicels of 2 to 3 lines within small narrow bracts. Sepals and petals narrow-linear, slightly dilated above the middle, the dorsal sepal incurved, about 4 lines long, the lateral sepals and petals shorter, very spreading or reflexed, the former dilated at the base and adnate to the basal projection of the column. Labellum articulate at the end of the basal projection, the linear claw about 1 line long above the articulation, the lamina hammer-shaped and peltately attached, ciliate with long hairs on the upper surface, the upper lobe emarginate or terminating in a short smooth point, the lower lobe or appendage very obtuse and less hairy. Column incurved, with 2 narrow-linear acuminate auricles just under the stigma and 2 short points behind it.—*Arthrochilus irritabilis*, F. v. M. *Fragm.* i. 43.

Hab.: Brisbane River, Moreton Bay, *W. Hill*, *C. Prentice*; Cave Creek, *W. E. Armit*, (*F. v. M.*); Rockingham Bay, *Dallachy*.

### 39. ACIANTHUS, R. Br.

(Needle-flowers, referring to the pointed perianth.)

Dorsal sepal erect or incurved over the column, concave, not very broad, and often produced into a fine point; lateral sepals narrow, erect or spreading; petals much shorter. Labellum about as long as the petals, sessile or nearly so,

undivided, the margin entire, the disk smooth or papillose, with or without 2 adnate calli or tubercles at the base. Column erect or incurved, semiterete or 2-winged. Anther broad, erect, 2-celled, with broad outer valves, the connective sometimes produced into a short point; pollen granular, but less so than in *Caladenia* and more distinctly collected into 4 masses in each cell.—Terrestrial glabrous herbs, with small underground tubers. Leaf solitary, immediately above the basal scariosus sheath or higher up the stem, broadly ovate-cordate. Flowers solitary or several in a terminal raceme, on a scape or stem without scales above the leaf, except the small bracts subtending the pedicels.

A genus of few species, nearly allied to *Caladenia*, but without the calli and fringes to the labellum of that genus and a different foliage.

Column not winged. Sepals with fine points. Labellum oblong-lanceolate.

Flowers 3 to 10. Dorsal sepal with a point under 2 lines.

- |   |                           |
|---|---------------------------|
| Dorsal sepal ovate-lanceolate. Labellum with 2 papillose lines on the surface   | 1. <i>A. fornicatus</i> . |
| Dorsal sepal lanceolate, contracted at the base. Labellum smooth on the surface | 2. <i>A. exsertus</i> .   |

1. ***A. fornicatus*** (arched), *R. Br. Prod.* 321; *Benth. Fl. Austr.* vi. 370. Stem slender, 6 to 8 in. high. Leaf at the base or below the middle, broadly ovate or orbicular, deeply cordate and stem-clasping with broad rounded auricles, usually 1 to 1½ in. long, sometimes sinuate or even rather deeply 3-lobed. Flowers 4 to 10, on short pedicels; bracts ovate or lanceolate, acute. Dorsal sepals ovate-lanceolate, 3 to 4 lines long, erect, incurved, concave, acute and the midrib produced into a fine point of 1 to 1½ line; lateral sepals nearly as long but linear, with a long point and angular or toothed on each side of the point, close together or shortly united under the labellum; petals lanceolate, about half as long as the dorsal sepal, with a short point. Labellum much shorter than the dorsal sepal but variable in length, nearly sessile or on an exceedingly short claw, oblong-lanceolate, acuminate, concave at the base with 2 very short raised longitudinal plates or calli, smooth along the centre with 2 very prominent broad raised papillose lines parallel to the reflexed margins, the point smooth. Column not too lines long, much incurved, semiterete, not winged, often concealed in the dorsal sepal, but sometimes bent forward as in *A. exsertus*. Anther with a very short point. Pollen-masses 4 in each cell, of the somewhat solid consistence of *Eriochilus* but obtuse at the base. Stigma very prominent.—Lindl. *Gen. and Sp. Orch.* 397; Endl. *Iconogr.* t. 16; Reichb. f. *Beitr.* 25; Fitzg. *Austr. Orch.* i., Pt. 1.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller*; Rockingham Bay, *Dallachy*; Mount Wheeler, *Thozet*.

2. ***A. exsertus*** (protruding), *R. Br. Prod.* 321; *Benth. Fl. Austr.* vi. 370. A slender delicate plant, much resembling *A. fornicatus*, but smaller. Leaf deeply cordate, ovate or orbicular and often sinuate as in that species. Flowers rather smaller, 3 to 6 in the raceme, the pedicels very short. Dorsal sepal slightly incurved, concave, but narrow and much contracted at the base, about 3 lines long, including the short point; lateral sepals almost subulate; petals lanceolate, about half as long as the sepals. Labellum nearly as long as the sepals, oblong-lanceolate as in *A. fornicatus* but on a more distinct claw, the raised plates at the base rather longer and the surface of the lamina smooth or with very few papillæ in 2 rows. Column slender, not winged, about half as long as the sepals, incurved and protruding forwards from the dorsal sepal. Pollen of *A. fornicatus*.—Lindl. *Gen. and Sp. Orch.* 397; Hook. f. *Fl. Tasm.* ii. 25, t. 119; Reichb. f. *Beitr.* 25; Fitzg. *Austr. Orch.* i. Pt. 1.

Hab.: Between Stanthorpe and the border of N.S.W.

40. *ERIOCHILUS*, R. Br.(Erion, wool; *cheilos*, lip.)

Dorsal sepal erect, slightly incurved and concave; petals nearly as long usually narrower, erect or spreading; lateral sepals longer, spreading, oblong or elliptical, contracted into a distinct narrow stipes. Labellum much shorter, with a narrow concave erect claw, the margins often produced into small erect lateral lobes, the lamina or middle lobe recurved, very convex, entire, the surface villous, without calli. Column erect, the front angles sometimes ciliate or very narrowly winged. Anther erect, not mucronate, 2-celled, the outer valves large, folded over and concealing the small inner valves; pollen at length powdery or granular but much less so than in *Caladenia* and usually seen in 4 distinct and almost smooth masses in each cell, contracted at one end into points or short caudicles.—Terrestrial glandular-pubescent or hairy rarely glabrous herbs, with small underground tubers. Leaf solitary at the base of or higher up the stem, ovate or lanceolate. Flowers pink or white, 1 or more nearly sessile on a scape or peduncle, without empty bracts above the leaf, each flower subtended by a short loosely sheathing ovate bract.

The genus is limited to Australia.

1. *E. autumnalis* (autumnal), *R. Br. Prod.* 323; *Benth. Fl. Austr.* vi. 372. A slender plant, rarely exceeding 6 in., more or less glandular-pubescent. Leaf radical, ovate, acute, usually dying away before the time of flowering, but occasionally still persisting at the base of some flowering specimens. Flowers pink, solitary or 2 or 3 rather distant, the subtending bracts loosely sheathing, 1 to 2 lines long, and no empty ones on the scape lower down. Dorsal sepal erect, slightly incurved, narrow-lanceolate, acute, scarcely contracted at the base, 3 to 3½ lines long; lateral sepals half as long again, very acute, elliptical-lanceolate, contracted into a distinct often slender stipes; petals rather shorter than the dorsal sepal, linear or linear-spathulate. Labellum about half as long as the lateral sepals, with an erect concave narrow claw, sometimes showing at the apex minute lateral lobes or angles, the lamina or middle-lobe recurved, oval-oblong, convex and hairy but without prominent calli. Column shorter than the dorsal sepal, narrowly-winged below the very broad concave stigma.—*Lindl. Gen. and Sp. Orch.* 427; *Endl. Iconogr.* t. 6; *Hook. f. Fl. Tasm.* ii. 26, t. 120 A; *Epipactis cucullata*, *Labill. Pl. Nov. Holl.* ii. 61, t. 211, f. 2; *Eriochilus cucullatus*, *Reichb. f. Beitr.* 27; *Fitzg. Austr. Orch.* ii., Pt. 2.

Hab.: Brisbane River, Moreton Bay, *W. Hill*; and other southern localities.

The Queensland plants have usually smaller flowers than the same species in the southern colonies.

41. *CYRTOSTYLIS*, R. Br.

(Referring to the curved column.)

Dorsal sepal linear or linear-lanceolate, erect and incurved, concave; lateral sepals and petals very narrow, spreading, nearly equal in length to the dorsal sepal, or the petals shorter. Labellum with a short claw, flat, undivided, entire, with 2 calli at the base produced into raised lines along the lamina. Column elongated incurved, winged upwards. Anther terminal erect, 2-celled; pollen-masses granular distinctly cohering in 4 masses.—Terrestrial glabrous herbs. Leaf solitary at the base of the stem, lamina broad and spreading. Scape without any empty bracts usually bearing a raceme of several flowers.

Besides the Australian species there are others in New Zealand.

1. **C. reniformis** (kidney-shaped), *R. Br. Prod.* 322; *Benth. Fl. Austr.* vi. 376. A small delicate glabrous plant. Leaf orbicular-cordate or reniform, radical, sessile, the lamina varying from under  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. diameter. Scape from under 2 in. high and 1-flowered to 6 or 7 in. with 4 or 5 pale red flowers. Bracts subtending the pedicels short broad loose and truncate, or rarely acuminate. Dorsal sepal 4 to 5 lines long; lateral sepals and especially the petals often shorter and very narrow. Labellum nearly as long as the dorsal sepal, obtuse emarginate or with a short point, the medial raised lines terminating in the centre of the lamina or reaching nearly to the end. Column slender,  $\frac{2}{3}$  the length of the dorsal sepal, the wings sometimes very short under the anther, sometimes extending halfway down.—*Lindl. Gen. and Sp. Orch.* 398; *Hook. f. Fl. Tasm.* ii. 26, t. 119; *Hook. Journ. Bot.* i. t. 135; *Caladenia reniformis*, *Reichb. f. Beitr.* 67; *Fitzg. Austr. Orch.* i., Pt. 4.

Hab.: Brisbane River, Moreton Bay, and other southern localities.

42. CALADENIA, R. Br.

(From *kalos*, beautiful, and *aden*, a gland.)

Dorsal sepal erect or incurved over the column, usually narrow, lateral sepals nearly equal to it but flat and spreading, petals narrow, erect or spreading, or rarely sepals and petals all nearly equal and spreading. Labellum erect at the base, undivided or 3-lobed, the lateral lobes when present erect, the middle lobe or upper part of the undivided labellum recurved, the margins often fringed or toothed, the disk with sessile or stipitate oblong linear or clavate calli, in 2 or more longitudinal rows, or irregularly crowded or scattered; in one species no calli but the margin fringed. Column erect or incurved, more or less 2-winged in the upper part. Anther erect, 2-celled, the outer valves broad, the inner much smaller, the connective usually produced into a point. Pollen-masses granular.—Terrestrial herbs, usually hairy, with small underground tubers. Leaf solitary, linear lanceolate or oblong, from within a scarious sheathing scale close to the ground. Flowers solitary or very few in a loose raceme, on an erect scape, leafless except a small narrow sheathing scale or empty bract about the middle, and a similar bract under each pedicel, and in one species the radical leaf and empty bract are deficient. Flowers usually erect, variously coloured.

The Australian species are all endemic.

SECT. I. **Calonema**.—*Sepals acuminate, with long or short points, the dorsal one erect and incurved. Labellum inconspicuously veined, the disk with 2 or more rows of calli.*

Sepal-points long. Lateral lobes of the labellum fringed, sometimes passing into the middle lobe.

Leaf linear-lanceolate. Calli of the labellum in 4 to 6 rows . . . . . 1. *C. Patersoni*.

SECT. II. **Eucaladenia**.—*Sepals acute or obscurely acuminate, rarely obtuse, the dorsal one usually erect and concave. Labellum inconspicuously veined, the disk with 2 or more rows of calli (sometimes arranged or united at the base almost in a semi-circle.)*

Flowers pink or white.

Leaf oblong or lanceolate. Labellum deeply 3-lobed, the long calli in 2 short rows, more or less converging in a semi-circle.

Calli all free . . . . . 2. *C. latifolia*.

Leaf very long. Labellum with the lateral lobes small, the calli short and thick in 2 rows, the rest of the disk covered with papillæ or small calli.

Sepals and petals  $\frac{3}{4}$  in. or more. Middle lobe of the labellum entire . . . . . 3. *C. suaveolens*.

Leaf narrow-linear. Labellum with the lateral lobes broad and obtuse.

Sepals and petals lanceolate, usually 6 to 8 lines long. Calli of the labellum in 2 rarely in 4 rows . . . . . 4. *C. carnea*.

Flowers blue.

Leaf usually linear, glabrous or slightly hairy.

Labellum broadly sessile, lateral lobes broad and obtuse, middle lobe lanceolate; calli in 2 rows.

Leaf lanceolate, linear . . . . . 5. *C. cœrulea*.



1. **C. Patersoni** (after Col. Paterson), *R. Br. Prod.* 324; *Benth. Fl. Austr.* vi. 381. More or less hairy and from under 1ft. to near 2ft. high, the upper portion and flowers often minutely glandular-pubescent. Leaf oblong-linear or lanceolate, 2 or more inches long. Flowers 1, 2 or very rarely 3, the bracts subtending the pedicels small and linear. Sepals more or less dilated in the lower part, tapering into a long point sometimes dilated again towards the end, the whole length varying from 1 to above 2in., the points or the whole sepal usually glandular-pubescent. Petals shorter and not dilated at the base or rarely as long as the sepals. Labellum rarely half as long as the sepals, broadly ovate or ovate-lanceolate and undivided or dilated into broad lateral lobes, the margins more or less fringed ciliate or crenate, the end or middle lobe recurved; calli numerous, linear or clavate, more or less distinctly arranged in 4 or more longitudinal rows. Column as long as the erect portion of the labellum, shortly winged at the apex; anther-point usually prominent.—*Lindl. Gen. and Sp. Orch.* 422; *Reichb. f. Beitr.* 81; *C. pulcherrima*, *F. v. M. Fragm.* v. 93, 101; *Fitzg. Austr. Orch. i.*, Pt. 3.

Very variable in the length and proportions of the sepals, in the shape of the labellum and its fringes and calli, and in the colour of the flowers, which are usually of a pale-greenish hue outside and yellowish or pink inside, the calli and end or middle lobe of the labellum usually and sometimes the whole disk of a rich purple.

*Var. dilatata.* Labellum with broad lateral usually pale-coloured deeply fringed lobes, the middle lobe ovate, dark-coloured; calli very numerous in several rows. *C. dilatata*, *R. Br. Prod.* 325; *Lindl. Gen. and Sp. Orch.* 422; *Hook. f. Fl. Tasm. ii.* 27, t. 122 B; *Reichb. f.*, *Beitr.* 32; *C. filamentosa*, *Lindl. l.c.* 421, not of *R. Br.*; *C. longicauda*, *Lindl. Swan Riv. App.* 52, t. 8 A; *Gen. and Sp. Orch.* 422; *Endl. in Pl. Preiss. ii.* 9.

*Hab.*: Between Stanthorpe and the border of N.S.W.

2. **C. latifolia** (leaves broad), *R. Br. Prod.* 324; *Benth. Fl. Austr.* vi. 384. Hairy, from  $\frac{1}{2}$  to 1ft. high. Leaf oblong-lanceolate,  $1\frac{1}{2}$  to 4in. long. Flowers pink or rarely white, usually 2 or 3, rather distant, on short pedicels. Lateral sepals varying in different specimens from 6 to 11 lines long, oblong-lanceolate, obtuse or scarcely acute, the dorsal sepal rather shorter and more acute, the petals somewhat shorter and more lanceolate. Labellum not half the length of the sepals, shortly cuneate at the base, deeply 3-lobed, the lateral lobes oblong-obtuse and entire, the middle lobe longer, ovate or broadly lanceolate, fringed near the base with a few marginal calli, the calli of the disk linear-clavate, rather long, in 2 short converging rows, sometimes almost forming a semi-circle, sometimes rather longer and more parallel. Column shortly and rather broadly winged at the apex. Anthers with a long point.—*Lindl. Gen. and Sp. Orch.* 419; *Reichb. f. Beitr.* 30, 64; *Hook. f. Fl. Tasm. ii.* 28; *C. mollis*, *Lindl. Swan Riv. App.* 51; *Gen. and Sp. Orch.* 419; *C. elongata*, *Lindl. Swan Riv. App.* 52; *Gen. and Sp. Orch.* 419; *Fitzg. Austr. Orch. ii.* Pt. 5.

*Hab.*: Southern localities.

3. **C. suaveolens** (sweet-scented), *Reichb. f. Beitr.* 67; *Benth. Fl. Austr.* vi. 385. Glabrous and usually 1ft. high or rather more. Leaf linear or linear-lanceolate, 6 to 8in. long, and often 2 or 3 empty sheathing-scales on the stem. Flowers 2 to 6, rather distant, almost sessile within sheathing bracts of  $\frac{1}{2}$  to  $\frac{3}{4}$ in. Dorsal sepal lanceolate, acuminate, incurved, concave,  $\frac{3}{4}$  to nearly 1in. long; lateral sepals and petals nearly as long, linear, spreading or recurved. Labellum not half so long as the sepals, the erect part broad with the erect lateral lobes rounded and not very prominent, the middle lobe ovate-oblong, obtuse, recurved; calli in 2 rows along the claw or erect part and between the lateral lobes, sometimes almost confluent, the remainder of the disk almost covered with smaller calli or papillæ more or less arranged in several rows. Column broadly winged. Anther with a prominent point.—*Lyperanthus suaveolens*, *R. Br. Prod.* 325; *Lindl.*

Gen. and Sp. Orch. 392; F. v. M. Fragm. v. 98; Reichb. f. Beitr. 32; *Caladenia sulphurea*, A. Cunn. in Field, N.S. Wales, 361; *Leptoceras sulphurea*, Lindl. Gen. and Sp. Orch. 416; Fitzg. Austr. Orch. i., Pt. 4.

Hab.: Stanthorpe, *J. Davidson*; Nerang, *H. Schneider*.

4. **C. carnea** (flesh coloured), *R. Br. Prod.* 324; *Benth. Fl. Austr.* vi. 386. Slender, usually under 1ft. high, sparingly hairy or nearly glabrous or glandular papillose. Leaf narrow-linear, often long. Flowers 1 to 3, pink in the typical form, often longitudinally veined and usually with transverse bands of a darker hue on the labellum and column. Sepals 6 to 8 lines long, or in some varieties rather smaller, lanceolate, acute, the dorsal sepal erect and as well as the petals rather smaller than the lateral ones. Labellum not above half as long as the lateral sepal, the lateral lobes broad, obtuse and prominent, the middle lobe lanceolate, recurved, fringed with a few linear calli; calli of the disk linear in 2 rows in the typical form. Column narrowly winged.—Lindl. Gen. and Sp. Orch. 417; Endl. Iconogr. t. 51; Hook. f. Fl. Tasm. ii. 29, t. 121 A; Reichb. f. Beitr. 28; *Arethusa catenata*, Sm. Exot. Bot. t. 104; *C. alata*, *R. Br. Prod.* 324 (with smaller flowers); Lindl. Gen. and Sp. Orch. 418; Hook. f. Fl. Tasm. ii. 30, t. 125; Reichb. f. Beitr. 29; *C. angustata*, Hook. f. l.c.; Fitzg. Austr. Orch. i., Pt. 7.

Hab.: Keppel and Shoalwater Bays, *R. Brown*; from Brisbane to Wide Bay in great abundance, *Leichhardt*, *F. v. Mueller* and others; Rockhampton, *O'Shanesy*; Nercool Creek, *Bowman*; Darling Downs, *Law*; Mount Elliott, *Fitzalan*.

A small plant like *C. carnea* but more glabrous.

Var. *alba*. Besides the flowers being white the plants are usually larger than the pink ones.—Fitzg. Austr. Orch. i. Pt. 7.

5. **C. cærulea** (blue), *R. Br. Prod.* 324; *Benth. Fl. Austr.* vi. 388. A small plant like *C. carnea*, but more glabrous, the empty bract on the stem smaller and more erect but with the solitary blue flower of that species. Leaf linear or linear-lanceolate. Stem rarely 6in. high. Lateral sepals 4 to 5 lines long, oblong-lanceolate, glandular-dotted but scarcely veined; dorsal sepal as long but narrower; petals both narrower and shorter. Labellum more than half or nearly as long as the lateral sepals, broad almost from the base; lateral lobes broad, erect, obtuse, with transverse bands of a darker hue, middle lobe lanceolate, almost acute, entire or slightly fringed; calli linear-clavate, in 2 rows. Column rather narrowly winged almost from the base. Anther-point very short.—Lindl. Gen. and Sp. Orch. 417; Hook. f. Fl. Tasm. ii. 29; Reichb. f. Beitr. 28; Fitzg. Austr. Orch. i., Pt. 5.

Hab.: This has very nearly the range of *C. carnea*, and for the little difference there is between them might be given as a variety of that species.

#### 43. GLOSSODIA, R. Br.

(Alluding to the tongue-like calli on the labellum.)

Sepals and petals nearly equal, spreading. Labellum sessile, undivided, not fringed, without calli or plates on the disk, but, at its base 2 (sometimes united into 1) linear clavate calli or appendages erect against the column and from half to nearly its whole length. Column erect, often incurved, 2-winged. Anther erect, 2-celled, the outer valves broad, the inner much smaller, the connective produced into a small point. Pollen-masses granular.—Terrestrial herbs usually hairy, with small underground tubers. Leaf solitary, oblong or lanceolate, from within a scarios sheath close to the ground; flowers 1 to 2 on an erect scape, leafless except an empty sheathing bract at or below the middle, and a similar bract under each pedicel. Flowers erect, blue or purple.

The genus is limited to Australia.

SECT. I. **Euglossodia**.—*Labellum with a broad biconvex pubescent base. Column-wing not at all or scarcely extending above the base on the anthers Eastern species.*

- Sepals and petals 7 to 10 lines long. Labellum-appendage single, dilated and 2-dentate at the apex . . . . . 1. *G. major*.
- Sepals and petals 4 to 6 lines long. Labellum-appendages 2, linear-clavate, scarcely united at the base . . . . . 2. *G. minor*.

1. **G. major** (greater), *R. Br. Prod.* 326; *Benth. Fl. Austr.* vi. 392. Hirsute with long spreading hairs with a few shorter ones sometimes glandular. Tuber ovoid, often  $\frac{1}{2}$  in. long. Leaf oblong or lanceolate, 1 to 2 in. long. Scape 6 in. to 1 ft. high with 1 or rarely 2 blue flowers. Sepals and petals oblong-lanceolate, obtuse, 6 to 8 lines long, not blotched. Labellum not half so long as the calyx, ovate broad biconvex and pubescent with white hairs in the lower half, the upper half lanceolate blue and glabrous, the basal callus or appendage single, linear, erect against the column, with a broad reflexed 2-dentate or 2-lobed head. Column as long as the labellum, broadly winged, but the wing not at all or scarcely extending along the anther.—*Lindl. Gen. and Sp. Orch.* 423; *Endl. Iconogr.* t. 41; *Hook. f. Fl. Tasm.* ii. 31, t. 120; *Reichb. f. Beitr.* 34; *Caladenia major*, *Reichb. f. Beitr.* 67; *Fitzg. Austr. Orch.* i. Pt. 4.

Hab.: Moreton Bay, *Leichhardt*; *Armidales*, *Parrott*; and other southern localities.

2. **G. minor** (lesser), *R. Br. Prod.* 326; *Benth. Fl. Austr.* vi. 329. Hirsute with long spreading hairs mixed with shorter sometimes glandular ones as in *G. major*, but a smaller plant. Stems rarely above 3 or 4 in. high and almost always 1-flowered. Leaf lanceolate, the small sheathing bract usually green. Flower blue. Sepals and petals oblong-lanceolate, 5 to 6 lines long. Labellum about  $\frac{1}{3}$  the length of the sepals, broad, biconvex and pubescent with white hairs or papillæ in the lower half, the spreading upper half triangular, acute, flat, glabrous, the basal calli or appendages 2, linear, flattened, clavate at the end, rather shorter than the column, very shortly united at the base. Column nearly as long as the labellum, broadly winged but the wing not produced on the anther.—*Lindl. Gen. and Sp. Orch.* 423; *Reichb. f. Beitr.* 34; *Caladenia minor*, *Reichb. Beitr.* 67; *Fitzg. Austr. Orch.* i. Pt. 4.

Hab.: Archer's Station, Moreton Bay, *Leichhardt*; *Stanthorpe* and other southern localities.

44. CALOCHILUS, R. Br.

(From *kalos*, beautiful; *cheilos*, a lip.)

Dorsal sepal erect, rather broad, concave; lateral sepals about as long, broadly lanceolate, spreading; petals much shorter, broadly falcate. Labellum as long or longer, undivided, contracted at the base, the margin and whole surface densely fringed except a narrow terminal point or ligula. Column short, with a rather broad wing more or less produced behind the anther but not beyond it. Anther bent forward at the base, usually recurved towards the end, obtuse or obtusely acuminate or rostrate. Pollen-masses granular. Rostellum much shorter than the anther.—Terrestrial glabrous herbs, with ovoid underground tubers. Leaf usually solitary, long and narrow, but usually 2 or 3 erect almost leaf-like sheathing bracts on the stem. Flowers few in a terminal raceme, green or yellow, with more or less of purple especially the labellum.

The genus is limited to Australia.

- Anther rostrate. Column-wing quite open in front, with a gland on each side within its anterior angles or lobes . . . . . 1. *C. campestris*.
- Anther very obtuse. Column-wing without any gland, open in front. Labellum with 2 short longitudinal intramarginal erect plates or auricles near the base . . . . . 2. *C. paludosus*.

1. **C. campestris** (a field plant), *R. Br. Prod.* 320; *Benth. Fl. Austr.* vi. 315. Stem usually rather stout, from under 1ft. to above 1½ft. high, with a rather long leaf and 3 to 5 flowers, but sometimes with the habit of *C. paludosus*. Sepals in the typical form 4 to 5 lines long, the petals much shorter. Labellum ½in. long or more, obovate or obovate-oblong, the margins and surface covered with long purple fringes except near the base where (in the same typical form) there is a raised plate or thickened surface quite smooth and extending more or less along the centre of the narrow part of the labellum, and the end is produced into a linear or lanceolate smooth often flexuose point varying much in length. Column-wings rather broad and dilated in front into a variously-shaped lobe or angle with a dark-coloured gland inside, the two wings not at all connected in front. Anther bent forward at the base, recurved and acuminate or rostrate upwards.—*Lindl. Gen. and Sp. Orch.* 459; *Bot. Mag.* t. 3187; *Hook. f. Fl. Tasm.* ii. 15, t. 106 A; *Reichb. f. Beitr.* 21; *C. herbaceus*, *Lindl. l.c.*; *Fitzg. Austr. Orch. i.*, Pt. 4.

Hab.: Southern localities.

Var. *grandiflora*. Flowers 1 to 3, larger than in the common form, and altogether resembling *C. paludosus*, the labellum covered with fringes or linear calli from the base, but without intramarginal appendages of that species, and the glands of the column-wings as in *C. campestris*.

Hab.: Islands of Moreton Bay.

2. **C. paludosus** (a swampy land plant), *R. Br. Prod.* 320; *Benth. Fl. Austr.* vi. 316. Usually more slender than *C. campestris*, with a long leaf and only 2 or 3 rarely 4 flowers, often but not always larger than in that species. Sepals usually 7 to 8 lines long; petals not half so long, strongly veined. Labellum covered with the long fringes or cilia, shorter and much crowded towards the base, with 2 longitudinal but short and much raised plates near the base resembling auricles but intramarginal, not strictly marginal as figured (C 3) in Endlicher's plate, the terminal smooth point of the labellum usually long flexuose and linear. Column-wing produced behind the anther to about its length, broadly rounded in front on each side, without the glands of *C. campestris*. Anther as broad as long, very obtuse, neither acuminate nor rostrate.—*Lindl. Gen. and Sp. Orch.* 459; *Endl. Iconogr.* t. 14; *Reichb. f. Beitr.* 22; *Fitzg. Austr. Orch. i.* Pt. 4.

Hab.: Cooper's Plain, *Dr. C. Prentice*; and other southern localities.

#### 45. CHILOGLOTTIS, R. Br.

(From *cheilos*, a lip, and *glotta*, the tongue.)

Dorsal sepal erect, incurved, concave, contracted at the base; lateral sepals narrow-linear or terete; petals lanceolate falcate. Labellum on a very short claw, ovate or obovate, undivided, the disk with variously arranged calli. Column elongated, incurved, winged. Anther terminal, erect, 2-celled; pollen-masses granular.—Terrestrial herbs, with small underground tubers. Leaves 2, radical or nearly so. Scape 1-flowered, without any empty bract below the one subtending the terminal pedicel.

Australian species are endemic.

Dorsal sepal 5 to 6 lines long, much contracted at the base; lateral sepals linear-terete. Calli of the labellum slender, scattered over the whole disk . . . . . 1. *C. diphylla*.  
Dorsal sepal spatulate, 7 lines long. Calli of the labellum a large recurved one near the base, and 9 or 10 flat ones along the centre, surrounded by slender one . . . . . 2. *C. trilabra*.

1. **C. diphylla** (2-leaved), *R. Br. Prod.* 323; *Benth. Fl. Austr.* vi. 390. Radical leaves 2, from ovate-elliptical to oblong-lanceolate, usually acute,  $\frac{2}{3}$  to 1½ in. long, contracted into a petiole of 2 to 3 lines. Scape from 3 to 6 in. high, bearing occasionally a single sheathing bract near the base besides the one subtending the terminal pedicel. Dorsal sepal cuneate, 5 to 6 lines long, shortly acuminate and much contracted in the lower half; lateral sepals linear-terete, spreading or reflexed, very slender or somewhat thickened in the upper half, as long as or longer than the dorsal one; petals lanceolate, attached by a broad base, acute, rather shorter than the sepals. Labellum more or less obovate, obtuse or acute, contracted at the base into a distinct long or short claw; calli covering the disk, mostly shortly linear, but some larger and thicker ones arranged more or less in 2 rows, and 1 or 2 at the base of the lamina, much longer rather thick and reflexed, all however very variable as to form and numbers. Column about as long as the petals.—*Bauer, Ill. Pl. N. Holl.* t. 8; *Lindl. Gen. and Sp. Orch.* 386; *Hook. f. Fl. Tasm.* ii. 23; *Reichb. f. Beitr.* 27; *Caladenia diphylla*, *Reichb. f. Beitr.* 67; *Epipactis reflexa*, *Labill. Pl. Nov. Holl.* ii. 60, t. 211, f. 1: *Acianthus? bifolius*, *R. Br. Prod.* 322; *Reichb. f. Beitr.* 26; *Fitzg. Austr. Orch.* ii. Pt. 2.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller*; and other southern localities.

2. **C. trilabra** (3-lipped), *Fitzg. in Brit. Journ. Bot.* xxi. 304. Leaves 2, sessile, oblong-lanceolate, acute, about 10 lines long, 4 lines broad. Scape about 3 in. high, with 1 large sheathing acute bract below the ovary. Dorsal sepal spatulate, acuminate, about 7 lines long, light red-brown tinged with green. Lateral sepals linear, about 7 lines long, acute, yellowish. Labellum light red-brown, about 5 lines long, obovate, acute, on a broad claw; 1 large greenish reflexed callus near the base and about 9 or 10 other large, flat, dark red-brown calli along the centre of the disk, surrounded by numerous small clavate slender calli. Petals similar to the labellum, but not quite so broad and with hardly so fully developed calli. Column shorter than the petals, but slightly winged, the wings extending behind the anther into a deeply 4-toothed crest. Anther with a short point.—*Fitzg. Austr. Orch.* ii. Pt. 2.

Hab.: Given as a Queensland plant in *Muell. 2nd. Syst. Cens. Austr. Pl.* 192.

46. POGONIA, Juss.

(Alluding to the bearded lip.)

Petals and sepals free, erect connivent or somewhat open, equal or the petals smaller. Labellum erect, concave, undivided or lobed, the disk crested papillose or bearded. Column elongated, semiterete, usually angular or winged upwards. Anther lid-like, incumbent, sessile or shortly stipitate. Pollen granular, cohering in 2 entire or 2-lobed masses, free or attached to the rostellum by an elastic web.—Terrestrial herbs, forming a spherical tuber under ground. Flowering stems or scapes in the Australian section leafless besides scarious sheathing scales, erect, bearing a raceme (usually one-sided) of pendulous pedicellate flowers, sometimes reduced to a single flower, usually red. Leaves developed later than the flowers, solitary on separate stems, those of the Australian species not as yet observed.

The genus is a widely-spread one, having been originally founded on North American species. The section *Nervilia*, to which the Australian species belong, characterized by the separate development of the solitary leaf and of the flowering stems, is spread over tropical Asia and the Mascarene islands as well as those of the Archipelago.

Flowers solitary on the scape, 6 to 7 lines long. Labellum 3-lobed, the middle lobe contracted at the base, the disk papillose . . . . . 1. *P. uniflora*.  
 Flowers 2 to 6 in the raceme, 7 to 8 lines long. Labellum shortly 3-lobed, the middle lobe broad at the base, the disk bearded . . . . . 2. *P. holochila*.

Flowers 2 or 3 in the raceme, nearly lin. long. Labellum quite entire, broadly obovate, the disk smooth . . . . . 3. *P. Dallachyana*.  
 Flowers few, 3 to 4 lines long. Labellum entire, obcordate, glands in few rows . . . . . 4. *P. pachystomoides*.

1. ***P. uniflora*** (single flowered), *F. v. M. Fragm.* v. 201; *Benth. Fl. Austr.* vi. 310. Flowering stem very slender, under 6in. long, with few rather long loose sheathing scales and terminating in a single flower, blue according to Dallachy, pink according to F. v. Mueller. Pedicel very short, the junction with the stem marked by a small bract, wanting on some specimens. Sepals and petals 6 to 7 lines long, linear, rather acute, the lateral sepals somewhat broader or linear-lanceolate. Labellum nearly as long as the sepals, 3-lobed, the lateral lobes broadly triangular and obtuse, the middle lobe at least as long, ovate-oblong, obtuse, much contracted at the base; disk with a papillose line, narrow and double at the base, expanded upwards and extending partially on to the middle lobe. Column very slender at the base, broadly 2-winged upwards.

Hab.: Rockingham Bay, *Dallachy*.

2. ***P. holochila*** (lip prominent), *F. v. M. Fragm.* vi. 200; *Benth. Fl. Austr.* vi. 310. Flowering stems slender, 6 to 10in. high, with a few rather long sheathing scarious bracts, the upper ones sometimes almost leafy at the end. Flowers 2 to 6, on slender pedicels of 1 to 3 lines, apparently pink, but like those *P. uniflora* said by Dallachy to be blue. Bracts linear, rather long. Sepals and petals 7 to 8 lines long, the lateral sepals oblong-linear, the dorsal sepal and petals narrow-linear, the petals more contracted at the base. Labellum nearly as long as the sepals, broadly ovate, shortly sinuate-3-lobed, the lateral lobes broadly rounded, the middle one smaller, rather broader than long; disk with a bearded line extending to half way along the middle lobe. Column slender, very shortly winged at the apex.

Hab.: Rockingham Bay, *Dallachy*; Endeavour River, *Hon. Miss Lovell*.

3. ***P. Dallachyana*** (after J. Dallachy), *F. v. M. Herb.*; *Benth. Fl. Austr.* vi. 310. Stems about 6in. high, with 2 or 3 long loose sheathing scales. Flowers 2 or 3, on short pedicels crowded at the end of the stem. Bracts linear. Sepals said to be reddish, nearly lin. long, narrow-lanceolate, acuminate, the petals rather shorter and narrower. Labellum about  $\frac{3}{4}$ in. long, broadly obovate, quite entire, contracted and embracing the column at its base; the disk without any raised papillose or bearded lines. Column 3 to 4 lines long, dilated and winged at the apex only.

Hab.: Rockingham Bay, *Dallachy*.

4. ***P. pachystomoides*** (like a *Pachystoma*), *F. v. M. Fragm.* viii. 174. Stem slender. Bracts distant, 1 to  $1\frac{1}{2}$  lines long, cucullate. Flowers few, pedicellate. Sepals 3 to 4 lines long, glabrous, membranous, obtuse, pale yellow, dorsal obovate, lateral ones and petals oval-oblong narrowed towards the base. Labellum entire, obcordate truncate, of about 2 lines long, tender-membranous, the glands thick at the base. Column about 2 lines long. Anther almost renate pointless.

Hab.: Rockingham Bay, *W. Hill*.

#### 47. GASTRODIA, R. Br.

(From *gaster*, a stomach.)

Sepals and petals united in a 5-lobed tube or cup, gibbous at the base under the labellum. Labellum shorter than the perianth, shortly adnate to it at the base along the centre, entire or with 2 obtuse auricles near the base, oblong, the

margins undulate, the disk with 2 longitudinal raised lines or plates confluent upwards into a single one. Column elongated, the apex concave, with a membranous margin. Anthers lid-like, incumbent, very shortly stipitate, deciduous, the cells contiguous. Pollen granular. Stigma on a short protuberance at the base of the column.—Herbs parasitical on roots, leafless and not green. Scapes simple, erect, with short loosely sheathing scales. Flowers white, in a terminal raceme.

The Australian species are endemic.

Stems 12 to 18 in. high . . . . . 1. *G. sessamoides*.  
Stems only a few inches high . . . . . 2. *G. ovata*.

1. ***G. sesamoides*** (Sesamum-like), *R. Br. Prod.* 330; *Benth. Fl. Austr.* vi. 309. Stems 1 to 1½ ft. high, the sheathing scales loose and very obtuse or shortly acute, 2 to 3 lines long, approximate at the base of the stem, distant higher up. Raceme erect, usually 1 to 4 in. long, but sometimes much longer. Bracts scarious, very broad and obtuse, shorter than the pedicels. Flowers white or brownish outside on pedicels of 2 or 3 lines. Perianth varying from 6 to 8 lines long, the lobes short and broad. Labellum scarcely shorter than the perianth, broadly oblong, very obtuse, much undulate. Column nearly as long as the labellum, angular, the basal stigmatic protuberance very prominent. Capsule obovoid-turbinate.—*Endl. Iconogr.* t. 5; *Lindl. Gen. and Sp. Orch.* 384; *Hook. f. Fl. Tasm.* ii. 31, t. 126 (the stigmatic protuberance overlooked by the artist); *Reichb. f. Beitr.* 44; *Fitzg. Austr. Orch.* ii., Pt. 5.

Hab.: In a few southern localities.

2. ***G. ovata*** (ovate), *Bail. Bot. Bull.* xiv. Creeping stems about 1½ in. long, deep-green, fleshy, constricted at the nodes, almost moniliform, internodes of very irregular form. Flowering stems very slender, about 3 in. high, clothed by weak hairs, usually bearing at the base 1 to 3 ovate-acuminate or cordate leaves, 6 to 12 lines long, petioles somewhat broad, sheathing base short and loose; between these and the flowers are usually 1 or 2 oblong or lanceolate, loose scales. Flowers about 3, almost sessile, their subtending bracts narrow-lanceolate. Perianth campanulate, lobed by the free upper portions of the segments; the outside somewhat furfuraceous, dirty-white stained with red, scarcely exceeding 3 lines. Labellum on a rather long claw, lamina broadly oblong, margins undulate, bearing on the disk two dark thick lines, merging into 1 on the claw. Column short except for a long terminal appendage. Anther large, giving a gibbous appearance to the dried perianth. Pollen copious, yellow. Capsule ovoid-oblong about 5 lines long. Seeds long, narrow-winged.

Hab.: Mountain Range, near Cairns, *L. J. Nugent*.

The specimens received of this plant were somewhat imperfect, therefore some doubt remains as to genus.

#### 48. EPIPOGUM, Gmel.

Sepals and petals free, nearly equal, narrow, erect or spreading. Labellum sessile, large, ovate, concave, with a short obtuse spur at the base. Column very short, the margin membranous. Anther lid-like, with a large thick terminal appendage. Pollen-masses 2, granular, attached to the gland by long caudicles. Leafless terrestrial herbs, with a thick and fleshy or branching and coral-like rhizome. Scapes simple ascending or erect, with a few scarious scales, not green. Flowers white (or sometimes pink?) in a terminal raceme usually nodding or pendulous.

The genus has very few species scattered in few individuals over a great part of the Old World. The only Australian one is also in tropical Asia and Africa.

1. ***E. nutans*** (nodding), *Lindl. in Journ. Linn. Soc. i. 177; Benth. Fl. Austr. vi. 308.* "Maapa, Barron River, *E. Cowley*. Stem ascending from a thick rhizome, 6 to 9in. high, with 2 or 3 empty scarious bracts besides those which subtend the pedicels, all ovate-lanceolate, acute, 3 or 4 lines long. Flowers white, on short pedicels in a raceme occupying the greater part of the plant. Dorsal sepal and petals lanceolate, nearly 4 lines long, very thin, connivent, lateral sepals narrower. Labellum sessile on a broad base enclosing the column, as long as the sepals, broadly ovate and very concave, entire, the spur about 1 line long, the disk with 2 obscure rows of papillæ along the centre. Appendage at the end of the anther as large as the anther itself.—*Galera nutans*, Blume, *Bijdr. 415, Coll. Orchid. t. 52, 54 E; Podanthera pallida*, Wight.  *Ic. t. 1759* (represented much larger in all its parts than the Australian specimen); *E. Guilfoylii*, *F. v. M. Fragm. viii. 30; Fitzg. Austr. Orch. ii., Pt. 5.*

Hab.: A few localities near Brisbane, *Dr. T. L. Bancroft; Barron River, E. Cowley; Mackay, L. J. Nugent.*

#### 49. HABENARIA, R. Br.

(From the long strap-like spur resembling a rein.)

Dorsal sepal erect, very concave; lateral sepals free, connivent or spreading; petals entire or bipartite, usually connivent under the dorsal sepal. Labellum 3-lobed or rarely entire, with a spur or pouch at the base. Column very short, with 2 anterior linear-clavate processes lying on or partially adnate to the base of the labellum. Anther erect, with a broad connective and marginal cells, but the connective usually so short that the erect diverging cells appear disconnected. Pollen granular in 2 masses in each cell, each pair with a caudicle attached to a gland or an appendage of the stigma opposite to the cell, and more or less confluent with it.—Terrestrial herbs, with underground usually ovoid tubers. Leaves alternate on the stem or collected near the base. Flowers several or many in a terminal spike.

A large genus dispersed over the warmer and temperate regions of both the New and the Old World.

Lateral lobes of the labellum long and very narrow-linear like the middle lobe.

Leaves narrow-oblong. Spur of the labellum above 1in. long . . . . . 1. *H. elongata*.

Leaves linear. Spur of the labellum under  $\frac{1}{2}$ in. long . . . . . 2. *H. graminea*.

Lateral lobes of the labellum filiform, 1in. long; middle lobe shorter. Spur  $1\frac{1}{2}$ in. long . . . . . 3. *H. Millari*.

Lateral lobes of the labellum very short and broad or quite obsolete, rarely shortly acuminate; middle lobe oblong or broadly linear. Spur shorter than the sepals . . . . . 4. *H. xanthantha*.

1. ***H. elongata*** (elongate), *R. Br. Prod. 313; Benth. Fl. Austr. vi. 394.* A rather stout species, above 1ft. high. Leaves oblong 2 to 4in. long. Spike rather dense. Dorsal sepal ovate, obtuse, 2 to  $2\frac{1}{2}$  lines long; petals about as long, broadly falcate; lateral sepals rather longer, adnate at the base to the sides of the spur. Labellum lobes very narrow-linear, the middle one above  $\frac{1}{2}$ in. long, the lateral ones rather shorter; the spur at least  $1\frac{1}{2}$ in. long, thickened beyond the middle. Anterior processes of the column clavate and cristate.—*Lindl. Gen. and Sp. Orch. 317; F. v. M. Fragm. vii. 15; Reichb. f. Beitr. 6.*

Hab: Rockhampton, *O'Shanesy*.

2. ***H. graminea*** (grass-like), *Lindl. Gen. and Sp. Orch. 318; Benth. Fl. Austr. vi. 394.* Stems slender, under 1ft. high. Leaves at the base of the stem linear or linear-lanceolate, acute, under 3in. long. Spike slender, short or long, with short narrow bracts. Dorsal sepal in the typical form  $2\frac{1}{2}$  lines long, lanceolate, concave; petals as long, slightly falcate; lateral sepals rather longer,



broadly falcate, all rather obtuse. Labellum deeply divided into 3 narrow-linear lobes about as long as the sepals; the spur about 4 lines long, thickened beyond the middle. Anterior processes of the column curved, rather long, adnate at the base to the labellum. Anther-cells adnate to linear processes of the stigma quite separated from each other by the very short connective and rostellum.—F. v. M. *Fragm.* vii. 16.

Hab.: Rockingham Bay, *Dallachy*; Pioneer River, *L. J. Nugent*.

This species is also in Khasia and Silhet.

3. **H. Millari** (after T. Barclay-Millar), *Bail. Bot. Bull.* 3. Slender, about 2ft. high. Leaves few at base of stem, linear, 3 to 5in. long,  $\frac{1}{4}$ in. broad, tapering to a blunt point, the lower ones much abbreviated and falcate, sheathing bracts about 6. Racemes occupying about 6in., bearing about 20 flowers, subtending bract narrow-lanceolate, shorter than the pedicel. Sepals and petals about 2 or 3 lines long, striate, lanceolate. Labellum deeply divided into filiform lobes about 1in. long, the middle one shorter than the others; spur about  $1\frac{1}{4}$ in. long or twice the length of the pedicel. Anterior processes of the column erect with white globose heads, free from labellum arising from the base of the column. Anther-cells large and deeply separated.

Hab.: Walsh River, *T. Barclay-Millar*.

4. **H. xanthantha** (flowers yellow), *F. v. M. Fragm.* vii. 16; *Benth. Fl. Austr.* vi. 395. Stems slender, often above 1ft. high. Leaves at the base of the stem, linear or linear-lanceolate and acutely acuminate as in *H. graminea*. Flowers yellow, in a rather dense spike. Dorsal sepal and petals erect, obtuse, about 3 lines long; lateral sepals nearly the same length, quite free from the spur. Labellum linear-oblong or lanceolate, obtuse, as long as the petals and more or less 3-nerved like them, sometimes quite entire, sometimes with lateral lobes short and broad or tapering into a linear point, and the two lateral lobes sometimes unlike each other; spur curved, shorter than the sepals. Anterior processes of the column quite free from the labellum, and a small lateral tooth on each side between the anther and the anterior processes. Anther-cells deeply separated as in *H. graminea*.—*H. propinqua*, Reichb. f. *Beitr.* 53.

Hab.: Rockingham Bay, *Dallachy*.

## 50. APOSTASIA, Blume.

(Probably from *apostasis*, the anthers of this genus being disunited, while in the majority of Orchids they are united).

(*Niemeyera, F. v. M.*)

Sepals and petals 3 each, nearly equal and similar, spreading or recurved, the labellum similar to the other petals. Anthers 2, oblong-linear, attached near the base of the style, erect and embracing the style, with occasionally a dorsal staminode or imperfect anther. Style linear or filiform, with a terminal somewhat dilated obtuse or 3-toothed stigma. Ovary 3-celled, the placentas affixed to the axis.—Erect herbs with leafy stems. Flowers small, yellow, in simple or branched spreading racemes in the upper axils.

Besides the Australian species, which is probably endemic, there are two or three nearly allied to it in East India and the Archipelago.

1. **A. styliidioides** (Stylidium-like), *Reichb. f. in Herb. Kew.; Benth. Fl. Austr.* vi. 396. An erect glabrous plant, with simple stems of 6 to 8in. Leaves almost grass-like linear, tapering into long points, their sheathing imbricate bases covering the stem, varying from 3 to 6in. long, with 1, 3 or rarely more

nerves prominent underneath. Racemes shorter than the leaves, slender but rigid. Bracts lanceolate, 1 to 2 lines long. Ovary nearly 3 lines long at the time of flowering, elongated but still very narrow when in fruit. Sepals and petals narrow-linear, slightly recurved, about 2 lines long, the sepals obtuse, the petals with a dorsal point just below the apex. Anthers 2, without any rudimentary one, the two cells very unequal at the base, the connective scarcely produced beyond the cells. Style rather thick, the stigma with 3 short unequal erect teeth or lobes.—*Niemeyera stylidioides*, F. v. M. Fragm. vi. 96.

Hab.: Rockingham Bay, *Dallachy*.

I have followed Brown in considering the group of *Apostasiæ* as a tribe of *Orchidæ* rather than as a distinct Order, notwithstanding the number of anomalies it unites. It has the exceptional inflorescence of *Corymbis*, the perianth of *Thelymitra*, two anthers as in *Cypripedium*, and the 3-celled ovary of *Cypripedium* (*Uropedium* and *Selenipodium*).—Benth.

ORDER CXXVIII. SCITAMINEÆ.

Flowers hermaphrodite or unisexual, irregular. Perianth superior, normally of 6 parts in 2 series, the three outer ones united in a 3-toothed or 3-lobed tube or upper lip, or in genera free, the three inner ones variously combined with the outer perianth or more frequently with the staminodes or stamens, or the lower one free. Stamens normally 3 or 6 but in most genera only 1, in *Musa* only 5, bearing anthers, the others either wanting or converted into barren petal-like staminodes often called an inner corolla, or short and linear; in most genera one of them is usually larger, broadly petal-like and on the side opposed to the perfect stamen and is then called the *labellum*. Anthers 2-celled or in some 1-celled. Ovary inferior, 3-celled, with 1 or more ovules in each cell or rarely 1-celled. Style simple with a terminal entire or lobed stigma. Fruit a berry or a fleshy or dry capsule. Seeds albuminous. Herbs usually with a perennial rhizome. Stem short or rarely elongated unless formed of the convolute leaf-sheaths, and then often attaining a considerable height. Leaves entire, with long sheathing petioles, the limb often very large, with very numerous parallel veins diverging from the midrib. Flowers often very showy, in spikes, racemes or panicles, on a radical or terminal scape or peduncle.

A considerable tropical or subtropical Order, common to the New and the Old World.

TRIBE I. **Zingibereæ**.—*Outer perianth or calyx 3-toothed or 3-lobed or spathaceous; inner perianth or corolla free from it, combined with the filament into a tube, the limb 3-lobed with sometimes 2 inner additional lobes or staminodia. One perfect upper stamen, with a 2-celled anther embracing the style, and one large petal-like labellum or lower staminode opposite it, and sometimes 2 short linear stylodes at the base of the style.*

Flowers in dense spikes with imbricate bracts, on a short or tall scape separate from the leafy stems or tufts.

Flowers 3 to 5 within each bract. Corolla with 2 inner lobes or petal-like staminodes. Ovary 3-celled . . . . .

- 1. CURCUMA.
- 2. TAPEINOCHEILOUS.

Flowers 1 to 3 within each bract. Ovary 2-celled . . . . .

- 3. ZINGIBER.
- 4. AMOMUM.

Flowers solitary within each bract. Corolla without inner lobes. Connective produced into a long linear appendage. Corolla-tube cylindrical . . . . .

- 5. ELETTERIA.
- 6. COSTUS.

Connective produced into 3-lobed appendage beyond the anther. Corolla-lobes as long as the tube . . . . .

- 7. ALPINIA.

Connective not produced beyond the anther. Corolla-tube slender much longer than the lobes . . . . .

Flowers in a thick dense spike with imbricating bracts, terminating on leafy stem. Labellum convolute erect. Ovary 3-celled . . . . .

Flowers in a loose raceme or thyrus terminating a leafy stem. Labellum flat spreading . . . . .

TRIBE II. **Museæ**.—*Inner and outer perianth more or less combined, or each 3-parted to the base. Perfect stamens usually 5.*

Perianth of 2 segments, the upper outer one 5-lobed at the end, the lower inner one much smaller . . . . .

## 1. CURCUMA, Linn.

(From the Arabic name of one species.)

Flowers hermaphrodite. Calyx tubular, 3-toothed; corolla-tube longer than the calyx, the limb of 3 outer lobes of which the upper one is broader than the 2 others, and 2 inner lobes or staminodes resembling the 2 outer lower lobes and adnate at the base on their inner margins to the short broad petal-like filament of the perfect stamen. Labellum broad and petal-like; two short linear staminodes at the base of the style. Anther oblong-linear, the two cells folded round the summit of the style and produced at the base into auricles or spurs. Ovary 3-celled. Style filiform, with a capitate stigma. Capsule 3-celled, loculicidally 3-valved. Seeds several, arillate.—Herbs with a perennial rhizome and clustered fleshy roots. Leaves with convolute sheathing bases. Scapes simple with a thick erect spike. Bracts concave or saccate and imbricate at the base, with broad spreading often coloured ends. Flowers yellow, 3 to 5 within each bract.

The genus is generally distributed over tropical Asia, the only Australian species is endemic.

1. **C. australasica** (Australian), *Hook. f. Bot. Mag. t. 5620*; *Benth. Fl. Austr. vi. 263*. Rhizome with a cluster of white cylindrical tuberous roots. Leaves 1 to 1½ ft. long, lanceolate or narrow-elliptical, acute, tapering into a long sheathing petiole. Scape lengthening to about 6 in. below the broad spike, which attains from 5 to 7 in., the upper bracts 1 to 1½ in. long, with broad spreading rose-coloured ends, the lower bracts green, closely erect and broadly saccate at the base, with short broad spreading ends. Flowers of a pale yellow, about as long as the lower bracts. Corolla-tube twice as long as the calyx, dilated upwards, the upper lobe concave and broad, the lateral outer ones and upper inner one or staminodes broadly oblong; labellum broadly orbicular almost reniform, notched and undulate on the margin. Anther-auricles narrow and acute.

Hab.: Cape York, *Daemel, Gulliver*; Cape Sidmouth, *C. Walter*; Thursday Island.

## 2. TAPEINOCHEILOS, Miq.

(Referring to the shortness of the lip.)

Flowers hermaphrodite. Calyx tubular, shortly 3-lobed. Corolla-tube short, the limb 3-lobed, the dorsal lobe rather broader and shorter than the lateral ones. Labellum erect, concave, shorter than the corolla, obscurely 3-lobed. Filament broadly petal-like, continuous with the connective and shortly produced beyond the anther-cells. No staminodia. Ovary 2-celled, with numerous ovules. Style filiform, the stigma dilated, flatly 2-lobed, without appendages. Fruit dry, indehiscent, crowned by the persistent coriaceous calyx, 2-celled. Seeds angular, with a small arillus.

The genus is supposed to be limited to a single species, which is met with in the Indian Archipelago, New Guinea and Australia.

1. **T. pungens** (pungent), *Miq. in Ann. Mus. Lugd. Bat. iv. 101, t. 4*; *Benth. Fl. Austr. vi. 267*; var. *Queenslandia*. Stems spirally curved, attaining the height of 10 to 12 ft., leafy throughout. Leaves 6 to 8 in. long, lanceolate with long narrow points, contracted into a short petiole above the long sheathing base; the cone-like spike 6 to 12 in. long and 3 to 4 in. in diameter, borne upon a scape, bearing bract-like leaves, of from 1½ to 5 ft. high. Bracts rigid, striate, imbricate, the broad ends recurved, of a rich crimson. Flowers yellow, scarcely exceeding the bracts. Calyx about 10 lines long. Corolla 1½ in. long. Labellum

much shorter. Fruiting-calyx rigidly coriaceous, compressed but thick, above 1 in. long, the lobes recurved and rigid, the free tube as long as and quite continuous with the adnate base.—*Costus pungens*, Teysm. and Binnend.

Hab.: In most of the tropical coastal scrubs.

In the normal form the spike is said to terminate the main stem, which I noticed to be the case with the plants in New Guinea. In Queensland, however, I have always found the spike borne upon a scape quite distinct from the leafy stems (see note in Cont. to Fl. of N. Guinea Ql. Agri. Journ. iii., Pt. 2., Aug. 1898), therefore the Queensland plant is given here as a variety.

### 3. ZINGIBER, Adans.

(Said to be derived from the Greek *Zingiberis*, of Sanscrit origin, the rhizomes being horn shaped.)

Calyx cylindrical, shortly 3-lobed. Corolla-tube cylindrical, segments lanceolate, upper concave. Lateral staminodia none or adnate to the obovate-cuneate lip; filament short; anther-cells contiguous, crest narrow, as long as the cells. Ovary 3-celled; ovules numerous, superposed. Style filiform; stigma small subglobose. Capsule oblong finally dehiscent. Seeds large globose, arillate.

Species belonging to the tropics of the Old World.

1. **Z. officinale** (Rosc.), var. *Cholmondeleyi*. Queensland Ginger. Rhizome as in the common form. Leafy stems 2 to 4 ft. high. Leaves numerous, the middle ones on the stem exceeding 1 ft. long and 1 in. broad at the centre, shortly petiolate at the base above the sheath, the points thread-like; the ligule extending 4 to 5 lines above the attachment of the lamina. Scapes  $1\frac{1}{4}$  to  $1\frac{1}{2}$  ft. high, with numerous obtuse or emarginate stem-clasping bracts, sometimes bearing laminae. Spikes ovoid or cylindrical, about  $3\frac{1}{2}$  in. long and  $1\frac{1}{4}$  in. diameter. Outer suborbicular bract about 1 in. diameter, upper scarios margin pale-yellow. Flower buds yellow, subulate; when first appearing from behind the outer bract it gives to that organ the appearance of being cuspidate. Inner bract about 10 lines long, greenish towards the end, enclosing the calyx. Calyx hyaline, tubular in the lower portion. Corolla-tube slender, white, enlarging upwards, about 12 lines long. Segments 3, the lower ones 3-nerved, imbricating; posterior one 9-nerved, larger and hooding over the stamen and style; all about 9 lines long, lanceolate, yellow. Labellum 3-lobed, about  $\frac{3}{4}$  the length of the other segments, middle lobe oblong, margins incurved, undulate, purple blotched with yellow; the centre or disk yellow, speckled with purple; lateral lobes erect, ovate, embracing the stamen below the anther, purplish with yellow blotches, attached near the base of labellum. Anther white, connective narrow, incurved, horn-like, dark-purple. Style glabrous, filiform, with a ciliate ring encircling the stigma. Stylodia rather long.

Hab.: Cape York Peninsula, inland from Somerset, *Cholmondeley Jardine*.

I drew attention to this plant as a producer of a good commercial ginger in a paper read at the meeting of the A.A.A. Sci. Jan. 7th, 1898; and again in Ql. Agri. Jour. vi., Pt. 6, June, 1900.

### 4. AMOMUM, Linn.

(Alluding to the counter-poison qualities some species are supposed to possess.)

Calyx tubular, spathaceous or 3-lobed at the top. Corolla-limb as long as the tube, 3-lobed, the dorsal lobe broader than the lateral ones, without inner lobes. Labellum large, flat, entire or lobed. Filaments flat, the connective produced beyond the anther-cells into a 3-lobed appendage, the lateral lobes divaricate, the middle one erect, entire or notched; anther-cells embracing the style. Two small linear staminodes at the base of the style. Ovary 3-celled. Style filiform,

clavate at the end, with a concave stigma. Fruit succulent or opening in 3 valves. Seeds arillate.—Herbs with creeping rhizomes. Leaves on barren stems often several feet high. Flowering scapes short, with sheathing scales. Spike short, with broad imbricate bracts. Flowers usually large, one within each bract.

The genus is widely spread over the tropical regions of both the New and the Old World. The Australian species are endemic.

1. **A. Dallachyi** (after J. Dallachy), *F. v. M. Fragm.* viii. 25; *Benth. Fl. Austr.* vi. 263. "To-choon," Mount Cook, *Roth*. Leaves lanceolate, narrow-pointed, often above 1ft. long and nearly 2in. broad. Scares very short. Bracts shorter than the calyx, a few larger ones at the base of the spike, the largest 1½in. long. Calyx about 1in. long, membranous, striate-veined, shortly 3-toothed. Corolla yellow, the lobes about an inch long and rather longer than the tube, the dorsal one broadly ovate, the lateral ones oblong. Labellum as long as the corolla, ¾in. broad, orbicular, contracted at the base, shortly and obtusely 3-lobed, thickened along the centre. Middle lobe of the connective-appendage shorter than the lateral ones. Capsule green, about 1in. in diameter, numerous in the spike or head, more or less succulent, nearly globular, unequally muricate, tardily opening in 3 valves. Seeds rather numerous.

Hab.: Rockingham Bay, *Dallachy*; also in many other tropical localities. Roots eaten.—*Roth*, l.c.

### 5. ELETTARIA, White.

(From *Elettari*, the Malabar name.)

Calyx tubular, 2 or 3-toothed. Corolla-limb 3-lobed, shorter than the slender tube, without inner lobes. Labellum large, flat, entire or lobed. Filament flat, but the connective not produced beyond the anther-cells; anther-cells embracing the style. Two small linear staminodes at the base of the style. Ovary 3-celled. Style filiform, clavate at the end, with a concave stigma. Fruit succulent or opening in 3 valves. Seeds arillate.—Herbs with the habit of *Amomum*, but usually more slender, with smaller flowers, fewer in a looser spike.

The genus extends over tropical Asia, the Australian species endemic.

1. **E. Scottiana** (after W. J. Scott), *F. v. M. Fragm.* viii. 24; *Benth. Fl. Austr.* vi. 264. "Jiddo," Bloomfield River, *Roth*; "Bija," Johnstone River, *W. C. Harding*. Rhizome woody, the leafy stems attaining 12ft. or more. Leaves lanceolate, 1½ to 2ft. long and 3 to 4in. broad in the middle. Scares 2 or 3in. long, with imbricate sheathing scales, passing into involucrel bracts of about 2in., silky-pubescent outside, glabrous and pinkish inside. Bracts under each flower membranous, pellucid, 2 to 3in. long. Calyx the length of the bracts. Corolla-tube 3 to 4in. long, very slender, the lobes red, nearly equal, oblong, at least ½in. long. Labellum rather longer than the corolla-lobes, ovate, entire. Connective not extending beyond the apex of the anther-cells. Capsule ovate or ellipsoid, opening tardily in 3 valves. Seeds numerous.

Hab.: Rockingham Bay, *Dallachy*; and many other tropical localities. Fruit eaten raw.—*Roth*.

### 6. COSTUS, Linn.

(Derived from the Arabic.)

Flowers hermaphrodite. Calyx tubular, shortly 3-lobed. Corolla-tube short, the limb with 3 erect lobes. Labellum convolute, erect, usually large. Filament broad and petal-like, continuous with the connective and produced laterally and beyond the cells into a broad appendage. No staminodes. Ovary 3-celled, with

numerous ovules. Style filiform, the stigma dilated, flatly 2-lobed, with 2 dorsal appendages. Capsule 3-celled, opening loculicidally in 3 valves. Seeds arillate. —Herbs with an erect leafy stem and a dense terminal spike. Bracts broad, imbricate, with 1 flower in the axil of each.

The genus is spread over the tropical regions of both the New and the Old World. The Australian species endemic.

1. **C. Potieræ** (after G. Potier), *F. v. M. Frugm.* iv. 161; *Benth. Fl. Austr.* vi. 266. Stems about 10ft. high. Leaves on very short petioles, oblong-lanceolate, acutely acuminate, 4 to 9in. long, 1½ to 2½in. broad, sprinkled underneath with appressed hairs, the sheath shortly produced above the petiole, truncate and ciliate. Spike dense, globose or ovoid-globose, 2 to 3in. long. Bracts scarlet shorter than the calyx. Calyx about 1in. long, 3-toothed. Corolla yellow, the lobes 8 to 10 lines long and nearly equal. Labellum 1in. long or rather larger, orbicular, undivided, striate along the centre. Filament and connective produced into a narrow border and a long terminal appendage beyond the anther-cells. Capsule crowned by the persistent calyx, about ½in. long, opening loculicidally in 3 slits.

Hab.: Rockingham Bay, *Dallachy*.

7. ALPINIA, Linn.

(After Prosper Alpinie.)

(*Hellenia, Willd.*).

Flowers hermaphrodite. Calyx tubular, 3-toothed, often spathaceous. Corolla-tube longer than the calyx, the limb of 3 usually unequal lobes. Labellum broad, flat, usually exceeding the corolla-lobes. Filament narrow, often filiform, the connective not at all or only very shortly produced beyond the anther-cells. Two short linear staminiodes at the base of the style. Ovary 3-celled, with many ovules. Style filiform. Stigma terminal, concave. Fruit globular or obovoid, succulent or with a crustaceous or dry pericarp, indehiscent or rarely obscurely 3-valved. Seeds not very numerous.—Erect herbs with a tuberous rhizome and leafy stems. Flowers in a terminal raceme thyrsus or raceme-like panicle. Bracts usually deciduous.

At No. 1567 Hooker's l.c. Pt., reference is made to *A. modesta*, *F. v. M.*, Rockingham Bay, being like the N. Borneo species *A. Fraseriana*, *Oliver*, but I cannot find where Mueller mentions the above plant.—*F. M. D.*

A tropical genus limited to the Old World. The Australian species are endemic.

- |  |                           |
|--|---------------------------|
| Raceme simple. Anther-connective not produced beyond the cells. Capsule tardily 3-valved | 1. <i>A. racemigera</i> . |
| Thyrsus or panicle narrow. Anther-connective produced beyond the cells.                  |                           |
| Flowers under 1in. long. Anther connective very shortly produced.                        |                           |
| Fruit crustaceous indehiscent  | 2. <i>A. cœrulea</i> .    |
| Flowers above 1in. long. Anther-appendage obovate, 2 lines long.                         |                           |
| Capsule ellipsoid, 3-valved  | 3. <i>A. arctiflora</i> . |

1. **A. racemigera** (flowers in a raceme), *F. v. M. Frugm.* viii. 27; *Benth. Fl. Austr.* vi. 265. A low species. Leaves long-lanceolate, acuminate, about 1ft. long and 2½in. broad, on a minutely biauriculate sheath without any intervening petiole. Flowers pale yellow, numerous in a single raceme of ½ft. or shorter, the rhachis and pedicels pubescent. Bracts lanceolate, shorter than the pedicels which are 2 to 3in. long. Calyx unequally divided to the middle into 3 lobes, about 4 lines long. Corolla glabrous, about 8 lines long, the lobes about as long as the tube, nearly equal but the upper one more concave. Labellum orbicular-rhomboidal, 3 to 4 lines diameter. Filament broadly linear,

$\frac{3}{4}$  line long; anther nearly 1 line, the connective not produced beyond the cells. Style capillary, with a minute stigma. Capsule ovoid, red, 4 to 7 lines long, opening tardily in 3 valves. Seeds shining, 2 to 7 in each cell.

Hab.: Rockingham Bay, *Dallachy*.

2. **A. caerulea** (blue), *Benth. Fl. Austr.* vi. 265. Leafy stems attaining 4 or 6ft. Leaves oblong-lanceolate, often above 1ft. long and 2in. broad, acutely acuminate, shortly petiolate above the sheath, which ends in a broad obtuse erect auricle of 3 or 4 lines. Thyrsus terminal, 4 to 8in. long, appearing almost as a simple raceme when first flowering, but most of the peduncles, though short, developing 2 to 6 flowers, on pedicels of  $\frac{1}{2}$  to  $\frac{3}{4}$ in., the whole peduncle usually much shorter. A convolute bract of  $\frac{1}{2}$ in. or less under each pedicel or branch, and 2 or 3 long lanceolate sheathing bracts at the base of the panicle, often 2in. long. Calyx narrow, 4 to 5 lines long, usually split on the lower side. Corolla-tube slender, 6 to 7 lines long, lobes oblong-linear, about 4 lines long, the dorsal one scarcely broader than the others. Labellum longer than the lobe, broadly orbicular or almost reniform, about  $\frac{1}{2}$ in. diameter. Connective produced beyond the anther in a rounded or truncate appendage, not 1 line long. Fruit globular, indehiscent, about  $\frac{1}{2}$ in. diameter, with a brittle crustaceous blue pericarp. Seeds few, in each cell, closely packed with a small reddish arillus.—*Hellenia caerulea*, R. Br. Prod. 308.

Hab.: Common in the coastal scrubs north and south.

Leaves sometimes infested with the fungus-blight, *Phyllachora alpinie*, C. & M.

The aborigines in the tropics suck the fruits and spit out the seeds in masses, by which the line they have gone may be traced.—*Bail.*

Var. *Arundelliana* (after E. H. Arundell), *Bail., Proc. Roy. Soc. Ql.* xi. This variety is much smaller than the common form, the margin of the leaves are wavy, and the labellum of the flower, besides being small, is of a rosy-red colour. The fruit only differs in its smaller size. Although difficult to describe in words, the distinction between these two forms is very evident when seen in the scrubs growing side by side.

Hab.: Eumundi.

3. **A. arctiflora** (flowers crowded), *F. v. M. Fragm.* viii. 25; *Benth. Fl. Austr.* vi. 266. "Booroogun," Johnstone River, *W. C. Harding*. Stems attaining 12ft. Leaves long-lanceolate about 1 $\frac{1}{2}$ ft. long and 2 $\frac{1}{2}$  to 4in. broad, contracted into a very short petiole above the long sheathing base. Panicle narrow and dense, pubescent as well as the under side of the leaves. Outer bracts few, rather above 1in. long, those subtending the peduncles 1 $\frac{1}{2}$ in. long or shorter. Calyx about 1in. long, narrow, dilated upwards and acutely 3-lobed. Corolla white, pubescent outside, the lobes about 4 lines long, the tube longer. Labellum longer than the corolla, 2-lobed, at least  $\frac{1}{2}$ in. long and broad. Connective produced beyond the anther-cells into a cuneate-obovate appendage of about 2 lines. Style glabrous. Capsule ellipsoid, 3-valved, many-seeded.—*Hellenia arctiflora*, F. v. M. l.c.

Hab.: Rockingham Bay, *Dallachy*; Russell River and Freshwater Creek, near Cairns.

## 8. MUSA, Linn.

(In honour of Antonius Musa.)

Flowers usually unisexual. Perianth of 2 segments, the outer one formed of the 3 outer and 2 of the inner parts, tubular in the bud but open from the base on the lower side, petal-like with 5 teeth or short lobes of which 2 inner ones usually smaller than the 3 outer; the inner perianth-segment (or third inner part) much shorter and usually recurved. Perfect stamens 5, with linear anthers, the sixth either wanting or forming a filiform staminode adnate to the inner perianth-segment. Ovary 3-celled, with numerous ovules. Style elongated

clavate, with a concave stigma. Fruit oblong or cylindrical, often curved, more or less succulent and indehiscent. Seeds numerous, with a coriaceous testa and a broad concave hilum; albumen copious, mealy or almost granular.—Tall often almost tree-like herbs, the convolute sheaths of their very long large leaves forming a stem of considerable height. Scapes protruding from the centre of the leaf-sheath. Flowers clustered in the axils of large coloured bracts, forming a long terminal spike or raceme, either drooping or erect.

The genus is limited to the tropical regions of the Old World. The Australian species are endemic.

Panicle drooping. Fruit cylindrical, 4 to 5in. long . . . . .	1. <i>M. Banksii</i> .
Panicle drooping. Fruit oblong-ellipsoid, 2 to 3in. long . . . . .	2. <i>M. Fitzalani</i> .
Panicle erect. Fruit oval, angular, 2in. long . . . . .	3. <i>M. Hillii</i> .

1. **M. Banksii** (after Sir Joseph Banks), *F. v. M. Fragm.* iv. 132; *Benth. Fl. Austr.* vi. 261. "Morgogaba," Cleveland Bay, *Thozet*. Stem cylindric of moderate size, stoloniferous. Leaves oblong, 5 or 6ft. long,  $1\frac{1}{2}$  to 2ft. broad, on a petiole of  $1\frac{1}{2}$  to 2ft. Panicle drooping, upper bracts oblong, rather obtuse, 3 to 4in. long, a few of the lower ones much longer and acuminate. Flowers from 10 to 20 within each bract, on short pedicels. Male perianth conspicuously striate with numerous parallel longitudinal veins, the outer convolute segment or calyx about  $1\frac{1}{4}$ in. long and 5 lines broad if spread open, shortly 5-lobed, the 3 outer lobes lanceolate, about 2 lines long, the 2 inner ones oblong and rather shorter; the lower inner segment or petal 4 or 5 lines long and at least 3 lines broad, striate like the outer one, but with a prominent midrib produced into a rather long point beyond the segment. Stamens nearly as long as the outer segment. Ovary rudimentary, with a style about as long as the stamens, slightly clavate at the end. Female flowers with an ovary of nearly  $\frac{3}{4}$ in. Outer perianth segment under 1in. long, the outer lobes narrower and more acute than in the males, the inner lobes linear; lower inner segment or petal narrow-lanceolate, above  $\frac{1}{2}$ in. long. Anthers linear but smaller than in the males. Style rather shorter than the outer perianth-segment, thickly clavate towards the end with a large concave oblique unequally lobed stigma. Fruits in bunches of 12 to 20, each one on a stipes of 1 to 2in., cylindrical, straight or slightly incurved, 4 to 5in. long,  $\frac{1}{2}$  to  $\frac{3}{4}$ in. diameter. Seeds about 2 lines diameter, irregularly angular from pressure; testa coriaceous, marked with a broad concave hilum; albumen very white nearly almost granular.—J. G. Baker. *Ann. Bot.* vii. 217; also *Kew Bull.* (1894).

Hab.: Not uncommon in the tropical scrubs.

2. **M. Fitzalani** (after E. Fitzalan); *F. v. M. Fragm.* ix. 188. Stem cylindric, robust, green, about 20ft. high. Leaves patent, oblong, 10 to 12ft. long and often 2ft. broad. Panicle drooping. The fascicles rather distant. Flowers 7 to 10 to each bract. Bracts to the male flowers 2 to 3in. long, 1 to  $1\frac{1}{2}$ in. broad. Perianth about 1in. long, segments all conspicuously striate. Stamens as long or slightly longer than the segments. Anthers obtuse,  $2\frac{1}{2}$  to  $3\frac{1}{2}$  lines long. Style sterile long as the stamens. Female flowers unknown. Fruit oblong-ellipsoid, yellowish, angular, 2 to 3in. long, narrowed suddenly to a thick pedicel, about  $\frac{1}{2}$ in. long. Seeds depressed, angular, scarcely exceeding in diameter 2 lines.—J. G. Baker, *Ann. Bot.* vii. 217, also *Kew Bull.* (1894).

Hab.: Daintree River, *E. Fitzalan* (*F. v. M.*)

3. **M. Hillii** (after Walter Hill), *F. v. M. Fragm.* ix. 169 and 190. Stem attaining 30ft. in height, and 18in. in diameter at the base, not stoloniferous, cylindric. Leaves attaining 15ft. in length, base cuneate, the petiole long. Peduncle 3in. in diameter. Panicle erect 3 to 4ft. high, cylindric. Bracts 6in. long or more, ovate, obtuse, pale yellowish-green, with a brown tip. Male flowers not numerous to each bract. Perianth  $1\frac{1}{2}$ in. long, narrow, slightly curved,



sub-4-angled, pale-yellowish. Calyx-teeth short, obtuse, 2-lateral rather the largest, those of the median tipped terminating in thickened rugose, spindle-shaped prolongation of the midrib; 2 intermediate much the smallest. Petals linear-oblong, obtuse,  $\frac{1}{2}$  shorter than the calyx. Anthers pale pink, about as long as the filaments. Female flowers pentandrous. Perianth shorter than in the male. Ovary short, ovoid, 3-gonous. Style clavate, stigma 3-lobed. Fruit 2 to 2½ in. long, sessile, ovoid, acutely angled, truncate, fleshy. Seeds numerous, 3 to 4 lines in diameter, much depressed; testa black.—Hook. Bot. Mag. 7401; J. G. Baker in Ann. Bot. vii. 217, also Kew Bull. (1894).

Hab.: Daintree River, *E. Fitzalan*, *C. Adams* and others.

ORDER CXXIX. HÆMODORACEÆ.

Flowers hermaphrodite, regular or slightly irregular. Perianth usually more or less woolly, persistent or at length deciduous, segments 6, 2-serrate, stamens 1 to each segment or opposite the inner 3 only, filaments filiform. Anthers ovate, oblong or linear, often sagittate. Ovary-inferior or semi-inferior, 3-celled or occasionally 1-celled. Style filiform. Ovules solitary or few. Capsule 3-valved.

TRIBE I. **Euhæmodoreæ**.—*Perianth glabrous, divided to the ovary into distinctly 2-seriate segments. Stigmas very small. Leaves laterally flattened or terete. Inflorescence compound or rarely simply racemose.*

Stamens 3. Ovules 2 in each cell. Capsule almost superior 3-dymous . . . 1. HÆMODORUM.

TRIBE II. **Ophiopogonæ**.—*Ovary cells 1 to 2 ovulate.*

Filaments short, free. Perianth short superior . . . . . 2\* OPHIOPOGON.

1. HÆMODORUM, Sm.

(From the plant giving a red colour.)

Perianth persistent, divided to the ovary into 6 segments, all nearly equal or the outer ones shorter. Stamens 3, inserted at the base of the inner segments, which in the open flower are usually convolute round the filaments at the base. Ovary entirely or almost entirely inferior, the broad summit either flat or with 3 slight protuberances, 3-celled, or with 2 ovules in each cell. Style simple, obtuse, entire or obscurely 3-furrowed at the stigmatic end. Capsule half or almost entirely superior, the free part 3-dymous and opening in 3 loculicidal slits. Seeds ovate, flat, with a wing-like margin, peltately attached to a prominent placenta.—Erect glabrous herbs, the base of the stem or rhizome sometimes thickened and enclosed in the persistent sheathing base of the leaves so as to resemble narrow bulbs, the fibrous roots sometimes very thick and spongy and often red. Leaves sheathing and equitant at the base, the lamina laterally flattened or terete, the lower ones sometimes very long, the upper ones few and short. Flowers black, red, of a livid green, or perhaps in some of the small flowered species yellow, usually fragrant, in clusters compound heads cymes loose panicles or interrupted spikes, with a bract under each branch or pedicel, and usually 2 on each pedicel even when very short.

The genus is limited to Australia.

- Flowers greenish-purple, perianth segments nearly equal, about 5 lines long, in a compact compound terminal cyme. Leaves flat, 2 to 3 lines broad . . . . . 1. *H. planifolium*.
- Outer perianth-segments much shorter than the inner. Flowers red, in a terminal cyme. Leaves flat, 2 to 3 lines broad . . . . . 2. *H. coccineum*.
- Leaves flat, rigid and glaucous. Flowers loosely racemose along the branches of a spreading panicle . . . . . 3. *H. ensifolium*.
- Leaves terete. Flowers single pedicellate in a dichotomous panicle . . . . . 4. *H. tenuifolium*.

1. **H. planifolium** (leaves flat), *R. Br. Prod* 800; *Benth. Fl. Austr.* vi. 422. Stems from a thick base 2 to 3ft. high, scarcely branched below the inflorescence. Lower or radical leaves long, grass-like, flat, from under 2 lines to nearly 3 lines broad, the upper ones few and short. Flowers numerous, of a livid purple or greenish at the base, in short forked racemes or cymes collected in a compact more or less corymbose panicle, but usually looser than in *H. coccineum*. Bracts narrow, subulate-acuminate, usually longer than the pedicel. Perianth-segments linear or linear-lanceolate, obtuse in the bud but appearing acuminate when open the margins being involute, about 5 lines long, the outer ones scarcely shorter than the inner. Stamens much shorter than the perianth; anthers linear, about as long as the filaments. Ovary wholly inferior, the summit showing only 3 slight protuberances. Capsule more than half superior, tridymous, 4 to 5 lines broad.—*Bot. Mag.* t. 1610.

Hab.: Between Stanthorpe and the border of N.S.W., and the gullies about Helidon.

2. **H. coccineum** (scarlet), *R. Br. Prod.* 800; *Benth. Fl. Austr.* vi. 422. "On-tho," Mitchell River, *Palmer*. "Tan-di," Cooktown, *Roth*. "Anto," Palmer River, *Roth*. "Leana," Batavia River, *Roth*. Stems from a thick base 2 to 3ft. high, not branched below the inflorescence. Leaves at the base of the stem 1 to 2ft. long, flat, 2 to 3 lines broad, very finely striate the upper ones few and short. Flowers numerous red in dense cymes forming a compact terminal compound corymbose panicle. Perianth-segments linear, the outer ones thickened and dilated at the base, 3 lines long, the inner ones rather narrower and  $\frac{1}{3}$  longer. Stamens a little shorter or longer than the perianth, the anthers much shorter than the filaments. Ovary wholly inferior. Capsule half superior, about 4 or 5 lines broad, conspicuously 3-dymous or didymous by abortion of 1 cell.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*, *Henne*, *Gulliver*; Cape York, *M'Gillivray*, *Daemel*, *Veitch*; Albany Islands, *F. v. Mueller*; Fitzroy Island and Mount Elliott, *Fitzalan*; Rockingham Bay, very abundant, *Dallachy*; Cape River and Glenelle Creek, *Bowman*.

Used for making casket dilly-bags.—*Roth*.

A fine strong fibre is found in the tough drooping leaves.—*Palmer*.

3. **H. ensifolium** (leaves sword-shaped), *P. v. M. Fragm.* i. 64; *Benth. Fl. Austr.* vi. 423. A rigid glaucous species, 2ft. high or more. Leaves rigid, with long open sheaths, the lamina flat, obtuse, 2 to 3 lines broad and about 1ft. long in the radical leaves, those of the stem short. Panicle broad loose and divaricate, the ultimate branches loosely racemose, with very small bracts. Pedicels usually about as long as the flowers. Perianth-segments oblong-lanceolate, obtuse, scarcely 2 lines long, the outer ones quite as long as the inner. Stamens about as long as the perianth. Capsule nearly  $\frac{1}{2}$  in. broad.

Hab.: Near the Gulf of Carpentaria.

4. **H. tenuifolium** (leaves slender), *A. Cunn. Herb.*; *Benth. Fl. Austr.* vi. 423. Stems  $1\frac{1}{2}$  to 2ft. high. Radical and lower leaves with a rather broad short sheathing base, very long, slender and almost terete, about  $\frac{1}{2}$  line broad. Panicle loosely divaricate, the ultimate 1-flowered branches much longer than the flower, with small distant bracts, and not at all assuming the racemose character. Perianth-segments broadly-ovate, very obtuse, all nearly the same length, the outer almost membranous with a broad base, the inner ones of a thicker consistence, nearly orbicular, contracted at the base and of a deeper colour when dry. Filaments attaining nearly the length of the perianth; anthers ovate, usually slightly exerted.

Hab.: Peat and boggy ground, shores of Moreton Bay and island, *A. Cunningham*, *F. v. Mueller*; very common in the southern coastal swamps.

2. \*OPHIOPOGON, Ker.

(So called from its name of "Snake's-beard" in Japan or China.

Perianth superior, tube none. Segments 6, distinct, spreading, oblong. Stamens 6, affixed to the base of the segments; filaments short, erect; anthers oblong or linear. Ovary globose, 3-celled, with 2 ovules in each cell. Style erect, rather long, with a shortly 3-toothed stigma. Herbaceous perennial plants with grass-like leaves, the fibrous roots often thickening into tubers. Scape leafless.

An East Asiatic genus.

1. **O. japonicus** (of Japan), *Ker. in Bot. Mag.*, 1063. A grass-like stoloniferous herbs, the roots often thickening into slender tubers. Leaves narrow-linear, 3 to 6 inches long, 1 to 1½ line broad, 5 to 7-nerved. Scape 2 to 4 inches long, naked, angular, bearing a loose raceme of a few flowers; pedicels articulate, drooping; bracts lanceolate, scarious, 2 to 3 lines long. Perianth pale. Seeds globose.

It is not quite clear whether this plant is indigenous or naturalised. It was found by Mr. W. R. Kefford in the Three-mile Scrub near Brisbane a few years ago.

ORDER CXXX. IRIDACEÆ.

Flowers hermaphrodite, regular or irregular. Perianth superior, with a short or distinct tube, the limb of 6 petal-like segments, the three inner ones sometimes very small. Stamens 3, inserted at the orifice of the tube or base of the inner segments in all the Queensland species; all fertile in the Queensland species. Filaments free or united in a tube. Anther-cells 2, parallel, erect, opening outwards. Style more or less divided into 3 lobes or branches, usually stigmatic at the end and sometimes broad and petal-like. Ovary inferior 3-celled, with several often numerous ovules in each cell. Capsule opening loculicidally in 3 valves. Seeds albuminous, with a small embryo, the radicle next the hilum. —Herbs with a perennial tuberous creeping bulbous or very short rhizome, rarely annuals. Leaves usually either radical or alternate and equitant, that is distichous, sheathing and laterally flattened at the base, produced into a linear lamina laterally or vertically not horizontally flattened so that the inner edge is towards the stem, the outer edge a continuation of the keel of the sheath. Flowers either solitary and terminal or in spikes or clusters within 1 or 2 bracts often called spathes, the bracts within the cluster usually imbricate, but each flower opposed to the bract of the same node, not in its axil. Perianths in the Australian genera mostly blue white or rarely yellow.

The Order is generally disposed over the New and the Old World, more abundant in temperate than in tropical regions, and especially rich and diversified in South Africa. The peculiar inflorescence of the several-flowered *Irideæ* does not appear to have been generally noticed. It is a kind of cyme, each flower terminates an axis, which is continued by the development of an axillary bud between the subtending bract and the flower, which thus becomes opposed to the bract of the same node. As these subtending bracts are not superposed and unilateral as in the ordinary forked cyme, but alternate along the branch, the rhachis assumes a zigzag not a scorpioid character.—*Benth.*

SUBTRIBE I. **Sisyrinchieæ**.—*Rootstock very short, fibrous roots fascicles. Spatha with 2 or many flowers, very rarely 1-flowered. Perianth-tube none or very short, lobes spreading equal or the inner ones a little larger or smaller than the outer.*

- Three outer perianth-segments usually smaller than the inner bracts all membranous and open. Filaments free . . . . . 1. LIBERTIA.
- The 6 perianth-segments nearly equal. Bracts membranous. Filaments connate below the middle or to the top. Capsule on long pedicels . . . . 2. SISYRINCHUM.

**SUBTRIBE II. Aristeeæ.**—*Rootstock sometimes very short, the fibrous roots in fascicles, creeping at times or forming erect woody stems. Perianth-tube more or less ovolute. Capsule most frequently included in the spathe.*

Spikes solitary and terminal, the outer bracts enclosing 2 sessile spikelets.

The 3 outer perianth segments large, 3 inner very small. . . . . 3. PATERSONIA.

### 1. LIBERTIA, Spreng.

(After Mademoiselle M. A. Libert de Malmidy).

(*Renealmia*, R. Br.; *Nematostigma*, Dietr.)

Perianth regular, divided to the ovary into 6 nearly equal spreading segments. Filaments free; anthers linear-sagittate. Style shorter than the filaments, with 3 linear-subulate spreading branches, stigmatic and minutely toothed or fringed at the end. Capsule ovoid or globular, 3-valved, the pericarp thin.—Herbs with a short often very short leafy base, and grass-like flat leaves almost radical though distichous. Flowering stems erect, simple or branched, with 1 or 2 leaves below the inflorescence. Flowers clustered in the axils of sheathing bracts, each flower on a slender pedicel, opposed to a bract as in other *Irideæ*, but the shortness of the rachis of the cluster, and the length of the pedicels give the cluster the appearance of an umbel, and occasion some difficulty in tracing its real structure on the dried specimens. The inspection of fresh specimens however, prove it very clearly to be in conformity with the rest of the order.

The genus extends to New Zealand and extratropical South America.

1. **L. paniculata** (paniculate), Spreng. *Syst.* i. 168; *Benth. Fl. Austr.* vi. 413. Rhizome and leafy base of the stem very short. Leaves almost radical, grass-like, flaccid,  $\frac{3}{4}$  to  $1\frac{1}{2}$  ft. long and mostly about 3 lines broad. Stem 1 to  $1\frac{1}{2}$  ft. high, with sometimes a short leaf below the inflorescence. Panicle oblong loose and irregular, occupying often half the stem, glabrous as well as the whole plant or the pedicels slightly glandular-pubescent. Bracts membranous-scarious, the lower ones rather long and acuminate, those subtending the flowers 3 to 4 lines long, ovate or ovate-lanceolate, obtuse or acute. Flower-clusters umbel-like, the pedicels 3 to 4 lines long when in flower, at least twice as long under the fruits. Ovary obovoid, about  $1\frac{1}{4}$  line long under the flower. Perianth-segments about 4 lines long, ovate, spreading, the inner ones larger than the outer. Filaments dilated at the base but not united. Style column very short, with 3-linear-subulate spreading branches, minutely fringed at the end. Capsule ovoid-globular, 3 to 4 lines diameter.—*Sisyrrinchium paniculatum*, R. Br. Prod. 305; F. v. M. Fragm. vii. 91; *Renealmia paniculata*, R. Br. Prod. Addenda; *Nematostigma paniculatum*, Dietr. Sp. Pl. ii. 510.

Hab.: Met with in the creeks of the Southern Ranges.

### 2. SISYRINCHIUM, Linn.

(So called from pigs grubbing up the roots of some species.)

Perianth regular, the tube very short, the limb of 6 nearly equal spreading segments. Filaments united to above the middle or rarely at the base only; anthers oblong or lanceolate. Style shorter than the filaments, with 3 linear or subulate spreading branches, stigmatic at the end. Capsule ovoid or globular, 3-valved, the pericarp rather thin.—Herbs with fibrous roots, and a very short tufted stock, or rarely annuals. Stem erect, often branched, usually 2-edged. Leaves mostly or all radical, narrow. Flowers on slender pedicels, clustered within 2 sheathing herbaceous bracts, the outermost one subtending the cluster on the main axis, the second outer bract and the inner membranous ones each opposed to a pedicel within the cluster, fruiting pedicels exerted from the bracts.

The genus is widely spread over

1. **S. micranthum** (flowers small), *Car. Diss.* vi. 345, t. 191; *Benth. Fl. Austr.* 412. A slender annual, usually only 2 or 3 in. high but at times attaining 12 in., the branches flattened and 2-angled but not winged. Flower-clusters on peduncles longer than the subtending leaves or bracts, one or two at the end of the stem and often one or two from lower axils. Outer bracts of the cluster  $\frac{3}{4}$  to 1 in. long. Pedicels 6 lines long, very slender. Perianth-segments pale yellow, purple at the base and along the centre to the point; more or less hairy on the outside, about  $1\frac{1}{2}$  lines long. Staminal tube about half that length, free portion of filament purple. Capsule globose,  $1\frac{1}{2}$  to 2 lines in diameter. Seeds numerous.—*Bot. Mag.* t. 2116.

Hab.: Whether indigenous or not, doubtful, it is widely spread and very abundant and has been so for the past forty years.

By some stock-holders it has been considered poisonous to stock, but from experiment carried out by Mr. R. B. Howard, its only ill-effect upon animals is to cause violent scouring.

### 3. PATERSONIA, R. Br.

(After Col. Wm. Paterson.)

(*Genosiris, Labill.*)

Perianth regular, with a filiform tube and 3 outer broad spreading segments, the 3 inner ones very small and erect or almost obsolete. Filaments united to the middle or almost to the top into a tube; anthers oblong or lanceolate, the cells usually separated by a narrow membranous connective. Style filiform, longer than the anthers, usually constricted or articulate either near the base of the anthers or near the top, and often bent down or breaking off at the constriction, the 3 stigmatic lobes obovate-orbicular or broadly oblong, contracted and united in a cup or narrow and free at the base, reflexed on the style in the bud, spreading horizontally when in flower. Capsule sessile within the bracts, linear or oblong, 3-angled, opening loculicidally in 3 valves. Herbs with a perennial short rhizome. Leaves in radical distichous tufts or rarely on shortly elongated stems, long and grass-like or rigid. Scapes or peduncles long erect and leafless, bearing a single oblong or lanceolate terminal spike, with two outer bracts enclosing 2 sessile spikelets, each with 1, 2 or several flowers and as many membranous more or less scarious bracts, each bract of the spikelets opposed to a flower on the same node. Perianths blue or very rarely yellow or white.

The genus is limited to extra-tropical Australia, or scarcely crosses the tropics on the East coast.

- Quite glabrous. Outer bracts of the spike prominently striate. Perianth tube exerted. Staminal-tube, short, trifid . . . . . 1. *P. glauca*.  
 Leaves woolly or hairy at the base. Scape woolly. Outer bracts dark and strongly striate, covered with deciduous wool. Staminal tube trifid, short. Leaves about 2 lines broad or more. Leaves woolly on the edges only. Wool of the spike close and silky . . . . . 2. *P. sericca*.  
 Leaves glabrous or hairy at the base. Outer bracts green, glaucous or pale, strongly striate, glabrous or slightly silky hairy. Staminal-tube long and undivided. Outer bracts about 2 in. long, silky-hoary. Stem elongated. Leaves glabrous or hairy on the edges, 2 lines broad or less . . . . . 3. *P. glabrata*.

1. **P. glauca** (glaucous), *R. Br. Prod.* 304; *Benth. Fl. Austr.* vi. 402. Stems exceedingly short, clustered on the rhizome, with a few outer rigid sheathing scales, gradually passing into erect rigid leaves, the longest from  $\frac{1}{2}$  to  $1\frac{1}{2}$  ft. long and  $1\frac{1}{2}$  to nearly 2 lines broad, somewhat flattened, margins not thickened. Scapes usually much shorter than the leaves, but occasionally exceeding them, with 1 or 2 sheathing scales at their base. Spike with the two outer bracts  $1\frac{1}{2}$  to  $1\frac{3}{4}$  in. long, acute, rigid, somewhat glaucous, finely but prominently striate, each spikelet containing 3 or 4 flowers, the bracts membranous and quite glabrous, as well as the flowers. Perianth-tube usually exceeding the

bracts by 3 to 5 lines; outer lobes ovate or ovate-oblong, obtuse, above  $\frac{1}{2}$  in. long; inner ones oblong-lanceolate, scarcely more than 1 line long. Staminal column short, divided to about the middle. Style slightly thickened at the end, the laminae ovate, the fringes of long cilia figured by Endlicher from Bauer's drawing not noticeable on our plants.—Hook. f. Fl. Tasm. ii. 34; Bot. Mag. t. 2677; Lodd. Bot. Cab. t. 1182; Endl. Iconogr. t. 50; *Genosiris fragilis*, Labill. Pl. Nov. Holl. i: 13, t. 9; F. v. M. Fragm. vii. 36.

Hab.: Near Wallangarra.

2. **P. sericea** (silky), *R. Br. in Bot. Mag. t. 1041, Prod. 303; Benth. Fl. Austr. vi. 406.* Stems scarcely any. Leaves radical, long, erect and rigid, rarely above 2 lines broad, the edges very woolly at the base when young. Scapes shorter than the longest leaves, usually about 1ft. high, silky-woolly towards the end. Spike stout and usually many-flowered, the outer bracts  $1\frac{1}{2}$  to near 2in. long, at first silky-woolly, but the wool often wearing off leaving the bracts prominently striate and usually dark-coloured or black in the dried specimens. Ovary very woolly; the perianth-tube less so or glabrous towards the end, not longer than the outer bracts; outer segments of the limb broadly ovate, almost truncate or emarginate, of a deep violet blue; inner segments small, ovate or lanceolate, sometimes very minute, filaments at first shortly free but at length often separate to the middle or even lower. Style jointed near the top, the laminae broadly obovate-oblong or nearly orbicular, as in other species closely reflexed in the bud, spreading when the flower is open.—*Genosiris sericea*, F. v. M. Fragm. vii. 35.

Hab.: Port Bowen, *R. Brown*; Moreton Island, *F. v. Mueller*; Wide Bay, *Leichhardt*; Glasshouse Mountains, *Byerley*; Dawson River, *Woolfs*.

3. **P. glabrata** (glabrous), *R. Br. Prod. 304; Benth. Fl. Austr. vi. 407.* This species is at once recognised by its rather slender stem of 3 to 6in. with distichous leaves not so close as in other species and the lower ones very short, the upper ones from 6in. to above 1ft. long, rarely above 2 lines broad, finely veined, the keel and sometimes also the inner edge or margins silky-woolly towards the base. Scapes or peduncles one or sometimes two on the stem, rather slender, rarely exceeding the leaves, either quite glabrous as well as the spike, or the upper part silky-hoary with a very short pubescence. Outer bracts  $1\frac{1}{2}$  to near 2in. long, very acute, rather narrow, pale-coloured and often slightly silky-hoary, distinctly striate, with broad scarious margins. Perianth-tube shortly exceeding the bracts, thinly villous at the base as well as the ovary; outer segments of the limb about  $\frac{3}{4}$  in. long in some specimens, above 1in. in others; inner ones oblong-lanceolate or slightly cuneate,  $\frac{3}{4}$  to  $1\frac{1}{2}$  lines long. Staminal column rather long and slender.—Lodd. Bot. Cab. t. 768; *Genosiris glabrata*, F. v. M. Fragm. vii. 35; *P. media*, *R. Br. l.c.*

Hab.: Shoalwater Bay, *R. Brown*; Moreton Island, *F. v. Mueller*; not uncommon.

## ORDER CXXXI. AMARYLLIDÆ.

Flowers hermaphrodite, regular or oblique. Perianth superior, with or without a distinct tube, the limb of 6 coloured or petal-like segments, all equal or rarely the 3 inner ones rather larger or smaller. Stamens 6, inserted at the orifice of the tube or base of the segments; filaments free or united at the base into a short tube or corona; anthers versatile or rarely attached at the base, with 2 parallel cells opening inwards or laterally. Style single, with 3 adnate stigmas, usually very small and confluent on the obtuse end, rarely oblong or linear and connate or diverging into stigmatic branches. Ovary inferior or rarely half-superior, 2 celled with several usually numerous rarely

only 1 or 2 ovules in each cell, amphitropous anotropous or rarely orthotropous, attached to an axile placenta, or rarely the ovary reduced to 1 cell by the abortion of 2 carpels or by the obliteration of the dissepiment. Fruit usually a capsule, opening loculicidally either at the free apex only or to the base in 3 valves, rarely succulent and indehiscent, or bursting irregularly. Seeds albuminous, with a small or linear embryo, the radicle near to or more or less distant from the hilum.—Herbs with a perennial short or tuberous or creeping rhizome, or bulbous base. Leaves mostly radical, or nearly so, the sheathing base either distichous or imbricate or bulbous, the lamina entire, usually narrow with contiguous parallel veins, either laterally compressed (equitant), terete, channelled or flat, rarely broad with distant primary veins and transverse veinlets. Scapes or flowering stems terminal, leafless or with one or more sheathing bracts or leaves much smaller than the radical ones, with a single terminal flower or more frequently with several or many flowers either in a terminal umbel surrounded by 2 or more membranous or coloured bracts, or few in a terminal raceme or many in a terminal thyrus or panicle, each branch and each flower subtended by a bract, the inflorescence usually centripetal. Perianths glabrous or hairy, most frequently white, yellow or red.

The Order is generally distributed over the warmer and temperate regions of the globe, most abundant in dry, sunny countries.

**TRIBE I. Hypoxideæ.**—*Perianth hairy or rarely glabrous. Stigmas or stigmatic lobes large, free or connate. Ovules many, in 2 rows in each cell. Seeds with a crustaceous testa, the hilum produced into a hooked beak. Leaves horizontally flattened or terete. Flowers in a simple spike or raceme or solitary.*

- Flowers solitary or few in a loose pedunculate raceme. Perianth divided to the ovary into spreading segments . . . . . 1. HYPOXIS.
- Flowers sessile within sheathing or imbricate bracts in a dense spike. Perianth usually with a long tube . . . . . 2. CURCULIGO.

**TRIBE II. Amaryllideæ.**—*Perianth glabrous. Stigmas small. Bulbous plants. Leaves horizontally flat, channelled or terete. Flowers umbellate or rarely solitary on leafless scapes.*

- No corona. Flowers large. Ovules several, in 2 rows in each cell . . . . . 3. CRINUM.
- Filament connected below the middle by a corona. Ovary 3-celled, with 2 ovules in each cell. Leaves broad, with distant primary veins . . . . . 4. EURYCYLES.
- Ovary 1-celled, with 2 ovules. Leaves narrow with close veins, or broad with distant primary veins . . . . . 5. CALOSTEMMA.

**TRIBE III. Agaveæ.**—*Perianth glabrous. Stigma small. Tall often woody plants, not bulbous. Leaves horizontally flat, channelled. Inflorescence compound.*

- Radical leaves very numerous. Flowers large, red or pale, in terminal depressed or thyrusoid panicles . . . . . 6. DORYANTHES.

1. HYPOXIS, Linn.

(Alluding to the capsule being elongated at the base.)

Perianth persistent, divided to the ovary into 6 rarely 4 nearly equal spreading segments. Stamens 6, rarely 4, inserted at the base of the segments; anthers oblong or linear, more or less lobed at the base. Ovary 3-celled, rarely 2-celled, with many ovules in 2 rows in each cell. Style short, with 3, rarely 2, oblong or linear erect stigmas connate or free, papillose outside. Capsule globular oblong or linear, crowned by the persistent perianth, which usually but not always at length falls off, carrying with it the top of the capsule, this then bursts into 3 valves and scatters the seeds. Seeds globular, with a crustaceous tubercular testa, the hilum prominent and hooked.—Herbs with bulbous or tuberous rhizomes, covered with sheathing membranous or fibrous scales. Leaves radical, flat or terete, usually hairy. Scape leafless or with a single sheathing leaf. Flowers white or yellow, solitary or few in a short raceme.

The genus is spread over tropical Asia and Africa, more abundant in South Africa, with two or three American species.

- Capsule globular or oblong, not above twice as long as broad. Anthers deeply divided at the base . . . . . 1. *H. hygrometrica*.  
 Anthers scarcely or very shortly lobed at the base.  
 Perianth-segments 3 to 5 lines long. Stamens nearly equal. Capsule ovoid or oblong . . . . . 2. *H. glabella*.  
 Capsule linear, 4 or 5 times as long as broad.  
 Leaves narrow-linear but flat with prominent nerve-like margin . . . . . 3. *H. marginata*.

1. **H. hygrometrica** (hygrometric), *Labill. Pl. Nov. Holl.* i. 82, t. 108; *Benth. Fl. Austr.* vi. 449. Rhizome thickened into a small tuber emitting thick clustered roots and covered at the top by the membranous leaf-sheaths not splitting into fibres. Leaves narrow-linear or almost filiform, from under 6in. to nearly 1ft. long, usually sprinkled or ciliate with long slender hairs. Scape shorter than the leaves, almost filiform, from only 2 or 3in. long with a single small flower, to near 6in. with 2, 3, or very rarely more flowers. Ovary turbinate. Perianth yellow, the segments about 4 lines long in the common form but sometimes smaller, usually glabrous, the outer one often darker coloured outside. Anthers deeply divided at the base into linear auricles. Style columnar, the stigmas ovate, erect, and connate. Capsule obovoid-globular, under 2 lines diameter. Seeds globular, elegantly tuberculate.—*R. Br. Prod.* 289; *Hook. f. Fl. Tasm.* ii. 36.

Hab.: Rockhampton, *O'Shanesy*; Armidale, *Perrott*; common in the south.

In all places the rootstock of this plant is used for food by the natives.

Var. *pratensis*. A small hairy slender variety, with 2 or 3 small flowers to the scape.—*H. pratensis*, *R. Br. Prod.* 289.

Hab.: From Wallangarra to Rockhampton.

Var. *elongata*. A larger hairy variety. Leaves flatter, often above 1 line broad. Flowers 2 to 5, each subtended by a subulate bract. Perianth-segments fully 5 lines long.

Hab.: From Wallangarra to Rockhampton.

2. **H. glabella** (glabrous), *R. Br. Prod.* 289; *Benth. Fl. Austr.* vi. 450. The whole plant quite glabrous. Rhizome globular, bulb-like, covered with the fibrous remains of old leaf-sheaths. Leaves linear-subulate, terete or channelled above, expanded at the base into a narrow scarious sheath, the lamina varying from 2 to 3in. long in some specimens, above 6in. in others. Scape shorter than the leaves, with a long linear erect sheathing bract at or below the middle. Ovary oblong-turbinate. Perianth very variable in size, the segments from 3 to 5 lines long, but usually about 4 lines. Stamens nearly equal; anthers entire at the base or with exceedingly short obtuse auricles. Style-column shorter than the erect free stigmatic lobes. Capsule ovoid or oblong, but not above twice as long as broad when ripe.—*Hook. f. Fl. Tasm.* ii. 36, t. 130 A; *H. vaginata*, *Schlecht. Linnæa*, xx. 568.

Hab.: Warwick and other southern localities.

3. **H. marginata** (marginate), *R. Br. Prod.* 289; *Benth. Fl. Austr.* vi. 451. Leaves slightly hairy, flat though very narrow, the longest 1½ft. long, but some only 2 or 3in., about 1 line broad, all with prominent nerve-like margins. Scapes filiform, 1-flowered, 2 to 4in. long, with very long fine spreading hairs under the flower and upon the ovary. Capsule linear, nearly ½in. long and very narrow.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

## 2. CURCULIGO, Gærtn.

(From the supposed resemblance of the seed to a weevil.)

Perianth persistent or at length withering away, the tube more or less elongated above the ovary (except in *C. recurvata*), the limb of 6 spreading nearly equal segments. Stamens 6, . . . . .



more or less free at the base. Ovary 3-celled, with numerous ovules in two rows in each cell. Style connate with the perianth-tube, shortly free above it with 3 erect or connate stigmatic lobes papillose outside. Fruit succulent, sessile within a sheathing bract. Seeds few, the testa striate, the funicle usually dilated.—Herbs with a thick rhizome and long flat or plicate-nerved radical leaves. Scapes very short or rarely longer than the spike. Flowers in short spikes or heads, each one subtended by a broad sheathing bract longer than the ovary and fruit.

The genus extends over tropical and Southern Africa and Asia, with one American species. Both the Australian species have a wide range over tropical Asia.

Leaves broad. Flowers in a dense nodding head on a scape of several inches.

Perianth tube scarcely any . . . . . 1. *C. recurvata*.

Leaves narrow. Flowers in an almost sessile spike. Perianth-tube filiform . . . . . 2. *C. ensifolia*.

1. **C. recurvata** (recurved), *Ait. Hort. Kew. ed. 2, ii. 253*; *Benth. Fl. Austr.* vi. 448. Rhizome thick, with densely-clustered fibrous roots. Leaves radical, glabrous or nearly so, the petioles 6in. to near 1ft. long with a broad sheathing base, the lamina oblong-lanceolate, 1 to 3ft. long, strongly ribbed and plicate. Scapes densely woolly, from scarcely above ground to 6 to 8in. high, recurved under the inflorescence. Spike or head of flowers nodding, very dense, ovoid or nearly globular, 1 to 2in. diameter, with broadly lanceolate imbricate striate more or less woolly-hairy bracts, the outer ones usually empty and sometimes above 1in. long, the upper ones subtending the flowers shorter. Perianth very woolly-villous on a short thick pedicel; segments of the limb ovate, spreading, 3 to 4 lines long, glabrous inside, separated almost to the ovary or united at the base in an exceedingly short ring. Filaments very short, the anthers oblong and erect, connivent into a cone round the style, which is slender slightly dilated and minutely 3-lobed at the stigmatic end. Capsule nearly globular, more or less succulent, softly hairy, about 3 lines diameter. Seeds globular, with a black rugose crustaceous testa.—*Bot. Reg. t. 770*.

Hab.: Rockingham Bay, *Dallachy*; not uncommon in damp tropical scrubs.

The species extends over the eastern provinces of India and the Archipelago.

2. **C. ensifolia** (leaves sword-shaped), *R. Br. Prod. 290*; *Benth. Fl. Austr.* vi. 448. "Jool-lun," Butcher's Hill; "U-o-ba," Morehead River; "Un-dor-a," Musgrave River; "Kom-mol," Cooktown; Yuara, Palmer River; *Roth*. Stem short, produced into a descending rhizome with fibrous roots and more or less covered with the scarious sheathing bases of old leaves. Leaves usually 6 to 9in. long and  $\frac{1}{4}$  to  $\frac{1}{2}$ in. broad in the middle, but sometimes 1 to 1 $\frac{1}{2}$ ft. long and almost  $\frac{3}{4}$ in. broad, tapering at both ends, with prominent nerves and more or less hairy especially towards the base. Spikes short and erect at the base of the leaves, the scarious sheathing bracts subulate-acuminate, often 1in. long. Ovary almost sessile, elongated, enclosed in the bract. Perianth-tube filiform, hairy,  $\frac{1}{2}$  to  $\frac{3}{4}$ in. long above the ovary; segments of the limb usually 3 to 4 lines long, with lanceolate-pointed segments more or less hairy outside. Filaments short; anthers linear, the parallel cells shortly free at the base. Style column very short below the stigmas, which are as long as the anthers and connate or shortly free at the top. Capsule oblong, enclosed in the sheathing bract. Seeds several, the black testa elegantly striate but not tubercular.—*S. stans*, *Labill. Sert. Austr. Calcd. 18, t. 24*; *C. orchoides*, *Miq. Fl. Ind. Bat. iii. 585* and others, but not of *Roxb.*

Hab.: Prince of Wales and other islands off Cape York, *R. Brown*; Wide Bay, *Leichhardt*; Rockingham Bay, *Dallachy*; Fitzroy Island, *C. Walter*; Broadsound, *Bowman*; Keppel Bay, *Thozet*; Moreton Bay, *C. Stuart*; Bundaberg, *J. Keys*.

Root, after being roasted. eaten.—*Roth, l.c.*

## 3. CRINUM, Linn.

(Supposed to be the Greek for Lily.)

Perianth hypocrateriform or funnel-shaped; tube long, cylindrical, straight or curved; segments linear, lanceolate or oblong, subequal. Stamens inserted at the throat of the perianth-tube; filaments long, filiform. Anthers linear, versatile. Ovary 3-celled; ovules few, sometimes 2 only in a cell, but in the Australian species sometimes from 10 to 12, sessile or immersed in the thick placenta. Style usually long, filiform, more or less declinate; stigma minute, capitate. Fruit irregular in shape, finally bursting. Seeds large, bulbiform, with very thick albumen.—Rootstock a large bulb, with membranous tunics and a produced neck which in some species forms a thick stem, the bulb entirely disappearing. Leaves persistent, often broad. Peduncle or scape solid. Flowers few or many in an umbel, white or reddish; pedicels usually short; spathe-valves 2, broad.

The genus extends over tropical and southern Africa and Asia.

- Stem 1, 2 or more ft. high, and 4 or more in. thick. Leaves glaucous 3 to 4ft. long, about 4in. broad, thick, margins smooth. Peduncles  $1\frac{1}{2}$  to 3ft. long. Flowers in umbel about 25. . . . . 1. *C. pedunculatum*.  
 Stem probably short above the ground. Leaves deep-green,  $2\frac{1}{2}$ ft. long, 4 to 5in. broad. Peduncle  $1\frac{1}{2}$  to 2ft. long. Flowers in umbel about 20. . . . . 2. *C. Douglasii*.  
 No perennial stem above ground.  
 Leaves 2ft. long,  $\frac{3}{4}$ in. broad. Scape  $1\frac{1}{2}$ ft. high. Flowers in umbel 6 to 7 . . . . . 3. *C. venosum*.  
 Leaves 2 to 5ft. long, 2in. broad. Scape 2ft. high. Flowers in umbel 10 to 30 . . . . . 4. *C. brachyandrum*.  
 Leaves 2 to 3ft. long,  $2\frac{1}{2}$ in. broad in the centre. Scape 2 to  $2\frac{1}{2}$ ft. high. Flowers in umbel 8 to 10 . . . . . 5. *C. brevistylum*.  
 Leaves 1 to  $1\frac{1}{2}$ ft. long,  $1\frac{1}{2}$  to  $3\frac{1}{2}$  lines broad. Scape 6 to 12in. high. Flowers in umbel 1 or sometimes 2 . . . . . 6. *C. uniflorum*.  
 Leaves from  $1\frac{1}{2}$  to more than 2ft. long, 1 to  $1\frac{1}{2}$ in. broad, the margins more or less scabrous. Scape 1ft. or more high. Flowers in umbel few . . . . . 7. *C. angustifolium*.  
 Leaves 2ft. or more long, 1 to  $1\frac{1}{2}$ in. broad, margin scabrous. Scape 1 to  $1\frac{1}{2}$ ft. high. Flowers in umbel 8 to 10 . . . . . 8. *C. pestilentis*.  
 Leaves  $1\frac{1}{2}$ ft. long,  $\frac{1}{2}$ in. broad, margins slightly scabrous. Scape about 16in. high. Flowers in umbel about 10 . . . . . 9. *C. brisbanicum*.  
 Leaves  $1\frac{1}{2}$  to 2ft. long, 1 to  $1\frac{1}{2}$ in. broad, margin scabrous. Scape  $1\frac{1}{2}$  to 2ft. high. Flowers in umbel 6 to 8 . . . . . 10. *C. flaccidum*.

1. ***C. pedunculata*** (peduncles long), *R. Br. Prod.* 297; *Benth. Fl. Austr.* vi. 455. Stems several to a plant, thick, often 5 or 6in. diameter, from 1 to over 2ft. high, leafy in the upper half. Leaves usually about 15 to a stem, glaucous, thick, 3 or 4ft. long, and over 4in. broad above the centre, and slightly tapering to somewhat obtuse points; the longitudinal nerves and cross veinlets prominent; margins smooth. Peduncles usually from the axils of the lower leaves, often exceeding 2ft. in length, compressed,  $1\frac{1}{2}$ in. broad near the base, 1in. broad at the top. Involucral bracts of firm consistence, 4in. long,  $1\frac{1}{2}$ in. or more broad at the base, tapering to blunt points; the thread-like bractioles about 3in. long, and 1 line broad, flat, and white. Flowers in umbel about 24. Pedicels  $1\frac{1}{2}$ in. long, the ovary  $\frac{1}{2}$ in. long. Perianth-tube erect, green, angular, rather slender,  $3\frac{1}{2}$  to 4in. long; segments linear, white,  $2\frac{1}{2}$ in. long, 4 or 5 lines broad; filaments spreading about  $\frac{2}{3}$  of the length of the segments, purplish in the upper half; anthers narrow-linear, 6 or 7 lines long, pollen yellow. Style erect,  $\frac{1}{2}$  to  $\frac{3}{4}$  or slightly exceeding the length of the filaments, purple, or, when long, white towards the base. Stigma minutely lobed. Capsules 1 to 2in. in diameter, irregularly globose, on stout pedicels from 1 to  $1\frac{1}{2}$ in. long, the terminal beak prominent, 4 or 5 lines long. Seeds 9, angular, immersed in the placenta, varying much in shape and size.—*Ql. Agri. Journ.* iv. 47.

**Hab.:** Creeks off Brisbane River. A common plant of the southern swamps. The leaves at times infested with the







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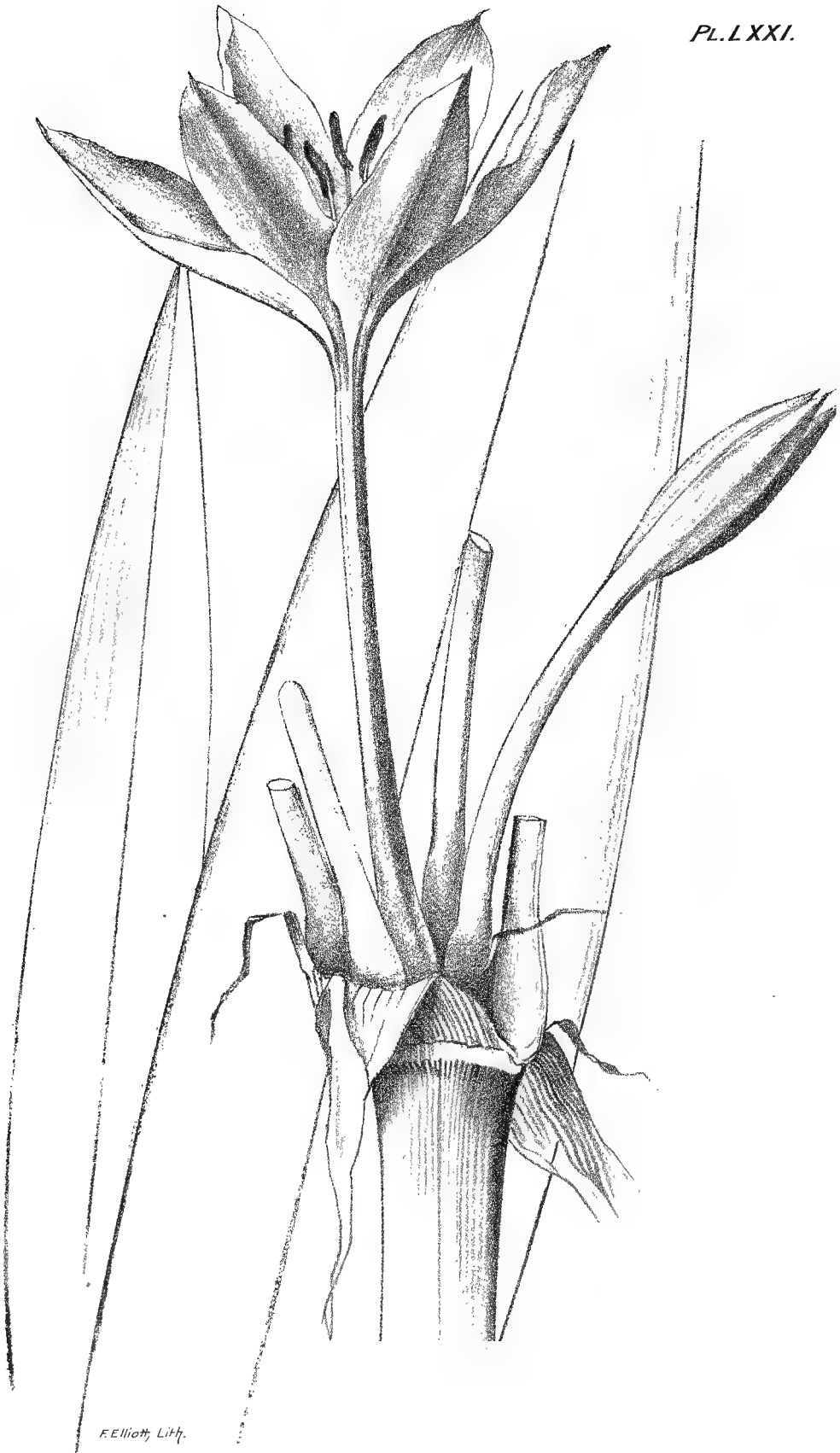
*F. Elliott, Lith.*











F. Elliott, Lith.

*Crinum*

2. **C. Douglasii** (after the Hon. John Douglas), *Bail. Bot. Bull.* x. A handsome plant, in general appearance before sending up its flower-scape reminding one of a *Furcraea*. It does not seem to form a columnar stem like *C. pedunculatum*. Leaves numerous, deep green, about 2½ ft. long and 4 or 5 in. broad, tapering from above the middle to a somewhat blunt point, the longitudinal nerves numerous, crossed by horizontal veins, which, from being very prominent, give a tessellated appearance to the upper face of the leaf. Peduncle somewhat compressed, and darkly mottled, about as long as the leaves, bearing an umbel of about 20 flowers on rather thick pedicels, which are about as long as the ovaries, the involucre bracts membranous, about 4½ in. long, and ¾ in. broad at the base. Perianth-tube about 5½ in. long and scarcely exceeding 2½ lines in diameter. Segments of the limb shortly pointed, 3½ in. long, those representing the sepals rather the longest and broadest, ½ in. wide in the broadest part; the margins of these are also undulate, and give a frilled or crenulate appearance; the margins of the inner segments have smooth, not wavy, margins. Filaments about ¾ the length of the segments, slender, purplish-red except towards the base; anthers very slender, ½ in. long. Style as long as the segments, purplish except near the base. Stigma of 3 short fringed lobes.

Hab.: Islands of Torres Straits.

3. **C. venosum** (veiny), *P. Br. Prod.* 297; *Benth. Fl. Austr.* vi. 453. Bulb globose, smooth, about 1¼ in. in diameter. Leaves about 2 ft. long, ¾ in. broad. Scape about 1½ ft. high, more or less compressed. Involucral bracts about 3 in. long. Umbel of 6 to 8 or sometimes as many as 20 then often 4 or 5 abortive. Flowers sometimes sessile, sometimes on pedicels, ¾ in. long, the ovary tapering at the top into a neck or beak, sometimes short, sometimes longer than the ovary itself. Perianth-tube 2 to 4 in. long, slender, the segments of the limb acuminate, 1½ to 2 in. long, 4 to 5 lines broad in the middle, not more conspicuously veined in the dried state than other species. Filaments 4 to 5 lines long; anthers nearly or quite as long. Style a little longer than the stamens.

Hab.: Sweet's Island, *R. Br.* and *Henne*; Cumberland Island, *R. Br.*; Cape York.

4. **C. brachyandrum** (stamens short), *Herb. in Baker's Handb. of Amaryll.* 83. Bulb 3 in. diameter; neck short. Leaves about 20 to a bulb, suberect, ensiform, 3 to 5 ft. long, 2 in. broad, deep-green, not tapering much to the point. Scape 2 ft. high. Flowers about 10 to 30 to an umbel, not perfectly erect; pedicels very short. Perianth-tube greenish, under 3 in. long; segments lanceolate, ½ in. broad, rather longer than the tube. Filaments scarcely an inch long. Style an inch long. Seeds 2 in a cell.—Baker's *Amaryllidæ*, 1888.

Hab.: Doubtful. Recorded for Queensland by Baron von Mueller in his *Cens. of Austr. Pl.*, and J. G. Baker l.c., neither authors, however, having seen specimens and no figure of it has been published. If such a species really exists its position would be as here placed between *C. venosum* and *C. brevistylum*.

5. **C. brevistylum** (style short), *Bail. Ql. Agri. Journ.* ii. 197, *Plate xvii.* Bulb globular-ovate, 4 to 6 in. diameter, not producing a persistent column, but forming an annual crown of foliage consisting of about 12 to 14 leaves of a slaty-green. Leaves ensiform, erecto-patent, from 2 to over 3 ft. long and 2½ in. broad about the middle, then gradually tapering to a rather blunt end. Scapes often more than one arising from amongst the outer leaves, from 2 to 2½ ft. high, compressed, thick, ¾ to over 1 in. broad. Involucral bracts 2½ to over 3 in. long, rather blunt, 1 in. broad at the base; flowers in umbel from 8 to 10, pedicels thick, shorter, or sometimes as long as the ovaries which are about ½ in. long. Perianth white, not strongly fragrant, drooping in the bud; tube rigidly erect under the cup-shaped open flower, green or greenish, 3 to 4½ in. long, more or less

angular, segments linear-lanceolate, about  $2\frac{1}{2}$ in. long,  $\frac{3}{4}$  to 1in. broad near the centre, the outer ones with subulate green tips. Stamens erect, less than one-half the length of the segments, upper half of the filaments purple, pink, or in the flowers of some plants white. Anthers narrow,  $\frac{1}{2}$ in. long, style enclosed in the tube and only about two-thirds its length, the upper part purplish; stigma obtusely lobed.

Hab.: Turtle Island off Somerset.

6. **C. uniflorum** (single-flowered), *F. v. M. Fragm.* iii. 23; *Benth. Fl. Austr.* vi. 451. "Bulb ovate-globular." Leaves 5 or 6 to a bulb, linear, 1 to  $1\frac{1}{2}$ ft. long,  $1\frac{1}{2}$  to 3 lines broad, flaccid. Scape slender, 6in. to 1ft. high, bearing only 1 or rarely 2 sessile or shortly pedicellate flowers enclosed in 2 bracts of about 2in. in length. Ovary not at all or scarcely contracted at the top. Perianth white, the tube 4 to 5in. long, recurved in the bud; segments of the limb  $2\frac{1}{2}$  to 3in. long, 4 to 6 lines broad in the middle. Filaments bright red,  $1\frac{1}{2}$ in. long. Anthers  $\frac{1}{2}$ in. long and narrow. Style longer than the stamens. Ovules several in a cell.—Baker's *Amaryll.* 83.

Hab.: Coen River, Gulf of Carpentaria, *R. Brown*; Swee's Island, *Henne*; Albany Island, Cape York, *M'Gillivray*; sandy flats exposed to the sun, Somerset, Cape York, *Veitch*.

7. **C. angustifolium** (narrow-leaved), *R. Br. Prod.* 297; *Baker's Handl. of Amaryll.* 83. Bulb sub-globose, 3in. diameter, the neck short. Leaves linear, firm in texture, sub-erect,  $1\frac{1}{2}$  to over 2ft. long, 1 to  $1\frac{1}{2}$ in. broad, tapering to the point, scabrous or serrulate at the margin. Scape 1ft. or more high. Umbel few-flowered. Involucres bracts lanceolate, 2 or more in. long; pedicels short. Perianth-tube slender, 3 to 4in. long, curved in the bud stage. Segments lanceolate,  $2\frac{1}{2}$  to 3in. long,  $\frac{1}{2}$ in. broad. Filaments bright-red,  $1\frac{1}{2}$  to 2in. long. Anthers linear,  $\frac{1}{2}$ n. long. Style as long as the segments. Ovules 5 to 6 in a cell.

Hab.: Frequently met with inland. Mr. Baker gives the two following forms as varieties of this species.

Var. *confirtum*, *Herb. in Bot. Mag. t.* 2522. Flowers sessile; perianth-segments 4in. long, a little exceeding the tube.

Var. *blandum*, *Roem. Amaryll.* 76, *Bot. Mag. t.* 2531. Leaves broader than in the type. Perianth-segments broader. Filaments whitish.

8. **C. pestilentis** (ill effects of flowers), *Bail. Ql. Agric. Journ.* ii. 198; *Pl. xvii.*, *Fig.* 1; showing to separate flowers. Bulb ovate-globular, 3 or 4in. diameter, usually situated 10 or more inches below the surface of the ground. Leaves deep-green, linear, 2 or more ft. long, 1 to  $1\frac{1}{2}$ in. broad, texture firm, margin scabrous. Scape 1 to  $1\frac{1}{2}$ ft. high, compressed,  $\frac{3}{4}$  to 1in. broad. Flowers pure white or slightly blushed on the outside, about 10 in each umbel. Involucral bracts about 3 to  $5\frac{1}{2}$ in. long and  $\frac{3}{4}$ in. broad at the base, sometimes tapering to a narrow point, sometimes almost linear with a broader apex. Pedicels  $\frac{1}{2}$  to  $1\frac{1}{2}$ in. long. Ovary beaked, of equal length with the pedicels or shorter. Perianth-tube  $3\frac{1}{2}$ in. long. Segments of limb 3 or 4in. long and 1in. broad about the middle, the outer with subulate points. Filaments white, not declinate, about half as long as the perianth-segments, anthers lunate about 4 lines long. Style slender, nearly the length of the segments, and slightly green in the upper half. Stigma minute. Fruit on stout pedicels about 1in. long, compressed globular, but often so bluntly lobed as to appear quadrate, the larger ones about  $1\frac{1}{2}$ in. diameter but scarcely that high, crowned by the entire, rigid, green furrowed perianth-tube. Seeds about 8, angular.

Hab.: Bulloo River, *J. F. Bailey*.

I was led to give the above name to the present species from the fact that persons camping in places where it is flowering in quantities being apt to be seized with violent vomiting. I have



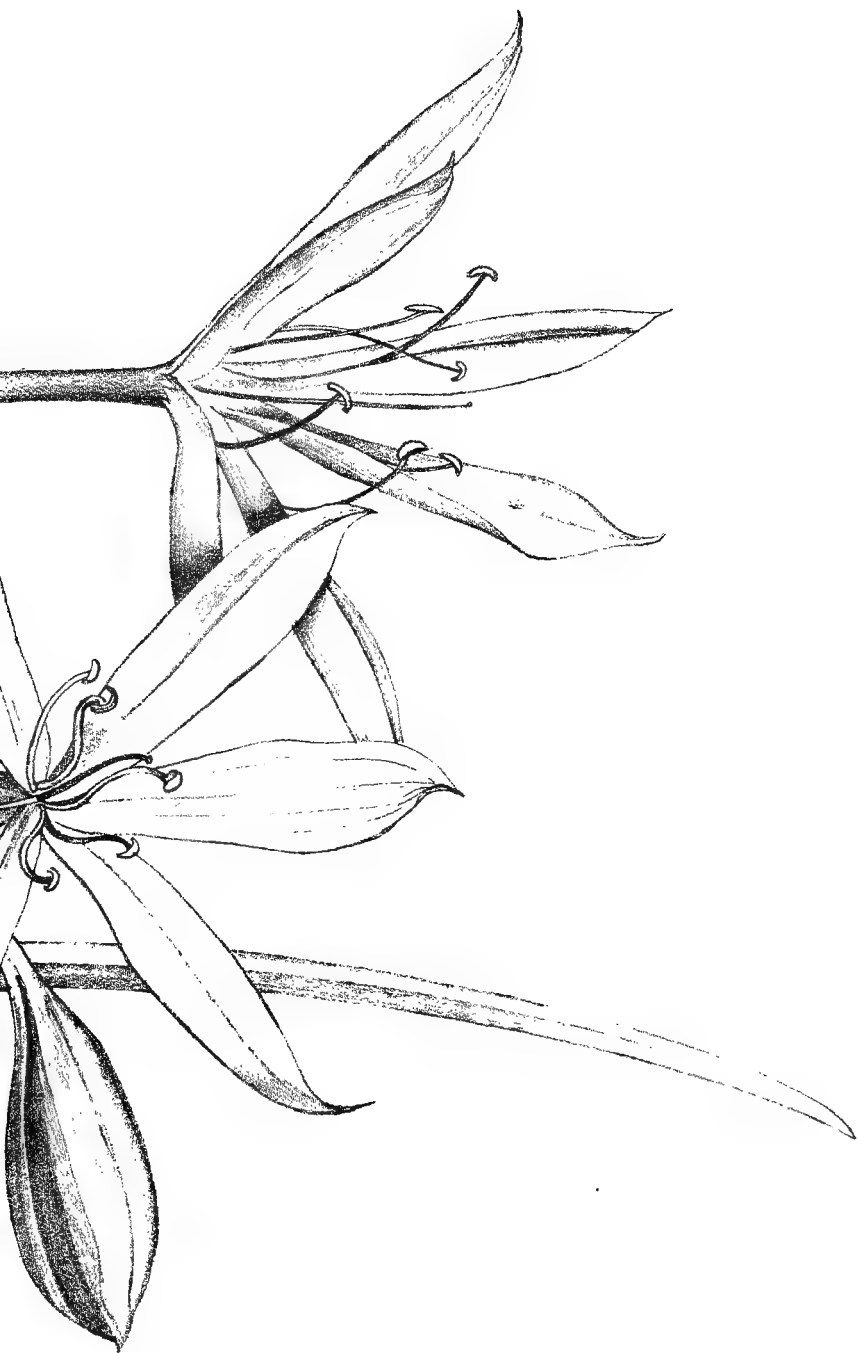




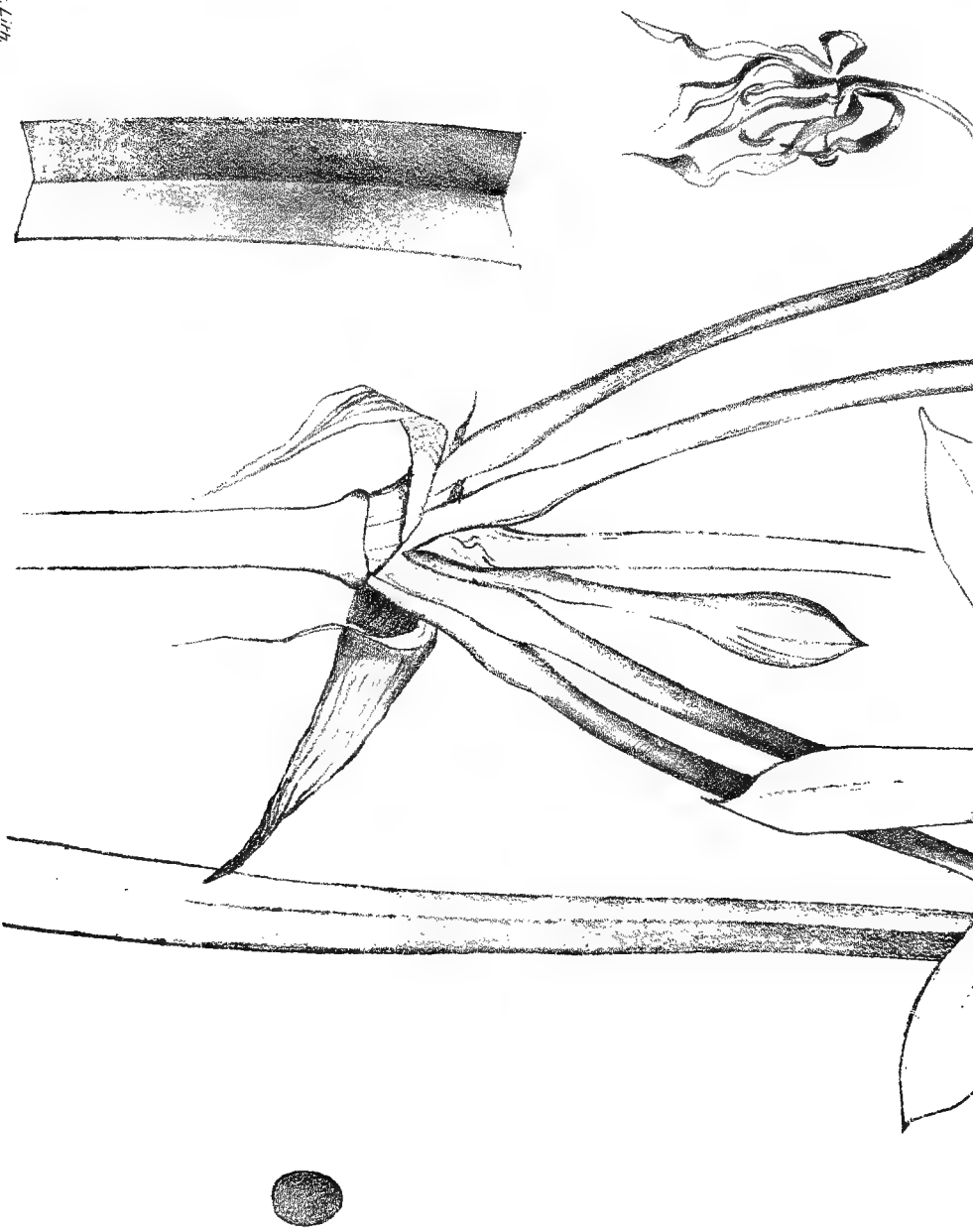








F. ELLIOT, LITH.



*Crinum brisbanicum*, Bail.  
Gov't Printing Office, Brisbane.



myself felt unwell from the odour of a single flower in a room. The species is very near one mentioned by Mr. Baker under the name *C. angustifolium*, var. *blandum*, also *C. arenarium*, B. Herb., in Bot. Mag. t. 2531, which is in Flora Austr. under *C. flaccidum*.

9. **C. brisbanicum** (of Brisbane), *Bail. Ql. Agric. Journ.* iv. 47. Bulb about 1½ in. diameter, not produced into a column. Leaves 5 or 6 to each plant, linear, substance rather thick, the margins very slightly rough, about 18 in. long and about ½ in. broad, of a deep bright-green. Scape about 16 in. high, compressed-cylindric, scarcely exceeding ½ in. diameter at the base. Flowers in umbel about 10, the 2 large involucral bracts 2 or 3 in. long, the interior ones (bracteoles) thread-like. Pedicels about 6 or 7 lines, ovary 3 lines long. Perianth-tubes slender, greenish, 3 in. long. Segments lanceolate, 2¼ in. long, ½ in. broad, white, with more or less greenish subulate points, those on the outer segments the longest. Stamens about half the length of the segments, those opposite the outer segments shorter than the other three; filaments deep-pink. Anthers 2¼ in. long. Style coloured like the filaments and shortly exceeding them. Buds pinkish outside and pendulous before opening. Flower fragrant, erect.

Hab.: Sandy land near the coast, Brisbane River.

10. **C. flaccidum** (feeble), *Herb. in Bot. Mag.*, t. 2193; *Benth. Fl. Austr.* vi. 454. Bulb ovoid, 3 to 4 in. diameter, neck very short. Leaves linear, 1½ to 2 ft. long, 1 to 1½ in. broad, the nerves close, margins scabrous. Scape 1½ to 2 ft. high, much compressed. Flowers white, usually 6 to 8 in the umbel, on pedicels varying from ½ to 1½ in., the bracts of the involucre much dilated at the base, 3 to 4 in. long. Ovary not beaked and scarcely contracted under the perianth. Perianth-tube scarcely 3 to 4 in. long, usually curved, the segments of the limb about 2½ to 3 in. long, and much broader than in any other Australian species, ¾ in. in some specimens, nearly 1 in. in others, the whole size of the flower evidently variable. Filaments from ⅔ to ¾ as long as the segments; anthers from scarcely above 3 lines to 1½ in. Ovules several in each cell, superposed.—*Amaryllis australasica*, Ker. in Bot. Reg. t. 426; *A. australis*, Spreng. Syst. ii. 54.

Hab.: A southern inland species.

4. EURYCLES, Salisb.

(Alluding to the broad divisions of the corona.)

Perianth deciduous, funnel-shaped, with a slender but usually short tube and 6 nearly equal broad lobes. Stamens 6, inserted at the mouth of the tube; filaments united at the base or to above the middle in a corona, produced between the free parts of the filaments into 2 lobes and sometimes separating between the filaments so as to leave them free but dilated into lateral appendages; anthers 2-lobed at the base. Ovary 3-celled, with 2 ovules in each cell collaterally attached to an axile placenta. Style filiform, obtuse, with a terminal stigma. Fruit more or less succulent, with 1 or few seeds.—Bulbous herbs. Leaves all radical, petiolate, the lamina broad with longitudinal rather distant veins and transverse veinlets between them. Scape leafless. Flowers usually white, in a terminal umbel surrounded by 2 or 3 membranous bracts.

The genus extends over some islands of the Indian Archipelago.

Leaves very broad and cordate. Corona not ¼ as long as the perianth-lobes . . . . .

- 1. *E. amboinensis*.
- Leaves ovate, not cordate. Corona not ⅓ as long as the lobes . . . . . 2. *E. Cunninghamii*.

1. **E. amboinensis** (of Amboyna), *Loud. Encycl. Pl.* 242; *Benth. Fl. Austr.* vi. 456. "Bulb. tunicate, brown." Leaves usually several, on rather long petioles, broadly ovate-cordate orbicular-cordate or almost reniform, often 8 to

10in. long and as broad or broader, with numerous arcuate rather distant veins and transverse veinlets between them. Scapes 1 to 2ft. high, bearing an umbel of numerous white flowers. Bracts of the involucre 2 or 3, shorter than the pedicels, which vary from  $\frac{3}{4}$  to near 2in. long, articulate immediately under the ovary. Perianth above 2in. long, the lobes elliptical-oblong, rather longer than the tube. Corona 4 to 5 lines long, divided to below the middle into 6 lobes, each one divided at the apex into 2 lanceolate acuminate diverging lobes with the filament between them; stamens altogether shorter than the perianth.—Hook. Bot. Mag. under t. 3399; *Pancratium amboinense*, Linn., Red. Lil. t. 384, Bot. Mag. t. 1419; *Eurycles sylvestris*, Salisb. in Trans. Hort. Soc. i. 337; Kunth, Enum. v. 689, with several synonyms; *Pancratium australasicum*, Ker. in Bot. Reg. t. 715; *Eurycles australasica*, Loud. Encyl. 242; *E. australis*, Schult. Syst. vii. 911; Kunth, Enum. v. 691.

Hab.: Islands of Caincross, *Veitch* (with flowers  $2\frac{1}{2}$ in. long); Rockingham Bay, *Dallachy*; Mount Elliott, *Fitzalan*. The species is also in the Indian Archipelago.

**2. E. Cunninghamii** (after A. Cunningham), *Ait. MS.*; *Lindl. Bot. Reg. t. 1506*; *Benth. Fl. Austr.* vi. 456. Bulbs about lin. diameter. Leaves on long petioles, ovate, not cordate, but veined as in *E. amboinensis*, varying from 4 to 10in. long. Scapes about 1ft. high, with an umbel of 6 to 10 flowers surrounded by 2 or 3 bracts. Perianth 1 to  $1\frac{1}{2}$ in. long, the tube rather shorter than the obovate-oblong lobes. Corona about  $\frac{2}{3}$  the length of the perianth, with 2 lanceolate lobes to each filament, and sometimes splitting lower down between them. Fruit apparently succulent, nearly globular, about  $\frac{1}{2}$ in. diameter, but not quite ripe.—Bot. Mag. t. 3399.

Hab.: Brisbane River, Moreton Bay, *A. Cunningham*, *F. v. Mueller*, *Leichhardt*, *C. Stuart* and others; Rockhampton, *Bowman*.

### 5. CALOSTEMMA, R. Br.

(Alluding to the pretty crown of flowers.)

Perianth at length deciduous, with a slender but usually short tube and a funnel-shaped or spreading nearly equal 6-parted limb. Stamens 6, inserted at the mouth of the tube; filaments united to about the middle in a tubular corona, truncate or shortly lobed between the free parts of the filaments; anthers 2-lobed at the base. Ovary 1-celled, with 2 or 3 ovules collaterally attached to one side of the cavity. Style filiform, obtuse, with a terminal stigma. Fruit globular, succulent, ripening usually only one rather large fleshy seed.—Bulbous herbs. Leaves all radical, narrow with close parallel veins or broad with more distant veins and transverse veinlets. Scapes leafless. Flowers variously coloured, smaller than in *Eurycles*, in a terminal umbel surrounded by 2 or 3 membranous bracts.

The genus is endemic in Australia. The remarkable reduction of the ovary to a single cell appears to be due to the early abortion of two of the carpels.—*Benth.*

Leaves linear. Perianth-tube dilated under the limb. Flowers yellow . . . . 1. *C. luteum*.  
Leaves ovate. Perianth-tube not dilated under the limb. Flowers white . . . . 2. *C. album*.

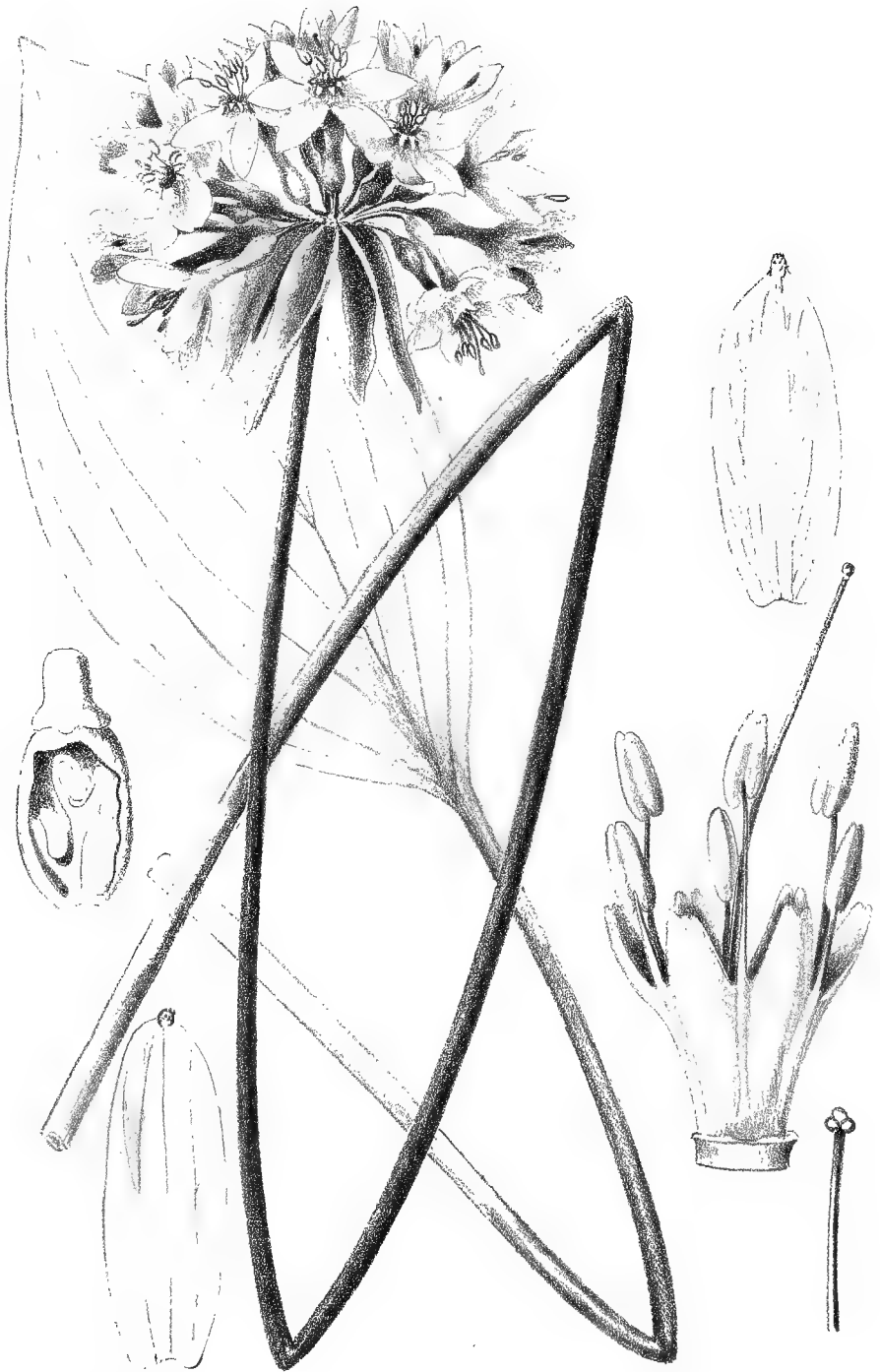
**1. C. luteum** (yellow), *Sims, Bot. Mag. t. 2101*; *Benth. Fl. Austr.* vi. 457. Corona-tube narrow with purple lined in the lower half, usually truncate between the filaments or minutely toothed, but sometimes produced into short broad entire or notched lobes. Stamens often shortly exceeding the perianth.—Kunth, Enum. v. 688; Bot. Reg. t. 421 and 1840, t. 19; *C. candidum*, Lindl. in Mitch. Three Exped. i. 54; Kunth, l.c.

Hab.: Rockhampton, *Thozet*, *O'Shanesy*; Barcoo, *Schneider*; Darling Downs, *Law*; Cooper's Creek.

This plant has been considered poisonous to stock.







F.C. Willd., Del. et Lith.

*Calce.*

## CXXXI. AMARYLLIDÆ.

### 6. DORYANTHES, Corr.

(Alluding to the flower-stem resembling a spear.)

Perianth of 6 nearly equal deciduous segments spreading from near the base; the three inner ones slightly dilated at the base. Stamens 6; filaments linear-subulate or slightly dilated at the base; anthers elongated, the basal lobes closing over the filament. Style elongated, 3-furrowed, with an obtuse terminal 3-angled stigma. Capsule 3 to 4 in. long, oblong-clavate or turbinate, with a woody endocarp opening loculicidally in 3 valves. Seeds flat, reniform, in 2 rows in each cell.—Very tall herbs, with clustered roots and very long and numerous radical leaves. Stems simple with short leaves. Flowers large, red to nearly white, in short elongated spikes collected into a large terminal depressed panicle or head or elongated into thyrsoïd panicles.

The genus is limited to Australia.

1. **D. excelsa** (tall), *Correa in Trans. Linn. Soc.* vi. 213, t. 23, 24; *Benth. Fl. Austr.* vi. 452. Radical leaves above 100, 4 or more ft. long, broadly sword-shaped. Stem 10 to 18 ft. high with numerous short linear-lanceolate erect leaves sheathing at the base. Flowers red, in a dense terminal globular head of 1 ft. or more in diameter, surrounded by a few green acuminate leafy bracts or floral leaves, the spikes or clusters within the head of 3 or 4

Loryanthes.]

## CXXXI. AMARYLLIDÆ.

flowers each, subtended by coloured lanceolate bracts, the rhachis 1 to 2 in. long in the normal form, with an oblong or lanceolate coloured bract under each flower. Pedicels short and thick. Ovary or adnate perianth-tube about  $1\frac{1}{2}$  in. long; segments of the limb about 4 in. long, broadly oblong-linear, obtuse, thick, concave and undulate, nearly erect quite at the base, then spreading or recurved. Filaments about 3 in. long, adnate to the perianth at the base; anthers above 1 in. long.—R. Br. Prod. 298; Bauer Illustr. Pl. N. Holl. t. 12 to 14; Bot. Mag. t. 1635.

Hab.: W. Hill mentions a white-flowered variety which he found on Mount Lindsay.—*Benth.*

Var. *Palmeri*. Leaves 5 to 6 ft. long, 2 to 4 in. broad. Flower-stem 8 to 10 ft. high, the upper portion forming a thyrsus. Bracts linear-lanceolate, coloured like the flowers. The secondary bracts about 4 in. long, bearing 3 to 4 flowers; the bract subtending each flower short. Perianth-segments oblong-lanceolate, pale or white inside below the middle, about  $2\frac{1}{2}$  in. long, spreading from near the base. Filaments rather thick at the base. Anthers about  $\frac{3}{4}$  in. long. capsule 4 in. long,  $1\frac{1}{2}$  in. broad, oblong-rostrate. Seed with wing 1 in. long.—*D. Palmeri*, W. Hill; *Benth. Fl. Austr.* vi. 452.

Hab.: Cunningham's Gap, Mount Mistake, and many other localities on the Main Range.

Var. *Guilfoylei*. Leaves 8 to 9 ft. long, 7 to 8 in. broad. Flower-stem 13 to 15 ft. high, one half being occupied by the thyrsus. Bracts lanceolate about 1 ft. long. Each secondary rhachis bearing several flowers of an intense vermilion; bract subtending flower oblong, about 3 in. long. Perianth-segments oblong-lanceolate, 2 to  $2\frac{1}{2}$  in. long. Filaments rather thick at the base. Anther about  $\frac{1}{2}$  in. long.—*D. Guilfoylei*, *Bail. Bot. Bull.* vii.

Hab.: Burdekin River, W. R. *Guilfoyle*.

2. **C. album** (white), *R. Br. Prod.* 298; *Benth. Fl. Austr.* vi. 458. Leaves resembling those of *Furycles Cunninghamii*, but smaller, ovate, acute, tapering at the base, 3 to 5 in. long, 2 to 3 in. broad, with distant converging primary veins and transverse veinlets. Scapes 1 to 1½ ft. high, bearing an umbel of numerous white flowers on filiform pedicels of ¼ to ⅓ in. surrounded by 3 or 4 bracts. Perianth-tube narrow, 4 to 5 lines long; segments of the limb narrow, not quite so long as the tube, spreading from the base so as to give the flower a more hypocrateriform shape instead of the more funnel-shape of *C. purpureum* and *C. luteum*. Corona produced between the filaments into lanceolate entire or bifid lobes as long as the filaments. Fruit globular, rather large.

Hab.: Turtle Island, Gulf of Carpentaria, *R. Brown*.

A remarkable species with the flowers of *Calostemma* and the leaves of *Furycles*.

Dr. Hooker's plate has been reproduced in the hope that it may be the means of the plants rediscovery.

## ORDER CXXXII. TACCACEÆ.

Flowers-hermaphrodite, regular. Perianth superior, persistent, tubular or campanulate, 6-lobed: Stamens 6, inserted in the tube, opposite to the lobes; filaments broad, hood-shaped, shortly 2-lobed at the end; anther-cells 2, parallel, adnate to the inside of the hood and projecting between the lobes. Ovary inferior, 1-celled, with 3 parietal placentas and many anatropous or amphitropous ovules. Style short, with a broad umbrella-shaped stigma deeply divided into 3 bifid lobes. Fruit a berry, crowned by the withered perianth. Seeds ovoid, many-ribbed; albumen copious, embryo minute, near the hilum when basal, at a distance from it if lateral.—Herbs with a perennial tuberous creeping or fibrous rhizome. Leaves radical, on long petioles, large and much divided, or in species not Australian undivided. Flowers on a radical scape in a dense terminal simple umbel, usually intermixed with long filaments (barren pedicels), and surrounded by an involucre of a few large thin bracts.

The Order is limited to a single genus, represented in the tropical regions of the New as well as the Old World. The only Australian species has a wide range over the Indian Archipelago and the Islands of the South Pacific.

### 1. TACCA, Forst.

(From the Amboynan name Tää.)

Characters and distribution those of the Order.

1. **T. pinnatifida** (pinnatifid), *Forst.*; *Kunth, Enum.* v. 458; *Benth. Fl. Austr.* vi. 458. "Be-ung-gal," Bloomfield River; "Pe-ang-gul," Butcher's Hill; "Ung-ke," Morehead River; "Niu," Batavia River; "An-tith-a," Red Island, *Roth*. Rhizome tuberous, globular, attaining under cultivation a large size but usually not above 2 or 3 in. diameter in the wild plants. Petioles erect, 1 to 3 ft. long below the ramification, divided always into 3 branches which are again often bifid or trifid or dichotomous or irregularly branched, each branch pinnate with remarkably variable distant or more or less confluent segments. In the larger varieties the three branches are often 2 to 3 ft. long, once bifid or trifid, the larger segments ovate-lanceolate acuminate and 4 to 6 in. long, but intermixed with smaller ones, some of which often very small, obovate or oblong and very obtuse; some, whether large or small, contracted into a short petiolule and distant, others decurrent along the petiole, or confluent with the next segments. In another Australian form (*T. Brownii*, *Seem. Fl. Vit.* 100) the leaf-branches are under 1 ft. long, the segments all more or less lanceolate and acuminate but very unequal in size. In a third rather distinct Australian form (var. *aconitifolia*, *F. v. M.*, *T. maculata*, *Seem. Fl. Vit.* 103) the leaves are more regularly divided, the branches almost dichotomous

with numerous linear-lanceolate segments regularly diverging so as to form a circle of about 6 to 8 in. diameter. Scapes the length of the petioles, arising from within its sheathing base, with sometimes a scarious sheathing scale outside the petiole. Involucres of few (about 4 to 6) oblong or lanceolate obtuse or acuminate bracts of a thin texture, 1 to 2 in. long, but those of the same involucre very unequal and often 2 or 3 additional very small ones. Flowers numerous, on pedicels  $\frac{1}{2}$  to 1 in. and usually mixed with numerous long filaments or capillary barren pedicels 3 to 4 in. long. Perianth-segments in some ovate and 2 lines long, in others lanceolate and 3 lines, but the difference owing to different stages of development, the inner lobes scarcely larger than the outer. Berry ovoid-globular,  $\frac{3}{4}$  to 1 in. diameter, contracted into a short neck crowned by the persistent withered perianth limb.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown, Sweers*; Rockingham Bay, *Dallachy*; Fitzroy island, *C. Walter*: common on the islands of the tropical coast.

Root, after being soaked, hammered and roasted, eaten.—*Roth* l.c.

### ORDER CXXXIII. DIOSCORIDEÆ.

Flowers unisexual, usually diœcious, regular. Perianth superior, of 6 lobes or segments. Stamens 6 or 3, inserted on the perianth or in the centre of the flower round a rudimentary ovary, shorter than the perianth-lobes; anthers with 2 parallel cells opening inwards. Ovary inferior, 3-celled, with 2 pendulous ovules in each cell. Stigmas 3, entire or 2-cleft, on a single or distinct styles, or sessile on the ovary. Fruit a 3-angled capsule, opening at the angles in 3 loculicidal valves, or an indehiscent berry. Seeds albuminous, with a minute embryo near the hilum.—Herbs often forming large tuberous rhizomes or woody half underground trunks, the stems usually slender long and twining. Leaves alternate or opposite, entire or divided, the nerves or primary veins parallel or digitate, the intervening veinlets reticulate. Flowers small, usually of a yellowish green, in axillary simple or paniculate spikes or racemes, the male inflorescence usually more branched than the female.

The Order comprises but few genera, dispersed over the tropical and temperate regions of the globe.

#### 1. DIOSCOREA, Linn.

(After Pedacius Dioscorides, the Greek physician.)

(*Helmia, Kunth*.)

Flowers diœcious. Stamens in the Australian species 6. Capsule 3-angled or 3-lobed, opening longitudinally at the angles, often leaving their nervelike margins free. Seeds winged.—Underground rhizomes often tuberous and known by the name of *Yams*. Stems twining.

A large tropical and subtropical genus, especially numerous in South America.

A. *Leaves 3 to 5 foliate.*

Perianth and fruit unknown. Leaves 3 to 5 foliate, and as well as the stems more or less hairy . . . . . 1. *D. sp.?*

B. *Leaves simple.*

Perianth-segments broad. Capsule broader than long. Seeds winged all round.

Leaves frequently opposite, ovate-cordate or triangular-hastate with a broad open basal sinus . . . . . 2. *D. transversa.*

Perianth-segments narrow. Capsule longer than broad. Seeds winged at one end only. Leaves alternate, ovate-cordate . . . . . 3. *D. sativa.*

1. **D. sp. ?** Stems slender, more or less clothed with short brownish hairs. Leaves 3 to 5-foliolate, leaflets often hairy like the stems, ovate-lanceolate, apiculate, mostly 2 to 3in. long; petioles long as the leaflets, with pisiform bulbs in the axils. As I stated in *Vol. vii. p. 443, Rep. Aust. Ass. Ad. Sc.*, this plant is nearly allied to *D. Kumaonensis*, Kunth, Hook. Fl. Brit. Ind. vi. 290.

Hab.: Thursday Island.

2. **D. transversa** (transverse), *R. Br. Prod.* 295; *Benth. Fl. Austr.* vi. 460. "Am-pu," Red Island, *Roth*; "Kowar," Rockhampton, *Thozet*; "Guiaba" or "Gyabi," Barron River, *E. Cowley*. A slender glabrous twiner with a tuberous rhizome. Leaves opposite or alternate, triangular-hastate or ovate-cordate, the basal lobes always very spreading with a broad obtuse sinus, more or less acuminate, 5 or 7-nerved, usually 3 to 4in. long and scarcely half as broad, but on barren shoots sometimes broader than long. Male flowers sessile and distant along the rachis of interrupted slender spikes of 1½ to 2in., the spikes clustered along the branches of axillary panicles. Perianth-segments orbicular, above 1 line diameter in some specimens, not half so large in others, but perhaps not fully developed, all much imbricate, the 3 inner ones rather smaller. Anthers on short filaments inserted on a disk, with a small rudiment of an ovary in the centre. Female racemes simple, 2 to 4in. long, the flowers distant. Ovary oblong-linear. Perianth of the males but smaller. Styles short, distinct, the stigmas shortly 2-cleft. Capsule shortly stipitate, the axils about ¾in. long, the protruding angles or lobes about ¼in. long.

Hab.: Very common in southern more rare in northern localities.

The fragrance of the minute flowers at times very powerful.

Roots, after being roasted, eaten, *Roth*.

3. **D. sativa** (cultivated), *Linn. Spec. Pl.* 1463, *Hort. Cliff. t.* 28, but not of *Kunth, Enum.*; *Benth. Fl. Austr.* vi. 461. Yam. "Kun-janga," Butcher's Hill; "Wi-ka," Morehead River; "Un-woo," Red Island; "Dai-peri," Batavia River, *Roth*; "Karro," Mitchell River, *Palmer*. Stems from a tuberous rhizome elongated and twining; often bearing green globular bulbs in the axils of the leaves. Leaves alternate, broadly ovate, deeply cordate, usually 9-nerved, or when 7-nerved the extreme lateral nerves forked, very variable in size, in the Australian specimens usually 3 to 6in. long and nearly as broad. Male spikes slender, 1 to 2in. long when fully out, usually numerous, clustered along the branches of long narrow axillary panicles. Flowers very small, the perianth-segments very narrow, those of each series almost valvate in the bud, the inner ones linear. Stamens 6, the anthers almost sessile in the centre of the flower round a rudimentary pistil. Female flower in longer slender single spikes. Capsule oblong, the axis about ¾in. long. Seeds flattened, winged at the lower end only, assuming quite the form of a samara, the wing at least twice as long as the nucleus.—*D. bulbifera*, *R. Br. Prod.* 294; *Wight, Ic. t.* 878 and of most modern authors but not of *Linn.*—*Helonia bulbifera*, *Kunth, Enum. v.* 435.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; abundant in most of the tropical scrubs.

Roots eaten after being soaked and roasted.—*Roth* and *Palmer*.

Var. *elongata*. "Kalkur," Cooktown, *Roth*. "Anyorbil," Palmer River, *Roth*. The yams long.

Var. *rotunda*. "Wokai," Cooktown, *Roth*. The yams round.

The above description is far from satisfactory but my material does not allow me to furnish good descriptions of the three or more species or varieties that are generally quoted here under the name of *D. sativa*, *Linn. Wight. Ic.* 878, *D. bulbifera*, *Linn.*, represents one grown in Queensland gardens from which it has strayed in a few instances but is not indigenous; the indigenous ones never have such large leaves nor such large axillary tubers, this species was first introduced by *Capt. L. Hope*.

## 2. PETERMANNIA, F. v. M.

(After A. Petermann.)

Flowers hermaphrodite. Perianth superior, almost 6-parted to the base; narrower. Stamens 6, attached to the base of the perianth, nearly as long as the segments oblong spreading or at length reflexed, subequal, or the inner ones slightly segments; filaments erect, short; anthers oblong erect, cells contiguous, dehiscence extrorse. Ovary inferior, ovoid, contracted at the apex, 1-celled, placentas 3, parietal; style slender, columnar, shorter than the perianth; stigma capitate. Ovules to each placenta many, horizontal or pendulous. Fruit a 1-celled many-seeded berry. A tall, climbing, branching shrub; the stems often prickly. Leaves alternate, shortly petiolate, oblong or lanceolate, acuminate, rigid, nerves many, subparallel, the interior ones confluent with the costa, the veinlets reticulate. Flowers in loose cymes or racemes, axillary, lateral or leaf-opposed, flowers few, rhachis flexuose; the inflorescences sometimes reduced to a tendril.—Benth. and Hook. Gen. Pl. iii. 746.

The genus is limited to a single species.

1. *P. cirrosa* (tendril bearing), *F. v. M. Fragm.* ii. 93; *Benth. Fl. Austr.* vi. 462. A glabrous climber, 15 to 20ft. high, with the aspect rather of the *Smilax* tribe than of the *Dioscorideæ*, the branches slightly angular and bearing a few minute prickles. Leaves alternate, rigid, oblong lanceolate or ovate-lanceolate, acuminate, 2 to 3in. long,  $\frac{3}{4}$  to 1in. broad, tapering into a short petiole slightly twisted at the base as in *Smilax*, the longitudinal veins numerous, but mostly starting from the midrib below the middle and not reaching the base of the leaf, with reticulate veinlets between the veins. Panicles narrow and loose, leaf-opposed and rather longer than the leaves, the branchlets short and the inflorescence few-flowered, in some parts the inflorescences are replaced by simple tendrils. Fruit a berry, crowned by the scar of the fallen flower, containing many seeds.—Hook. Ic. 1391.

Hab.: Border of N.S.W. towards the Tweed River.

## ORDER CXXXIV. ROXBURGHIAEÆ.

Flowers hermaphrodite, regular. Perianth inferior, of 4 deciduous segments, all nearly equal and similar, imbricate in 2 rows. Stamens 4, almost hypogynous; filaments very short, free or united in a ring; anthers erect, with 2 cells opening laterally or inwards in longitudinal slits. Ovary free, 1-celled; ovules several, either erect from the base or suspended from the apex of the cavity; stigma terminal, sessile. Fruit a capsule, opening in 2 valves. Seeds several, the funicle bearing as a strophiole a dense tuft of hairs or long linear papillæ; testa striate. Embryo linear or small, in a fleshy albumen.—Erect herbs or tall twiners. Leaves alternate opposite or verticillate, petiolate, with distant primary veins and transverse veinlets. Flowers 2 or more together on slender pedicels, in axillary clusters or short racemes.

Genera and species few.

## 1. STEMONA, Lour.

(stamen, remarkable form of)

(Roxburghia, *Banks in Roxb. Corom. Pl.* i. 29, t. 32.)

Perianth-segments 4, lanceolate, many-nerved. Stamens hypogynous, filaments very short, more or less connate in a ring; anthers linear, erect, connective produced beyond in a very long linear-lanceolate erect appendage. Ovary free, compressed. Stigma small, sessile, pointed; ovules 2 or more, erect, funicles long or short. Capsule ovoid or oblong, compressed, few-seeded. Seeds erect,

ovoid or oblong, terete, grooved, beaked; funicle bearded, testa thick. Roots of fleshy tubers. Leaves opposite, alternate or whorled, ovate, 3 to 9-nerved. Flowers solitary, or few and subracemose.

1. **S. javanica** (of Java), *Kunth, Enum. v. 288, var. ? Australiana; Benth. Fl. Austr. vii. 1.* A glabrous twiner. Leaves alternate, from ovate to lanceolate, acutely acuminate, rounded truncate or shortly tapering at the base, mostly 3 to 4 in. long, on very short petioles, 5-nerved or when very narrow 3-nerved, with very numerous fine parallel veinlets. Flowers 2 together in the axils, on filiform pedicels of 6 to 9 lines articulate above the middle, with a small lanceolate bract at their base. Perianth-segments narrow-lanceolate, acute, 5-nerved, about  $\frac{1}{2}$  in. long. Filaments united in a short cup round the ovary. Anthers including the appendage nearly as long as the perianth, the connective thickened and rugose both at the back and in front between the narrow linear lateral cells, and produced beyond them into a long smooth linear appendage. Ovary ovoid, contracted at the end, with a very obtuse sessile stigma. Ovules not numerous. Fruit not seen.

Hab.: Endeavour River, *Banks and Solander* (if correctly determined).

#### ORDER CXXXV. LILIACEÆ.

Flowers hermaphrodite or rarely more or less diœcious, regular or rarely slightly oblique. Perianth inferior, with or without a distinct tube, the limb or whole perianth of 6 coloured or petal-like lobes or segments, imbricate in 2 series or the outer ones rarely valvate; all equal and similar, or the 3 inner ones rather larger or smaller or more united or occasionally broader and thinner than the 3 outer. Stamens usually 6, attached to base of the lobes or segments or almost, rarely quite, hypogynous, or rarely slightly perigynous, the 3 opposite the outer segments often smaller, and in a few genera reduced to staminodia or deficient; filaments free or shortly united at the base; anthers erect or versatile, with 2 parallel cells opening inwards or laterally or rarely outwards, or by terminal pores. Ovary superior, 3-celled (imperfectly so in *Astelia*), with several often numerous, rarely only 1 or 2, ovules in each cell, amphitropous anatropous or rarely orthotropous, attached to an axile placenta. Style usually single with a small terminal stigma entire or obscurely 3-lobed, or in a few genera divided to the base or nearly so into 3 oblong or linear diverging or recurved stigmatic branches. Fruit either an indehiscent berry, or a capsule loculicidally or in a few genera septicidally opening in 3 membranous coriaceous or slightly fleshy valves, or rarely dividing into 3 indehiscent 1-seeded nutlets, in a few species reduced by abortion to 1 cell or nutlet. Seeds various, the testa frequently black, crustaceous or thin and adnate. Embryo small or linear, variously placed within a fleshy cartilaginous or hard albumen.—Perennial or rarely annual herbs with a short or tuberous creeping rhizome, or (in genera not Australian) a bulbous base, or the stock growing up into a woody caudex, or the stems elongated branching shrubby or even arborescent or occasionally climbing. Leaves most frequently in radical tufts, or crowded at the ends of the caudex or branches, but sometimes spread along the branches, their sheathing bases distichous, or variously imbricated, or scattered, and often persistent after the blade has fallen away, the blade or lamina entire or minutely scabrous-denticulate, usually narrow with parallel veins, flat channelled or terete, rarely broad with distant primary veins and transverse veinlets. Scapes or flowering stems or peduncles terminal or rarely axillary, leafless or with 1 or 2 leaves below the inflorescence smaller than the lower ones, and passing into the bracts under the branches of the inflorescence or pedicels, which are usually reduced to small scales, and sometimes entirely



wanting. Inflorescence variously branched or simple, usually centripetal, or reduced to a single terminal flower. Perianth usually glabrous, very variously coloured, often blue, as well as red, white, yellow, or purple.

The Order is generally distributed over the warmer and temperate regions of the globe; most abundant in dry sunny countries.

TRIBE I. **Smilacææ**.—Stems climbing. Leaves 3 to 5-nerved and reticulately veined, petioles often cirrhiferous. Flowers small, in umbels. Anthers after dehiscence 1-celled. Ovules few, orthotropous or half anatropous.

- Flowers dioecious, in sessile or pedunculate umbels . . . . . 1. SMILAX.
- Flowers hermaphrodite, in racemes either simple and axillary or terminal and paniculate . . . . . 2. RHIPOGONUM.

TRIBE II. **Asparagææ**.—Stems erect or climbing. Leaves replaced by usually linear or acicular cladodes. Flowers small, solitary, fascicled or racemose. Anthers distinctly 2-celled. Ovules few, orthotropous or half anatropous.

- Cladodes or leaves clustered, subulate. Flowers axillary . . . . . 3. ASPARAGUS.

TRIBE III. **Luzuriagææ**.—Stems erect, branching shrubby or climbing. Leaves various. Flowers axillary or terminal, solitary or fascicled cymose or rarely racemose. Anther-cells distinct. Ovules few or numerous, anatropous or half anatropous.

- Leaves flat, solitary. Anthers erect. Tall climbers. Flowers axillary. Inner perianth-segments fringed . . . . . 4. EUSTREPHUS.
- Flowers in terminal cymes. Inner perianth-segments entire . . . . . 5. GRITONOPLEBIUM.

TRIBE IV. **Hemerocalleææ**.—Leaves linear, radical. Flowers large, paniculate, racemose or spicate. Perianth cylindrical or funnel-shaped. Filaments inserted in a dorsal pit of the anther. Ovules numerous. Fruit a capsule.

- Ovary stipitate, with numerous ovules in each cell. Capsule septicidally 3-valved. Flowers pendulous in a terminal raceme . . . . . 6. BLANDFORDIA.

TRIBE V. **Dracænææ**.—Leaves radical or on an erect woody stem. Perianth cylindrical funnel-shaped or campanulate. Anthers basifixed or dorsifixed, filaments not inserted in a pit. Fruit a berry. Ovary with the cells 1-ovulate.

- Ovary with the cells 1-ovulate . . . . . 7. DRACÆNA.
- Ovary with the cells many-ovulate . . . . . 8. CORDYLINA.

TRIBE VI. **Asphodeleææ**.—Rootstock short, or a bulb. Flowers racemose or paniculate. Perianth segments distinct. Capsule loculicidal or a berry in Dianella.

- Perianth deciduous, not twisted; filaments bearded. Raceme simple . . . . . 9. BULBINE.
- Perianth spirally twisted over the ovary after flowering, at length deciduous. Capsule 3-valved, filaments glabrous. Anthers 6 or 3, the cells opening longitudinally, but the outer valve produced beyond the inner. Inner perianth-segment fringed, enclosing the inner stamens in the bud. Umbels usually 2 or more flowered . . . . . 10. THYSANOTUS.
- Perianth not twisted, persistent round the fruit, unchanced or withering. Filaments hairy in the upper half. Flowers loosely racemose. Anthers not recurved. Seed angular . . . . . 11. ARTHROPODIUM.
- Filaments glabrous. Anthers with basal crests. Seeds angular . . . . . 12. DICHOPOGON.
- Perianth spirally twisted over the ovary after flowering, at length deciduous. Umbels or clusters in a simple raceme. Anthers 6, free opening in slits. Capsule obtuse-angular; ovules 2 in each cell. Seeds globular . . . . . 13. CÆSIA.
- Flowers minute, solitary or 2 together along the rigid branches; filaments glabrous. Nutlets 1-seeded, indehiscent . . . . . 14. CORYNOTHECA.
- Perianth persistent. Filaments abruptly thickened under the anther. Anthers erect, opening in terminal pores. Fruit a berry . . . . . 15. DIANELLA.
- Filaments bearded or with adnate appendages under the anther. Anthers recurved after flowering. Seeds flattened . . . . . 16. STYPANDRA.

TRIBE VII. **Alliææ**.—Rootstock in the genus Allium a bulb.

- Scape simple; flowers umbellate or capitate, at first enclosed in a spathaceous involucre. Capsule loculicidal, tunicate bulbs. Perianth segments connate . . . . . 17. \*NOTHOSCORDUM.

TRIBE VIII. **Johnsoniæ**.—*Rootstock short or creeping. Stems not bulbous, often low branching or rush-like. Flowers in fascicles or crowded in terminal heads; bracts imbricate.*

- Perianth spirally twisted over the ovary after flowering but at length deciduous; filaments bearded or woolly. Nutlets usually 2 or 3. Umbels terminal . . . . . 18. TRICORYNE.
- Perianth the outer segments free, the inner ones shortly united at the base. Anthers 6, short, 2-lobed at the base. Seeds few, black, not flattened . . . . . 19. LAXMANNIA.
- Flowers in heads on long peduncles. Bracts densely imbricate. Perianth hypocrateriform, tube very slender. Stamens 6. Capsule 3-valved . . . . . 20. BORYA.
- Flowers in umbels, with numerous scarious imbricate bracts. Anthers 3, divided into long erect lobes . . . . . 21. SOWERBYA.

TRIBE IX. **Anguillaricæ**.—*Rootstock a tunicate corn. Stem one or more leaved. Anthers dehiscing extrorsely. Styles 3, distinct, or rarely connate at the base.*

- Perianth segments free, deciduous, induplicate or convolute round the opposite stamens in the bud. Capsule septically 3-valved . . . . . 22. BURCHARDIA.
- Perianth persistent the segments quite distinct. Flowers simply spicate . . . . . 23. ANGUILLARIA.
- Perianth-segments separately deciduous. Flowers few. Inflorescence simple . . . . . 24. IPHIGENIA.

TRIBE X. **Uvularicæ**.—*Rootstock tuberous or creeping. Stems leafy. Leaves not sheathing. Flowers axillary or terminal. Anthers dehiscing extrorsely. Style filiform, 3-fid.*

- Perianth-segments without appendages. Flowers solitary or few in a terminal umbel. Capsule loculicidally 3-valved. Leaves ovate or lanceolate . . . . . 25. SCHELHAMMERA.
- Perianth-segments with glandular appendages at the base. Flowers solitary or few in axillary peduncles. Capsule loculicidally 3-valved. Leaves ovate or ovate-lanceolate . . . . . 26. KREYSIGIA.

1. SMILAX, Linn.

(Alluding to the sharp prickles which often cover the stems.)

(*Coprosmanthus, Kunth.*)

Flower dioecious. Perianth deciduous, of 6 distinct spreading segments, all equal, or in species not Australian the 3 outer ones larger or united at the base, or the 3 inner ones wanting. Stamens 6, or in a few species not Australian 3, inserted at the base of the segments, filaments filiform or very short; anthers oblong, the 2 parallel cells separated by a scarcely prominent dissepiment, and when open apparently 1-celled; the stamens all rudimentary only in the female flowers. Ovary rudimentary or entirely deficient in the male flowers, sessile in the females, 3-celled, with 1, or rarely 2, erect ovules in each cell. Style very short, divided to the base or nearly so into 3 oblong usually recurved stigmatic lobes. Fruit a globular berry, usually ripening only 1 or 2 thick seeds without strophioles. Testa thin but hard, smooth and shining, closely appressed to the hard albumen. Embryo either very small or half the length of the albumen, distant from the hilum.—Branching climbers, the stems and main branches hard, often armed with scattered prickles. Leaves ovate orbicular or narrow, usually coriaceous and shining, with transverse or reticulate veins between the longitudinal nerves, marked with numerous small transparent dots, intermixed sometimes with larger oblong ones; the petioles usually short, bearing on each side a simple tendril, sometimes reduced to a short point, and more or less winged below the tendrils. Flowers small, white or pale green or purple; pedicellate in sessile or pedunculate umbels, which are either solitary in the axils, or several in axillary or terminal panicles. Bracts in the umbel very small, imbricate, with one pedicel in each axil.

A large genus, dispersed over the tropical and temperate regions both of the New and the Old World. The Australian species are both endemic, though they are nearly allied to corresponding Asiatic species.

- Perianth-segments broad, scarcely above 1 line long. Filaments shorter than the anthers . . . . . 1. *S. glycyphylla.*
- Perianth-segments narrow, 1½ to 2 lines long. Filaments rather longer than the anthers . . . . . 2. *S. australis.*

1. ***S. glycyphylla*** (leaves sweet), *Sm. in White, Voy.* 230; *Benth. Fl. Austr.* vii. 7. Glabrous and quite unarmed. Leaves lanceolate or ovate-lanceolate,  $1\frac{1}{2}$  to 3 in. long or rarely more, acute or acuminate, narrowed or rounded at the base or rarely almost cordate, 3-nerved, rigid, often very glaucous or white underneath, but sometimes equally green on both sides; the petioles twisted, short but slender, bearing slender tendrils, but not at all or scarcely winged below them. Peduncles axillary and simple, or a few of the upper one in a terminal panicle. Pedicels rarely 3 lines long. Perianth nearly globular in the bud, the outer segments broadly ovate, scarcely above 1 line long. Anthers almost sessile, very much shorter than the perianth. Female flower with outer segments twice as broad as the inner. Berry the size of that of *S. Australis*.—R. Br. *Prod.* 293; *Endl. Iconogr.* t. 39; *F. v. M. Fragm.* vii. 77.

Hab.: Not uncommon in both North and South localities.

2. ***S. australis*** (Australian), *R. Br. Prod.* 293; *Benth. Fl. Austr.* vii. 7. A glabrous climber, ascending sometimes to a considerable height, the stems and branches usually more or less armed with scattered prickles, of which, however, some specimens show none at all, or here and there only a very minute one. Leaves from ovate-lanceolate or oblong to nearly orbicular, 2 to 4 in. long, or rarely much larger; usually 5-nerved, but the outer nerve on each side often short or irregular, and sometimes scarcely distinguishable from the reticulate veins, the petioles short and twisted, narrowly or scarcely winged below the tendrils. Umbels many-flowered, on axillary peduncles usually simple and  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, but sometimes longer slightly branched and bearing 2 or 3 umbels. Pedicels filiform, 2 to 4 lines long. Perianth oblong when in bud, the segments narrow,  $1\frac{1}{2}$  to nearly 2 in. long. Filaments in the male flowers rather longer than the anthers, which are oblong and at length recurved; in the female flowers the filaments are usually present, but without anthers. Ovary entirely deficient in the males, sessile with 1 ovule in each cell in the females. Berry black, globular, about 4 lines diameter, with 1 globular seed or 2 flattened on their inner faces. Embryo often at least half as long as the albumen.—*F. v. M. Fragm.* vii. 78; *S. latifolia* and *S. elliptica*, *R. Br. Prod.* 293; *S. spinescens*, *Miq.* in *Linnæa*, xviii. 83.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Brisbane River, Moreton Bay, *A. Cunningham*, *F. v. Mueller* and others; Rockingham Bay, *Dallachy*; Cape York, *M'Gillivray*. There are doubtless several forms or species among the specimens generally regarded as *S. australis*, *R. Br.*, but these cannot be described until they are brought under cultivation and the plants studied at all stages of their development.

## 2. RHIPOGONUM, Forst.

(Said to be in allusion to its flexible shoots.)

Flowers hermaphrodite. Perianth deciduous, of 6 distinct spreading segments, all equal or the outer ones shorter and often, but not always, surrounded by 2, 3, or even 4 small bracts. Stamens 6, hypogynous; filaments short, somewhat flattened; anthers sagittate, erect, nearly as long as the perianth. Ovary sessile, 3-celled, tapering at the top into a very short style, divided into 3 thick recurved stigmatic lobes; ovules solitary in each cell, pendulous, orthotropous or nearly so. Fruit a globular berry, usually ripening 1 globular seed, or sometimes 2 or 3 seeds variously flattened, with a large hilum, without any strophiole. Testa thin, light brown, closely adnate to the hard albumen. Embryo small, at a distance from the hilum.—Tall branching climbers. Leaves often mostly opposite or nearly so, but sometimes all alternate, 3 or 5-nerved, with transverse reticulate veins, the petioles without wings or tendrils. Flowers sessile or shortly pedicellate, in racemes either simple and axillary or the upper ones forming a terminal leafless panicle.

The Australian species are all enc

- Glabrous. Leaves narrowed into a distinct twisted petiole.  
 Leaves mostly 3 to 4in., not above twice as long as broad. Flowers usually pedicellate . . . . . 1. *R. album*.  
 Leaves mostly 6 to 8in., three times as long as broad. Flowers usually sessile . . . . . 2. *R. discolor*.  
 More or less pubescent. Leaves rounded or cordate at the base and nearly sessile.  
 Leaves 2 to 3in. long. Ovary glabrous . . . . . 3. *R. Fawcettianum*.  
 Leaves 3 to 6in. long. Ovary densely villous . . . . . 4. *R. Elseyanum*.

1. **R. album** (white), *R. Br. Prod.* 293; *Benth. Fl. Austr.* vii. 9. A tall glabrous climber, the principal branches often covered with prickles, the smaller ones usually without any, or only with a few small ones. Leaves irregularly opposite or alternate, on short twisted petioles, elliptical or oblong, varying to ovate or almost lanceolate, shortly acuminate, narrowed at the base, mostly 3 to 4in. long, though occasionally nearly twice as long or under 3in.; coriaceous, 3 or 5-nerved, the intermediate reticulate veins prominent. Racemes axillary, simple, shorter or scarcely longer than the leaves, a few of the upper ones sometimes forming a terminal leafless panicle. Flowers usually distant along the rhachis, at first nearly sessile, but the pedicels growing out to 2 or 3 lines, or sometimes pedicellate from the first. Perianth 3 to 4 lines long. Ovary glabrous. Berry 4 to 5 lines diameter, said to be red when fresh, drying black. —*Kunth. Enum.* v. 272; *F. v. M. Fragm.* vii. 79; *R. Mooreanum*, *F. v. M. Fragm.* i. 44.

Hab.: Brisbane River, Moreton Bay, *A. Cunningham*; Rockhampton, *Dallachy*; and many other localities.

Var. *leptostachya*. Racemes slender, often branched, but with few flowers on slender pedicels of 3 to 4 lines.

Hab.: Rockingham Bay, *Dallachy*.

2. **R. discolor** (2-coloured), *F. v. M. Fragm.* vii. 78; *Benth. Fl. Austr.* vii. 9. A stout glabrous climber, nearly allied to *R. album*, with similar prickly or smooth branches. Leaves oblong or lanceolate, 6 to 8in. long, and rarely above 2in. broad, rounded or narrowed into a twisted petiole at the base, much thicker than in *R. album*, the transverse reticulate veins much fewer and not so fine. Racemes axillary, 4 to 6in. long, the flowers sessile or nearly so. Perianth-segments rather shorter and broader than in *R. album*. Ovary glabrous.

Hab.: From the Tweed River to Wallangarra.

3. **R. Fawcettianum** (after — Fawcett), *F. v. M. Herb.*; *Benth. Fl. Austr.* vii. 9. Branches slender, without prickles, sprinkled with a loose rufus pubescence. Leaves on very short petioles or almost sessile, lanceolate or ovate-lanceolate, acuminate, cordate at the base, 2 to 3in. long, 3 or 5-nerved. Racemes axillary, slender but many-flowered. Flowers shortly pedicellate, rather smaller than in *R. album*. Filaments slender, as long as the anthers. Ovary glabrous.

Hab.: The southern border of Queensland.

4. **R. Elseyanum** (after J. Elsey), *F. v. M. Fragm.* i. 44, vii. 80; *Benth. Fl. Austr.* vii. 10. A stout climber, the branches leaf-nerves and rhachis of the racemes clothed with a loose brown pubescence, the main stems said to be prickly as in other species, although our specimens are entirely unarmed. Leaves on very short petioles or almost sessile, elliptical oblong or ovate, 3 to 6 lines long, acuminate, rounded or cordate at the base, of a thick texture, 3 or 5-nerved, but the lateral nerves starting from the midrib considerably above the base so as to be almost penninerved. Racemes axillary, about as long as the leaves. Flowers rather large, closely sessile or very shortly pedicellate. Perianth-segments

oblong. Anthers long, on short filaments as in *R. album*, but the ovary very densely villous, contracted into a very short thick style, with closely adnate recurved stigmatic lobes. Ovules and fruit of *R. album*.

Hab.: In many of the southern scrubs.

### 3. ASPARAGUS, Linn.

(Referring to the tearing prickles with which some species are armed.)

(*Asparagopsis*, Kunth.)

Flowers hermaphrodite polygamous or unisexual. Perianth deciduous, of 6 distinct nearly equal spreading 1-nerved segments. Stamens 6, attached to the base of the segments; filaments filiform or flattened; anthers versatile, usually short, the cells opening in longitudinal slits. Ovary sessile, short, 3-celled with 2 or very few ovules in each cell; style simple, with a short 3-lobed stigma. Fruit a globular indehiscent berry. Seeds usually reduced to a single one, with a black shining testa; albumen hard; embryo transverse.—Stems herbaceous, from a creeping rhizome, or shrubby much-branched and spreading or climbing to a considerable height, often armed with prickles under the branches. Cladodes (formerly called leaves, but now theoretically believed to be abortive branches) usually clustered, subulate, angular or laterally flattened, surrounded by small scarious scale representing the real leaves. Flowers small, solitary or 2 together in the axils of the scale-like real leaves, or by the reduction of flowering branches without cladodes forming short axillary racemes.

A very large genus, widely spread over the warmer and temperate regions of the Old World. The only Australian species extends also over tropical and subtropical Asia and Africa.

1. **A. racemosus** (flowers in racemes) Willd.; Baker in Journ. Linn. Soc. xiv. 623; Benth. Fl. Austr. vii. 17. A slender but rigid much-branched straggling shrub, often climbing to a considerable height, armed with recurved prickles under the branches. Cladodes usually in clusters of 3 to 6, but sometimes solitary, very slender, slightly curved or rarely quite straight, flat or 3-angled, but always very narrow or subulate, very acute, mostly  $\frac{3}{4}$  to nearly 1½ in. long. Flowers mostly hermaphrodite, in racemes of 1 to 2 in., the pedicels scattered singly or 2 together along the rhachis, and usually about 2 lines long. Perianth-segments nearly 1½ line long. Stamens nearly as long as the perianth, the filaments slightly flattened; anthers small. Style short, with a spreading 3-lobed stigma. Berries small.—*A. fasciculatus*, R. Br. Prod. 281; F. v. M. Fragm. vii. 73; *Asparagopsis floribunda*, *A. Brownei*, and *A. Decaisnei*, Kunth, Enum. v. 98, 103, and numerous other synonyms quoted by Baker.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Cape York, *Daemel*; Cape Sidmouth, *C. Moore*; and other northern localities.

### 4. EUSTREPHUS, R. Br.

(Referring to the twining habit of plants.)

Perianth deciduous, of 6 distinct oblong segments, nearly equal in length, the 3 outer rather firmer, valvate in the bud, and shortly hoodshaped at the apex; the 3 inner flat, obtuse, with thin more or less fringed margins. Stamens 6, hypogynous, not exceeding the perianth; filaments flat, erect, and often cohering in a tube; anthers oblong, erect, the cells opening in longitudinal slits. Ovary sessile, short, 3-celled, with several ovules in each cell; style filiform, with a terminal undivided stigma. Fruit nearly globular, 3-celled, with little or no pulp, the pericarp succulent, but at length dry, and often opening loculicidally in 3 valves. Seeds irregularly shaped, with a black thickly membranous testa, hard albumen, and small embryo.—A glabrous, much-branched leafy climber. Flowers small, few together, pedicellate in the upper axils.

The genus is limited to a single

1. **E. latifolius** (leaves broad), *R. Br. Prod.* 281; *Benth. Fl. Austr.* vii. 18. Stems much-branched, often climbing to a great height, weak and flexuose, but not twining. Leaves sessile or nearly so, varying from broadly ovate-lanceolate to narrow-linear, usually tapering to a point, of a firm texture, with numerous fine but prominent nerves, mostly 2 to 4 in. long, those under the branches often reduced to small scales. Pedicels 2 to 6 together in the upper cells, axil filiform but rigid, 4 to 9 lines long, articulate close under the flower and persistent. Perianth-segments usually about 3 lines long. Stamens varying much in the respective proportions of the filaments and anthers, but both together usually almost as long as the perianth. Fruit usually above  $\frac{1}{2}$  in. diameter, of an orange colour, with about 8 to 12 seeds, but sometimes much smaller with very few seeds.—Baker in *Journ. Linn. Soc.* xiv. 572; *Bot. Mag.* t. 1245; *Endl. Iconogr.* t. 4; *E. Watsonianus*, *Miq. in Linnæa.*, xviii. 84; *P. Brownei*, *F. v. M. Fragm.* vii. 73; *Luzuriaga latifolia*, *Poir. Dict. Suppl.* iii. 535.

**Hab.:** Common north and south.

**Var. angustifolia.** Leaves mostly linear or narrow-lanceolate, but occasionally with a few broad ones.—*E. angustifolius*, *R. Br. l.c.*; *Luzuriaga angustifolia*, *Poir. l.c.* 536.

**Hab.:** Much more common in tropical and subtropical latitudes than the broad-leaved form. Shoalwater Bay to Northumberland Islands, *R. Brown*; from Moreton Bay, *A. Cunningham* and others, to Rockhampton, Port Denison, Rockingham Bay, &c., *Bowman*, *Fitzalan*, *Dallachy*, and many others. This form is more frequently met with climbing over the bushes on open pasture, while the broad leaved form is more of a scrub plant.

## 5. GEITONOPLESIMUM, A. Cunn.

(Referring to its near affinity to the preceding genus.)

Perianth deciduous, of 6 distinct oblong-segments equal in length, the 3 outer rather firmer, valvate in the bud and shortly hood-shaped at the apex; the 3 inner flat, obtuse, with thin entire margins, slightly imbricate. Stamens 6, hypogynous, not exceeding the perianth; filaments filiform, free or very slightly connected in a ring at the base; anthers oblong-linear, erect, the cells opening in longitudinal slits. Ovary sessile, short, 3-celled, with several ovules in each cell; style filiform, the stigmatic apex undivided. Fruit nearly globular, 3-celled, without pulp, the pericarp somewhat succulent, at length dry and sometimes opening loculicidally in 3 valves. Seeds irregularly-shaped, with a black rather thickly membranous testa, hard albumen and small embryo.—A glabrous, much-branched leafy climber. Flowers small, in loose terminal cymes.

The genus is limited to the single Australian species which extends to the South Pacific Islands. It closely resembles *Eustrephus* both in habit and character, differing only in inflorescence and in the entire not-fringed inner perianth-segments.—*Benth.*

1. **G. cymosum** (cymose), *A. Cunn. in Bot. Mag.* t. 3131; *Benth. Fl. Austr.* vii. 19. Stems much branched, twining and climbing to a considerable height, with small broad scales under each branch. Leaves from linear to lanceolate-oblong or almost ovate, contracted into a short petiole, obtuse acute or tapering into a fine point, usually 2 to 3 in. long, rather rigid, with fine nerves, the midrib more prominent. Flowers drooping, in loose terminal cymes, sometimes short simple and few-flowered, sometimes several in an oblong panicle of 3 to 4 in. Perianth purplish-green, 3 to 4 lines long, the pedicels usually shorter, articulate close under the flower, with a minute bract. Berry-like fruit of a dark blue, 4 to 6 lines diameter. Seeds few.—Baker in *Journ. Linn. Soc.* xiv. 572; *F. v. M. Fragm.* vii. 74; *Luzuriaga cymosa* and *L. montana*, *R. Br. Prod.* 282; *Medeola angustifolia*, *Red. Lil.* t. 393; *Geitonoplesium montanum* and *G. asperum*, *A. Cunn. l.c.*; *G. angustifolium*, *C. Koch in Walp. Ann.* vi. 143.

**Hab.:** From Moreton Bay, *A. Cunningham*, *Leichhardt*, to Rockhampton, Rockingham Bay, and Percy Islands, *Dallachy*, *A. Cunningham* and others; Stanthorpe and Killarney.

*P. O'Shanesy* recommends the young shoots as a substitute for *Asparagus*, *F. v. M.*

## 6. BLANDFORDIA, Sm.

(After the Marquis of Blandford.)

Perianth persistent, tubular but much widened upwards and sometimes almost campanulate, with 6 equal short and broad lobes. Stamens 6, attached at or rather above the middle of the corolla-tube and shorter or scarcely longer than its lobes; filaments filiform; anthers oblong, versatile, the cells opening in longitudinal slits. Ovary contracted into a long stipes, 3-celled, with numerous ovules in a double row in each cell, tapering into a short style, with a terminal 3-grooved stigma. Capsule on a long stipes, long and narrow, prominently 3-angled, opening septicidally in 3 valves. Seeds numerous, horizontal, oblong, the testa rather thick and densely covered with very prominent almost hair-like papillæ; albumen copious.—Herbs with thickly fibrous roots and tall rigid scapes or stems. Leaves crowded at the base of the stem, with distichously imbricated sheaths, the lamina long and narrow with prominent nerves; a few upper leaves distant, short and erect. Flowers large, pendulous, in a short simple terminal raceme, each one in the axil of a narrow bract, with two smaller very narrow bracteoles at the base of the pedicel. Capsule erect, more or less surrounded by the withered perianth.

The genus is limited to Australia.

Flowers rather numerous and crowded, the pedicels when in flower rarely exceeding the bracts.

Perianth (about 2in.) narrow in the lower part, very broad upwards.

Lobes about  $\frac{3}{4}$ in. Stamens attached below the middle . . . . . 1. *B. grandiflora*.

Flowers few, in a loose raceme, the pedicels much longer than the bracts.

Perianth ( $1\frac{1}{2}$ in. or more) broad almost from the base and much dilated upwards, almost campanulate . . . . . 2. *B. flammea*.

1. ***B. grandiflora*** (large flowers), *R. Br. Prod.* 296; *Benth. Fl. Austr.* vii. 23. A tall handsome species. Inflorescence a many-flowered crowded raceme, the bracts often nearly as long as the flowering pedicels. Lower leaves about 1ft. long and 2 lines broad; the short upper sheathing leaves ending in erect almost subulate points. Perianth fully 2in. long, red at the base but the yellow apex usually extending to  $\frac{1}{3}$  of its length, the lower part narrow to nearly  $\frac{1}{2}$  its length, then much expanded, the lobes broadly ovate and fully  $\frac{1}{2}$ in. long. Stamens attached below the middle of the perianth.—*Paxt. Mag.* vii. 219 with a plate; *B. Cunninghamii*, *Lindl. Bot. Reg.* 1845 under t. 18; *Bot. Mag. t.* 5734; *Baker in Journ. Linn. Soc.* xi. 365.

Hab.: Stradbroke Island, *Rev. B. Scortechina* and *Bail*.

2. ***B. flammea*** (flame-coloured), *Hook. Bot. Mag. t.* 4819; *Benth. Fl. Austr.* vii. 24. A tall species, with narrow foliage and showy flowers, bracts not  $\frac{1}{4}$  the length of the pedicels. Perianth usually above  $1\frac{1}{2}$ in. long, much dilated almost from the base and very broad upwards, so as to be almost campanulate, the lobes short broad and obtuse, the colour usually a rich brown-red in the lower part, the broad upper portion from yellow to orange, but sometimes yellow or orange almost or quite from the base.—*Baker in Journ. Linn. Soc.* xi. 366; *Lindl. in Paxt. Mag. Bot.* xvi. 353, with a plate; *Fl. des Serres, t.* 585; *B. Cunninghamii*, *Fl. des Serres, t.* 1829, but not of *Lindl. Maid. and Campb., Fl. Pl. N.S.W., No.* 18.

Hab.: Stradbroke Island, *Rev. B. Scortechini* and *Bail*, and in swamps in other southern localities.

*Var. aurea*—*B. aurea*, *Hook. Bot. Mag. t.* 5809, *Baker in Journ. Linn. Soc.* xi. 366. The perianth yellow from the base. *Var. princeps*, *Bot. Mag. t.* 6209, the perianth as large as that of *B. grandiflora*, but shaped as in *B. flammea* of which it has also the loose raceme and short bracts.—*Benth.*

7. DRACÆNA, Linn.

(The inspissated juice of some species resembling dragon's blood)

Perianth deciduous, tubular, straight, with 6 equal narrow lobes, as long as or shorter than the tube. Stamens 6, inserted at the orifice of the tube, and not exceeding the lobes; filaments filiform or flattened; anthers oblong, versatile, the cells opening in longitudinal slits. Ovary sessile, short, 3-celled, with 1 erect ovule in each cell; style filiform, with a capitate obscurely 3-lobed stigma. Fruit a succulent indehiscent berry, with 3 cells and seeds, or frequently 1 or 2 only by abortion. Seeds thick and large, with a thin smooth testa closely adhering to the hard albumen; embryo usually small.—Shrubs or trees, the trunk and branches marked by the annular scars of fallen leaves. Leaves at the ends of the branches long and narrow, sessile or contracted into a petiole, dilated and stem-clasping but scarcely sheathing at the base. Flowers in panicles or heads, articulate on the top of the pedicels. Bracts usually small, scarious, with a pair of smaller bracteoles when the flower is solitary within the bract, several when the flowers are clustered.

A considerable genus, inhabiting the warmer regions of the Old World and including the celebrated Dragon trees of Teneriffe. The only species found in Australia is widely spread over the Indo-Australian region.

1. **D. augustifolia** (leaves narrow), *Roeb. Baker in Journ. Linn. Soc.* xiv. 526; *Benth. Fl. Austr.* vii. 20. Stems much branched and slender but woody, attaining 6 to 20ft. in height. Leaves rather crowded under the terminal panicle, 8in. to nearly 1ft. long,  $\frac{1}{2}$  to 1in. broad, ending in a fine point, shortly contracted at the base but not distinctly petiolate nor sheathing. Panicle  $\frac{1}{2}$  to 1ft. long, with few branches, the pedicels 2 to 3 lines long, very slender, usually clustered 2 or 3 together along the branches. Bracts and bracteoles small. Perianth narrow, white or greenish, about  $\frac{3}{4}$ in. long, the lobes linear, rather longer than the tube. Stamens attached about the middle of the tube, the anthers much shorter than the filiform filaments. Fruit  $\frac{1}{2}$ in. diameter or rather more, pulpy inside with 1, 2 or 3 large seeds.—*Cordylina Runphii*, F. v. M. *Fragm.* v. 194, but not the plant figured under that name in *Bot. Mag.* t. 4279; *Dracæna reflexa*, F. v. M. *Fragm.* vi. 120, but not the Mauritius plant to which Lamarck gave that name.

Hab.: Barnard and Fitzroy Islands, *M'Gillivray*; Cape York, *Daemel*; and the Islands of Torres Strait.

8. CORDYLINA, Comm.

(Referring to the club-like form of the stems of some species.)

Perianth deciduous, tubular, straight, with 6 narrow lobes, usually longer than the tube, all equal or the 3 outer ones rather shorter. Stamens 6, inserted at the base of the lobes and shorter than them or scarcely longer; filaments filiform or flattened; anthers narrow-oblong, the cells opening in longitudinal slits. Ovary sessile, short, 3-celled, with several (4 to 16) ovules in each cell, superposed in 2 rows; style filiform, with a capitate or shortly 3-lobed stigma. Fruit nearly globular, 3-celled, without pulp, but the pericarp more or less succulent, often becoming quite dry when fully ripe, indehiscent or more or less opening loculicidally in 3 valves. Seeds several in each cell, or solitary by abortion, variously but usually curved, the testa crustaceous, black and shining; albumen waxy; embryo curved and sometimes nearly as long as the albumen.—Shrubs or trees, the branches marked by the annular scars of the fallen leaves. Leaves crowded under the panicle or more or less spread along the branches, long and narrow or short and broad, petiolate or nearly sessile, with short



imbricate sheaths. Panicles terminal or sometimes axillary, the flowers usually smaller than in *Dracæna*, solitary or clustered along the branches, sessile or pedicellate, each within a small bract with 2 small bracteoles at their base.

The genus is widely spread over the warmer regions of the Old World, with one American species. Of the Australian species one is common over a great part of the Indo-Australian region, the others are endemic.

Perianth-segments of equal length.

Leaves 1 to 1½ ft. long, 1 to 3 in. broad, with a short petiole . . . . . 1. *C. terminalis*.

Leaves 3 to 6 in. long, 1½ to 2½ in. broad, with a rather long petiole . . . . . 2. *C. Murchisoniæ*.

Inner perianth-segments longer than the outer. Leaves 1 to 2 ft. long, ½ to 1 in. broad or even narrower . . . . . 3. *C. stricta*.

1. ***C. terminalis*** (terminal), *Kunth*; *Baker in Journ. Linn. Soc.* xiv. 539; *Benth. Fl. Austr.* vii. 21. "Churoga," Tully River, *Roth*. Stems attaining 5 to 20 ft. Leaves crowded under the panicle, from 1 to 3 ft. long or the upper ones half that length, varying from 1 to 5 in. broad, acuminate at the end and tapering at the base into a sheathing petiole. Panicle often 1 to 2 ft. long, with spreading solitary or clustered branches of 3 to 18 in. Flowers scattered along the branches either singly or in clusters of 2 or 3, varying from almost sessile to borne on pedicels attaining sometimes 4 or 5 lines. Perianth usually about 4 lines but sometimes attaining 5 lines in length, white reddish or almost purple, divided to about the middle into 6 equal segments. Stamens attached near the base of the segment; anthers not much shorter than the filaments and not exceeding the perianth. Ovules 4 to 10 in each cell of the ovary. Fruit red, nearly globular, 3 to 4 lines diameter, mealy or succulent when fresh.—*Dracæna terminalis*, *Jacq. Ic. Rar.* t. 448; *Red. Lil.* t. 91; *Bot. Reg. t.* 1749; *Lodd. Bot. Cab. t.* 1224; *D. ferrea*, *Linn.*; *Bot. Mag. t.* 2053; *Cordylina cannaefolia*, *R. Br. Prod.* 280; *F. v. M. Fragm. v.* 196; *C. sepiaria*, *Seem. Fl. Vit.* 311, t. 94.

Hab.: Shoalwater Bay, *R. Brown*; Ipswich, *Nerst*; Pine River, *Fitzalan*; Rockingham Bay, *Dallachy*; common in most scrubs north and south.

The species is generally spread over tropical Asia and Polynesia.

*Dr. Roth* states that at the Tully River the aboriginal children's teeth are buried in the bases of the leaf stalks, so as to ensure their getting a second set.

Var. *Manners-Suttoniæ*—*C. Manners-Suttoniæ*, *F. v. M. Fragm. v.* 159—from Mount Elliott, *Fitzalan*, and Rockhampton, *Dallachy*, *Bowman*, is remarkable for the rather large white flowers on pedicels in the typical specimens 4 to 5 lines long.

Var. *cannaefolia*. Leaves oblanceolate, 12 to 15 in. long, 2 to 2½ in. broad. Pedicels very short. Perianth-segments 2 lines long, the campanulate tube twice as long as the segments.—*C. cannaefolia*, *R. Br. Prod.* 280.

Var. *hedychioides*. Leaves oblanceolate, 2 to 3 in. broad. Pedicels ½ to 1 line long. Perianth deeply divided, 4 to 5 lines long. Berry 4 to 5 lines in diameter.—*C. hedychioides*, *F. v. M. Fragm. v.* 196.

Hab.: Cape York, *Daemel*.

Var. *Baileyi*, *Bail. Bot. Bull.* ix. A beautiful variegated form, found in one of the Pimpama scrubs by *W. B. Bailey*, a nurseryman of the district. Plants of this may be seen in some Brisbane bushhouses.

2. ***C. Murchisoniæ*** (after Lady Murchison), *F. v. M. Fragm. v.* 195, 1866. A small leafy species, the stems often not above 2 ft. high. Leaves much shorter than in the other species, usually 3 to 6 in. long and 1½ to 2½ in. broad, abruptly contracted into a rather long petiole, and covering nearly the whole of the flowering branch. Panicle sometimes not longer than the leaves, sometimes twice as long, with few branches. Flowers the same as in *C. terminalis*. Fruit also similar but smaller.—*Baker in Journ. Linn. Soc.* xiv. 541; *C. Haageana*, *C. Koch, Wochenschr. für. Gärtn.* 1867, 195; *Benth. Fl. Austr.* vii. 22.

Hab.: Rockhampton, *O'Shanesy*; Rockingham Bay and Mount Elliott, *Dallachy*; Port Denison, *Fitzalan*.

3. **C. stricta** (narrow), *Endl. in Ann. Wien. Mus.* i. 162; *Benth. Fl. Austr.* vii. 22. Habit and stature of *C. terminalis*, but the leaves very much narrower, rarely lin. and often not above  $\frac{3}{4}$  in. broad when 1 to 2ft. long. Perianth almost violet, inflorescence of *C. terminalis*, except that the three outer segments of the perianth are distinctly shorter than the inner ones when the flower is fully out, and sometimes not above  $\frac{3}{4}$  of their length. The pedicels are also usually very short or the flowers quite sessile. Fruit purple.—*F. v. M. Fragm.* v. 195; *Baker in Journ. Linn. Soc.* xiv. 544; *Dracæna stricta*, *Sims, Bot. Mag.* t. 2575; *Bot. Reg.* t. 956; *Charlwoodia congesta*, *Sweet. Fl. Austr.* t. 18; *Cordyline angustifolia* and *C. congesta*, *Kunth. Enum.* v. 32; *C. rigidifolia*, *C. Koch and Bouché in Berl. Gartenzeit.* quoted by *Baker*.

Hab.: Islands of Moreton Bay.

9. BULBINE, Linn.

(Some species forming bulb-like tubers.)

Perianths deciduous, of 6 equal segments, free or slightly connected at the base. Stamens 6, attached to the base of the perianth, and shorter than its segments; filaments filiform or shortly dilated at the base, bearded above the middle by a dense tuft of filiform or clavate hairs; anthers oblong-linear, usually recurved or twisted after shedding the pollen, the cells opening inwards in longitudinal slits. Ovary sessile, 3-celled, with several ovules in each cell superposed in 2 rows; style filiform, with a terminal stigma. Capsule nearly globular, 3-valved. Seeds few, angular, black, the testa opaque, smooth or tubercular-granulate.—Perennials, with fibrous roots proceeding sometimes from a thick tuber under the stock. Leaves radical or crowded at the base of the stem, with short sheaths. Scape simple, leafless, ending in a simple raceme of yellow flowers, the pedicels solitary within a scarious bract, and articulate immediately under the flower.

Besides the two species endemic in Australia, there are a considerable number natives of South Africa.

Perianth usually about  $\frac{3}{4}$  in. long or more. All the filaments bearded.

Root often tuberous . . . . .

1. *B. bulbosa*.

Perianth about  $\frac{1}{2}$  in. Only the 3 inner filaments bearded. No tuber to the root . . . . .

2. *B. semibarbata*.

1. **B. bulbosa** (bulb-shaped tube), *Haw. Rev. Pl. Succ.* 33; *Benth. Fl. Austr.* vii. 34. Roots in old plants forming a bulb-shaped tuber immediately under the stock, but not really bulbous. Leaves all radical, linear-subulate, rather thick, grooved in front, from under 6in. to above 1ft. long, with very short sheathing bases. Scapes 1 to 2ft. high, the raceme when fully out often above 6in. long. Scarious bracts varying from very short to half as long as the pedicels. Pedicels erect, rarely longer than the flowers when first out, but lengthening more or less after flowering. Perianth-segments oblong, usually 5 to 6 lines long, but sometimes at least 8 lines, yellow, with a narrow dark obscurely 3-nerved centre. Filaments all equal or the inner ones longer, the tuft of hairs sometimes very short immediately under the anther or rather below it, sometimes occupying the upper half of the filament with the anther almost buried in it; itself quite glabrous, usually shorter than the filament. Capsule erect, about 3 lines diameter, ripening 1 or 2 seeds in each cell.—*Baker in Journ. Linn. Soc.* xv. 345; *Hook. f. Fl. Tasm.* ii. 51; *F. v. M. Fragm.* vii. 70; *Anthericum bulbosum*, *R. Br. Prod.* 275; *Bot. Mag.* t. 3017; *A. semibarbatum*, *Hook. Bot. Mag.* t. 3129, not of *R. Br.*; *Bulbine australis*, *Spreng. Syst.* ii. 86; *B. suavis*, *Lindl. in Bot. Reg.* 1838, Misc. 45; *B. Fraseri* and *B. Hookeri*, *Kunth. Enum.* iv. 565, 566.

Hab.: Condamine River, *Leichhardt*; Darling Downs, *Woolis*; Curriwillighie, *Dalton*; Burnett River, *Haly*.

2. **B. semibarbata** (half (3) of the stamens bearded), *Haw. Rev. Pl. Succ.* 33; *Benth. Fl. Austr.* vii. 35. Roots fibrous, without any tubers under the stock. Leaves usually narrow-linear, but varying in length almost as much as in *B. bulbosa*. Scapes from a few in. to about 1ft. high, the racemes looser and the flowers fewer and smaller than in *B. bulbosa*. Perianth rarely above 3 lines long, and the pedicels usually longer. Stamens 3 opposite the outer segments almost hypogynous, the filaments short without beards, 3 attached to the base of the inner segments with much longer filaments bearded above the middle or immediately under the anther, as in *B. bulbosa*. Capsule rarely above 2 lines diameter, ripening 3 or 4 black angular seeds, often coarsely reticulate or tuberculate on the angles.—Baker in *Journ. Linn. Soc.* xv. 349; Hook. f. *Fl. Tasm.* ii. 52; F. v. M. *Fragm.* vii. 70; *Anthericum semibarbatum*, R. Br. *Prod.* 275; *Bulbine floribunda*, Schrad. in various Botanical Gardens; *Triglochin racemosum*, Endl. in *Pl. Preiss.* ii. 54.

Hab.: Damp land in many southern localities.

Both species are known by the name of Native Onion or Leek and are considered poisonous to cattle, sheep and horses. It has the same effect upon each kind of animal, but cattle are said to survive the longest, sheep will linger about 3, horses 6 days.

## 10. THYSANOTUS, R. Br.

(From the Greek for a fringe.)

(*Chlamyspermum*, *Salisb.*)

Perianth spirally twisted over the ovary after flowering, but sometimes at length deciduous, of 6 distinct segments, all nearly equal in length, with an opaque 3-nerved centre, the 3 outer usually narrow, acute with narrow thin entire margins, the 3 inner with broad coloured margins, rolled inwards over the inner stamens in the bud, and elegantly fringed on the edges. Stamens 3 opposite the outer segments hypogynous or sometimes wanting, 3 attached to the base of the inner segments, all more or less declinate in the expanded flower, shorter than the perianth; filaments short or rarely nearly as long as the anthers; anthers linear, the parallel cells confluent at the apex and opening longitudinally, the inner valve shorter and narrower than the outer one, those of the inner stamens usually longer than the others, and often terminating in a long narrow beak. Ovary sessile or contracted into a short thick stipes, 3-celled, with 2 superposed ovules in each cell; style filiform, undivided. Capsule usually globular, 3-valved. Seeds 1 or 2 in each cell, not flattened, the upper one erect, the lower pendulous, the funicle expanded into a white or yellowish strophiole; testa black, thickly membranous or almost crustaceous.—Perennials with a tufted or thick often horizontal stock and fibrous roots thickened into tubers in some species. Leaves radical, grass-like. Scapes leafless or nearly so, simple or variously branched. Flowers in terminal or rarely lateral umbels rarely reduced to a single flower. Bracts short scarious, imbricate. Pedicels articulate below the middle.

The species are nearly all Australian.

SERIES I. **Hexandræ**.—Stamens 6, 3 usually but not always longer than the others.

Stock densely tufted, with numerous radical leaves. No tubers. Umbels single.

Slender and glabrous. Flowers 3 to 4 lines long, on long pedicels . . . 1. *T. chrysantherus*.

Stock usually tufted, with several radical leaves often rather long. Roots often tuberous. Scape paniculate at the end, with several few-flowered umbels.

Leaves very narrow. Panicle loose. Bracts 1 to 2 lines long. Stamens 3 distinctly longer than the others . . . . . 2. *T. tuberosus*.

Leaves few, shorter than the scape. Umbels 2 to 3-flowered . . . . . 3. *T. Baueri*.

1. **T. chrysantherus** (golden flowers), *F. v. M. Fragm.* v. 202; *Benth. Fl. Austr.* vii. 40. Stock tufted, with fibrous roots not tuberous. Radical leaves rather numerous, very narrow, shorter than the scape. Scape slender, simple, 6in. to above 1ft. long, bearing a single umbel of 3 to 6 flowers. Pedicels filiform, much longer than and sometimes 3 times as long as the perianth. Perianth usually about 4 lines long. Stamens 6, 3 of them longer but not very much longer than the 3 others. Seeds with a white strophiole.—Baker in *Journ. Linn. Soc.* xv. 337, under *T. chinensis*.

Hab.: Musgrave Tel. Station, Cape York Peninsula, *T. Barclay-Millar*.

2. **T. tuberosus** (tuberous), *R. Br. Prod.* 282; *Benth. Fl. Austr.* vii. 41. Fibrous roots swollen into tubers more or less distant from the stock. Leaves radical, not numerous, narrow-linear, varying from quite short to at least as long as the scape, rarely above 1 line broad and sometimes very fine. Scape erect, rigid, terete, 6in. to above 1ft. high, branching into a loose irregularly dichotomous panicle, varying from narrow-pyramidal to almost corymbose, each branch terminating in an umbel of 1 to 3 or 4 flowers, with sometimes a second umbel sessile on the branch rather lower down. Bracts under the branches and pedicels lanceolate, acute, 1-nerved, with scarious margins, and usually 2 short broad scarious bracteoles (often united into one) at the base of each pedicel. Perianths when full-grown, 6 to 7 lines long in the larger varieties, scarcely above 4 lines in the smaller, on pedicels varying from 3 or 4 lines to twice that length. Stamens 6, the 3 opposite the inner segments nearly as long as the perianth, ending in a narrow beak; the 3 others shorter, often much shorter, but the proportions very variable, and sometimes 1 or 2 of the longer ones fully twice the short ones.—Baker in *Journ. Linn. Soc.* xv. 335; *F. v. M. Fragm.* vii. 69; Charsley, *Wild Pl. Melb.* t. 6, f. 1; *T. isantherus*, *Lindl. Bot. Reg.* t. 655, not of *R. Br.*

Hab.: Broadsound, *R. Brown*; from Moreton Bay, *F. v. Mueller* and many others, to Rockhampton, *Bowman, O'Shanesy* and others; and Rockingham Bay, *Dallachy*; Port Curtis, *M'Gillivray*.

3. **T. Baueri** (after Francis Bauer), *R. Br. Prod.* 283; *Benth. Fl. Austr.* vii. 42. Root-fibres swollen into ovoid or oblong tubers, generally distant from the stock. Leaves not numerous, narrow, usually much shorter than the scape, with rather broad scarious sheaths, but all withering very early, most specimens being quite leafless. Scape from under 6in. to near 1ft. high, simple including the inflorescence or slightly branched in the upper part. Umbels mostly 2 or 3-flowered, and usually several sessile along the upper part of the scape and its branches, besides the terminal one, the scarious bracts often rather large. Pedicels rather shorter than the perianth. Perianth-segments varying in size as in other species, but rarely under 4 or above 5 lines long, the opaque centres very dark in the dried specimens. Stamens 6, unequal, but the 3 longer ones sometimes not much exceeding the others.—*F. v. M. Fragm.* vii. 69; Baker in *Journ. Linn. Soc.* xv. 336, but not the northern *T. Banksii* given as a synonym.

Hab.: Southern localities, *F. v. M.*

## 11. ARTHROPODIUM, R. Br.

(Referring to the jointed pedicels.)

Perianth persistent but not twisted, of 6 spreading segments, nearly equal in length, but the inner ones broader, and often crisped or shortly fringed on the edges. Stamens 6, attached to the base of the segments or almost hypogynous, shorter than the perianth; filaments shortly filiform, with a dense tuft of woolly hairs or a papillose appendage in their upper part or occupying nearly the whole filament; anthers linear, erect, the cells opening inwards in longitudinal slits.

Ovary sessile, 3-celled, with several ovules in each cell; style filiform, with a terminal stigma. Capsule 3-valved. Seeds usually few, black, angular, the testa smooth or minutely glandular, not shining.—Tufted perennials, with the fibres often thickened into tubers. Leaves radical or crowded at the base of the stem, linear and grass-like, with scarios sheathing bases. Stems simple or with few elongated branches, leafless or with only 1 or 2 short distant leaves below the inflorescence. Flowers loosely racemose, the filiform pedicels solitary or few together within a scarios bract, and when several accompanied by very small bracteoles within the bract.

The Australian species are all endemic, others are met with in New Zealand and New Caledonia.

Anthers shorter than the filaments, recurved after shedding the pollen; filaments with woolly-hairy appendages.

Flowers usually 2 or 3 to each bract. Filaments woolly-hairy only above the middle . . . . . 1. *A. paniculatum*.

Flowers usually solitary, small. Filaments shortly woolly-hairy from near the base . . . . . 2. *A. minus*.

Anthers longer than the filaments; filaments very shortly hairy.

Inflorescence with few long branches. Perianth about 5 lines long.

Leaves subulate, or if flat  $\frac{1}{2}$  line broad . . . . . 1. *A. dianellaceum*.

1. ***A. paniculatum*** (paniculate), *R. Br. Prod.* 276; *Benth. Fl. Austr.* vii. 56. Fibrous roots thickened into tubers, but only at a distance from the stock. Stems erect, 1 to 2ft. high, usually divided above the middle into a few long slender spreading flowering branches. Leaves narrow, crowded at the base of the stems, from 2 or 3in. to nearly 1ft. long, with broad scarios sheathing bases, and occasionally a smaller leaf on the stem below the inflorescence. Flowers white or purplish, 2 to 4 together along the branches on filiform pedicels from 2 or 3 lines to above 1in. long, in the axils of minute bracts. Perianth-segments 3 or rarely 4 lines long, the inner ones much broader than the outer, and often but not always denticulate or almost fringed on the margin. Filaments with a dense tuft of woolly hairs only above their middle.—Baker in Journ. Linn. Soc. xv. 352; Hook. f. *Fl. Tasm.* ii. 50; F. v. M. *Fragm.* vii. 66; *Anthericum paniculatum*, Andr. Bot. Rep. t. 395; *Phalangium paniculatum*, Poir. Dict. Suppl. iv. 383; *Anthericum milleflorum*, Red. Lil. t. 58; *Phalangium pendulum*, Red. Lil. t. 360 (?) Bot. Mag. t. 1421, Endl. Iconogr. t. 28; *Anthericum pendulum*, Hornem.; Willd. Enum. Hort. Berol. 371; *Arthropodium pendulum*, DC.; Kunth. Enum. iv. 620, Baker in Journ. Linn. Soc. xv. 353; *A. minus*, Lindl. Bot. Reg. t. 866; *A. Lindleyi*, Kunth. l.c. 621.

Hab.: In several southern localities.

2. ***A. minus*** (lesser), *R. Br. Prod.* 276; *Benth. Fl. Austr.* vii. 56. Roots a fascicle of oblong tubers close to the stock. Stems slender, from under 6in. to 1ft. or rather more, simple or rarely with one branch. Leaves radical, much shorter than the stem, varying from 1 to 3 lines broad. Flowers solitary within each bract or very rarely 2 together, usually smaller than in *A. paniculatum*, the perianth-segments  $2\frac{1}{2}$  to 3 lines long. Filaments longer than the anther, the woolly hairs extending over the greater part of their length.—Baker in Journ. Linn. Soc. xv. 353; Hook. f. *Fl. Tasm.* ii. 51.

Hab.: Border of N.S.W. near Wallangarra.

3. ***A. dianellaceum*** (Dianella-like), *F. v. M. Fragm.* x. 65; *Benth. Fl. Austr.* vii. 57. Fibrous roots more or less thickened into tubers. Radical leaves few, subulate or when flat not above  $\frac{1}{2}$  line broad, very shortly dilated into sheaths and not split into filaments. Stems very slender, 1 to  $1\frac{1}{2}$  foot high, with few filiform branches. Pedicels solitary, recurved, filiform,  $\frac{1}{2}$  to  $\frac{3}{4}$ in. long.

Bracts very small. Perianth-segments narrow, about 5 lines long. Filaments short, papillose-hairy in the upper half; anthers linear, at least twice as long as the filament.

Hab.: Brisbane River.

12. **DICHOPOGON**, Kunth.

(Referring to the appendages of the anthers.)

Perianth persistent but not twisted, of 6 spreading segments, nearly equal in length, but the inner ones much broader and sometimes slightly crisped or fringed on the edges. Stamens 6, attached to the base of the perianth or almost hypogynous, shorter than the segments; filaments short, flattened at the base, not bearded; anthers longer, erect, linear, with 2 small crest-like appendages at the base reflexed on the filament (and sometimes shortly adnate to it?); the cells opening inwards in longitudinal slits. Ovary sessile, 3-celled, with several ovules in each cell superposed in 2 rows; style filiform, with a terminal stigma. Capsule globular, 3-valved. Seeds several, angular, black, the testa smooth or granular, not shining.—Tufted perennials, with the fibrous roots often thickened into tubers. Leaves radical, grass-like, with scarios sheathing bases. Stems simple or with a few long branches, leafless or with a short leaf under the lowest branch. Flowers purple lilac or rarely blue, in a long simple raceme at the end of each branch, solitary or 2 or 3 together within distant scarios bracts, the pedicels articulate at or above the middle.

The genus is limited to Australia. It was formerly included in *Arthropodium*, and may perhaps still be considered as a section only, distinguished by Kunth as having the appendages to the stamens attached to the anthers and not to the filament. —*Benth.*

- Capsule erect. Anther-appendages very short . . . . . 1. *D. strictus*.
- Capsule reflexed. Anther-appendages rather long . . . . . 2. *D. Sieberianus*.

1. **D. strictus** (straight), *Baker in Journ. Linn. Soc.* xv. 319, *excl. syn.*; *Benth. Fl. Austr.* vii. 58. Radical leaves narrow linear, varying in length from 3 or 4 in. to twice as much, always shorter than the stems, the older tufts often surrounded by numerous long filaments, the remains of old leaf-sheaths. Stems from under 1ft. to above 2ft. high, the scarios bracts under the branches and pedicels sometimes very narrow and small, sometimes broadly scarios, 3 lines long, besides a more or less lengthened terminal point. Flowers solitary or in clusters of 2 or 3 within each bract, and when more than one accompanied by small bracteoles within the bract, the clusters distant along the rachis. Pedicels erect, spreading or recurved, shorter or longer than the flowers. Perianth-segments usually 5 to 6 lines long, 3-nerved in the centre. Appendages to the base of the anthers usually short and crest-like. Fruiting pedicels erect or spreading, the capsule always erect.—*Arthropodium strictum*, R. Br. Prod. 276; F. v. M. Fragm. vii. 66; *A. laurum*, Hook f. Fl. Tasm. ii. 51, t. 131, not of Sieb.; *Dichopogon humilis*, Kunth, Enum. iv. 623, and probably also *D. setosus*, Kunth, l.c. 624; *D. undulatum*, Reg. Gartenfl. ii. 1, t. 37.

Hab.: Moreton Bay, *Fitzalan*; Darling Downs, *Leichhardt*; Rockhampton (?) *Bowman*.

This species varies very much in stature, in the size and shape of the scarios bracts, in the flowers all solitary or all in clusters of 2 or 3, erect or pendulous, in the size of the perianth and length of the pedicels.

2. **D. Sieberianus** (after F. W. Sieber), *Kunth, Enum.* iv. 623; *Benth. Fl. Austr.* vii. 59. Habit of the slender narrow-leaved specimens of *D. strictus*. Stems mostly about 1ft. high, simple or slightly branched. Leaves very narrow. Flowers in clusters of 2 or 3 like those of *D. strictus*, but the pedicels reflexed from near the base. Appendages to the base of the anthers rather long and almost adnate to the filament. Capsules always reflexed.—*Arthropodium laurum*, Sieb. in Roem. et Schult. Syst. vii. 441.

Hab.: Border of N.S.W. near Wallangarra.

13. *CÆSIA*, R. Br.  
(After Frederick Cæsius.)

Perianth spirally twisted over the ovary after flowering, but at length deciduous, of 6 3-nerved segments, shortly united at the base, all equal in length, but the inner ones with broader thin margins. Stamens 6, attached to the base of the perianth, and shorter than the segments; filaments filiform; anthers oblong, shorter than the filaments, recurved, the cells opening inwards in longitudinal slits. Ovary sessile, 3-celled, with 2 superposed ovules in each cell; style slightly thickened upwards, undivided. Capsule depressed, obtusely 3-angled or 3-lobed, opening at length in 3 valves. Seeds usually solitary in each cell, globular, the short funiculus expanded into a small broad strophiole; testa black, crustaceous, tubercular-granulate.—Tufted herbs with fibrous roots more or less thickened into oblong tubers. Leaves grass-like, crowded at the base of the stem. Stems simple or branched. Flowers blue or rarely white, in clusters or sessile umbels along the upper portion of the stem or branches, forming terminal racemes. Bracts very short and scarious.

Besides the Australian species, which are all endemic and possibly varieties of a single one, there are several African ones.

Perianth-segments 3 to 4 lines long. Leaves often rather broad, not surrounded by filaments . . . . . 1. *C. vittata*.  
Perianth-segments under 3 lines long. Leaves rather broad or narrow, not surrounded by filaments, flaccid with fine nerves . . . . . 2. *C. parviflora*.

1. *C. vittata* (ribbon-like), *R. Br. Prod.* 277; *Benth. Fl. Austr.* vii. 46. Fibres more or less thickened into long tubers. Leaves crowded at the base of the stem, with more or less scarious sheaths and grass-like blades, very variable in length and breadth, but mostly shorter than the stem, a few much smaller at the base of the branches. Stem erect, simple, or with a few long branches, usually about 1ft. high, but sometimes not half that length, and sometimes much longer, the inflorescence occupying more than the upper half. Umbels or clusters of 2 to 4 or rarely more flowers, sessile along the rhachis, surrounded by very short scarious bracts, the filiform pedicels within the umbel varying from 2 to 4 lines. Perianth-segments usually blue, 3 to 4 lines long. Capsule about 2 lines broad, depressed at the top, and more prominently lobed than in *Anthericum*; but when ripe opening at the top in 3 valves, as in that genus.—Baker in *Journ. Linn. Soc.* xv. 358; Hook. f. *Fl. Tasm.* ii. 53; F. v. M. *Fragm.* vii. 68.

Hab.: Herbert Creek, *Bowman*; Warwick, *Beckler*, and many other southern localities.

Var. *chlorantha*. Perianth segments white with a greenish centre. *C. chlorantha*, F. v. M. *Fragm.* i. 63; Baker in *Journ. Linn. Soc.* xv. 359.

Hab.: Peak Downs, *F. v. M.*

2. *C. parviflora* (flowers small), *R. Br. Prod.* 277; *Benth. Fl. Austr.* vii. 47.—Closely allied in every respect to *C. vittata*, and scarcely more slender or with narrower leaves, but both the flowers and fruits much smaller, the perianth-segments under 3 lines long.—Baker in *Journ. Linn. Soc.* xv. 358; Hook. f. *Fl. Tasm.* ii. 53; F. v. M. *Fragm.* vii. 67; *C. occidentalis*, R. Br. *Prod.* 277; Endl. in *Pl. Preiss.* ii. 33; Baker in *Journ. Linn. Soc.* xv. 358; *C. micrantha*, Lindl. *Swan Riv. App.* 57; Endl. l.c. 34.

Hab.: Moreton Bay, *Herb. F. Mueller*; Burnett River, *Daly*; Rockhampton? *Bowman*.

14. *CORYNOTHECA* F. v. M.  
(Referring to the club-shaped fruit.)

Perianth spirally twisted over the ovary after flowering but at length deciduous, of 6 spreading segments, all nearly equal in length, the inner ones rather broader. Stamens 6, attached to the base of the perianth and shorter than the segments,

the 3 opposite the inner segments longer than the 3 others; filaments filiform, glabrous; anthers ovate or oblong, usually shorter than the filaments; the cells opening inwards in longitudinal slits. Ovary 3-celled, with 2 or sometimes only 1 ovule in each cell, and all except 1 constantly abortive; style filiform, with a terminal stigma. Fruit a single ovoid indehiscent 1-seeded nutlet. Seed obovoid, erect or pendulous, the funicle shortly expanded into a black strophiole; testa black, crustaceous, minutely granulated but often shining.—Slender rigid much-branched herbs, leafless except a few radical narrow leaves early withering away, and scarious scales under the branches. Flowers minute, solitary or rarely 2 together within minute bracts along the smaller branches.

The genus is limited to Australia.

1. **C. lateriflora** (lateral-flowering), *F. v. M. Fragm.* vii. 68; *Benth. Fl. Austr.* vii. 49. Stems rigid but not thick, with numerous branches, dichotomous or clustered 2 or 3 together, elongated and divaricate. Leaves very rarely seen at the base of the stem, very narrow almost subulate, and only 2 or 3 in. long, those of the stem reduced to scarious scales under the branches, or the lower ones sometimes produced into a subulate point of  $\frac{1}{2}$  to lin. Flowers whitish, solitary or rarely 2 together along the branches, on very short pedicels within a minute scarious bract. Perianth  $1\frac{1}{2}$  to nearly 2 lines long. Anthers oblong but usually shorter than the filament. Fruit an obovoid nutlet, little more than 1 line long, the abortive cells forming a protuberance along one side.—*Casia lateriflora*, R. Br. Prod. 277; Baker in Journ. Linn. Soc. xv. 360.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown.*

## 15. DIANELLA, Lam.

(After the goddess Diana.)

Perianth persistent, of 6 distinct oblong segments, either equal in length or the 3 inner ones rather shorter, all with thin margins, and 3 to 5 rarely 6 or 7 parallel veins more or less approximate in the centre. Stamens 6, 3 opposite the outer segments hypogynous, 3 more or less adhering to the base of the inner segments; filaments abruptly thickened at the apex or nearly to the base; anthers erect, the cells opening in terminal pores often continued in longitudinal slits sometimes nearly to the base. Ovary sessile, short, 3-celled, with several superposed ovules in each cell; style filiform, with a terminal somewhat capitate stigma, entire or slightly 3-furrowed. Fruit a blue indehiscent berry. Seeds few, variously shaped, with a black testa coriaceous smooth and shining, a white waxy albumen and small embryo.—Glabrous perennials, with thick fibrous roots, the stock often stoloniferous or slightly branched. Scapes or stems erect, rigid, often several feet high. Leaves crowded at the base of the stems or more or less spread on the lower part, distichous and sheathing at the base, with a long lamina, a few upper ones reduced to short sheaths and a small erect lamina. Flowers blue, pedicellate, nodding, in loose dichotomous cymes collected in a terminal panicle. Bracts at the base of the pedicels small and scarious or none. Pedicels articulate close under the flower.

The genus is chiefly Australian, but extends in a very few species to tropical Asia, the Mascarene and Pacific Islands, and New Zealand.

Leaves radical or nearly so, very shortly sheathing the base of the stem.

Anthers longer than the filament, which is thickened only above the middle.

Leaves narrow, usually long and nearly flat, the sheathing base scarcely keeled . . . . . 1. *D. levis.*

Leaves long, narrow, rigid, with the margins much revolute, the sheathing base keeled . . . . . 2. *D. revoluta.*



Stem often branching at the base and more or less leafy, the sheathing base of the leaves laterally flattened and acutely keeled. Anthers longer than the filament.

Leaves narrow, mostly under  $\frac{1}{2}$  in. broad . . . . . 3. *D. cœrulea*.  
 Leaves  $\frac{1}{2}$  to 1 in. broad . . . . . 4. *D. ensifolia*.

1. ***D. lævis*** (smooth), *R. Br. Prod.* 280; *Benth. Fl. Austr.* vii. 14. Stems varying from under 1ft. in some of the inland specimens to 2 or 3ft. in luxuriant ones. Leaves usually few at the base of the stem, the short sheathing base rounded on the back or only slightly compressed and scarcely keeled, the blade in the typical specimens very long and narrow, often above 2ft. long and  $\frac{1}{4}$  to nearly  $\frac{1}{2}$  in. broad, flat or with scarcely recurved margins when dry, the edges smooth or slightly scabrous; in the smaller inland specimens the leaves are much shorter than the stem and spreading or recurved. Panicle varying from loose and spreading to narrow with the cymes contracted into short clusters. Perianth-segments 3 to 4 or rarely 5 lines long, all 5-nerved or the inner ones only 3-nerved. Filaments with the thickened apex much shorter than either the filiform base or the oblong-linear anther, which varies from  $1\frac{1}{2}$  to 2 lines long. Berry globular.—Baker in *Journ. Linn. Soc.* xiv. 577; *D. longifolia*, *R. Br. Prod.* 280; *F. v. M. Fragm.* vi. 122; *D. stramosa*, *Lindl. Bot. Reg.* t. 751.

Hab.: Various localities throughout the State.

*Var. aspera*. Leaves usually short, spreading, rigid, and often, but not always, scabrous on the edges and midribs. *D. elegans*, *F. v. M. Fragm.* vi. 122, but scarcely of Kunth, who describes the anthers as brown, whilst they appear to be always yellow in *D. lævis*.—*Benth.*

2. ***D. revoluta*** (revolute), *R. Br. Prod.* 280; *Benth. Fl. Austr.* vii. 15. Leaves distichous and crowded at the base of the stem, the sheaths with prominent keels, two or three outer ones with scarcely any or very short laminae, the inner ones with narrow rigid blades often 2 or 3ft. long, with the margins closely revolute over the midrib, leaving a deep furrow on the upper side, the edges and midrib scabrous or smooth. Panicle when fully out looser and more spreading with larger flowers more deeply coloured than in *D. cœrulea*. Perianth often above 4 lines long, sometimes less. Anther considerably longer than the filaments, of which the thickened apex is usually very short. Berries small, globular.—Baker in *Journ. Linn. Soc.* xiv. 578; *F. v. M. Fragm.* vi. 121; *D. divaricata*, *R. Br. Prod.* 280; Baker, l.c.; *D. longifolia*, *Bot. Reg.* t. 784, not of *R. Br.*

Hab.: Upper Burnett River, *F. v. M.*; Rockhampton, *O'Shanesy*, *Bowman*.

3. ***D. cœrulea*** (blue), *Sims, Bot. Mag.* t. 505; *Benth. Fl. Austr.* vii. 16. Leaves distichous and sheathing at the base, not so closely crowded on the stock as in the preceding species but more or less extending over the lower part of the stem, which is often branched at the base; the sheaths much flattened laterally, prominently and acutely keeled, and usually but not always scabrous on the edges; the lamina long, erect, and narrow, rarely attaining  $\frac{1}{2}$  in. in breadth and sometimes under 2 lines. Panicle usually loose as in *D. lævis*, but often smaller and the cymes sometimes dense and almost sessile along the main rhachis. Perianth-segments 3 to 4 lines long, with 5 or 3 nerves less crowded in the centre than in *D. lævis*. Filaments shorter than the anthers, with the thickened apex not longer than the filiform base and sometimes very short. Berry small and globular.—*R. Br. Prod.* 279; Baker in *Journ. Linn. Soc.* xiv. 576; *F. v. M. Fragm.* vi. 123; *Red. Lil.* ii. t. 79; *D. revoluta*, *Bot. Reg.* t. 1120.

Hab.: From Moreton Bay, *A. Cunningham* and others, to Rockingham Bay, *Dallachy*; Palm Island, *Henne*; Cape York, *M'Gillivray*, *Hann's Expedition*; common in scrubs.

*Var. congesta*, (*D. congesta*, *R. Br. Prod.*; Baker, in *Journ. Linn. Soc.* xiv. 576). Stems branching, especially from near the base, attaining the height of 2ft. or more. Leaves distichous, the lamina 1ft. long and about  $\frac{1}{2}$  in. broad, the margins and keel smooth, although

the latter is sharply prominent. Sheaths much flattened, with sharp smooth keels, nearly half as long as the lamina. Panicle shorter than the leaves, peduncle flattened, with one or two of the last leaves reduced to erect sheathing bracts. Flowers deep blue, in a few dense sessile cymes, shortly pedicellate, the buds nearly globular, when expanded about  $\frac{3}{16}$  in. in diameter. Bracts scarious, brown, ovate-acuminate, small, 1 to 2 lines long. In all the flowers opened most or all the organs of reproduction were metamorphosed into petaloid bodies.

Hab.: Southport, *H. Schneider*. On the sea coast sand, amongst the bushes just above high-water mark.

The above plant is, I think, identical with Dr. Brown's one from Torres Straits, but neither Brown, in *Prod.*, nor Baker, in *Journ. Linn. Soc.*, describes the flowers. Bentham, in *Flora Austr.* vii., 16, says that: "The inflorescence in the specimen preserved is scarcely fully developed and almost destroyed by insects."

I have a specimen gathered by R. C. Burton, near Northcote, a few years ago, which has also double flowers, but in nothing else differs from *D. lavis*, R. Br.

4. ***D. ensifolia*** (sword-like leaves), *Red. Lil. t. 1*; *Benth. Fl. Austr.* vii. 16. Very near the broad-leaved forms of *D. carulea*, with the stems similarly leafy in the lower part and the sheaths acutely keeled, but the blades usually much broader, varying from  $\frac{1}{2}$  to 1 in. in breadth and the sheaths shorter and looser. Panicle of *D. carulea*. Perianth-segments fully 4 lines long. Filaments shorter than the anthers, the thickened part very short and as broad as the anthers themselves. Fruit nearly globular, larger than in *D. carulea*.—Baker in *Journ. Linn. Soc.* xiv. 576; *Bot. Mag. t. 1404*; *D. nemorosa*, Jacq. *Hort. Schœnbr.* t. 94.

Hab.: This, the common species in tropical Asia and in the Mascarene and Pacific Islands, is represented in Australia at Rockingham Bay, and is precisely similar to some from China and the Philippine Islands.

### 16. STYPANDRA, R. Br.

(Referring to the tuft of tow under the anther.)

Perianth withering after flowering but not twisted, and at length deciduous, of 6 spreading segments usually 5-nerved, all equal and entire or the inner ones broader. Stamens 6, hypogynous, much shorter than the perianth; filaments either filiform and flexuose at the base with a dense woolly tuft under the anther, or shortly tomentose-woolly from the base; anthers oblong, very much rolled back after shedding the pollen. Ovary sessile, 3-celled, with several ovules in each cell; style filiform, undivided. Capsule ovoid or oblong, 3-valved. Seeds several (3 to 6) in each cell, ovate, more or less flattened, with a black smooth crustaceous testa, opaque or shining.—Perennials with fibrous roots. Stems erect or ascending, simple below the inflorescence or branched and sometimes woody at the base. Leaves either all radical or distichously spreading on the stem. Flowers blue, in a very loose terminal dichotomous cyme. Pedicels filiform, often 2 or 3 together and terminal or solitary along the branches. Bracts minute or none, or the lower ones leaf-like in the leafy species.

The genus is limited to Australia.

- |   |                          |
|---|--------------------------|
| Stem leafy to the inflorescence, often branched at the base and sometimes woody   | 1. <i>S. glauca</i> .    |
| Stems leafless except at the base. Leaves linear, in dense radical tufts, very rigid, $1\frac{1}{2}$ to 3 lines broad. Flowers blue or yellowish, very rarely white | 2. <i>S. cœspitosa</i> . |

1. ***S. glauca*** (grey), *R. Br. Prod.* 279; *Benth. Fl. Austr.* vii. 53.—A leafy perennial with stems on a creeping rhizome sometimes low and tufted, or weak and ascending, under 1ft. high, sometimes 2 or 3ft. high, woody and branched at the base. Leaves distichous, the sheaths usually concealing the stem, somewhat flattened with an acute keel, or almost terete, the blade erect or spreading, linear or lanceolate, usually 3 to 4 in. long, but sometimes twice that length and varying from 2 to 4 lines in breadth. Flowers in a loose terminal dichotomous cyme usually leafy at the base, the branches very spreading, the filiform pedicels recurved, varying from  $\frac{1}{2}$  to 1 in long, mostly solitary but sometimes 2 together

at the ends of the branches, without subtending bracts except sometimes a leafy one under the lowest. Perianth blue, often turning red in drying, the segments very acute, 5-nerved, about 6 lines long. Stamens very much shorter; filaments filiform and twisted in the lower half, with a dense oblong tow-like tuft of hairs under the anther; anther shorter than the filament, much recurved, almost spiral after shedding the pollen. Capsule oblong, 3 to 4 lines long. Seeds several in each cell, rather less flattened than in *S. cæspitosa*, smooth but not shining.—Baker in Journ. Linn. Soc. xv. 356; F. v. M. Fragm. vii. 64; *S. propinqua*, A. Cunn. in Bot. Mag. t. 3417; *S. frutescens*, Knowl. and Westc. Fl. Cab. ii. 61, 6), t. 63; *S. virgata*, Endl. in Pl. Preiss. ii. 35.

Hab.: Stanthorpe.

2. ***S. cæspitosa*** (tufted), *R. Br. Prod.* 279; *Benth. Fl. Austr.* vii. 54. Stems from a thick horizontal rhizome erect, 1 to 2ft. high, simple below the inflorescence. Leaves mostly radical, with very short distichous sheaths, erect, rigid, 6in. to 1ft. long and  $1\frac{1}{2}$  to 3 lines broad. Scapes leafless or occasionally with 1 or 2 short leaves with long sheaths. Inflorescence loosely dichotomous and occupying at least half the total height of the plant. Pedicels erect, filiform but rigid, 1 to 2in. long, usually 3 or 4 together in an umbel at the end of each branch. Bracts linear-lanceolate and almost leafy under the principal branches, very small under the smaller branches and pedicels. Perianth erect, blue or yellowish inside or very rarely white, the segments 5 to 6 lines long, narrower and less acute than in *S. glauca*. Stamens about half as long as the segments, the filaments densely covered with very short cottony hairs almost from the base. Capsule oblong, about 3 lines long. Seeds several in each cell, rather flat, smooth and shining.—Baker in Journ. Linn. Soc. xv. 355; Hook. f. Fl. Tasm. ii. 55; F. v. M. Fragm. vii. 65.

Hab.: Stanthorpe.

### 17. \*NOTHOSCORDUM, Kunth.

(From *nothos*, spurious; and *scordon*, garlic.)

Perianth withering, persistent; segments 6, connate at the base or to the middle, the other portion patent or campanulate-connivent, subequal, 1-nerved. Stamens 6, fixed to the base of the segments, filaments dilated, subulate at the apex. Anthers oblong dorsifixed, dehiscence introrse. Ovary sessile, 3-celled; style filiform, often persistent; stigma small, ovules in cells numerous. Capsule membranous, 3-dym. or 3-lobed, cells dehiscent. Seeds angular-compressed, or nearly flat, black. Leaves radical, linear, flat. Scape simple, not leafy. Flowers umbellate, not articulate with the pedicels. Involucral bracts 2. The garlic scent wanting in the genus.—Benth. and Hook. Gen. Pl. iii. 802.

1. ***N. fragrans*** (fragrant), *Kunth*. Flowers whitish, with brownish-purple or lilac streaks on the outside of each segment, very fragrant. Umbel lax, 6 to 20-flowered. Leaves all radical, narrow-lorate. Scape 1 to 2ft. high.—*Allium fragrans*, Vent., Bot. Reg. 898.

Hab.: North America; naturalised near Bundaberg, *J. Keys*; and likely to become a pest, as besides its bulbs it produces an abundant quantity of seed; otherwise it is a pretty plant for the garden, flowering through the summer months.

### 18. TRICORYNE, R. Br.

(Referring to the 3 club-shaped fruits.)

Perianth spirally twisted over the ovary after flowering but at length deciduous, of 6 narrow 3- or 5-nerved segments, all entire, and equal or the inner ones rather narrower. Stamens 6, hypogynous, shorter than the perianth; filaments filiform, with a dense woolly tuft under the anther. Anthers narrow-oblong,

erect, emarginate at the base, the cells opening inwards in longitudinal slits. Ovary sessile, deeply 3-lobed and 3-celled, with 2 erect ovules in each cell or lobe; style filiform, undivided. Fruit divided to the base into 3 (reduced sometimes by abortion to 2 or 1) 1-seeded indehiscent nutlets, dry or slightly fleshy, strongly reticulate or ribbed. Seed black with a crustaceous testa and fleshy albumen.—Perennials with fibrous roots. Stems usually wiry and branching, the branches often clustered. Leaves few and grass-like, or all reduced to scarious scales; more rarely small and more leafy plants. Flowers in terminal umbels with small imbricate scarious bracts, of which one or two outer empty ones often elongated or leaf-like.

The genus is limited to Australia.

Stems wiry or rush-like, branched and without leaves, except a few at the base, usually 1 to 2ft. high. Flowers 6, or fewer in the umbel or rarely more.

Stems bordered by narrow wings . . . . . 1. *T. platyptera*.

Stems usually with clustered branches, deeply striate, acutely angled, or slightly flattened.

Quite glabrous . . . . . 2. *T. anceps*.

Stem and branches hispid . . . . . 3. *T. muricata*.

Stems less branched, terete, or slightly striate . . . . . 4. *T. elatior*.

Stems simple, under 1ft., with a single many-flowered umbel, and rather long radical leaves . . . . . 5. *T. simplex*.

1. **T. platyptera** (broadly-winged), *Reichb. f. Beitr. Syst. Pflanzenk* 72; *Benth. Fl. Austr.* vii. 51. Stems from a shortly creeping base erect or ascending, sparingly branched, 1 to nearly 2ft. high, the branches flattened with the margins more or less winged, the total breadth varying from 1 to 3 lines. Leaves very few at the base of the stem and rarely 1in. long, those under the branches rigid, erect, under  $\frac{1}{2}$ in. or all reduced to very small scales. Umbels of several, often more than 6, flowers. Perianth-segments 4 to 5 lines long, the pedicels nearly as long. Bracts under the pedicels all very small. Nutlets obliquely ovoid, nearly two lines long, strongly ribbed when dry, contracted at the base into a short thick stipes.—*T. pterocaulon*, Baker in Journ. Linn. Soc. xv. 363.

Hab.: Sandy shores, Cape York, *Veitch, Daemel*; Fitzroy Island, *Walter*; Dunk Island, *McGillivray*; Cleveland Bay, *Bowman*; Port Denison, *Hecate Expedition*; gathered also in *Hann's Expedition*; common in tropical localities.

2. **T. anceps** (two-edged), *R. Br. Prod.* 278; *Benth. Fl. Austr.* vii. 51. Stems erect, slender but rigid and very much branched, the branches often densely clustered, the principal ones prominently striate, but terete or slightly compressed, the numerous smaller ones flattened or acutely 3- or 4-angled but not distinctly winged. Leaves reduced to small scales. Umbels of 3 to 6 flowers, with very small bracts. Perianth-segments about 4 lines long, the pedicels shorter. Nutlets as large as in *T. platyptera* but smooth.—Baker in Journ. Linn. Soc. xv. 363.

Hab.: Sandy shores, Endeavour River, *Banks and Solander, A. Cunningham*; Rockingham Bay, *Dallachy*; and many other tropical localities.

3. **T. muricata** (muricate), *Baker in Journ. Linn. Soc.* xv. 363; *Benth. Fl. Austr.* vii. 52. Stems erect, rigid, with numerous slender strongly striate or angular branches as in *T. anceps*, but the angles hispid with small rigid transparent hairs. Leaves reduced to scales, umbels and flowers of *T. anceps*, of which this might be placed as a hispid variety.

Hab.: Wide Bay, *Bidwill*.

4. **T. elatior** (taller), *R. Br. Prod.* 278; *Benth. Fl. Austr.* vii. 52. Stems from a perennial sometimes thick and woody rhizome erect or ascending more or less branched often under 1ft but sometimes above 2ft. high, the branches few

or numerous, but rarely more than 3 in a cluster, slender or even filiform striate but less so than in *T. anceps*. Lower leaves often grass-like, 2 to 4 in. long, the upper ones and sometimes all reduced to short scales. Umbels usually 3 or 4 flowered, the scarious bracts usually prominent and 1 or 2 outer ones often produced into subulate points of 3 or 4 lines. Perianth very variable in size, but usually about 4 lines long. Nutlets smaller than in *T. anceps*.—Baker in Journ. Linn. Soc. xv. 362; Bauer, Illustr. Pl. Nov. Holl. t. 11; Endl. Iconogr. t. 61; Endl. in Pl. Preiss. ii. 35; Hook. f. Fl. Tasm. ii. 55; *T. anceps*, Endl. l.c. 36, not of R. Br.

Hab.: Moreton Island, *M'Gillivray*, *Eaves*; Condamine River, *Leichhardt*; Peak Downs, *F. v. Mueller*; Rockhampton, *O'Shanesy*; Port Curtis, *M'Gillivray*; Stantborpe.

*T. scabra*, R. Br. Prod. 278, from Keppel Bay, appears to be a common form of *T. elatior*, but with a few minute hairs scattered on the lower part of the stem, very different from the hispid *T. muricata*.—Benth.

5. **T. simplex** (simple), *R. Br. Prod.* 278; *Benth. Fl. Austr.* vii. 52. Stems simple or very rarely once-branched, 6 in. to 1 ft. high, with a few grass-like leaves sometimes as long as the stem. Umbel solitary, terminal, with very numerous flowers (usually above 20), the pedicels longer than the perianth. Bracts all scarious or rarely 1 or 2 outer ones with fine points. Perianth-segments about 5 lines long.—Baker in Journ. Linn. Soc. xv. 362.

Hab.: Southern localities.

## 19. LAXMANNIA, R. Br.

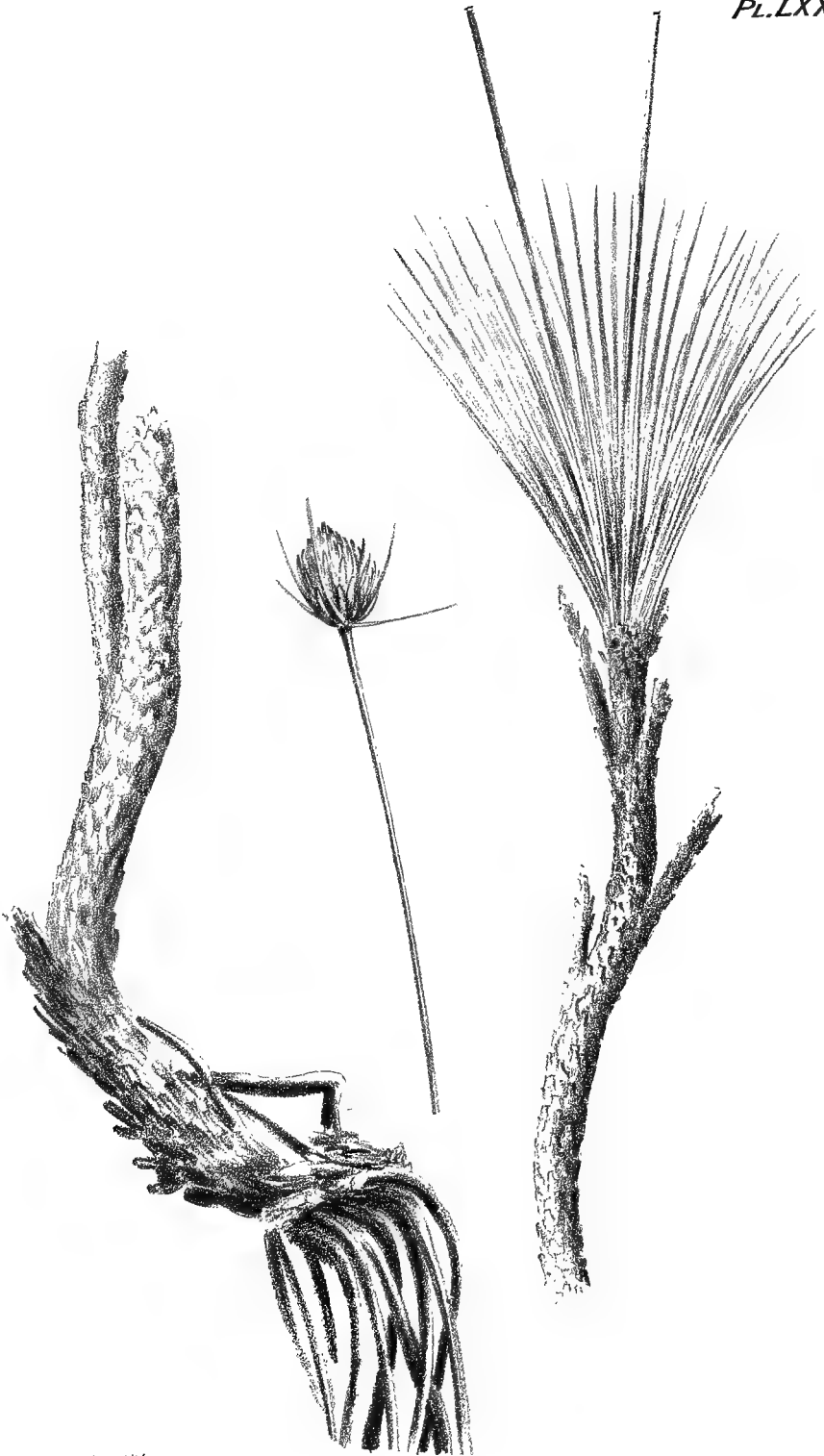
(After E. Laxmann.)

Perianth withering and persistent but not twisted, of 6 segments, the 3 outer ones distinct from the base, the 3 inner very shortly united at the base or almost free. Stamens 6, shorter than the perianth, 3 opposite the outer segments hypogynous or nearly so, 3 adnate to the middle of the inner segments; filaments filiform; anthers short, 2-lobed at the base, fixed on the back at the base of the lobes, the cells opening inwards in longitudinal slits. Ovary contracted at the base or almost stipitate, 3-celled, with 2 to 4 ovules in each cell; style shortly filiform, with a somewhat dilated entire stigma. Capsule enclosed in the perianth, 3-valved. Seeds few, black, not flattened, smooth but not shining, without any strophiole.—Perennials with fibrous roots not tuberous. Stems either short and densely tufted or elongated branched and diffuse. Leaves narrow-linear or subulate, in radical or terminal tufts, dilated at the base into scarious sheathing appendages, which are often produced at the top into simple or woolly-ciliate bristles. Flowers white or pink, in terminal pedunculate or sessile heads, with imbricate scarious bracts, the outer bracts empty usually entire and forming an involucre usually shorter than the perianths, the inner ones subtending each flower short very thin and transparent, jagged or fringed on the edge or more frequently divided to near the base into woolly hair-like segments, sometimes described as hairs of the receptacle.

The genus is limited to Australia.

1. **L. gracilis** (slender), *R. Br. Prod.* 286; *Benth. Fl. Austr.* vii. 65. Stems slender, branched, forming loose tufts of 1 ft. or more. Leaves crowded at the base and ends of the branches, leaving leafless intervals of  $\frac{1}{2}$  to 1 in., the short broad scarious sheathing bases imbricate with a few woolly hairs on their margins, the blades filiform, erect or spreading,  $\frac{1}{2}$  to more than 1 in. long. Flower-heads small, on slender peduncles of several inches. Outer empty bracts few, very thin and transparent, ovate, quite entire and glabrous, 1 to 2 lines long; inner flowering ones short, more or less fringed with narrow teeth or ciliate with long woolly hairs at the base. Flowers pink, very shortly pedicellate or almost





F.C. Wills, Del. et Lith.

*Borya septentrionalis*, F. & M.

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sessile, the segments about 2 lines or at length nearly 3 long, the outer ones rather shorter than the inner. Ovary contracted into a short stipes.—F. v. M. *Fragm.* vii. 88.

Hab.: Dawson River, *F. v. Mueller*; Rockhampton, *O'Shanesy*; the Islands of Moreton Bay and many other localities; it is a plant frequently met with on sandy spots inland as well as on the coast.

## 20. BORYA, Labill.

(After Col. Bory de St. Vincent.)

Perianth withering but persistent, hypocrateriform, the tube slender, cylindrical, the limb of 6 spreading nearly equal linear lobes. Stamens 6, inserted at the base of the lobes and as long as them or nearly so; filaments filiform; anthers short, erect, ovate-sagittate, the cells opening inwards in longitudinal slits. Ovary sessile, ovoid, 3-celled, with several (about 20) ovules in each cell, superposed in two rows; style filiform, with a small capitate stigma. Capsule enclosed amongst the persistent bracts, 3-valved. Seeds few, with a black crustaceous testa, without any strophiole.—Perennials with the stems either very short and tufted or elongated and branched, always densely covered with the closely imbricated persistent bases of the leaves. Leaves narrow-linear subulate or almost filiform, much crowded on the stock or on the upper part of the stems when elongated. Flowers in globular or ovoid heads on long peduncles. Bracts densely imbricated, a few of the outer ones empty, subulate, forming an erect or spreading involucre, the inner ones broad, usually obtuse, brown or black, each with a single flower sessile in its axil, the tube enclosed in a bracteole similar to the bract but broader, with inflected scarious margins.

The genus is limited to Australia.

1. **B. septentrionalis** (northern), *F. v. M. Fragm.* v. 41; *Benth. Fl. Austr.* vii. 71. A perennial or low shrub, very variable in aspect according to age and situation, sometimes forming short tufts with the leaves almost radical and scape-like peduncles, but the stems often growing out to 6 or 18 in. high, crooked or nearly erect, simple or branched, the lower portion covered with the persistent imbricate bases of the leaves and occasionally rooting. Leaves crowded in the upper portion, erect spreading or recurved, from under 1½ in. to above 2 in. long, always ending in rigid pungent points. Peduncles erect, simple, 6 to 12 in. long. Flower-heads from ovoid to depressed globular, 6 to 9 lines diameter. From 3 to 7 of the outer bracts empty, lanceolate-subulate or linear, very rigid and pointed, and seldom longer than the head; inner flowering bracts dark-brown, 4 to 5 lines long, all very obtuse or a few of the outer ones almost acute or empty and passing into the involucre bracts. Bracteoles enclosing the flowers as long as the bracts. Perianth-tube slender, longer than the bracts; the lobes linear, about the length of the tube.

Hab.: Fissures of rocks, Rockingham Bay, *Dallachy*; Walsh's Pyramid and other mountains.

## 21. SOWERBÆA, Sm.

(After James Sowerby.)

Perianth persistent without twisting, of 6 oblong or ovate segments, all free or the inner ones shortly connate at the base. Stamens 3 perfect, opposite the inner segments at their base, with very short filaments, anthers erect divided to below the middle into 2 linear lobes opening laterally in longitudinal slits, the 3 opposite the outer lobes reduced to short filaments without anthers or entirely wanting. Ovary short, 3-celled, with 2 to 6 ovules in each cell. Style filiform, with a terminal stigma. Capsule 3-celled, enclosed in the persistent perianth, opening loculicidally in 3 valves. Seeds few, more or less angular, with a thick but scarcely crustaceous black testa minutely granulated. Embryo small, linear.



in the centre of the albumen.—Tufted perennials with fibrous roots. Leaves at the base of the stem linear-filiform. Stems or scapes leafless, simple or rarely branched at the base, with a single terminal globular umbel of pink flowers, and small scarious imbricate bracts at the base of the pedicels.

The genus is limited to Australia.

1. **S. juncea** (Rush-like), *Sm. in Trans. Linn. Soc.* v. 160, t. 6; *Benth. Fl. Austr.* vii. 61. Stems simple, slender, 1 to 2ft. high. Leaves at the base of the stem somewhat distichous, linear-filiform, terete, all short or some nearly as long as the stem, bordered at the base and sometimes up to nearly 2in. with scarious transparent sheathing margins. Umbel many-flowered, the imbricate bracts either all very short and scarious or 2 or 3 of the outer ones of a firmer consistence, rather larger and acute. Pedicels at first scarcely exceeding the bracts, lengthening as the flower expands, but rarely longer than the perianth. Perianth pink, the segments oval-oblong, 3 lines long or rather more, all affixed at about the same level. Anther-bearing filaments very short and flattened, alternating with as many nearly similar but without anthers; anthers usually attaining to about half the perianth, divided almost to their cordate base. Seeds usually about 3 in the capsule.—*R. Br. Prod.* 285; *Andr. Bot. Rep. t.* 81; *Bot. Mag. t.* 1104; *Red. Lil. t.* 341.

Hab.: On sandy land; very common on the coast.

## 22. BURCHARDIA, R. Br.

(After Dr. Henry Burchard.)

Perianth of 6 distinct deciduous segments, all nearly equal and similar, induplicate or convolute round the corresponding stamens in the bud, spreading and flat when in flower. Stamens 6, attached to the base of the perianth-segments and shorter than them; filaments flattened towards the base; anthers linear-oblong, attached near the base, the cells opening outwards in longitudinal slits. Ovary sessile but tapering at the base, prominently 3-angled, 3-celled, with numerous ovules superposed in 2 rows in each cell; style short, with 3 recurved stigmatic lobes. Capsule oblong or ovoid, deeply 3-furrowed and obtusely 3-angled, opening septicidally in 3 valves, with marginal placenta. Seeds angular, with a brown thin adnate testa. Embryo small, in a fleshy albumen, not far from the hilum.—Herb with a fibrous root, and simple or slightly branched stem, with few narrow leaves not distichous. Flowers in a terminal umbel, a few outer bracts forming a small involucre.

The genus is limited to the single Australian species.

1. **B. umbellata** (flowers in umbels), *R. Br. Prod.* 273; *Benth. Fl. Austr.* vii. 33. Stem enclosed at the base in a few brown sheaths of old leaves but not bulbous, 1 to 2ft. high, usually simple but occasionally with 1 or 2 erect branches. Leaves 1 to 3 at the base of the stem, narrow-linear, concave, 3 to 6in. long, with a sheathing base, the upper leaves few, much shorter or reduced to sheathing bracts. Flowers several often numerous in the umbel, irregular sometimes partially centrifugally developed, varying however in number as well as size, each one in the axil of a small bract, 2 or 3 of the outer bracts often larger forming an involucre but always much shorter than the pedicels, which vary in length from a few lines to 2in. Perianth-segments white, oblong or elliptical, usually about 4 lines, but varying from 3 to 6 lines long. Capsule when full grown attaining about  $\frac{1}{2}$ in.—*Hook. f. Fl. Tasm.* ii. 46; *Endl. in Pl. Preiss.* ii. 44; *B. multiflora* and *B. congesta*, *Lindl. Swan Riv. App.* 58; *Endl. l.c.*

Hab.: Common on sandy coastal land.

23. ANGUILLARIA, Br.

(After Luigi Anguillara, a Professor of Botany at Padua, who died in 1570.)

Perianth persistent, of 6 distinct spreading segments, all equal and similar. Stamens 6, attached to the base of the segments or almost hypogynous, shorter than the perianth; filaments filiform, dilated towards the base; anthers ovate-oblong, versatile, the cells opening laterally in longitudinal slits. Ovary sessile, 3-celled, with rather numerous ovules in each cell; styles 3, distinct or united at the base, shortly filiform, recurved, stigmatic along the inner edge at least towards the end. Capsule prominently 3-angled, opening loculicidally in 3 valves. Seeds small, globular, the testa thin brown and appressed; albumen fleshy, rather hard. Embryo small, near the hilum.—Small herbs, the base of the stem and persistent brown leaf-sheaths thickened into a narrow tunicated bulb. Leaves few, linear, the uppermost reduced to a broad loose sheath and short lamina or point. Flowers often more or less dioecious, either solitary and terminal or sessile along the rhachis of a simple spike. Bracts none.

The genus is endemic in Australia.

1. **A. dioica** (male and female plants distinct), *R. Br. Prod.* 273; *Benth. Fl. Austr.* vii. 29. Bulb tunicated. Stem varying from 2 or 3 in. to nearly 1 ft. high. Leaves few, the lowest reduced to brown elongated sheaths, perfect ones usually 3 or 4, linear, varying from 1 to 3 or even 4 in. long, the lowest sometimes narrow from the base, the others more or less dilated at the base into a broad loose sheath, the uppermost often reduced to the broad base with a short point or only acute, and therefore sometimes called a spatha. Flowers either solitary and terminal or 1, 2 or more sessile along the simple rhachis which is often flexuose, polygamous, the strictly female ones without staminodia generally on a separate plant, the males and hermaphrodites usually in one spike. Perianth-segments oblong or linear, 3 to 6 lines long, bearing below the middle on the upper surface a transverse gland sometimes broken up into 2. Styles shortly filiform, distinct from the base. Capsule ovate or oblong, truncate at the top, 4 to 5 lines long.—*Endl. in Pl. Preiss.* ii. 44; *Hook. f. Fl. Tasm.* ii. 46; *Endl. Iconogr.* t. 3; *A. biglandulosa* and *A. uniflora*, *R. Br. Prod.* 273; *A. monantha*, *Endl. in Pl. Preiss.* ii. 45; *A. australis*, *F. v. M. Fragm.* vii. 74; *Pleea Sieberi*, *Reichb. in Sieb. Pl. Exs.*; *Melanthium Brownii*, *Schlecht. Linnæa*, i. 86.

Hab.: Moreton Bay, *Leichhardt*; Warwick, *Beckler*; Darling Downs, *Woolfs*; Armidale, *Perrott*; Rockhampton, *O'Shanesy*; Stanthorpe.

24. IPHIGENIA, Kunth.

(After the priestess to Diana.)

Perianth deciduous, of 6 distinct spreading segments, all equal and similar. Stamens 6, hypogynous, very much shorter than the perianth; anthers ovate-oblong, versatile, the cells opening laterally in longitudinal slits. Ovary sessile, 3-celled, with rather numerous ovules in each cell; styles 3, very shortly united at the base, recurved, stigmatic along the inner edge. Capsule less angular than in *Anguillaria*, opening loculicidally in 3 valves. Seeds small, globular, the testa thin brown and appressed; albumen fleshy. Embryo small, near the hilum.—Herbs forming a small tunicated bulb, the stem simple, with few narrow leaves. Flowers few, on long pedicels, or sessile in a species not Australian.

The Australian species is widely distributed over East India. The genus is closely allied to *Anguillaria*, and was included in it by R. Brown, differing from it chiefly in the separately deciduous perianth-segments and stamens.

1. **I. indica** (Indian), *Kunth. Enum.* iv. 213; *Benth. Fl. Austr.* vii. 31. Stems simple, about 1 ft. high in the Australian specimens, slender, with a few rather long linear or linear-lanceolate leaves, sheathing at the base. Flowers

few, at the end of the stem, on rather long slender pedicels, subtended, at least the lower ones, by leafy bracts. Perianth purple or red, the segments narrow-linear, about 3 lines long in the Australian specimens, longer in some Indian ones. Capsule ovoid or oblong, 4 to 5 lines long.—F. v. M. *Fragm.* vii. 74; *Anguillarã indica*, R. Br. *Prod.* 273; Wall. *Pl. As. Rar.* iii. t. 259.

Hab.: Roc'hampton and adjoining districts, *Bowman*, *O'Shanesy*; Rockingham Bay, *Dallachy*; and many localities in the south.

## 25. SCHELHAMMERA, Br.

(After C. C. Schelhammer.)

Perianth of 6 distinct deciduous segments, all nearly equal and similar, induplicate or convolute round the corresponding stamens in the bud, spreading and flat when in flower. Stamens 6, attached to the base of the segments and shorter than them; filaments thick or flattened, tapering under the anther; anthers oblong, erect, the cells opening laterally in longitudinal slits, turned outwards when fully out. Ovary sessile, prominently 3-angled, 3-celled, with several ovules superposed in 2 rows in each cell; style more or less deeply divided into 3 recurved lobes stigmatic along the inner edge. Capsule nearly globular, with an almost fleshy pericarp, opening loculicidally in 3 valves. Seeds irregularly ovoid-globular, the funicle expanded into a broad irregular strophiole; testa very thin, light brown, closely appressed; albumen rather hard. Embryo very small, near the hilum.—Perennials, with fibrous roots and simple or branched stems. Leaves sessile, ovate or lanceolate. Flowers terminal, pedicellate, solitary or several together in an umbel pedunculate or sessile within the last leaves.

The genus is limited to Australia. .

Flowers usually above 10 in the sessile umbel . . . . . 1. *S. multiflora*.  
Umbels pedunculate . . . . . 2. *S. pedunculata*.

1. ***S. multiflora*** (flowers numerous), R. Br. *Prod.* 274; *Benth. Fl. Austr.* vii. 32. Stems from a knotted rhizome, rather more rigid than in *S. undulata*, simple or branched, mostly 6in. to nearly 1ft. high. Leaves 1 to 2in. long, almost shining with the margins quite entire, several of the upper ones close together forming an involucre round the umbel. Flowers pure white, several (usually above 10) together in a terminal umbel sessile within the last leaves, with sometimes a few minute bracts at the base of the pedicels besides the involucral leaves. Pedicels filiform,  $\frac{3}{4}$  to 1in. long. Perianth-segments about 4 lines long. Ovules usually 4 in each cell; seeds only 1 or 2.—F. v. M. *Fragm.* vii. 72.

Hab.: Endeavour River, *Banks and Solander*; Rockingham Bay, *Dallachy*; Cape York Peninsula, *Hann's Expedition*, n. 367; Cape York, *Daemel*.

2. ***S. pedunculata*** (stalked), F. v. M. in *Vict. Nat. March*, 1891. Baron Mueller (l.c.) states: Leaves 7in. long and 2in. broad, much acuminate, shortly petiolate, pellucid. A larger plant with the transverse secondary venules closer than in *S. multiflora*. Peduncles of umbels 1 to 1½in., the fruit considerably larger than in the last-named species. Sepals and petals same as in *S. multiflora*.

Hab.: Mount Bartle Frere, *Stephen Johnson*.

## 26. KREYSIGIA, Reichb.

(After F. L. Kreysig.)

(*Tripladenia*, Don.)

Perianth of 6 distinct deciduous segments, all nearly equal and similar, induplicate or convolute round the corresponding stamens in the bud, spreading and flat when in flower as in *Schelhammera*, but bordered on each side near the base

by a glandular appendage. Stamens 6, attached to the base of the segments and shorter than them; filaments tapering under the anther; anthers oblong, erect, the cells opening laterally in longitudinal slits, turned outwards when fully out. Ovary sessile, 3-angled, 3-celled, with 3 or 4 ovules in each cell; style deeply divided into 3 recurved lobes stigmatic along their inner edge. Capsule nearly globular, opening loculicidally in 3 valves. Seeds bright-brown, tuberculose, with a large strophiole, the embryo not completely enclosed in the albumen, but only covered by the strophiole. Perennial with a knotty rhizome and the simple stems and ovate or lanceolate leaves of *Schelhammera*, but the flowers axillary on a slender peduncle.

The genus is limited to the single species endemic in Australia.

1. **K. multiflora** (many-flowered), *Reichb. Iconogr. Exot.* iii. 11, t. 229; *Benth. Fl. Austr.* vii. 32. Stems from a knotty rhizome, ascending or erect, simple, flexuose,  $\frac{3}{4}$  to 1 $\frac{1}{2}$  ft. high. Leaves ovate or ovate-lanceolate, clasping the stem by their cordate base, acute, 2 to 3 in. long, with numerous prominent nerves connected by transverse veinlets. Peduncles axillary, bearing at their apex 1, 2 or rarely 3 flowers on filiform pedicels, with 3 or 4 linear bracts at the base of the pedicels and shorter than them, the whole inflorescence usually shorter than the leaves. Perianth-segments ovate or oblong, about 4 lines long, but varying in size, the lateral appendages at their base either dilated or 2, or 3 or even 4-lobed at their glandular apex. Capsule 3 or 4 lines diameter. Seeds 2 lines diameter, obtusely angular, tuberculose, bright-brown, with a large expanded strophiole.—*Bot. Mag.* t. 3905; *F. v. M. Fragm.* vii. 71; *Schelhammera multiflora*, *Lodd. Bot. Cab.* t. 1511, not of Br.; *Tripladenia Cunninghamii*, *Don* in *Proc. Linn. Soc.* 1839, *Ann. Nat.* 46, *Hist. ser. 1*, iv. 282.

Hab.: Pine River, *Statter*; Nerang Creek, *Schneider*; Macpherson Range, *Tryon*; not uncommon in southern localities.

ORDER CXXXVI. PONTEDERIACEÆ.

Flowers usually slightly irregular, hermaphrodite. Perianth inferior, with or without a distinct tube, the limb or whole perianth of 6 coloured petal-like lobes or segments, imbricate in 2 series, all nearly equal and similar. Stamens 6 or 3, attached to the base of the lobes or segments, often dissimilar; anthers 2-celled, opening laterally or inwards by longitudinal slits or terminal pores. Ovary superior, 3-celled or with 3 parietal placentas, with 1 or more ovules to each cell or placenta; style single, with a terminal 3-lobed or 6-toothed stigma. Fruit a capsule, opening loculicidally in 3 valves, but sometimes enclosed in the persistent tube of the perianth. Seeds albuminous, with a slender embryo, the radicle next to the hilum.—Aquatic herbs. Leaves usually petiolate, with numerous parallel veins. Flowers blue or white, in spikes or racemes proceeding from the sheath of the last or only leaf of the scape, usually with 1 or 2 sheathing bracts at the base of the peduncle.

A small Order dispersed over the tropical and sub-tropical regions of both the New and the Old World, extending in North America to more temperate districts. The only indigenous Australian species belongs to a genus confined to the Old World, whilst the other genera are exclusively American. The Order only differs from Liliaceæ in the aquatic habit and the slight irregularity of the flower.—*Benth.*

- Perianth funnel-shaped. Stamens 6, anthers versatile. Ovary 1-celled by abortion, 1 ovulate . . . . . 1. \*PONTEDERIA.
- Perianth funnel-shaped. Stamens 6, anthers versatile. Ovary 3-celled, with many ovules in each cell . . . . . 2. \*EICHORNIA.
- Perianth campanulate, no tube. Stamens 6, anthers erect. Ovary 3-celled, with many ovules in each cell . . . . . 3. MONOCHORIA.

## 1. \*PONTEDERIA, Linn.

(After J. Pontedera.)

Aquatic plants with stem-like or creeping rootstocks. Flowers numerous usually crowded at the sides of a rhachis, scarcely pedicellate, the inflorescence terminal compound, and densely cylindric, rarely almost simple and racemose. Perianth funnel-shaped with an incurved slender, or rarely abbreviated tube. Stamens 6. Radical leaves on long petioles, the lamina cordate-ovate, rotundate or rarely lanceolate, with a long loose sheath below the petiole. Stem or branch erect, simple, 1-leaved

The species belong to N. and S. America.

1. *P. cordata* (heart-shaped), *Linn.* Pickerel weed. Stems 1 to 2ft. high, radical leaves few, lamina coriaceous, cordate-ovate, petioles dilated and sheathed at the base. Flowers rather small in a more or less dense spike. Perianth blue pubescent outside, the upper lobe with a greenish spot on the inside. —*Bot. Mag.* 1156; *P. lanceolata*, *Lodd. Bot. Cab.* 613.

Hab.: An American aquatic naturalized in a few still waters near Brisbane.

## 2. \*EICHHORNIA, Kunth.

(After J. A. F. Eichhorn.)

Perianth funnel-shaped, tube short or elongated and slender, limb erecto-patent, more or less oblique, the lobes not very unequal. Stamens 6, of unequal length, declinate, some included, the others exerted, filaments filiform, slightly flattened near the base. Ovary sessile, 3-celled. Style filiform; stigma terminal slightly dilated or very shortly 3 or 6 lobed. Ovules numerous in each cell. Capsule enclosed in the withered perianth-tube, ovoid, oblong or linear; pericarp membranous. Seeds numerous, ovoid, many-ribbed, embryo cylindric, albumen farinaceous.—Aquatic herbs with roundish, petiolate radical leaves, the petiole often inflated.

Natives of South America and tropical Africa.

1. *E. speciosa* (showy), *Kunth.* Water Hyacinth. A floating plant, the roots having a calyptrate covering at the extremity like *Lemna*. Stems very short, the leaves almost entirely emersed, roundish but very variable in shape; petioles long or short, more or less inflated below the middle, with a sheathing scale at the base. Scape from 6 to 12in. long, with several sheathing bracts. Flowers 6 to 12, tube curved, glandular-pubescent outside near the base, pale-purple; the 5 lower-segments nearly equal, the upper one larger and marked with a yellow spot in a cloud of blue. Stamens inserted within the tube 3 long 3 short; filaments lilac with numerous pedicellate glands; anthers oblong. Ovary tapering upwards into the style, stigma capitate.—*E. crassipes*, *Solms.*; *E. crassicaulis*, *Schlecht.*; *Pontederia azurea*, *Sw. Bot. Mag.* 2932.

Hab.: South America. Now naturalized in the still waters of southern localities.

## 3. MONOCHORIA, Presl.

(From *monos*, one, and *chorizo*, to separate; the anterior stamen is different from the remaining five.)

(Limnostachys, *F. v. M.*)

Perianth nearly regular, divided to the base into 6 segments. Stamens 6, 1 usually larger or otherwise different from the others. Ovary 3-celled, with numerous ovules in each cell.—Leaves radical on long petioles. Scapes with a single apparently petiolate leaf, the short raceme in its axil appearing to proceed from a swelling in the middle of the petiole.

The genus contains very few species limited to the Old World; the only Australian one, is as far as known, endemic.

1. **M. cyanea** (blue), *F. v. M. Fragm.* viii. 44 ; *Benth. Fl. Austr.* vii. 72. Stems or rhizomes creeping in mud or shortly ascending in water, covered with long thin membranous sheathing scales, one or two of the lower ones produced into a leaf or a long petiole, lamina ovate, acuminate, rounded or cordate at the base, 1½ to 3in. long. Scapes from the axils of the upper sheaths with their terminal leaves at first resembling the lower leaves with a similar lamina, but with a swelling in the middle of the petiole which proves to be the sheathing base of the single leaf, from whence issues a shortly pedunculate loose spike or raceme of 3 to 10 flowers, the base of the peduncle enclosed in a membranous sheath. Flowers sessile or very shortly pedicellate, without bracts. Perianth blue, the segments 5 or 6 lines long or at length rather more, shortly united at the base. Filaments dilated, all nearly equal, without any tooth, one anther often a little longer or smaller than the others but sometimes scarcely different, all opening at first in terminal pores which are afterwards slit down to the base. Seeds ovoid, with 10 to 12 prominent ribs.—*Limnastachys cyanea*, *F. v. M. Fragm.* i. 24.

Hab.: Still waters in southern localities.

ORDER CXXXVII. PHILYDRACEÆ.

Flowers hermaphrodite, irregular. Perianth inferior, persistent, divided to the base into 2 broad petal-like segments, anterior and posterior. One perfect stamen, attached to the base of the anterior segment or almost hypogynous; filament flattened; anther variously shaped, attached at the base or adnate, with 2 parallel cells, straight or twisted, opening in longitudinal slits; staminodia 2, hypogynous, alternating with the perianth-segments, flat and somewhat petal-like but small, free or more or less connate at the base with the anther-bearing filament. Ovary superior, 3-celled or with 3 parietal placentæ, projecting far into the cavity; style terminal, simple, with a small or broad terminal stigma; ovules numerous in each cell or placenta, anatropous. Fruit a capsule, opening loculicidally in 3 valves. Seeds numerous, small; testa membranous. Embryo small, at the base of a fleshy albumen.—Erect herbs. Leaves linear or flag-like. Flowers sessile and solitary within more or less sheathing bracts along the rhachis of a simple spike, or along the simple branches of a terminal panicle.

The Order is limited to three genera, two represented in Queensland.

- |   |                 |
|---|-----------------|
| Anther terminal, very much twisted. Ovary imperfectly 3-celled. Leaves flag-like. Spike long, simple . . . . .                      | 1. PHILYDRUM.   |
| Anther erect, on a very short filament. Ovary perfectly 3-celled. Leaves flag-like. Spikes in a terminal branched panicle . . . . . | 2. HELMHOLTZIA. |

1. PHILYDRUM, Banks.

(A lover of water—plant found in swamps.)

Perianth-segments many-nerved, the margins slightly involute in the bud. Stamen attached to the base of the anterior segment and not exceeding it; filament flattened, tapering upwards; anther terminal, transverse, the cells excessively twisted; staminodia hypogynous, but often slightly connate at the base with the anther-bearing filament. Ovary 1-celled, with 3 parietal placentæ projecting far into the cavity but not meeting in the centre, each with 2 divaricate broad lobes covered on the inner or under surface with very numerous ovules; style columnar, with a terminal broad 3-angled stigma. Capsule oblong, opening loculicidally in 3 valves. Seeds very numerous and small, narrow-oblong, brown with black tips, minutely tuberculate, with a short pale funicle.—Tall perennial, with flag-like leaves. Flowers sessile within sheathing bracts along the rhachis of a long terminal spike.

The genus is limited to the single species.

1. **P. lanuginosum** (woollen), *Banks in Gartn. Fruct.* i. 62; *Benth. Fl. Austr.* vii. 74. Roots fibrous. Stem erect, simple or scarcely branched, about 2 to 6ft. high, with more or less of white wool, especially on the inflorescence, wearing away with age. Leaves from under 1 ft. to 1½ft. long, distichous sheathing and equitant at the base of the stem, the upper ones shorter and passing into short lanceolate or ovate-lanceolate sheathing bracts, all however longer than the perianth, the inflorescence forming a long terminal interrupted spike, more woolly than the rest of the plant. Flowers closely sessile, solitary or rarely two together within each bract. Perianth-segments yellow, hairy, about ¾in. long and nearly as broad. Capsule about ½in. long, the pericarp thin, opening tardily in 3 valves.—*R. Br. Prod.* 265; *Kunth, Enum.* iii. 380; *Guillem. Ic. Pl. Austral.* t. 5; *Bot. Mag.* t. 783.

Hab.: Brisbane River and Moreton Bay, Sandy Cape, Keppel Bay, Broadsound, *R. Brown*; Rockhampton and neighbourhood, *Bowman, O'Shanesy* and others; Rockingham Bay, *Dallachy*; Port Curtis, *M-Gillivray*; Cape York, *Daemel*; Stanthorpe.

The same species ranges over the Malayan Peninsula and Archipelago and South China.

## 2. HELMHOLTZIA, F. v. M.

(After Professor Herman Helmholtz.)

Perianth-segments faintly several-nerved, ovate-lanceolate, membranous, almost petal-like, the posterior ones with 2 prominent nerves near the margin. Stamen almost hypogynous at the base of the anterior segment; filament very short and flat, anther-erect, ovate-oblong, much longer than the filament, the cells parallel, not twisted, opening inwardly in longitudinal slits; staminodia petal-like, short and broad, very shortly connate with the anther-bearing filament. Ovary perfectly 3-celled; style subulate with a minute terminal stigma. Capsule nearly globular, 3-furrowed, the pericarp rather thick but probably at length 3-valved. Seeds numerous, small, dark-brown, smooth.—Tall erect perennial, with long almost radical flag-like leaves and numerous rather small flowers in a terminal pyramidal panicle.

Plants especially the inflorescence more or less woolly . . . . . 1. *H. acorifolia*.  
Plant quite glabrous . . . . . 2. *H. glaberrima*.

1. **H. acorifolia** (Acorus-leaved), *F. v. M. Fragm.* v. 203; *Benth. Fl. Austr.* vii. 75. "Kuranda," Barron River, *E. Cowley*. Stems erect, simple except the inflorescence, 2 to 5ft. high, with a more or less woolly inflorescence. Leaves nearly radical, flag-like, erect, 3 to 5ft. long and 1 to 1½in. broad; the midrib rather prominent; the longitudinal nerves on either side several and quite faint and are crossed by faint parallel ones obliquely from the midrib to the margin; the short sheathing bases distichous and imbricated. Flowers in a dense terminal pyramidal panicle of 1ft. or more long, sessile along its branches, within lanceolate acuminate bracts, spreading under the flower and scarcely exceeding it. Perianth-segments white, with inflexed margins, 3 or scarcely 6 lines long. Capsule globose, 2 to 3 lines diameter, woolly-villous, 3-sulcate. Seeds oblong, about 1 line long, many of them truncate or almost hooked at the apex, and sometimes narrowly winged.

Hab.: Rockingham Bay, *Dallachy*; top of Bellenden Ker, *F. M. B.*; Johnstone River, *W. R. Kefford*; Kuranda, *E. Cowley*.

2. **H. glaberrima** (quite glabrous), *Theo. Caruel, in A. and C. DC. Monog. Phanc.* iii. 6. Plant tufted, about 3ft., altogether glabrous. Leaves equitant, ensiform, acuminate, about 2ft. long and 1in. broad, coriaceous, margins entire, midrib prominent, the nerves very oblique, few, with transverse veinlets, the sheaths scarious at the edges. Flowering stem exceeding the leaves, terete, leafy. Panicle erect, the branches erecto-patent 1ft. long. Upper bracts white, lower ones green, ensiform. Flowers sessile, 9 lines broad. Outer perianth-segments

oblong ovate, obtuse or apiculate, recurved, white; inner ones much smaller, also recurved and obtuse. Stamens slightly curved, filaments very short and stout. Anthers oblong, obtuse, with parallel contiguous cells, connective orange-red at the back. Ovary curved, unequally 3-lobed and 3-celled, quite glabrous; style slender, and the stigma minute.—*Philydrum glaberrimum*, Hook. Bot. Mag. 6056.

Hab.: Southern localities, *Rev. B. Scortechini*.

## ORDER CXXXVIII. XYRIDEÆ.

Flowers sessile in the rigid dark brown imbricating bracts of a terminal head or spike, bisexual. Bracteoles (sepals?) 3, deciduous, scarious, embracing the claws of the petals, 2 lateral, 1 broader dorsal often hooded. Petals 3, clawed, claw erect spreading, limb golden yellow, marcescent. Stamens 3, inserted at the bases of the petals, included; anther sagittate, staminodia 3, alternating with the inner segments, filiform, bearded or antheriferous, sometimes wanting. Ovary free, imperfectly 3-celled; placentas 3, many-ovulate, basal and confluent or parietal; style trifid, stigmas capitate or dilated; ovules anatropous. Capsule loculicidally 3-valved, or with the top circumsciss. Seeds numerous, linear or oblong. Albumen floury. Embryo minute.—Erect, tufted, rush-like, scapigerous herbs. Stem short, simple. Leaves radical, elongate, narrowly linear, flat or terete, sheath short. Scape stout or slender, stiff as long or longer than the leaves, terete angular, or compressed.

### 1. XYRIS, Linn.

(From the Greek, leafpoints of some species sharp.)

Flowers hermaphrodite, sessile within 2 opposite persistent navicular bracteoles by some considered as outer perianth-segments. True perianth with a short tube, the limb divided into 4 segments, 1 outer anterior 1 thin and almost petal-like or somewhat scarious, very broad, completely enveloping the inner segments, but becoming detached at the base and cast off as the flower expands, 3 inner broad yellow petal-like spreading segments, withering after flowering. Perfect stamens 3, opposite the inner segments, attached to their base and shorter than them; anthers erect, sagittate, with 2 cells opening laterally in longitudinal slits somewhat turned outwards; staminodia usually 3, alternating with the inner segments, short and filiform, with a terminal tuft of jointed hairs or an imperfect anther, or in some species wholly deficient. Ovary sessile, imperfectly 3-celled; ovules numerous on 3 placentas, either basal and confluent or elongated parietal and quite distinct, or sometimes separating from the sides of the ovary except at the base and apex. Style single, divided at the end into 3 spreading branches, each terminating in a capitate or dilated stigma. Capsule globular or ovoid, often 3-furrowed, opening loculicidally in 3 valves or sometimes circumsciss, the hardened apex falling off entire. Seeds small and numerous, linear or oblong, usually striate; embryo lenticular, applied to the extremity of the albumen furthest from the hilum.—Tufted perennials or rarely annuals. Leaves radical or surrounding the base of the scape or stem, linear and grass-like or rigid and subulate or rush-like. Flowers solitary and sessile within imbricate rigid glume-like scales, forming a terminal head or short spike on a simple leafless scape, the outer bracts of the head usually empty and in some varieties of various species somewhat enlarged into a small involucre.

The genus is widely spread over the warmer regions both of the New and the Old World.

I have described the 2 outer navicular scarious or glume-like organs outside the perianth as bracteoles from their position at the base of the perianth as well as from their consistence and persistence, whilst the broad segment enveloping the inner ones is evidently the real outer perianth, being placed like the inner segments at the apex of the tube.—*Benth.*



Placentas of the ovary parietal, free from each other and extending to the apex of the cavity.

Bracts entire or minutely ciliate. Anther-cells dorsally affixed to a small connective. Staminodia penicillate.

Leaf-tufts on a perennial stock, with rigid sheathing bases. Staminodia densely penicillate . . . . . 1. *X. complanata*.

Leaf-tufts annual. Leaves grass-like. Staminodia very slender, with few hairs or scarcely any . . . . . 2. *X. pauciflora*.

Placentas very short and confluent at the base of the ovary.

Other characters of *X. operculata*, but bracteoles not winged . . . . . 3. *X. gracilis*.\*

Placentas connate at the base of the ovary, extending also up the sides.

Capsule usually hardened at the apex.

Staminodia densely penicillate. Bracteoles with a prominent or winged usually ciliate keel.

Bracts broad, glabrous, appressed, entire or the inner one jagged . . . . . 4. *X. operculata*.

1. ***X. complanata*** (flattened), *R. Br. Prod.* 256; *Benth. Fl. Austr.* vii. 77. Stock perennial. Leaves tufted, generally surrounded by a few old brown sheaths, grass-like, flat, often very narrow, varying from 1 or 2 to above 3 in. long. Scape more or less flattened, from under 1 ft. to about 1½ ft. high. Flower-head at first short and ovoid, but sometimes lengthening into a cylindrical spike of ½ to 1 in., the scales broad, light-brown, entire or the inner ones slightly ciliate, the lower empty ones very few. Bracteoles prominently keeled or with a narrow dorsal shortly ciliate wing. Inner perianth-segments broad but small. Anther-cells quite distinct, dorsally attached to a small connective; staminodia densely penicillate. Style divided nearly to the base. Placentas of the ovary free from each other and extending to the apex of the cavity. Seeds very numerous and small.—*X. laevis* and *X. scabra*, *R. Br. Prod.* 256; *X. elongata*, Rudge in *Trans. Linn. Soc.* x. 289, t. 15; *F. v. M. Fragm.* viii. 205.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Facing Island (*X. laevis*), *R. Brown*; Moreton Bay, *F. v. Mueller* and others; Rockhampton, *O'Shanesy*; Endeavour River, *A. Cunningham*; Rockingham Bay, *Dallachy*; Port Denison, *Fitzalan*.

The species is also in East India if *X. Walkeri*, Wight in Kunth, *Enum.* iv. 19, be really identical, as it appears to be.

Var. *bracteata*. Outer scales of the flower-head enlarged into spreading bracts of 3 to 4 lines.

Hab.: Moreton Bay, *Leichhardt*.

Var.? *leptocaulis*. Scares very narrow, scarcely compressed or angular-terete. Flower-heads small and short. Flowers not examined.

Hab.: Cape York, *M'Gillivray*; Upper Brisbane River and Providence Hill, *F. v. Mueller*.

2. ***X. pauciflora*** (few-flowered), *Willd. Phytogr.* i. 2, t. 1; *Benth. Fl. Austr.* vii. 77. Apparently annual. Leaves in radical tufts, grass-like, narrow, rarely above 6 in. long. Scares sometimes only 2 or 3 in. high, but varying from that to 1 ft. or rather more, terete or slightly flattened. Flower-head ovoid-globose, attaining 4 to 5 lines diameter when full-grown but often very much smaller, the scales very broad, entire, brown with very thin almost hyaline margins. Bracteoles thin and light-coloured, quite glabrous without prominent keels. Perianth small for the genus. Anthers almost sessile, the cells quite distinct dorsally attached to a small connective; staminodia very slender, with very few terminal hairs and often very difficult to find. Capsule obovoid, the placentas adnate to the apex of the valves.—Kunth, *Enum.* iv. 17; *X. pauciflora*, *X. paludosa*, *X. denticulata*, and *X. pusilla*, *R. Br. Prod.* 256; *X. oligantha*, *Steud. Syn. Glum.* ii. 288.

Hab.: Endeavour River, *Banks and Solander*, *A. Cunningham*; between Norman and Gilbert Rivers, *T. Gulliver*.

The species is also widely spread over tropical Asia. Brown's four species were all described from Banks and Solander's Endeavour River specimens, and appear to me to differ only in size and luxuriance; the two smallest slender forms, 2 to 3 in. high with very small heads (*X. paludosa* and *pusilla*), gathered in the same locality by Cunningham, represent well Willdenow's figure; the larger forms are, however, more frequent in India as well as in Australian collections.—*Benth.*

Var. *albiflos*. Plant from all appearance annual. Leaves in radical tufts somewhat crimson-coloured, rather flattish and falcate with a slight twist, none attaining lin. in length. Scape about 4in. high, reddish in the lower half, slightly flexuose and flattened. Flower-head ovoid, about 2 lines long, the scales brown with a few hairs at the top, and hyaline margins. Bracteoles thin, of lighter colour, and slightly keeled. Perianth white, segments ovate-lanceolate. Anthers rather large on filaments not quite so long as the anther and twisted, dorsally attached. Capsule oblong, the placentas adnate to the apex of the valves. Seeds very numerous, striate, of a deep golden yellow, oblong, ovate to somewhat fusiform.

Hab.: Fraser Island, *Hon. Miss Lovell*.

Upon careful examination of the above plant, I find it only to differ from other varieties or forms in its deep-coloured foliage and white flowers. It was found on damp sandy soil, in company with another small variety of the species, and which I think probably is *Robt. Brown's X. pusilla*. This has the same deep-coloured leaves, but the flowers are yellow.

3. *X. gracilis* (slender). *R. Br. Prod.* 256; *Benth. Fl. Austr.* vii. 79. Very similar to the narrow-headed specimens of *X. operculata*, and not always easy to distinguish from them. Leaves usually shorter, flatter, and more twisted, sometimes nearly 1 line broad, but in some varieties as narrow as in that species. Flower-heads ovoid-oblong, the scales black and entire. Bracteoles smooth and shining, entire, without dorsal wings. Inner perianth-segments very broad, but rather smaller than in *X. operculata*. Ovary partially 3-celled, the placentas confluent at the base, with linear erect ovules, and not extending much up the sides of the cavity.—*Hook. f. Fl. Tasm.* ii. 69; *X. juncea*, *R. Br. Prod.* 256.

Hab.: Brisbane River and towards Wallangarra.

4. *X. operculata* (top of capsule lid-like), *Labill. Pl. Nov. Holl.* i. 14, t. 10; *Benth. Fl. Austr.* vii. 79. Stock perennial, with persistent tufts of distichous shining brown leaf-sheaths, some of them produced into very narrow almost subulate leaves, mostly under 6in. long. Scapes slender, 1 to 1½ft. high, enclosed at the base in a rather long sheath without any lamina in the centre of the tuft of leaves. Flower-head from ovoid to globular attaining sometimes 4 to 6 lines diameter, but often much smaller, the scales black, broad and rounded, entire or the inner ones denticulate or fringed at the end. Bracteoles opaque with scarious margins, the prominent keel usually ciliate or fringed at the end. Inner perianth-segments very broadly obovate, 4 to 6 lines diameter. Anthers deeply lobed at the base and shortly so at the upper end. Staminodia filiform, with a dense tuft of jointed hairs. Style rather long, the terminal stigmas variously dilated. Placentas of the ovary more or less cohering in the axis, and continued to the apex of the cavity, though sometimes at length detached from the sides. Capsule obovoid, the hardened apex usually falling off entire; the lower part only splitting into valves.—*R. Br. Prod.* 257; *Hook. f. Fl. Tasm.* ii. 69; *Bot. Mag.* t. 1158; *Lodd. Bot. Cab.* t. 205.

Hab.: Islands of Moreton Bay and about Stanthorpe.

The species varies much in stature, in the size of the heads, and in the scales of the flower-heads, either distinctly superposed in five rows or more or less irregularly imbricate, the outer empty ones few or numerous, and the flowering ones almost all quite entire or more or less jagged or fringed.—*Benth.*

## ORDER CXXXIX. COMMELINACEÆ.

Flowers hermaphrodite or rarely polygamous, usually slightly irregular. Perianth of 6 segments, free or rarely united at the base, more distinctly representing a calyx and corolla than in any other syncarpous Monocotyledons, 3 outer ones thin and membranous or herbaceous, much imbricate, the outermost often smaller, 3 inner very delicate and petal-like, spreading, one often rather different in shape or size from the others. Stamens 6 or fewer by abortion, attached to the base of the segments or almost hypogynous; anthers when perfect 2-celled. the cells opening laterally or inwards in longitudinal slits or

rarely in terminal pores; staminodia when substituted for stamens all on one side of the flower, not alternating with the perfect stamens. Ovary 3-celled or rarely 2-celled, with 1, 2, or more orthotropous ovules in each cell, laterally attached to the inner angle and when several superposed in 1 or 2 rows. Style simple, with a terminal entire or 3-lobed stigma. Fruit a capsule or rarely indehiscent though dry. Seeds thick, peltate or angular, the testa often wrinkled or reticulate. Embryo small, partly sunk in the side of the fleshy albumen remote from the hilum, and usually covered by a small deciduous operculum.—Herbs erect or more frequently weak or creeping at the base, rarely in species not Australian twiners, or tall and almost shrubby. Leaves parallel-veined, with sheathing bases. Flowers usually blue, purple, or white, in panicles, umbels, or clusters, either terminal or issuing from the leaf-sheaths on the side of the stem opposed to the leaf.

The Order is chiefly tropical or subtropical, and is common to the New and the Old World. Of the six Australian genera, three are spread over both hemispheres, one is limited to the Old World, one to the Indo-Australian region, and one only is endemic in Australia.—*Benth.*

TRIBE I. **Pollieæ**.—*Fruit indehiscent, crustaceous.*

Panicle terminal, of scorpioid cymes . . . . . 1. POLLIA.

TRIBE II. **Commelinæ**.—*Capsule loculicidal. Stamens 3 perfect, with 1 to 3 staminodia.*

Cymes solitary, included in a spatha. Ovary 3-celled, cells 1 to 2 ovulate . . . 2. COMMELINA.  
Cymes naked, paniculate, rarely in a spatha . . . . . 3. ANEILEMA.

TRIBE III. **Tradescantieæ**.—*Capsule loculicidal. Stamens 6 perfect.*

Cymes from imbricating bracts, scorpioid or 1 or few flowered, corolla tubular below . . . . . 4. CYANOTIS.  
Flowers paniculate. Stems erect . . . . . 5. FLOSCOPA.  
No spatha. Flowers usually in spikes. Outer segments herbaceous.  
Ovary 3-celled . . . . . 6. CARTONEMA.

1. POLLIA, Thunb.

(*Aclisia, F. Mey. Lamprocarpus, Blume*).

Perianth-segments all free, 3 outer ones membranous, thin, very broad and much imbricate, 3 inner petal-like, obovate, nearly equal. Stamens 6, somewhat declinate, all perfect or the 3 upper ones reduced to staminodia with small empty anthers; perfect anthers ovate, emarginate at the base, the cells opening in longitudinal slits. Ovary 3-celled with several ovules in each cell superposed in 2 rows; style subulate, with a small stigma. Fruit ovoid or globular, usually blue and shining, indehiscent but dry with a brittle pericarp. Seeds angular, with a brown testa.—Tall perennials, usually weak and creeping at the base. Leaves large. Flowers in terminal thyrsoid panicles, the primary branches often forming clusters almost whorled. Bracts all shorter than the flowers.

The genus extends over tropical and eastern subtropical Asia. Of the two Australian species one is endemic, the other reaches the Solomon Islands.

Margin of the leaf-sheaths and leaves quite entire. Branches of the oblong panicle in distinct clusters or whorls . . . . . 1. *P. macrophylla*.  
Margin of the leaf-sheaths and base of the petiole undulate crisped.  
Branches of the short sessile panicle densely crowded . . . . . 2. *P. crispata*.

1. **P. macrophylla** (leaves long), *Benth. Fl. Austr.* vii. 90. Quite glabrous. Stems creeping and rooting at the lower joints, ascending or erect to the height of several feet. Leaves broadly lanceolate, acuminate, mostly 6 to 8 in. long, tapering into a short petiole above the sheath, the margin not at all waved, the sheath loosely cylindrical,  $\frac{1}{2}$  to 1 in. long, the orifice oblique and quite entire, the uppermost leaf usually sessile and stem-clasping almost without any sheath. Panicle shortly pedunculate above the last leaf, oblong, 3 to 4 in. long, the branches collected in distinct clusters almost verticillate, each branch rarely above  $\frac{1}{2}$  in. long, bearing several flowers on short slender pedicels. Bracts lanceo-

late and leafy under the lowest clusters of branches, small, very broad, obtuse and thin under the pedicels. Outer perianth-segments scarcely 2 lines long, inner ones rather longer, blue. Perfect stamens 3, the 3 others reduced to staminodia. Fruit ovoid, rather narrow, usually about 3 lines long.—*Aneilema macrophyllum*, R. Br. Prod. 270.

Hab.: Northumberland Islands, *R. Brown*; Brisbane River, *F. v. Mueller*; Rockingham Bay, *Dallachy*; Fitzroy River, *O'Shanesy*; Port Denison, *Fitzalan*; Killarney. The species is also in the Solomon Islands.

2. ***P. crispata*** (crisped), *Benth. Fl. Austr.* vii. 90. A weak ascending perennial, rooting at the base. Leaves lanceolate, acuminate, 4 to 6in. long, tapering at the base, the very short petiole and orifice of the sheaths undulate-crisped, almost denticulate, the sheath loosely cylindrical,  $\frac{1}{2}$  to 1in. long; the uppermost leaves crowded and smaller. Panicle closely sessile within the last leaves, about 2in. long, the crowded branches attaining at length 1 to 2in. Flowers white, perhaps rather larger than in *P. macrophylla*, otherwise similar. Fruit ovoid, about 3 lines long.—*Aneilema crispata*, R. Br. Prod. 270; Bauer, *Illustr. Fl. Nov. Holl.* t. 6.

Hab: Moreton Bay to Killarney.

2. COMMELINA, Linn.

(After J. and G. Commelin.)

Perianth-segments all free, 2 of the outer ones larger than the third outermost, and one of the inner frequently differently shaped or more sessile than the two others. Perfect stamens usually 3, the central one with a larger anther than the two others; staminodia 3 or rarely 2, with deformed anthers. Ovary 3-celled or rarely 2-celled; ovules in each of 2 cells 2 superposed, 1 only in the third smaller cell, or ovules 1 in each of 3 cells, or the third cell entirely wanting. Style filiform, with a small stigma. Capsule usually 3-celled, the 2 biovulate cells opening loculicidally, the third uniovulate cell remaining long closed at the back of one of the valves, but sometimes all 3 cells open loculicidally or the third cell is deficient. Seeds smooth or pitted, rugose or reticulate.—Weak herbs, often creeping at the base. Flowers in a complicate oblique leafy bract or spatha, usually 2 or more on a peduncle included in the spatha, with a second peduncle in the same spatha articulate halfway up and bearing a single usually male flower, or reduced to a short barren bristle. Fruiting pedicels recurved so as to ripen the capsule within the spatha.

The genus is widely spread over the warmer regions of both hemispheres, supplying several common weeds of cultivation.

Spatha not cordate, closed at the base, forming an oblique turbinate inverted cone open at the top only.

- Capsule 3-celled . . . . . 1. *C. undulata*.
- Capsule 2-celled . . . . . 2. *C. ensifolia*.

Spatha cordate at the base, with rounded auricles closely appressed but not connate.

- Leaves ovate-lanceolate or rarely narrow, contracted above the sheath.
- Spatha acute, rarely acuminate. Seeds pitted . . . . . 3. *C. cyanca*.
- Leaves very narrow, not contracted above the sheath. Spatha with a long point. Seeds smooth or slightly rugose . . . . . 4. *C. lanceolata*.

1. ***C. undulata*** (wavy), *R. Br. Prod.* 274; *Hook. in Fl. Brit. Ind.* vi. 373. Stems stout. Leaves lanceolate undulate. Spathas subsessile ovate hooded acute. Ovary 3-celled, cells 1-ovulate. Seeds free in the cells, shortly ellipsoid smooth.—Clarke Monogr. 179; *C. ensifolia*, *F. v. M. Fragm.* viii. 60; *Benth Fl. Austr.* vii. 83 (in part) (not of *R. Br.*); *C. setosa*, *Wight in Wall. Cat.* 8981 D.

Hab.: Northern localities, coastal and inland.

2. **C. ensifolia** (sword shaped), *R. Br. Prod.* 269; *Hook. in Fl. Brit. Ind.* vi. 374. Stems 12 to 18in. slender. Leaves 2 to 4in. long, 2 to 4 lines broad, linear-lanceolate, glabrous, or with deciduous hairs, or villous. Spathas 4 to 8 lines, very shortly pedunculate, broadly ovate acute cucullate, glabrous or hairy; base truncate on one margin, hooked at the other; raceme simple. Capsule 2-celled. Seeds ellipsoid smooth.—Clarke *Monogr.* 188; *Benth. Fl. Austr.* vii. 83 (in part); *C. striata*, Wall. Cat. 8981 (in part); *C. lunata*, Heyne Mass. *Commelina sp. striatæ affinis*, Edgw. in *Trans. Linn. Soc.* xx. 90.

Hab.: Walsh Riv. r, *T. Barclay-Millar*; and a few other northern localities.

T. P. Keys, of Camowéal, states that in times of scarcity of vegetable this plant is used as a vegetable under the name of "Scurvy-grass."

3. **C. cyanea** (blue), *R. Br. Prod.* 269; *Benth. Fl. Austr.* vii. 84. Glabrous. Stems weak, creeping and rooting at the base, ascending to 1 or 2ft. Leaves ovate-lanceolate to narrow-lanceolate, acuminate, mostly  $1\frac{1}{2}$  to 3in. long, very shortly contracted at the base above the sheath. Spathas on short peduncles opposed to the upper leaves, broad, shortly acuminate, deeply cordate at the base with rounded auricles not connate, mostly  $\frac{3}{4}$  to 1in. long. Peduncles 2, shorter than the spathe below the articulation, but the pedicels protruding beyond it, one peduncle with a single male flower or without any, the others with 2 or rarely 3 flowers on short pedicels. Outer perianth-segments under 3 lines, the inner twice that diameter, those of each series nearly equal. Three perfect anthers, the larger one sagittate, 2 or 3 staminodia. Ovary with 2 ovules in each of 2 cells, 1 only in the third. Capsule with the 2-seeded cells dehiscent, the third usually indehiscent. Seeds more or less marked with small scattered pits.—*C. communis*, F. v. M. *Fragm.* viii. 59, but not exactly the common Asiatic and African, *C. communis*, Linn.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller*; Warwick, *Beckler*; Springsure, *Wuth*; Rockhampton, *Dallachy*, *O'Shanesy*, and others; Rockingham Bay, *Dallachy*; Cape York, *Veitch*.

4. **C. lanceolata** (lanceolate), *R. Br. Prod.* 269; *Benth. Fl. Austr.* vii. 84. Resembles the slender narrow-leaved forms of *C. cyanea*, but the leaves appear to be always narrow-linear or linear-lanceolate, and the upper ones at least gradually enlarged at the base into a very short sheath without any contraction above it. Spathas narrow and usually produced into a long point, cordate at the base with free rounded auricles. Flowers like those of *C. cyanea*, but one of the outer segments decidedly smaller and narrower than the others, the inner ones nearly equal. Larger anther sagittate, with shorter diverging auricles. Capsules ripening 1 or 2 seeds in each of 2 cells, the third cell remaining small and empty. Seeds smooth or coarsely wrinkled, without raised reticulations, or pitted surface like *C. cyanea*.—*C. agrostophylla*, F. v. M. *Fragm.* viii. 59.

Hab.: Bustard Bay, *Banks and Solander*; Port Curtis and Fitzroy Island, *M'Gillivray*; Normanton, *F. J. C. Wildash*.

### 3. ANEILEMA, R. Br.

(Alluding to the flowers not having a spathe.)

(*Aphylax*, *Salisb.*, name only)

Perianth-segments all free, 3 outer ones membranous, concave, slightly imbricate, 3 inner petal-like, obovate, nearly equal. Perfect stamens 3 or sometimes only 2, on one side of the flower; anthers ovate or oblong, the cells opening in longitudinal slits; staminodia 3 or 4 or only 2, with variously shaped imperfect anthers. Ovary 3-celled or rarely 2-celled, with 1 to 5 ovules in each cell superposed in 1 or 2 rows; style subulate with a small stigma. Capsule oblong ovoid or nearly globular, opening in 3 or rarely 2 valves. Seeds 1 or more in each cell superposed in a single row, almost cubical, usually rugose.—Weak herbs, with

ascending or erect stems. Flowers small, in a loose terminal panicle, singly pedicellate along the branches within a small concave bract, or 2 together within the terminal bract.

The genus is widely spread over the tropical regions of both hemispheres, but more abundant in the Old World than in the New. Of the six Australian species one is widely spread over tropical Asia and Eastern Africa, the others as far as hitherto known are endemic.

Filaments all glabrous. Ovary with only 2 perfect cells. Stems weak, ascending.

Leaves ovate-lanceolate. Ovules 3 or 4 in each cell.

Panicle slender, thyrsoid, usually pedunculate. Capsule oblong . . . 1. *A. acuminatum*.

Inflorescence sessile, of 2 short 2-flowered branches. Ovary with a third imperfect cell . . . 2. *A. biflorum*.

Leaves lanceolate. Ovules 2 in each cell. Capsule as broad as long . . . 3. *A. sclerocarpum*.

Leaves linear or narrow-lanceolate. Ovules 1 in each cell. Panicle long and slender. Flowers small . . . 4. *A. siliculosum*.

Filaments all or some of them bearded. Ovary 3-celled. Stem erect. Radical leaves linear, tufted.

Filaments all bearded. Panicle irregular, the pedicels distant along the branches . . . 5. *A. gramineum*.

Filaments of the perfect stamens bearded, of the staminodia glabrous. Pedicels close together along the branches, leaving a thickened denticulate rhachis . . . 6. *A. giganteum*.

1. **A. acuminatum** (acuminate), *R. Br. Prod.* 270; *Benth. Fl. Austr.* vii. 85. Stems from a creeping base ascending to 1ft. or rather more, including the panicle, the whole plant glabrous, except minute raised dots, giving a roughness to the leaves and rhachis of the panicle. Leaves ovate-lanceolate, acute,  $1\frac{1}{2}$  to 3in. long, mostly shortly petiolate above the sheath, the upper ones either crowded together or all distant. Panicle slender, thyrsoid, often 3 to 6in. long or even more, usually pedunculate above the last leaves, or rarely with smaller leaves close under it; branches simple, filiform, singly or rarely in pairs along the rhachis, the bracts under the branches very small and lanceolate. Pedicels filiform, 2 to 4 lines long, singly scattered along the branches within broad cucullate bracts under  $\frac{1}{2}$  line long, or 2 together within the uppermost bracts. Outer perianth-segments oblong,  $1\frac{1}{2}$  line long, inner ones twice as long, almost orbicular. Filaments all glabrous, 2 or rarely 3 with perfect anthers, 1, 2, or rarely 3 with abortive anthers. Ovary 2-celled, with 3 or 4 (sometimes 5?) ovules in each cell. Capsule oblong, very obtuse, much flattened, longer than the perianth. Seeds irregularly tuberculate-rugose.—*A. laxum*, *R. Br. Prod.* 270; *A. siliculosum*, *F. v. M. Fragm.* viii. 61, not of *R. Br.*

Hab.: Endeavour River and Bustard Bay, *Banks and Solander*; Moreton Bay, *F. v. Mueller*, *Backhouse* and others; Rockhampton, *O'Shanesy*, *Bowman* and others; Rockingham Bay, *Dallachy*; from the Tweed River to Wallangarra.

2. **A. biflorum** (two-flowered), *R. Br. Prod.* 270; *Benth. Fl. Austr.* vii. 86. Stems very slender, creeping and loosely branched at the base, the flowering branches ascending to 6 or 8in. Leaves ovate-lanceolate, acute, distinctly petiolate above the sheath, mostly 1 to  $1\frac{1}{2}$ in. long. Inflorescence sessile within the last leaf and rarely exceeding it, consisting usually of 2 short branches, each bearing 2 flowers within a small cucullate bract, without any bracts below it. Flowers rather smaller than in *A. acuminatum*. Perianth of that species. Filaments all glabrous, 3 with rather large anthers, 3 much shorter with small imperfect anthers. Ovary with 2 perfect cells containing usually 3 superposed ovules in each and a third smaller cell without perfect ovules. Capsule as in *A. acuminatum*. Seeds transversely rugose.

Hab.: Brisbane River, not uncommon in southern localities, *Bailey*.

3. **A. sclerocarpum** (fruit hard), *F. v. M. Fragm.* viii. 61; *Benth. Fl. Austr.* vii. 86. Stems weak, branching, ascending to about 1ft., with the minute scabrous dotting of *A. acuminatum*. Leaves lanceolate, acute, tapering into a

short petiole above the sheath, mostly  $1\frac{1}{2}$  to 2in. long. Panicle short, but loose and slender, sessile above the last leaf, with few rather long filiform branches, each bearing several flowers on filiform pedicels of 2 to 4 lines, solitary and distant along the branches but always 2 together within the last bract. Bracts very small and scarious except sometimes under the lowest 1 or 2 branches. Outer perianth-segments ovate, obtuse, about  $1\frac{1}{2}$  line long, inner ones longer. Filaments all glabrous, 3 with perfect anthers, 3 with abortive ones. Ovary 2-celled with 2 superposed ovules in each cell and no rudiment of the third cell. Capsule as broad as long and rather shorter than the perianth, the pericarp rather more rigid and darker coloured than in *A. acuminatum*. Seeds tuberculate-rugose.

Hab.: Herbert's Creek, *Bowman*.

4. ***A. siliculosum*** (capsule Silicula-like), *R. Prod.* 270 ; *Benth. Fl. Austr.* vii. 86. "A-un-du," Batavia River, *Roth*. Quite smooth and glabrous except a slight pubescence on the rhachis of the inflorescence. Stem weak, angular branched and leafy, about a foot high. Leaves broadly linear or almost lanceolate, broad and stem-clasping at the base but scarcely forming a distinct sheath, except perhaps the lower ones, tapering to a point, 6 to 7in. long and 4 to 6 lines broad below the middle. Panicle slender, thrysoid and at length 6in. long or even more as in *A. acuminatum*, but the flowers much smaller, the branches filiform with 2 or 3 flowers in each on filiform pedicels. Bracts very small. Outer perianth-segments 1 to  $1\frac{1}{4}$  line long, the inner scarcely 2 lines. Filaments all glabrous, 3 with perfect anthers, 3 with small abortive ones. Ovary 2-celled, with 1 ovule in each cell. Capsule very obtuse, rather longer than the perianth. Seeds 1 in each cell, oblong, transversely rugose.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown* ; Cape York, *M'Gillivray*.  
Roots eaten both raw and roasted.—*Roth*.

5. ***A. gramineum*** (grass-like), *R. Br. Prod.* 270 ; *Benth. Fl. Austr.* vii. 87. Rarely quite glabrous, usually with a scabrous pubescence at least on the leaf-sheaths and some long hairs or cilia on the margins of the sheaths and base of the leaves. Fibrous roots often much thickened, almost tuberous. Radical leaves tufted, grass-like, with short broad sheaths, mostly 3 or 4in. long, but in very luxuriant specimens at least twice that length, varying from 3 or 4 lines broad and tapering to a long point to very narrow almost subulate. Stems erect, 6in. to nearly 2ft. high, with few long leaves dilated into short sheaths. Panicle very irregularly and loosely branched, rarely much longer than broad, often forked at the base but the branches otherwise simple, long or short, on a flexuose rhachis, the pedicels rather distant along the branches with a scarious bract under each. Outer perianth-segments varying from under 3 lines to nearly 4 lines, the inner ones longer, usually pale blue and much veined, sometimes white. Filaments all bearded, 3 with perfect anthers, 3 with small abortive ones. Ovary 3-celled, with 4 or 5 ovules in each cell. Capsule oblong or ovoid, rather longer than the perianth. Seeds pitted-rugose.—*F. v. M. Fragm.* viii. 62.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown* ; Broadsound, *R. Brown* ; Brisbane River, Moreton Bay, *A. Cunningham*, *F. v. Mueller* and others ; Peak Downs and Mackenzie River, *F. v. Mueller* ; Rockhampton, *Bowman*, *O'Shanesy* and others ; Port Curtis, *M'Gillivray* ; Keppel Bay, *Thozet* ; Rockingham Bay, *Dallachy* ; towards Wallangarra.

6. ***A. giganteum*** (large), *R. Br. Prod.* 271 ; *Benth. Fl. Austr.* vii. 88. Quite glabrous. Fibrous roots much thickened, almost tuberous. Radical leaves tufted, linear or linear-lanceolate, with short broad sheaths, 6in. to 1ft. long or even more, tapering to a fine point. Stems erect from amongst or by the side of the leaf-tufts, 1 to 2ft. high or more, with few shorter leaves dilated into rather long sheaths, the uppermost under the first

branch of the inflorescence reduced to a sheathing bract. Panicle simple or forked at the base, each branch bearing 2 to 6 unilateral racemes scorpioid when young, the lowest on a long peduncle the uppermost almost sessile on the common rhachis. Pedicels close above one another, the bracts reduced to a small tooth, leaving in the old racemes a thickened closely denticulate rhachis. Outer perianth-segments thin and somewhat coloured, 3 lines long or rather more, inner ones larger, of a deep blue. Perfect stamens 3 with bearded filaments and rather large anthers; staminodes 3 with shorter glabrous filaments. Ovary 3-celled, with 2 ovules in each cell. Capsule acute or acuminate, rarely almost obtuse, about as long as the perianth. Seeds finely and not deeply sculptured.—*Commelina gigantea*, Vahl, Enum. ii. 177; *Aneilema longifolia*, Hook. Exot. Fl. t. 204; *A. ensifolium* and *A. secundum*, Wight, Ic. t. 2074, 2075; *A. nudiflorum*, F. v. M. Fragm. viii. 62, not of R. Br.

Hab.: Cape York, *Veitch*; Cape York Peninsula, *Hann's Expedition*.

Var. *gracilis*. Very slender, with smaller and fewer flowers.

Hab.: Rockingham Bay, common in long grass, *Dallachy*.

#### 4. CYANOTIS, Don.

(Blue ears; referring to colour and form of flowers.)

(*Zygomenes*, *Salisb.*, name only.)

Flowers regular. Outer perianth-segments more or less united in a 3-lobed calyx, inner segments more or less united in a tube at the base with 3 spreading lobes. Stamens 6, inserted on the inner segments; filaments bearded towards the top; anthers all perfect, the cells opening inwards in longitudinal slits. Ovary 3-celled, with 2 superposed ovules in each cell. Capsule 3-valved. Seeds laterally attached, one at the lower angle the other at the upper angle.—Creeping or ascending herbs. Flowers in short dense spikes or clusters, in a complicate falcate leafy bract or spathe, or within loose leaf-sheaths.

The genus is dispersed over the tropical regions of Asia and Africa, the only Australian species is a common Indian one from Ceylon and the Peninsula to the Malayan Archipelago and South China.—*Benth*.

1. **C. axillaris** (axillary), *Rem. and Schult.*; *Kunth. Enum.* iv. 105; *Benth. Fl. Austr.* vii. 82. A glabrous annual, with long creeping or shortly ascending branches. Leaves linear or linear-lanceolate, 2 to 4 in. long. Flowers 2 or 3 together within the short loose leaf-sheaths. Outer perianth-segments nearly 3 lines long, shortly united at the base; inner perianth deep blue, the tube slender, cylindrical, longer than the outer segments. Filaments thickened above a dense tuft of jointed hairs.—*Tradescantia axillaris*, Roxb. Coromb. Pl. t. 107; *Zygomenes axillaris*, Salisb. in Trans. Hort. Soc. i. 271; F. v. M. Fragm. viii. 62; *Cyanotis axillaris*, Clarke, Comm. et. Cyrt. Beng. t. 35 (copied from Roxburgh).

Hab.: Elliott and Burdekin Rivers, *Bowman*.

The species is a common Indian one. Salisb. in giving to it the name of *Zygomenes*, gave no indication of the extent or character he proposed to assign to it as a genus; it cannot therefore be taken as such a publication as necessarily to supersede the universally adopted name *Cyanotis*.—*Benth*.

#### 5. FLOSCOPA, Lour.

(From *flos*, a flower; and *scopa*, a broom; flower-racemes fastigiatae.)

(*Dithyrocarpus*, *Kunth*).

Perianth-segments all free, 3 outer ones membranous, concave, imbricate, 3 inner large, petal-like, one rather narrower than the others. Stamens 6, all perfect; anther-cells opening in longitudinal slits. Ovary contracted at the base or shortly stipitate, 2-celled with 1 ovule in each cell; style subulate, with a



small terminal stigma. Capsule shortly stipitate, compressed, didymous, opening in 2 valves. Seeds solitary in each cell, laterally attached.—Erect or ascending herbs, usually creeping at the base. Flowers small, pedicellate and racemose along the branches of a dense terminal panicle.

The genus is extensively dispersed over the tropical regions of the New as well as the Old World, and consists of but very few species, the majority of those published being reducible to the single Australian one which extends over the whole area of the genus.—*Benth.*

1. **F. paniculata** (paniculate), *Hassk. Pl. Jungh.* 151; *Benth. Fl. Austr.* viii. 89. Stems ascending to 1 or 2ft., usually glabrous. Leaves lanceolate or ovate-lanceolate, acuminate, 2 to 4in. long, scabrous on the upper side, the sheath fringed with long hairs, at least at the top. Flowers small, in a dense terminal ovate or broad hirsute panicle, 1½ to 2in. long, sometimes leafy at the base, the branches simple or the lower ones forked. Outer perianth-segments very hairy, 1 line long or rather more, inner ones but little longer, bright blue. Stamens exerted.—*Tradescantia paniculata*, *Roxb. Corom. Pl.* t. 109; also the several *Dithyrocarpi* figured by *Wight*, *lc.* t. 2079 and 2080, or described by *Kunth*, *Enum.* iv. 78 and 79, and other synonyms, quoted in *Benth. Fl. Hongk.* 377.

Hab.: Rockingham Bay, common, *Dallachy*; Daintree River, *Fitzalan*; Islands of Torres Straits. Widely diffused over tropical Asia, Africa and Brazil.

## 6. CARTONEMA, R. Br.

(Alluding to the short filament.)

Perianth-segments all free, 3 outer ones herbaceous, lanceolate, 3 inner very broad, petal-like, sessile, withering after flowering but persistent. Stamens 6, nearly equal; anthers oblong or rarely short, opening in terminal pores at length continued into lateral slits. Ovary 3-celled, with 2 superposed ovules in each cell. Style filiform, with a small terminal pedicellate stigma. Capsule 3-valved.—Herbs with leafy stems, simple or branched at the base. Leaves narrow. Flowers in simple terminal spikes or racemes, solitary within small or narrow bracts.

The genus is limited to Australia, and contains five species, all except one belonging to Queensland.

Inflorescence racemose, glandular; flowers distant. Filaments 3 times longer than the anther . . . . .	1. <i>C. Baileyi</i> .
Spikes dense. Outer perianth-segments 6 to 7 lines long. Filaments narrow. Anthers narrow, oblong . . . . .	2. <i>C. spicatum</i> .
Spikes elongated, the flowers all distant. Outer perianth-segments 3 to 4 lines long. Filaments shorter than the anthers . . . . .	3. <i>C. parviflorum</i> .
Spikes dense. Outer perianth-segments 3 to 4 lines long. Anthers ovate, much shorter than the filaments . . . . .	4. <i>C. brachyantherum</i> .

1. **C. Baileyi** (after J. F. Bailey), *Bail.* A slender weak plant, the stem only a few in. high, with a slight pubescence and dotted with numerous red glands. Leaves narrow and grass-like with a long rather loose sheathing base, nearly glabrous but glandular like the stem. Inflorescence terminal in elongated but slightly branched racemose-panicles about 6in. long. Flowers distant, pedicels rather stout, 1½ line long, bracts lanceolate long as the pedicels. Outer perianth-segments 2 lines long, striate glandular and hairy on the back, the points often elongated, margins scarious. Inner perianth-segments shorter and broader than the outer, white, the parallel longitudinal veins very prominent, turning reddish in the faded flowers. Filaments glabrous, flat, very thin, 3 times longer than the anthers. Anthers wavy. Capsule glabrous, the valves with elongated points. Seeds flat, coral-like, almost white, punctate in transverse rows.

Hab.: Weipa, Embley River, *J. F. B.*, June 1901.

This species approaches one given in *DC. Monogr. Phanerog.* iii. 264, as *Cartonema tenui*.

2. **C. spicatum** (spicate), *R. Br. Prod.* 271, partly; *Benth. Fl. Austr.* vii. 91. Stems branching at the base, usually hairy, rarely 6in. high below the spike. Leaves linear, tapering from a base of  $1\frac{1}{2}$  to 3 lines broad just above the sheath to a long point, the longer ones usually exceeding the spike. Spikes 1 to 3, sometimes very compact and only 2in. long, rarely elongated to 6in., and rather loose. Bracts linear-subulate, shorter than the perianth. Outer perianth-segments subulate-acuminate, 5 to 6 lines long, very hairy; inner segments obovate, nearly as long, often but not always spotted. Filaments slightly flattened, at first shorter but at length rather longer than the oblong-linear anthers, which open in terminal pores rarely splitting down the sides of the cells. Ovary and capsule glabrous.—*Kunth, Enum.* iv. 115; *Bauer, Illustr. Fl. Nov. Holl.* t. 7.

Hab.: Islands of Torres Straits.

3. **C. parviflorum** (flowers small), *Hassk. in Flora*, 1869, 365; *Benth. Fl. Austr.* vii. 91. Less hairy than *C. spicatum*, and taller, chiefly from the length of the spike, the leaves very long and narrow. Spike loose from the first with the flowers all distant and often lengthening to 1ft. or even more. Outer perianth-segments 3 to 4 lines long, inner ones usually more or less dotted. Filaments very short, anthers oblong, the cells opening in some specimens in terminal pores only, in others the slit extending to the base. Capsule small, glabrous.

Hab.: Musgrave Elec. Tele. Station, *T. Barclay-Millar*.

4. **C. brachyantherum** (anthers short), *Benth. Fl. Austr.* vii. 92. A dwarf plant, the stems not above 1 to 2in. high below the spike, the leaves mostly exceeding the spikes. Spikes about  $1\frac{1}{2}$ in. long, dense and hairy as in *C. spicatum*, but the flowers very much smaller, like those of *C. parviflorum*, and the anthers different from those of all other species, being shorter than broad, the cells opening laterally to the base. Capsule glabrous.

Hab.: Port Denison, *Fitzalan*.

## ORDER CXL. FLAGELLARIACEÆ.

Flowers small, in terminal panicles, uni- or bi-sexual. Sepals 6, persistent, imbricate. Stamens 6, hypogynous, filaments free; anthers basifixed erect. Ovary superior, 3-celled; style short, 3-cleft, or styles 3; ovules solitary in the cells, anatropous. Fruit a small berry or a drupe with 1 to 3 pyrenes. Seeds laterally attached; testa membranous or thick, albumen floury; embryonic lenticular. Stems tall leafy, erect or scandent. Leaves many-nerved or plaited, petiole sheathing.

Plants of the Old World and Pacific. Genera and species few.

### 1. FLAGELLARIA.

(Referring to the long flexible shoots resembling whips.)

Perianth persistent, of 6 distinct nearly equal spreading segments, thin but colored, the 3 inner ones rather larger. Stamens 6, hypogynous; filaments short, free; anthers erect, exceeding the perianth, the cells opening laterally in longitudinal slits. Ovary sessile, 3-celled, with one laterally attached ovule in each cell; style deeply divided into 3 linear-clavate stigmatic lobes. Fruit a small nearly globular indehiscent drupe, the exocarp thin, slightly succulent, the endocarp hard, 1 or rarely 2-celled, with 1 seed in each cell. Seed globular with a thin membranous testa closely lining the endocarp, and a copious

albumen. Embryo small, broadly clavate, at a distance from the hilum.—Leafy climbers, with long leaves ending in a spirally twisted point. Flowers small, in a terminal panicle.

Species few, the Queensland one extending over the tropical regions of Asia and Africa.

1. **F. indica** (Indian), *Linn.*; *Kunth., Enum.* iii. 370; *Benth. Fl. Austr.* vii. 10. "Pain-ki," Tully River, *Roth.* A tall glabrous climber, ascending sometimes to the tops of large trees, the stem  $\frac{1}{2}$  to 1 in. thick and mostly encased in the closed leaf-sheaths. Leaves long-lanceolate or linear-lanceolate, from 4 or 5 in. long to twice that length, besides the long points spirally twisted into tendrils, variable in breadth, many-nerved but not plicate, rounded at the base and almost petiolate on the sheath which ends on each side in a short rounded auricle. Flowers white, very numerous, sessile in clusters or short spikes on the ultimate small branches of a dense terminal panicle, with a small scale-like bract under each flower and under the smaller branches. Perianth-segments about 1 line long. Fruit about 2 lines diameter.—*Red. Lil.* v. t. 257; *Schnitzl, Iconogr.* i. t. 51. b; *R. Br. Prod.* 264.

*Hab.*: Northumberland and Prince of Wales Islands, *R. Brown*; islands along the coast, *A. Cunningham*; Cape York, *McGillivray, Daemel*; Rockingham Bay, *Dallachy*; Rockhampton, *O'Shanesy, Bowman* and others; Moreton Bay, *Eaves*.

Stems used for handles of fishing-nets, *Roth, l.c.*

*Var. gracilicaulis.* The stems of this form are seldom thicker than a pipe stem; the leaves are usually narrower and seem more numerous. The panicles are more elongated, and have fewer and more spreading branches.

*Hab.*: Scrubs about the Barron River.

## ORDER CXLI. JUNCACEÆ.

Flowers hermaphrodite or diœcious. Perianth inferior, persistent, with or without a distinct tube, the limb or perianth of 6 lobes or segments imbricate in 2 series or the outer ones rarely valvate, all or at least the outer ones, or in diœcious species, at least the females glume-like or rigid, or scarious thin and almost hyaline, the inner ones rarely somewhat petal-like. Stamens usually 6, attached to the base of the lobes or segments or almost hypogynous, the 3 opposite the inner segments deficient in a few species; filaments free; anthers erect or versatile, with 2 parallel cells opening laterally or inwards in longitudinal slits. Ovary superior, 3-celled or if 1-celled with 3 parietal or basal placentæ, with 1 or several ovules to each cell or placenta, anatropous or amphitropous. Style either single with a small terminal stigma, or short and more or less deeply divided into 3 oblong or subulate recurved stigmatic branches. Fruit a capsule, opening loculicidally in 3 valves, or rarely owing to the splitting of the valves 6-valved. Seeds erect or laterally attached, ovoid globular angular or rarely flattened, the testa appressed, rarely black and not shining. Embryo small and basal, rarely linear and transverse, in a hard or fleshy rarely almost mealy albumen.—Perennial or rarely annual rigid herbs, with a short or tuberous or creeping rhizome, or the stock growing up into a woody caudex rarely almost arborescent. Flowering stems or scapes leafless or nearly so except at the base, or branching and leafy and then usually slender and covered by the leaf-sheaths. Leaves mostly radical narrow grass-like or rigid with fine parallel veins. Flowers small (except in *Calectasiæ*), green brown or whitish, very rarely blue, often densely clustered with small imbricate scarious bracts, the single flowers or clusters solitary and terminal or in terminal panicles.

The two typical genera of this somewhat heterogeneous order are amongst the most generally spread, especially in extratropical and subtropical regions. The Order is very nearly allied to *Liliacæ*, to which some of the genera here included have been occasionally referred, according as the greatest weight has been attached to the distinctive characters derived from the perianth the seed or the habit.

TRIBE I. **Xerotesæ**.—*Perianth small, segments glume-like or scarious, sometimes the inner ones petal-like. Anthers versatile, dorsifixed.*

\* *Flowers diœcious. Styles or stigmatic branches distinct to the base, or scarcely connate throughout.*

Flowers diœcious. Style short with 3 recurved branches. Leaves in radical tufts or along short leafy stems, not fringed above the sheath. . . . 1. XEROTES.

\*\* *Flowers hermaphrodite. Style filiform, stigma small.*

Perianth-segments all free. Ovary 3-celled, with few ovules in each cell. Flowers in long dense cylindrical spikes, on a long scape or peduncle. . . . 2. XANTHORRHEÆ.

TRIBE II. **Eujuncesæ**.—*Perianth small, the segments all free and glume-like. Anthers erect. Style with 3 linear stigmatic branches. Leaves grass-like or terete, mostly radical or none.*

Ovary 1-celled, or more or less perfectly 3-celled, with several often many ovules to each placenta . . . . . 3. JUNCUS.

Ovary 1-celled, with 3 erect ovules . . . . . 4. LUZULA.

1. XEROTES, Banks.

(Referring to the dryness of the herbage.)

Flowers diœcious. Males: Perianth of 6 segments or lobes all equal and similar, free or united to the middle, or more frequently the 3 outer free from the base thin and hyaline or scarious, the 3 inner more petal-like and more united at the base. Stamens 6, 3 attached to the base or centre of the 3 inner segments or lobes, 3 alternating with them, all shorter than the perianth; anthers versatile, usually deeply lobed below their attachment and sometimes at the apex also, the cells then quite distinct and dorsally attached, opening in longitudinal slits. Ovary rudimentary or entirely deficient. Female flower: Perianth persistent, usually of a firmer consistence than in the males, of 6 equal and similar segments. Stamens none or reduced to small clavate staminodia. Ovary sessile, 3-celled, with 1 (or rarely 2?) erect ovules laterally attached in each cell; style very short or scarcely any, with 3 recurved stigmatic lobes. Capsule nearly globular, surrounded by the persistent perianth, coriaceous, smooth and shining or transversely wrinkled or rarely longitudinally striate, opening loculicidally in 3 valves. Seeds ovoid globular or somewhat angular when all three ripen; testa thin, adnate, not black; albumen rather hard; embryo linear or very short, erect from the base of the seed.—Stems tufted on a very short or creeping rhizome or stock, either densely leafy at the base only or slender elongated and leafy. Scapes or peduncles either very short or the inflorescence sessile in the tufts of radical leaves or at the ends of the leafy stems or more or less elongated below the inflorescence. Flowers small, the males usually either in dense clusters or solitary along the branches of a panicle, sessile or pedicellate within short scarious bracts; the female inflorescences either similar to the males or less branched or reduced to single sessile globular heads, or rarely both sexes in dense globular or oblong heads along a simple rhachis or connected into a long dense cylindrical spike.

The genus is nearly limited to Australia, one species only being also found in New Caledonia. Some of the wide-spread species are very variable and difficult to define, and the difficulty is often much increased by the extreme rarity of female specimens in collections; and when present, the uncertainty of their being correctly matched, the difference in habit, especially in inflorescence, between the two sexes being sometimes very striking.

SECT. I. **Euxerotes**.—*Male flowers paniculate or racemose or clustered along a simple or branched rhachis. Female inflorescence similar or more simple. Perianth-segments free from the base in both sexes or in the males the inner ones only shortly united. Leaves densely crowded or tufted on the very short or slightly elongated leafy stem (except in X. pauciflora). Scapes or peduncles terminal.*

SERIES I. **Glomeratæ**.—*Male flowers sessile and numerous in sessile clusters. Capsules smooth or nearly so.*

Three of the stamens attached to the centre of the inner perianth-segments  
Bracts obtuse and short.

Perianth about 1½ line long, all the segments free from the base, thin and broad . . . . . 1. X. Banksii.

Stamens all attached to the base of the segments.

Bracts, at least the lower ones, with subulate points usually exceeding the flowers. Leaves often rigidly 2-toothed at the apex . . . . . 2. *X. longifolia*.

SERIES II. **Fasciculatæ**.—Male flowers numerous in sessile clusters (irregular in *X. sororia*), but on pedicels exceeding the bracts.

Capsule transversely rugose.

Flowers numerous, in distinct clusters along the branches of the panicle or along a simple rhachis . . . . . 3. *X. multiflora*.

Flowers all erect and irregularly clustered in a small narrow compact panicle . . . . . 4. *X. sororia*.

SERIES III. **Sparsifloræ**.—Male flowers pedicellate or rarely sessile, singly; scattered in simple racemes or loose panicles, rarely here and there 2 or 3 together.

Panicles loose (usually on very short scapes). Perianth-segments all similar, usually narrow or acuminate.

Hyaline bracts very prominent. Perianth-segments nearly 2 lines long . . . . . 5. *X. effusa*.

Panicles less branched or reduced to simple racemes. Inner perianth-segments thicker than the outer, usually ovate or broad.

Leafy base of the stems short and tufted.

Flowers pedicellate, in a narrow loose panicle or simple raceme . . . . . 6. *X. filiformis*.

SECT. 2. **Cephalogyne**.—Male flowers sessile in sessile or rarely pedunculate clusters or heads usually several on a common rhachis, the perianth divided to the middle only into 6 equal lobes. Female flowers sessile in solitary sessile or very shortly pedunculate heads, the perianth divided to the base into 6 equal segments. Leafy stems often elongated, especially in the females, the scapes or peduncles terminal or in the upper axils.

Male flowers under 1 line or scarcely longer in several often numerous clusters.

Leafy base of the stems very short. Leaves above 1ft. long. Female heads very scarious on very short peduncles.

Sheathing bases of the leaves with scarious margins splitting into numerous filaments . . . . . 7. *X. elongata*.

SECT. 3. **Typhopsis**.—Flower-heads or spikes globular or cylindrical, very dense, the bracts split into dense masses of woolly hairs, males and females similar.

Leafy base of the stem very short. Leaves 1 to 2ft. long . . . . . 8. *X. leucocephala*.

1. **X. Banksii** (after Sir Joseph Banks), *R. Br. Prod.* 263; *Benth. Fl. Austr.* vii. 96. Leafy base of the stem often lengthening to 5 or 6ft., rather thick, densely covered with the sheathing bases of the leaves. Leaves distichous, spreading, mostly under 1ft. long and about 3 lines broad, the sheathing bases with narrow scarious margins. Scapes stout, not long below the inflorescence. Male flowers forming a panicle of 8in. to 1ft. with long spreading open clustered branches, the flowers sessile in globular clusters sessile along the branches and at their base. Bracts numerous, hyaline, much shorter than the perianths. Perianth-segments all equal, ovate, thin, hyaline, about 1½ line long when fully out. Stamens 3 attached to the centre of the inner segments, 3 at their base alternating with them. Ovary usually present and not much shorter than the perianth, but narrow with imperfect stigmas and abortive ovules. Female inflorescence only seen in fruit, either quite simple with dense globular clusters of numerous flowers, or with a short branch bearing a small cluster proceeding from the lowest cluster. Capsule about 3 lines diameter, smooth or strongly wrinkled.

Hab.: Endeavour River, *Banks and Solander*; Cooktown, *Fitzalan*; Cape York Peninsula, *Hann's Expedition*; Cape York, *Daemel*; frequent in islands off the coast, *C. Moore*; and apparently the same species, New Caledonia, *Veillard* and others.—*Benth.*

2. **X. longifolia** (leaves long), *R. Br. Prod.* 262; *Benth. Fl. Austr.* vii. 97 "Chindirigan," Tully River, *Roth*. Leafy base of the stems very short and tufted. Leaves radical or nearly so, 1 to 3ft. long, flat or slightly concave, varying from 1 to 3 lines in width, rather rigid, mostly 2 or more toothed at the apex, with a short membranous sheathing base. Scape from under 1ft. to nearly 3ft. high including the inflorescence, much flattened below the panicle, which is sometimes almost reduced to a short and few-flowered interrupted spike, but more

frequently pyramidal with numerous more or less clustered spreading branches, the whole inflorescence from 6in. to nearly 1½ft. long. Flowers small, very fragrant, sessile and numerous in dense clusters sessile along the rhachis at the base and ends of the branches, the clusters more numerous in the males than in the females. Bracts under the clusters shortly broad at the base, usually with long rigid subulate points, sometimes all far exceeding the flowers, sometimes nearly all short except under the lowest clusters. Bracts or bracteoles subtending or enclosing the flowers broad and hyaline, shorter than the perianths, often very numerous in the females, fewer or united into 1 under each flower in the males. Perianth varying from 1 to nearly 2 lines in length, usually but not always larger in the females than in the males, the 3 outer segments quite free, much imbricate, rigid and scarious though often very thin, the 3 inner more petal-like and obtuse but not longer, shortly united at the base in the males. Filaments short, dilated at the base, attached to the base of the inner perianth. Male flowers usually without any rudimentary ovary. Capsule shortly protruding from the persistent perianth, ovoid or almost globular, 2 to 3 lines diameter, hard, smooth and shining.—Hook. f. Fl. Tasm. ii. 63; F. v. M. Fragm. viii. 210; Bot. Reg. 1839, t. 3; *Lomandra longifolia*, Labill. Pl. Nov. Holl. i. 92, t. 119.

Hab.: Broadsound and Thirsty Sound, R. Brown; from Moreton Bay, F. v. Mueller and others, to Rockhampton, O'Shanesy; Rockingham Bay, Dallachy; Burdekin River, F. v. Mueller; very common on damp land.

Used for making dilly-bags.—Roth.

Leaves sometimes infested with the fungus-blight, *Lastadia xerotifolia*. C. & M.

This species varies like others in the length and breadth of the leaves, but much more conspicuously in the size and ramification of the panicle.

3. **X. multiflora** (flowers numerous), R. Br. Prod. 262; Benth. Fl. Austr. vii. 100. "Mau-u," Bloomfield River, Roth. Leafy base of the stem very short and tufted. Leaves radical, rigid, 1 to 2ft. long, varying from very narrow to nearly 2 lines broad. Scape terete or slightly flattened under the inflorescence, and including the inflorescence often longer than the leaves, but sometimes quite short, usually rigid. Panicle from a few inches to 1ft. long, the branches rigid, divaricate, mostly in clusters of 3 to 6 from the same node, rarely again branched. Male flowers clustered along the branches or at the ramifications, all pedicellate. Bracts and bracteoles numerous, small, scarious, the bracteoles often connate. Pedicels filiform, sometimes scarcely exceeding the bracts, sometimes 2 to 3 lines long. Perianth-segments free nearly from the base, about 1 line long, the inner rather longer than the outer and sometimes slightly acuminate. Filaments rather long, 3 of them adnate to the inner segments nearly half way up, the other 3 free almost from the base. Female rhachis simple or with a few branches from the lower clusters. Flowers sessile, longer than in the males, the perianth-segments attaining sometimes 2 lines. Capsule about 3 lines diameter, the valves rigidly coriaceous, marked with more or less prominent transverse wrinkles.—X. Brownii, F. v. M. Fragm. viii. 206.

Hab.: Endeavour River and Bustard Bay, Banks and Solander; Keppel Bay, R. Brown; Moreton Bay, Flood; Peak Downs, F. v. Mueller; Rockhampton, Thozet, O'Shanesy, Bowman; Rockingham Bay, Dallachy; Port Denison, Fitzalan; very common on open land.

Used for making dilly-bags.—Roth., l.c.

4. **X. sororia** (allied to previous species), F. v. M. in Herb. Kew.; Benth. Fl. Austr. vii. 100. Habit of the long rigid narrow-leaved forms of *X. filiformis*, but the panicles small, very narrow and compact, with very short erect branches or reduced to a single spike, and the flowers all erect and very shortly pedicellate. Fruit (in the Rockhampton specimens) rather longer than in *X. filiformis*, deeply marked with transverse wrinkles.—Benth.

Hab.: Rockingham Bay, Dallachy; Ewen River, Rockhampton, Bowman.

5. **X. effusa** (weak), *Lindl. in Mitch. Three Exped.* ii. 101; *Benth. Fl. Austr.* vii. 102.—Leafy base of the stem very short. Leaves densely tufted, long and rush-like rarely above 1 line broad and 2-pointed at the end, with rather long sheathing bases, the inner sheaths with scarious margins splitting into filaments. Flowers in slender spreading panicles of 2 to 4 in., nearly sessile within the tuft of leaves. Scarious bracts under the branches and pedicels very prominent, hyaline, ovate or lanceolate. Male flowers scattered along the branches, on filiform pedicels shorter than or more frequently longer than the perianth, solitary or rarely with a second more sessile flower within the same bract. Segments all free, lanceolate, of a slender almost petal-like consistence, nearly 2 lines long. Female flowers on shorter more rigid pedicels or quite sessile, rather longer than the males. Capsule fully 4 lines diameter, the valves striate lengthwise.—*X. fragrans*, F. v. M.; *Sond. in Linnæa*, xxviii. 219.

Hab.: Stanthorpe, *J. Davidson*.

6. **X. filiformis** (thread-like), *R. Br. Prod.* 261; *Benth. Fl. Austr.* vii. 103. Stems tufted, on a short hard rhizome, sometimes forming a very short branching caudex. Leaves radical, narrow-linear, sometimes almost terete and filiform, frequently canaliculate or flat and 1 to 2 lines broad or very rarely even broader; in luxuriant specimens  $1\frac{1}{2}$  to 2 ft. long, in dwarf specimens or varieties under 6 in., varying as in other species smooth or slightly scabrous. Scape very short under the inflorescence, terete or flat. Panicle narrow-pyramidal, sometimes almost reduced to a simple raceme of 2 or 3 in., almost sessile in the leaf-tufts, and varying from that to a length of 6 in. on a scape of 2 or 3 in., but always much shorter than the leaves, the branches short, the lowest often clustered. Flowers small, globular or ovoid, scattered along the branches on short recurved pedicels, each subtended by a narrow acute scarious bract shorter than the pedicel. Perianth-segments 1 to  $1\frac{1}{2}$  line long, generally larger on the females than in the males, the inner ones ovate or orbicular rather thick and petal-like, the outer thinner shorter and greenish. Filaments very short, 3 attached to the centre of the inner segments, 3 alternate with them at their base. No rudimentary ovary in the males nor staminodia in the females. Capsule ovoid-globular, about 3 lines diameter, often oblique by the abortion of 1 or 2 of the cells, the pericarp smooth, hard or almost fleshy, tardily opening.—*Dracana filiformis*, Thunb. Diss. Drac. 4 fig. 1; *Xerotes Thunbergii*, F. v. M. *Fragm.* viii. 208.

Hab.: Moreton Bay, *F. v. Mueller* and others; Darling Downs, *Law*; Cooper's Creek, *Bowman*; Rockhampton, *O'Shanesy*; Rockingham Bay, *Dallachy*.

7. **X. elongata** (lengthened), *Benth. Fl. Austr.* vii. 106. Leafy base of the stem very short. Leaves 1 to  $1\frac{1}{2}$  ft. long, very narrow, their sheathing bases rather long, with scarious margins splitting up into numerous filaments. Male inflorescence on a short scape simple or more frequently branched, 2 to 3 in. long, with small globular clusters of sessile flowers. Scarious bracteoles united round the flowers. Perianth above 1 line long when fully out, with a narrow turbinate dark-coloured entire base and 6 equal lobes shorter than the tube. Female flower-head solitary, globular, on a very short peduncle, the imbricate scarious bracts very prominent, with long points exceeding the flowers. Perianth stipitate within the bract, divided nearly to the base into petal-like segments above 1 line long.

Hab.: Moreton Island, *F. v. Mueller*.

8. **X. leucocephala** (head of flowers white), *R. Br. Prod.* 260; *Benth. Fl. Austr.* vii. 109. Stems tufted with very short leafy bases. Leaves radical or nearly so, 1 to 2 ft. long and scarcely above 1 line broad, with scarious margins at the base split into long fine filaments, and bordered here and there by a few filaments higher up. Scapes much shorter, rarely attaining 1 ft., slender and

terete or slightly flattened in the lower portion. Flower-heads usually globular or ovoid, very dense, about  $\frac{1}{2}$  in. diameter, either solitary and terminal or with 2 or 3 additional ones enclosing the scape at a distance from each other, or rarely 2 or 3 united in a cylindrical terminal spike. Bracts subtending the flowers shorter than the perianth, or rarely with subulate points protruding from the head before the flowers expand. Scarios bracteoles split low down or quite to the base into very numerous crisped filaments or hairs as long as the perianth, giving the head a woolly appearance and often described as wool on the receptacle. Perianth infundibuliform,  $2\frac{1}{2}$  to nearly 3 lines long, with 6 ovate lobes, 3 outer hyaline attached about halfway up the tube, 3 inner ones longer more petal-like and white about half as long as the tube. Stamens in the males attached immediately below the inner lobes. Ovary rudimentary at the bottom of the tube. Female flower-heads sometimes closely resembling the males, but more frequently forming a continuous spike. Outer perianth-segments rather larger in proportion to the inner. Ovary obovoid, almost stipitate. Fruit obovoid, acuminate, hard and shining.—*X. filamentosa*, A. Cunn. MS.; Brongn. in Duperr. Voy. Bot. 183, t. 35; *X. typhina*, Lindl. in Mitch. Three Exped. ii. 41.

Hab.: On sandy land; Keppel Bay, *R. Brown*; Port Curtis, *M'Gillivray*; Darling Downs, *Law*; Curriwillighie, *Dalton*; Boyne, *Hartmann*.

## 2. XANTHORRHÆA. Sm.

(Referring to the flow of yellow resinous matter from the stems.)

Perianth persistent, of 6 distinct segments, the 3 outer glume-like, erect, concave or almost hood-shaped at the top, 3 or 5-nerved, almost scarios on the margins, the 3 inner much thinner, usually 5-nerved, erect within the outer ones but more or less protruded beyond them into a short hyaline or white and petal-like spreading lamina. Stamens 6, hypogynous or those opposite the inner segments slightly adherent to their base, longer than the perianth and all equal; filaments somewhat flattened or thickened at the base, usually spreading horizontally beyond the perianth, contracted at the end into an inflexed point; anthers oblong or rarely ovate, entire at both ends, dorsally attached in the middle, the cells opening longitudinally. Ovary sessile, 3-celled, with few ovules in each cell near the base, tapering upwards into an undivided subulate style, with a terminal entire or 3-grooved stigma. Capsule protruding from the persistent perianth, ovoid or acuminate, hard-brown and shining, 3-valved. Seeds 1 or 2 in each cell, erect, ovate or oblong, flat, bordered by narrow margins; testa black, almost crustaceous but not shining; albumen fleshy but very firm almost cartilaginous; embryo linear, transverse in the middle of the seed, straight or curved.—Long-lived perennials, with a thick woody caudex, from very short to arborescent. Leaves in a dense tuft at the top of the caudex, long-linear, brittle, spreading or recurved, their broader closely imbricate bases remaining long persistent. Scape or peduncle terminal, hard, often several feet long, terminating in a dense cylindrical spike of numerous sessile flowers, closely packed with numerous bracteoles surrounding each flower within a small or subulate subtending bract. Caudex in several species emitting a copious dark or yellow resin. The only true wood formed by this genus is a flat-bottomed cone found in the centre of the stem at the base in old tall trees. This formation may be met with 2ft. long but its usual height is only a few inches, almost black and very hard and appears almost indestructible, as this portion of the stem may be seen on land where the trees had been destroyed many years before. In this state they have the appearance of large turned pegs rather than a natural growth.

The genus is limited to Australia.



Inner perianth-segments with obovate or orbicular white laminæ conspicuously spreading above the outer ones. Spikes short (rarely 8in.) Caudex very short.

Bracts and outer perianth-segments glabrous.

Spike above 1in. diameter. Inner perianth-segments 5 lines long  
Stamens twice as long . . . . . 1. *X. macronema*.

Spike 7 or 8 lines diameter. Inner perianth-segments about 3 lines long . . . . . 2. *X. minor*.

Inner perianth-segments with shortly dilated hyaline or whitish ends, but little longer than the outer and scarcely spreading.

Leaves much flattened, narrow. Scape under 1ft., spike  $\frac{3}{4}$  to 2in. long . . . . . 3. *X. pumilio*.

Leaves much flattened and mostly 2 to 3 lines broad (except towards point). Spike 2 to 4ft. long.

Spike densely tomentose-pubescent. Caudex very short . . . . . 4. *X. hastilis*.

Spike glabrous or nearly so. Bracteoles obtusely spatulate or scarcely acuminate. Caudex aborescent . . . . . 5. *X. arborea*.

Leaves 1 to nearly 2 lines broad, the dorsal angle usually and the facial one sometimes acutely prominent.

Subtending bracts with subulate points very prominent on the young spike. Caudex very short. Spike usually under 1ft. long. . . . . 6. *X. bracteata*.

Subtending bracts concealed under the bracteoles and perianth.

Caudex usually arborescent. Scape usually longer than the spike 7. *X. quadrangulata*.

1. ***X. macronema*** (stamens long), *F. v. M. Fragm.* iv. 112; *Benth. Fl. Austr.* vii. 113: Leaves narrow nearly flat or acutely triquetrous, 2 to 3ft. long. Scapes above 1ft. long. Spike 4 to 8in. long, thick and very dense, the flowers much flattened and larger with longer stamens than in any other species. Bracts linear-spathulate, quite glabrous, nearly as long as the outer perianth-segments. Outer segments oblong, shortly acuminate, about 3 lines long, concave, quite glabrous, inner segments fully 5 lines long, with white obovate-spreading laminæ. Stamens nearly twice as long as the perianth; anthers ovate-oblong.

Hab.: Islands of Moreton Bay and swamps of southern parts.

2. ***X. minor*** (the lesser), *R. Br. Prod.* 288; *Benth. Fl. Austr.* vii. 114. "Bulnan." Cairns, *Nugent*. Leaves crowded on the very short and thick caudex, 1 to 2ft. long and from 1 to nearly 2 lines wide, flat but thick or more or less triquetrous. Scape when full grown often longer than the leaves, the spike 3 to 8in. long, 7 to 8 lines diameter when fully out. Spathulate bracts and outer perianth-segments shortly acuminate, about 2 lines long, quite glabrous or minutely ciliate at the end; inner segments with white obovate spreading laminæ scarcely 1 line broad. Stamens about twice as long as the perianth, very spreading; anthers ovate-oblong, much smaller than in most species. Capsule acuminate and 7 to 8 lines long in some of the northern specimens, shorter and more obtuse in the southern ones.—*Hook. f. Fl. Tasm.* ii. 59; *F. v. M. Fragm.* iv. 112; *Bot. Mag.* t. 6297.

Hab.: On the southern hills; also hills about Cairns, *Nugent*.

3. ***X. pumilio*** (little), *R. Br. Prod.* 288; *Benth. Fl. Austr.* vii. 114. Caudex scarcely produced above the surface of the ground, or attaining 6 or 9in. according to Mr. Wheatcroft. Leaves under 1ft. long, twisted and very much recurved, flat, under 2 lines broad with the midrib prominent. Scape under 1ft. high, in the specimens to hand 5 to 9in. long, and less than  $\frac{1}{2}$ in. diameter. Spikes from  $\frac{3}{4}$  to 2in. long. Bracts 2 lines long, spatulate, green and minutely ciliate, the lower part very slender. Perianth-segments about 3 lines long, outer ones thick and glossy, green at the top, white below, margins very thin and much

involute. Stamens spreading, nearly twice as long as the perianth, filaments broad; anther oblong. Style erect, thick, about as long as the perianth; stigma minute. Capsule protruding, but not matured on the specimen examined.

Hab.: Port Curtis, *John Wheatcroft, M.A.*

The discovery again of this plant is of interest on account of its not having been met with, so far as I am aware, since it was first found by Dr. Robert Brown in about 1802 near about the same locality.

4. **X. hastilis** (flower spike pike-like), *R. Br. Prod.* 288; *Benth. Fl. Austr.* vii. 115. "Tchuckah," Bundaberg, *Keys*. "Goona-ngulla," Mackay, *Macartney*. Caudex very short or often scarcely prominent. Leaves 3 to 4ft. long, 2 to 3 lines broad, flat in front, but with the dorsal angle more or less prominent. Scape usually 3 to 4ft. long below the spike, which attains from 1½ to 2ft. but is not so thick as that of *X. arborea*, and readily known by the dense rusty tomentum covering the ends of the bracts and outer perianth-segments, especially conspicuous before the flowers expand. Bracts linear-spathulate, mostly very narrow. Outer perianth-segments about 2 lines long, oblong, 3 or 5-nerved, opaque, concave, scarcely acuminate, pubescent outside; inner ones very little longer; dilated hyaline and somewhat spreading at the end. Filaments only shortly exceeding the perianth. Full-grown fruiting spikes under 1in. diameter without the capsules, which are about ½in. long, obtuse, protruding from the spike.—*F. v. M. Fragm.* iv. 113; *Bot. Mag.* t. 4722.

Hab.: A swamp species in southern localities, extending to Mackay.

Analysis of resin: Resin soluble in alcohol 82%, Benzoic acid, 9.4%.—*Lauterer*.

5. **X. arborea** (tree-like), *R. Br. Prod.* 288; *Benth. Fl. Austr.* vii. 115. "Dackowar," Taromeo, *Shirley*. Caudex growing out to several feet in height with a diameter of 6 to 9in. Leaves as in *X. hastilis*, flat or triquetrous, 3 to 4ft. long, and 2 to 3 lines broad. Scape under the spike attaining 5 or 6ft. and the spike itself 3 to 4ft. long, 1 to 1½in. in diameter when full grown without the capsules. Bracts linear-spathulate, nearly as long as the perianth, quite glabrous or slightly ciliate at the tips. Perianth-segments about 3 lines long, 3-nerved, the outer ones concave at the end with a very short obtuse point, either quite glabrous or shortly and sparingly pubescent; inner ones scarcely longer, the dilated ends hyaline and slightly spreading. Stamens not much longer than the perianth. Capsule 7 to 8 lines long, more acuminate than in *X. hastilis*.

The common large species in southern localities.

Analysis of resin: Resin soluble in alcohol, 93.5%. Benzoic acid, 5.6%.—*Lauterer*.

The resin if given as a powder of 1 drachme or more, stops diarrhoea. Is also an excellent antiseptic for wounds and ulcers; also recommended for external application on chronic ulcers.—*Lauterer*.

6. **X. bracteata** (bracts prominent), *R. Br. Prod.* 288; *Benth. Fl. Austr.* vii. 116. Caudex very short. Leaves about 2ft. long, 1 to 1½ line broad, concave on the upper side, the dorsal angle slightly projecting in the lower part, tapering upwards into a narrow triquetrous point. Scape 2 to 3ft. high, the spike usually 4 to 6in. long and little more than ½in. diameter, but in some larger specimens twice that length and ¾in. diameter. Subtending bracts subululate and very conspicuous in the young spike, but most of them fallen away at the time of flowering or concealed by the outgrowing perianths. Bracts or bracteoles surrounding the flowers linear or linear-spathulate, distinctly acuminate, glabrous or with a tuft of a few hairs on their apex, all shorter than the perianth. Outer perianth-segments oblong, almost hoodshaped and acuminate at the top, scarcely 2½ lines long; inner segments rather longer, their dilated hyaline ends slightly spreading but much less conspicuous than in *X. minor*. Fruit small.

Hab.: Mr. Bentham considered that some specimens in Baron Mueller's Herbarium which were obtained from near Springsure might belong to this species.

7. **X. quadrangulata** (4-angled), *F. v. M. Fragm.* iv. 111; *Benth. Fl. Austr.* vii. 117. "Tehagun," Mount Perry, *Keys*. Caudex lengthening out to several feet. Leaves slender but rigid, 1½ ft. long, strictly 4-angular, though sometimes slightly flattened, rarely above 1 line broad: Spike 3 or 4 ft. long on a scape at least as long or longer, 1¼ in. thick when in flower. Bracts or bracteoles surrounding the flowers nearly as long as the outer perianth-segments, glabrous. Outer segments ovate-spathulate, concave or almost complicate, very shortly acuminate, quite glabrous; inner segments obtuse, about 3 lines long, 3 or 5-nerved, the whitish shortly flattened apex very little exceeding the outer-segments. Stamens not much longer than the perianth. Fruit not seen.—*Bot. Mag.* t. 6075.

Hab: Mount Perry, *J. Keys*.

### 3. JUNCUS, Linn.

(From *jungo*, to join; ropes are said to be made from some species.)

Perianth of 6 equal glume-like segments. Stamens either 6, 3 attached to the base of the inner segments and 3 alternate with them, or fewer 1, 2 or all 3 of the inner ones deficient, filaments filiform; anthers oblong or linear, erect, emarginate at the base or almost entire. Ovary sessile, with 3 parietal placenta sometimes scarcely prominent, more frequently protruding and sometimes meeting or even connate in the centre, dividing the ovary more or less perfectly into 3 cells; ovules usually numerous in each cell; style divided usually to the middle into 3 linear or filiform stigmatic lobes often spirally twisted. Capsule 3-valved, the valves usually bearing the placenta in their centre, or rarely the linear placenta becoming detached and remaining distinct or cohering in a central column. Seeds very small, usually ovoid, the testa minutely striate-reticulate, with a very thin transparent outer membrane, often scarcely distinct from the testa, but sometimes produced at the end of the seed into a terminal loose appendage often called a tail. Embryo small, near the hilum.—Perennial or rarely annual herbs, the stems usually tufted or crowded on a creeping rhizome. Leaves usually or all radical, grass-like or terete or sometimes all reduced to sheathing scales. Flowers small in little dense clusters or forked cymes, the clusters or cymes usually several or many, either sessile or nearly so in a dense head, or unequally pedunculate in a simple or branched irregular panicle, really terminating a simple leafless scape with 1, 2 or 3 leafy bracts at the base, but sometimes the inflorescence appears lateral, the bract being terete, but little dilated at the base and strictly erect, forming an apparent continuation of the stem.

The genus is very generally spread over almost all known parts of the world, most abundant in temperate or cool regions, in marshes, maritime sands or wet mountains, but found also in similar situations within the tropics.

Leaves grass-like and flat or rarely almost terete. Inflorescence terminal with spreading bracts.

Flowers brown, few or many in close clusters.

Flower-clusters paniculate (habit of *Luzula*).

Leaves all radical, mostly 1 to 3 lines broad. Stamens 3. Ovules and seeds numerous.

Flowers pale-coloured, in loose cymes or in clusters of 2, 3 or rarely more. Stems under 1 ft. high.

Annual. Flowers mostly distinct, in a much-branched leafy panicle

Tufted perennial. Flowers clustered (2 to 6), in a slightly branched leafy panicle

Leaves terete or nearly so or reduced to sheathing scales. Panicles apparently lateral below the end of rigid leafless stems (the subtending leafy bract erect and continuing the stem).

Leaves and terminal bract not jointed.

Filaments filiform. Seeds not tailed.

Stamens 3. Scales at the base of the stem usually short.

Flowers distinct in the panicle

1. *J. planifolius*.

2. *J. bufonius*.

3. *J. homalocaulis*.

*nunis*.

- Flowers all collected into distinct clusters . . . . . 5. *J. vaginatus*.  
 Stamens 6. Scales at the base of the stem short or longer than in  
*J. communis*. Flowers small, distinct in the panicle . . . . . 6. *J. pauciflorus*.  
 Stems very stout and tall with long loose scales at the base. Flowers  
 rather larg., distinct in the panicle. Stamens varying 3 to 6 . . . . . 7. *J. pallidus*.  
 Filaments short and flat. Seeds tailed. Stems very rigid. Stamens 6 . . . . . 8. *J. maritimus*.  
 Leaves and terminal bracts appearing jointed from internal cross  
 partitions of pith.  
 Stems more or less flattened usually 1 to 2ft. Perianth-segments  
 1½ line with long subulate points. Stamens usually 4 . . . . . 9. *J. prismatocarpus*.  
 Stems 2 to 7in. Flower-clusters small and few. Perianth-segments  
 1 line long, lanceolate, rather acute . . . . . 10. *J. capillaceus*.

1. **J. planifolius** (leaves flat), *R. Br. Prod.* 259; *Benth. Fl. Austr.* vii. 125. Stock tufted. Leaves radical, usually numerous, flat and grass-like, shorter than the stem, 1 to 3 lines or rarely nearly 4 broad, with long imbricating sheaths almost distichous, the whole habit nearly that of some varieties of *Luzula campestris*. Stems leafless, usually 1 to 1½ft. high, but sometimes much lower, with a terminal compound unequally branched cyme, the lower branches often clustered. Bracts all small and scarious, or rarely 1 or 2 leafy ones at the base of the inflorescence. Flowers brown, in globular clusters at the base of the ramifications and ends of the branches. Perianth-segments but little more than 1 line long, very acute. Stamens 3. Ovary with 3 parietal placentæ only very shortly connected at the base and numerous ovules. Capsule mucronate or scarcely acuminate, about as long as the perianth. Seeds ovoid, very small, the minute reticulations visible only under a ¼in. lens.—Hook. f. *Fl. Tasm.* ii. 64.

Hab.: Gullies of the Main Range and other southern localities.

2. **J. bufonius** (found where toads abound), *Linn.*; *Kunth. Enum.* iii. 353; *Benth. Fl. Austr.* vii. 127.—A pale-coloured tufted annual, rarely exceeding 6 to 8in. and often scarcely half that size, the stems erect, slender and branching, with a linear leaf or leafy bract under each branch. Leaves linear, from almost filiform nearly 1 line broad, the margins involute at least in the dried state, the lower to ones sometimes exceeding the stem, all dilated at the base into a rather long sheath. Flowers nearly sessile, solitary or in clusters of 2 or 3, terminal or sessile in the forks of a loose dichotomous leafy cyme. Bracts broadly ovate, thinly scarious, subtending each flower with 2 similar bracteoles immediately under the perianth. Perianth-segments pale-coloured, narrow, acuminate and very acute, mostly about 3 lines long, but variable in size, the inner ones rather smaller than the outer. Stamens 6 or rarely only 3. Capsule oblong, shorter than the perianth, the placentas usually at length detached from the valves and either cohering in a central column or ultimately separating. Seeds minute and numerous, without tails.—E. Mey. in *Pl. Preiss.* ii. 47; Hook. f. *Fl. Tasm.* ii. 64; *J. plebeius*, *R. Br. Prod.* 259.

Hab.: Southern localities.

3. **J. homalocaulis** (smooth stems), *F. v. M.*; *Hook., Benth. Fl. Austr.* vii. 128. A small tufted pale-coloured species apparently perennial, but without creeping rhizomes. Stems rarely exceeding 6in., slender, the inflorescence but little branched. Leaves from the base of the stem very narrow and almost terete, shorter than the stem. Flowers 2 to 6 together in clusters or heads sessile or pedunculate towards the end of the stem with a subulate leafy bract under the lowest cluster, the flowers sessile in the clusters and generally divaricate, at least after flowering, clusters few to each stem. Perianth-segments rigid, acutely acuminate, about 3 lines long, the inner ones rather shorter.

Stamens 6, style divided nearly to the base. Placentæ parietal, not very prominent. Capsule rather shorter than the perianth. Seeds ovoid without tails.—*J. plebeius*, Steud. Syn. Glum. ii. 307, and some others, not of R. Br.

Hab.: Border of N.S.W., near Wallangarra.

4. ***J. communis*** (common), *F. Mey. Syn. Junc.* 12; *Benth. Fl. Austr.* vii. 128. "Wirree," Bundaberg, *Keys*. Stems densely tufted on a horizontal or shortly creeping matted rhizome, usually 2 to 3ft. high, or even more, erect, terete, leafless except a few brown or pale-coloured leafy sheathing scales at the base. Panicle apparently lateral and sessile at from 2 or 3 to 6 or 8in. below the top, the leafy bract at the base of the inflorescence being erect, terete, continuous with the stem, and scarcely hollowed into a sheath at the base. Flowers numerous, densely crowded into a compact globular head of  $\frac{1}{2}$ in. diameter or forming a looser very unequally branched panicle of 1 to 2in. diameter flowering from the base, the central short branches having only 2 or 3 flowers, the others a considerable number, usually singly scattered along the branches of irregular cymes. Bracts within the panicle small and scarious. Perianth nearly or quite sessile, the segments all very acute, usually pale-coloured, above 1 line and under  $1\frac{1}{2}$  line long. Stamens in all the flowers examined 3 only, alternating with the inner segments. Capsule narrow-ovoid or elliptical, obtuse, as long as or rather longer than the perianth. Placentas very prominent and often meeting in the centre but not united except at the base. Seeds very numerous, minute, without tails.—Hook. f. *Fl. Tasm.* ii. 67; *J. effusus*, Linn.; R. Br. *Prod.* 258.

Hab.: Coastal swamps and marshes generally.

5. ***J. vaginatus*** (sheathed), *R. Br. Prod.* 258; *Benth. Fl. Austr.* vii. 129. This has the stems with sheathing scales at the base and the continuous terete terminal leafy bract of *J. communis*, but the panicle is looser with rather long branches, and the flowers in little dense distinct cymes almost contracted into clusters at the base of the ramifications and ends of the branches, almost as in *J. prismatocarpus*. Perianths small and stamens 6 as in *J. pauciflorus*.

Hab.: Southern wet places.

6. ***J. pauciflorus*** (few-flowered), *P. Br. Prod.* 259; *Benth. Fl. Austr.* vii. 129. Stems in the typical form crowded on a horizontal or shortly creeping rhizome and under 1ft. high, but attaining in other specimens 2 or 3ft., leafless except a few sheathing scales at the base, of which the innermost is often several inches long and sometimes produced into a leafy point of 1 or 2in. Inflorescence lateral as in *J. communis*, the leafy bract at its base terete and continuous, erect and terminating the stem. Panicle irregularly compound resembling that of the loose-flowered varieties of *J. communis*, but usually more slender, the flowers few or numerous rather smaller than in that species, and 6 stamens in all the flowers examined. Ovary, capsule and seeds of *J. communis*.—Hook. f. *Fl. Tasm.* ii. 67.

Hab.: Moreton Bay, *F. v. Mueller* and others; Rockhampton, *Thozet*.

7. ***J. pallidus*** (pale), *R. Br. Prod.* 258; *Benth. Fl. Austr.* vii. 130. A tall stout species, very nearly allied to the loose flowering varieties of *J. communis*. Stems several feet high, the sheathing scales enclosing their thick base long and loose, the innermost often 6 to 10in. long and tapering into a long point. Inflorescence lateral like that of *J. communis*, but more rigid and the flowers usually rather longer. Stamens usually 3, but occasionally varying to 4 or 5 and perhaps sometimes 6.—*J. vaginatus*, *E. Mey.* in *Pl. Preiss.* ii. 46; Hook. f. *Fl. Tasm.* ii. 68, not of R. Br.; *J. correctus*, Steud. Syn. Glum. ii. 296.

Hab.: Very common.

8. **J. maritimus** (maritime), *Lam.*; *Kunth, Enum.* iii. 322; *Benth. Fl. Austr.* vii. 130. Stems densely tufted on a horizontal or shortly creeping rhizome, very rigid, 2 to 3ft. high, with sheathing scales at the base, of which 1 or 2 inner ones terminate in a rigid terete pungent stem-like leaf shorter than the real stems. Panicle or cyme appearing lateral, the long outer leaf-like bract erect and continuing the stem but more distinct than in *J. communis*, owing to its broad sheathing base. Flowers in little clusters usually very numerous in an irregularly compound panicle sometimes very dense, sometimes looser with 1 or 2 of its branches elongated to several inches. Perianth-segments about  $1\frac{1}{4}$  line long the outer ones very acute, the inner with broad scarious margins. Stamens 6, the filaments short and broad. Capsule not exceeding the perianth, almost completely 3-celled. Seeds oblong, variable in size and number, the outer membrane almost always produced at both ends into short tails.—*R. Br. Prod.* 258; *E. Mey. in Pl. Preiss.* ii. 46; *Hook. f. Fl. Tasm.* ii. 66.

Hab.: South and north in brackish marshes.

9. **J. prismatocarpus** (fruit prismatic), *R. Br. Prod.* 259; *Benth. Fl. Austr.* vii. 131. Stems tufted or stoloniferous and shortly creeping at the base, 1 to 2ft. high, more or less compressed. Leaves few, erect from long sheaths, compressed or nearly terete, hollow inside but divided by cross partitions of pith giving them a jointed appearance. Panicle terminal, erect, compact or divaricate with long branches, with 1 or 2 erect leafy bracts at its base, jointed like the leaves. Flowers numerous in globular clusters terminating the branches or sessile at their base. Perianth-segments very narrow, with subulate points, about  $1\frac{1}{2}$  line long, the inner ones rather broader. Stamens usually 3, but sometimes 4 to 6, the filaments slender. Capsule narrow, with very prominent acute angles, from a little shorter to considerably longer than the perianth, the parietal placentæ scarcely prominent inside. Seeds minute, without tails.—*J. holoschanus*, *R. Br. l.c.*; *Hook. f. Fl. Tasm.* ii. 65; *J. commutatus*, *Steud. Syn. Glum.* ii. 301.

Hab.: Common near water north and south.

10. **J. capillaceus** (hair-like), *Hook. f. Fl. Tasm.* ii. 65, t. 134; *Benth. Fl. Austr.* vii. 132. Stems from a tufted or shortly creeping branching base erect, leafy, only 2 to 3in. high. Leaves very narrow or subulate, nearly terete, more or less distinctly divided inside by cross partitions of pith as in *J. prismatocarpus*, sometimes shorter than but often twice as long as the stem. Flowers in little clusters of 3 to 10, rarely reduced to single flowers, and often not above 3 or 4 clusters to the small panicle, the lowest bract usually elongated and leafy, the other bracts small. Perianth-segments about 1 line long, lanceolate with scarious margins, rather acute but without the subulate points of *J. prismatocarpus*. Stamens 6. Capsule as long as or shortly exceeding the perianth, obtusely angular and shortly beaked. Placentas scarcely prominent. Seeds without tails.

Hab.: Border of N.S.W., near Wallangarra.

#### 4. LUZULA, DC.

(Gramen Luzulæ, of Bauhin; the Glowworm Grass.)

Perianth of 6 equal glume-like segments. Stamens 6, 3 attached to the base of the inner segments, 3 alternate with them, all shorter than the perianth; filaments filiform; anthers oblong or linear, erect, emarginate at the base. Ovary sessile, 1-celled, with 3 ovules erect from a very short central placenta; style single, with 3 usually long and slender stigmatic lobes. Capsule 3-valved. Seeds 3 or fewer by abortion, erect, the very short central placenta usually connected with a slightly raised line in the centre of each valve, globular or ovoid, the testa minutely reticulate-striate with a very thin external hyaline membrane connected with the somewhat dilated funicle and sometimes shortly

produced beyond the seed. Embryo small, near the hilum, in an indenture of the almost farinaceous albumen.—Perennial herbs, usually tufted. Leaves grass-like, chiefly radical, often fringed with long fine white hairs. Flowers clustered or distinct, the clusters in irregular unequally branched compound umbels or panicles sometimes contracted into heads, each flower subtended by a scariosus bract and enclosed at the base in 1 or 2 broad short scariosus bracteoles.

The genus, nearly allied to *Juncus*, is similarly spread over the greater part of the globe, chiefly abundant in temperate regions and more common in woods and pastures than in marshes.

1. ***L. campestris*** (a field plant), *DC.*; *Kunth, Enum.* iii. 307; *Benth. Fl. Austr.* vii. 123. Stock usually tufted and often knotted with the short hardened bases of the leaves. Stems from a few inches to above 1ft. high, with a tuft of radical grass-like leaves 2 to 4in. long, rarely above 2 lines broad, usually bordered by long fine white hairs, and often 1 leaf higher up, besides a long leafy bract under the inflorescence terminating the stem. Flowers in dense clusters, of which usually 1 or 2 sessile or almost sessile, surrounded by several others on peduncles varying from  $\frac{1}{2}$  to 1in., but sometimes all the clusters collected into a sessile pyramidal head. Bracts shorter than the flowers, usually shining white and contrasting with the brown perianth. Perianth-segments very acute, 1 to  $1\frac{1}{2}$  line long, dark or light brown and often with scariosus margins. Capsule very obtuse, not exceeding the perianth.—*R. Br. Prod. Addend.*; *Hook. f. Fl. Tasm.* ii. 68; *E. Mey. in Pl. Preiss.* ii. 48.

Hab.: Southern localities.

## ORDER CXLII. PALMÆ.

Flowers unisexual or rarely hermaphrodite. Perianth inferior and persistent in the females, of 6 usually dry or rigid segments in 2 series, the outer ones usually imbricate or united in a 3-toothed or 3-lobed cup, the inner usually longer, valvate in the males, valvate or imbricate in the females. Stamens in the males 3, 6, or indefinite, attached to the receptacle and often surrounding a rudimentary or imperfect ovary; filaments usually short; anthers erect attached at the base or shortly above the base and somewhat versatile, with 2 parallel cells opening inwards in longitudinal slits. Staminodia in the females when present and stamens in the hermaphrodite flowers usually 6, attached to the base of the perianth. Ovary in the females superior, either 3-celled or divided into 3 distinct carpels, or in some genera 1-celled from the first and in many genera only 1 cell fertile. Style usually very short or completely divided into 3 short thick stigmas or lobes stigmatic inside, at first erect afterwards spreading, rarely columnar with 3 small terminal stigmas. Ovules solitary or rarely 2 in each cell or carpel, erect and anatropous or rarely laterally attached or pendulous and amphitropous or orthotropous. Fruit an indehiscent drupe or berry, the exocarp often thick, succulent fleshy or spongy and fibrous, sometimes thin and hard, the endocarp membranous crustaceous or hard and bony. Seed solitary or sometimes 2 or 3; testa thin or crustaceous, adnate to the albumen or sometimes more or less to the endocarp; hilum orbicular oblong or shortly linear, basal and oblique or rarely lateral or terminal, the raphe sometimes variously ramified. Albumen hard cartilaginous or white and brittle, entire ruminant or excavated on one side. Embryo small in a small cavity either basal and near the hilum or dorsal and more or less distant from it.—Woody plants either with long weak or climbing stems and alternate leaves, or with an erect stem or caudex often very tall with a terminal crown of large leaves which in decaying leave the stem covered with scales or fibres, or marked with annular scars. Leaves large, either pinnately or palmately divided into long lobes or segments, rarely bipinnate. Flowers usually numerous and small for the plant, in simple spikes or branched

panicles called *spadices*, usually pendulous and arising from amongst the leaves or from the trunk below them, and at first entirely enclosed in a large bract called a *spatha*, opening laterally and finally deciduous with frequently 1 or more smaller sheathing bracts below the *spatha*, and rarely none but sheathing bracts below or on the rhachis of the *spadix*. Flowers usually sessile along the rhachis or branches of the *spadix*, often especially the males 2 together from the same node or notch, subtended by 1 or 3 small bracts not unfrequently reduced to a slightly raised margin of the node.

This splendid Order, the pride of all tropical regions, is nearly restricted in Australia to Queensland, only a few species extending into New South Wales, Victoria and Lord Howe's Island. None of the Australian genera but the majority of the species are endemic.

TRIBE I. **Areceæ**.—*Leaves pinnatisect; segments free with reduplicate sides, or confluent as a plaited limb. Flowers monœcious or diœcious. Seeds umbilicate with ventral raphe and dorsal embryo.*

A. *Spadix infrafoliar (that is flowering after the fall of the leaf in the axil of which it was formed.)*

SUBTRIBE 1. **Euareceæ**.—*Male flowers unsymmetrical; sepals small; petals imbricate. Stigma in the fruit terminal. Spadix androgynous; flowers usually ternate, the middle one female.*

\* *Ovule basilar, erect.*

Male flowers minute, solitary or 2-nate towards the tips of the branches 3 or 6-androus; female larger, solitary. Albumen ruminatè . . . . . 1. ARECÆ.

\*\* *Ovule parietal.*

Flowers in threes middle one female. Stamens 6. Female flowers. Petals not longer than the sepals, imbricate at the apex. Albumen equable (solid). Leaf-segments split at the point . . . . . 2. HYDRIASTELE.

Flowers male; sepals small, carinate, imbricate. Stamens 9 to 24, filaments inflexed at the top. Female flowers, sepals and petals similar. Leaf-segments attenuate, acuminate, or the point 2-toothed . . . . . 3. ARCHONTOPHœNIX.

SUBTRIBE 2. **Ptychospermeæ**.—*Male flowers symmetrical, sepals broad, rounded, imbricate.*

\* *Albumen ruminatè.*

Male flowers: stamens 20 to 30; anthers versatile. Leaf-segments broad, præmorse . . . . . 4. PTYCHOSPERMA.

\*\* *Albumen equable.*

Male flowers: Stamens numerous, anthers versatile. Leaf-segments oblique, præmorse . . . . . 5. DRYMOPHLEUS.

SUBTRIBE 3. **Linospadiceæ**.—*Spadix simple; flowers monœcious, sunk in pits; ovary 1-celled.*

Male flowers numerous; anthers versatile, dorsifixed. Female flowers with 6 or many staminodia; ovule parietal, albumen ruminatè. Leaf-segments acuminate . . . . . 6. CALYPTROCALYX.

Male flowers: Stamens 6, 10, 12, anthers erect, basifixed, connective dilated. Female flowers: Staminodia numerous; ovule parietal; albumen equable. Leaf-segments præmorse. . . . . 7. BACULARIA.

SUBTRIBE 4. **Caryotideæ**.—*Spadices unisexual; flowers solitary or ternate with the females placed above the others. Petals of both sexes valvate.*

Male flowers: Sepals 3; stamens numerous. Albumen ruminatè . . . . . 8. CARYOTA.

ANOMALOUS GENUS.

Male-flowers in catkin-like branches of a drooping androgynous *spadix*; females capitate at the apex of the *spadix* . . . . . 9. NIPA.

TRIBE II. **Phœniceæ**.—*Leaves pinnatisect; leaf-segments with induplicate sides. Spadices interfoliar (flowering while the leaf in whose axil it is formed is still green); spatha solitary. Flowers diœcious. Ovary of 3 free carpels, one only ripening. Seeds ventrally grooved; embryo usually dorsal.*

Only the one genus . . . . . 10. \*PHœNIX.



TRIBE III. **Corypheæ**.—Leaves flabelliform, orbicular or cuneiform, plaited, lobed or segments with induplicate sides. Spadices interfoliar; spatha many. Flower usually bisexual. Ovary entire or 3-lobed or of 1 to 3 smooth carpels. Fruit smooth. Seeds with a small hilum; raphe ventral.

\* Stigma in the fruit terminal. Albumen equable; embryo dorsal.

Ovary of 3-trigonous carpels. Style filiform . . . . . 11. LICUALA.

Ovary of 3 globose carpels. Styles 3 free or coherent . . . . . 12. LIVISTONA.

TRIBE IV. **Lepidocaryeæ**.—Leaves pinnatisect, leaf segments with reduplicate sides. Spadices interfoliar or terminal; spatha usually many. Ovary 1 to 3-celled. Fruit clothed with reflexed shining closely imbricate appressed scales.

Stems elongate most frequently climbing. Leaf-segments acuminate, entire, nerves parallel. Spatha tubular, persistent . . . . . 13. CALAMUS.

TRIBE V. **Borasseæ**.—Leaves flabelliform. Spadices interfoliar; spatha numerous sheathing. Flowers dioecious; males minute, sunk in cavities of the catkin-like branches; perianth glumaceous; females very large, sessile on very short branches of a very stout spadix, each clothed with large coriaceous rounded bracts.

Male flowers numerous in alveolate spadices; stamens 6 . . . . . 14. BORASSUS.

TRIBE VI. **Cocoinæ**.—Leaves pinnatisect, segments with reduplicate sides. Spadices interfoliar, unisexual or androgynous; spatha 2. Ovary 3-celled, stigmas terminal. Fruit a drupe with a fibrous pericarp and terminal stigmas; endocarp woody or stoney, with 3 terminal pits of which two answer to arrested cells, the third is immediately over the position of the embryo in the subjacent albumen. Seed adherent to the endocarp by the diffuse reticulations of the raphe, which ramifies all over the seed.

Male flowers, petals lanceolate. Stamens 6. Fruit 1-seeded . . . . . 15. COCOS.

## 1. ARECA, Linn.

(From the Malabar name of the old trees of one species.)

Flowers monœcious in the same spadix, the upper ones or all of some branches males and singly sessile or two together, the females singly sessile along the main rhachis or at the base of the branches. Male flowers: outer perianth-segments scarcely imbricate; the inner 3-valvate. Stamens 3 to 6; filaments short; anthers basifixed erect; ovary rudimentary. Female flowers: perianth-segments of both series imbricate. Staminodia small, Ovary 1-celled, with 1 erect ovule. Stigmas 3. Drupe ovoid or oblong, the exocarp succulent, fibrous when dry. Seed erect, albumen deeply ruminant, embryo basilar.—Usually tall palms. Leaves pinnate, the spatha single; mostly Asiatic.

Stems several, 6 to 10ft. high. Leaves 3 to 6ft. long, the upper segments often broad and confluent. Stamens 3. Fruit elongate-pyriform . . . 1. *A. Aliceæ*.

Stem single, 15 to 20ft. high. Leaves 9 to 12ft. long, segments 70 to 80 on each side of the rhachis. Stamens 6. Fruit oval, about  $\frac{1}{2}$ in. long . . . 2. *A. appendiculata*.

1. **A. Aliceæ** (after the Princess Alice), *F. v. M. in Regel's Gartenflora*, 199 to 201. "Goolanjurie," Cairns, *Nugent*. Stems clustered, rather slender, 6 to 10ft. high. Leaves 3 to 6ft. long; segments somewhat erect, more or less confluent, acuminate. Panicle below the leaves, much branched; 3 stamens in the male flowers. Fruit elongate-pyriform, or nearly fusiform. Seed ellipsoid-ovate.—*F. v. M. Fragm.* xi. 88.

Hab.: Cairns, *W. Hill*.

2. **A. appendiculata** (referring to appendage on petals), *Bail. Bot. Bull.* iv. Trunk erect, with a diameter of about 1ft., attaining 20ft. in height to the base of the crown. Leaves 9 to 12ft. long, from 12 to 20 forming the crown, sheathing base short, petiole or portion without pinnae also short, pinnae alternate or subopposite, from 70 to 80 on each side of rhachis, the longest about 2 $\frac{1}{2}$ ft. long and 1 $\frac{1}{2}$ in. broad, those of the apex confluent at the base, forming a fan-like termination to the leaf: folded upon the rhachis, and tapering to a narrow, oblique, sometimes toothed point under surface white or grey dotted with minute

scurfy scales, and marked with 2 green lines down the centre; the upper surface deep-green, smooth, the midrib forming a sharp prominent ridge along the centre of the pinna and running out on the lower side an inch or so below the point. Inflorescence from amongst the bases of the leaves. Panicle including short peduncle about 2½ft. long, broad, deusely branched, the ultimate branchlets drooping, flexuose spikes. Bracts 3 or 4, the uppermost one yellowish-white, 2ft. long and about 6 or 7in. broad, lanceolate, outer side tomentose, inner glabrous. Flowers numerous, sessile or nearly so. Sepals 3, thin, valvate, about 1 line long, from a broad base tapering to a subulate point. Petals white, about as long again as the sepals, valvate, thick, fleshy, obtuse, bearing upon the inner face a prominent triangular gland or appendage. Stamens 6, the filaments very short, not so long as the rather large deeply sagittate anthers. Stigmas 3, short, spreading. Ovary 3-celled, maturing but 1 seed, the other 2 abortive. Fruit oval, nearly ½in. long, but not seen ripe.

Hab.: Bellenden-Ker, at an altitude of about 4,000ft., *Bellenden-Ker Expedition*, 1889. This may prove when better known a species of *Archontophoenix*.

2. HYDRIASTELE, H. Wendl. and Drude.

(From *hydria*, a water vessel or fountain, and *stele*, a column; alluding to the tall stems growing near springs.)

Spadices infrafoliar, branched. Flowers monœcious, spirally disposed, 3-nate the centre one female. Male flowers compressed. Sepals minute, acute not imbricate. Petals ovate-lanceolate, acuminate, valvate. Stamens 6, filaments short subulate, anthers linear, erect, basifixed. Female flowers much smaller than the males, subglobose, the perianth enlarging after flowering. Sepals reniform, imbricate. Petals a little longer, orbicular, convolute-imbricate. Staminodia obsolete. Ovary globose or ovoid, 1-celled; stigmas 3, minute, sessile, open, depressed, ovule pendulous from above the middle of the cell. Fruit small ellipsoid, smooth or ribbed terminated by the stigmas; pericarp fibrous. Unarmed palms the stem tall and ringed. Leaves pinnatisect, segments alternate, linear split or præmorse at the apex. Spadices broadly branching from the base, the branches slender, pendulous. Spathe 2, compressed deciduous. Flowers small the female ones minute. Fruit crimson.

Species few endemic.

Apex of leaf with confluent segments.

- Fruit ovoid or globose, 4 lines diameter . . . . . 1. *H. Wendlandiana*.
- Fruit ovoid, apiculate, 3½ lines long . . . . . 2. *H. Douglasiana*.
- Apex of leaf with free segments . . . . . 3. *H. costata*.

1. **H. Wendlandiana** (after Herm. Wendland), *Wendl. and Drude in Linnæa* xxxix. 209. A tall palm. Leaves many feet long, the segments numerous, unequal, the longest 1½ft. long, the upper ones confluent at the base, all or mostly jagged or toothed at the apex. Panicle of numerous slender pendulous spikes of about 1ft., the common peduncle very short broad and thick, marked with the scars of the spathe and of 2 outer bracts, the primary branches very short and thick, the rhachis of the spikes slender, the notches very little immersed. Spatha and male flowers unknown. Female perianth under the fruit about 2 lines diameter, the segments all very broad, the inner twice as long as the outer ones. Fruit ovoid or globular, when dry about 4 lines diameter and longitudinally striate with prominent ribs, succulent when fresh with a thin endocarp. Seed erect, with an oblong oblique basal hilum, the testa free from the endocarp, the albumen not ruminale.—*Kentia Wendlandiana*, F. v. M. Benth. Fl. Austr. vii. 138.

Hab.: Cape York, *W. Hill*; Cape Sidmouth, *Curdie*.

It is very probable that this species has only been met with at the Liverpool River, and that the specimens collected by Hill and Curdie, belonged to one or other of the following species for Bentham in Fl. Austr. expresses a doubt as to their belonging to the Arnhem's Land species.

2. **H. Douglasiana** (after the Hon. John Douglass, C.M.G.), *Bail. Ql. Agric. Journ.* i. A slender palm 20 to 30ft. high. Leaves about 5ft. long, the sheath, petiole and rhachis covered with a whitish or brownish, harsh, scurfy substance; leaf-sheath rather short, petiole about 9in.; segments about 20 on each side of the rhachis, very irregularly placed, sometimes 2 or 3 together forming distant sometimes confluent clusters; ribs usually 3, sharply prominent, folded and attached to the side of the rhachis, the apex of those in the middle of the leaf obliquely and deeply jagged, often forming on one side a tooth or point 2in. long with a thread-like end, several of the terminal ones confluent forming a fan-shaped end to the leaf—these have truncate doubly toothed ends. Inflorescence below the leaves, a densely bunched flagelliform panicle; the common peduncle flat, about 1in. long, the primary branches very short and flat, the rhachis of the spikes flattened, slender, and about 1ft. long. The dried perianth under the fruit cup-shaped, about 2 lines diameter, the inner segments retund and strongly striate. Fruit red, ovoid,  $3\frac{1}{2}$  lines long, apiculate by the persistent base of the style, strongly ribbed; epicarp free from the thin endocarp, albumen not ruminatè.

Hab.: Polo Creek, Somerset, Cape York Peninsula.

This elegant palm is nearly allied to *H. Wendlandiana*, but does not fully agree with the published description of that species.

3. **H. costata** (ribbed), *Bail. Ql. Agri. Journ.* ii. 129. The tree Mr. Jardine had cut down for the specimens he sent me stood 87ft. high, the trunk circumference being 41in. Leaves glabrous, except for a dense, close wool which clothes the lower part of the petioles and sheaths; sometimes a very slight patch may be seen upon the rhachis. The rhachis above the 1 or 2ft. petiole from 8 to 11ft. long,  $1\frac{1}{2}$ in. broad near the base, from which it tapers upwards, the upper portion laterally compressed. Segments all free, the apical ones very narrow and shortly decurrent but not confluent; the lowest also very narrow and distant, about 60 on each side, those of the centre of the leaf 3ft. (not interrupted as in *H. Douglasiana*, Bail.), folded and attached to the sides of the rhachis, tapering to almost filiform ends. Inflorescence below the leaves, in a pendulous dense flagelliform panicle: the common peduncle about  $1\frac{1}{2}$ in. long, showing the scars from whence 2 or 3 bracts, or the spatha and 2 bracts, had fallen, the portion of the peduncle which clasps the stem much thickened, primary branches short, thick, flattened, or angular, the ultimate spikes 15 to 18in. long, densely covered with fruit (no flowers seen). Perianth under the fruit about 2 lines diameter, segments broad, the inner ones twice as long as the outer ones, and not so spreading as in *H. Douglasiana*. Fruit when dry oval-oblong, about 4 lines long, very dark and glossy, with many prominent light-coloured longitudinal ribs, some of which are shorter than the others. Embryo basal, erect, albumen not ruminatè.

Hab.: Somerset, Cape York Peninsula, *Frank L. Jardine*.

After a careful examination and comparison of the two latter species of this genus with a few dried fruits and a single leaf-segment, given to me by the late Baron Mueller of the Liverpool River tree, the one upon which the species was founded, and the description of same by W. et D., I am fully convinced that they are specifically distinct from that species. In fruit, *H. Douglasiana*, somewhat closely resembles *H. Wendlandiana*; but there is a wide difference in the foliage of both these and *H. costata*, the terminal segments of the first two being confluent at the base, while in *H. costata* the leaf-segments are all free, and the fruit has much more prominent ribs than the other species; some of the ribs are thick, almost corky, their light colour contrasting strongly with the dark, almost black, fruit (at least when dry). The pretty red fruits of the other two species dry a pale colour.

### 3. ARCHONTOPHŒNIX, H. Wendl. and Drude.

(From *archonte*, chief, and *Phœnix*, the date, in allusion to their majestic aspect and their relationship.)

Spadices infræfoliar. Flowers monœcious, spirally disposed 3-nate, the middle one female, or male solitary and 2-nate, bracts and obscure bracteoles. Male

flowers asymmetric trigonously compressed. Sepals 3 small, roundish-triangular, keeled, imbricate. Petals 3, obliquely ovate-oblong, subacute, valvate. Stamens 9 to 24, filaments slender, connate at the extreme base, slender, the points inflated; anthers linear, base 2-fid, dorsifixed, versatile. Ovary rudimentary, styliiform. Female flowers smaller than the males, subglobose, perianth enlarging after flowering. Sepals 3, orbicular, convolute-imbricate. Petals similar but smaller. Staminodia 6, subulate or none. Ovary trigonous-ovoid, 1-celled; stigmas 3, minute, recurved; ovule parietal. Fruit small, globose, ellipsoid, stigmas subterminal, umbonate; pericarp fibrous. Seed erect, albumen deeply ruminant, embryo basal. Unarmed tall palms.

Leaf-segments glaucous on the underside.

Stem stout towards the base. Stamens 6 to 14 . . . . . 1. *A. Alexandræ*.

Stem much enlarged at the base, the rings forming steps at the base.

Doubtful if distinct from the above . . . . . 2. *A. Beatricæ*.

Leaf-segments green on both sides.

Stem cylindrical somewhat slender . . . . . 3. *A. Cunninghamii*

Stem very slender, the leaf-sheath forming a long erect point on the

opposite side of the stem. Stamens very numerous . . . . . 4. *A. Jardinei*.

1. **A. Alexandræ** (after Princess Alexandra), *Wendl. and Drude, in Linnæa xxxix.* 212. "Borum-bru," Cairns, *Nugent*. "Ko-pangara," Tully River, *Roth*. A tall palm, the stem attaining 70 to 80ft., enlarged towards the base. Leaves several feet long, the rhachis very broad and thick, glabrous or slightly scurfy, the segments numerous, the longer ones 1½ft. long, ½ to lin. broad, acuminate and entire or slightly notched, green above, ashy-glaucous or white underneath. Spatha 1½ft. long. Panicle when open above 1ft. long and broad; much branched, the rhachis more or less angular and flexuose, the notches scarcely immersed. Male perianth, 2 to 3 lines long, the inner segments very frequently oblique, pale-coloured, smoother and more acute than in *A. Cunninghamii*, the outer segments about 1 line long, slightly imbricate. Stamens usually 9 to 10, but varying in the flowers examined from 6 to 14, the filaments very short. Female perianth about 2 lines long, the segments all broad, and about equal in length. Fruit ovoid-globular, usually about 6 lines diameter. Ovary and seed of the genus.—*Ptychosperma Alexandræ*, F. v. M. *Fragm.* v. 47, 213, t. 43 and 44, not good, the stem too slender, and in *Fl. Austr.* vii. 140.

Hab.: Mackay, Rockingham Bay, and many other tropical localities.

2. **A. Beatricæ** (after the Princess Beatrice Mary Victoria Feodore), *F. v. M. in Chem. and Druggist* 1882. Step Palm. Stem stout, much enlarged at the base and there the rings formed by the scars of fallen leaves are unusually prominent, substance of stem comparatively soft. Leaves large, rigid, more erect than divergent, the rhachis straight, segments numerous, grey on the underside, apex pointed. Panicle moderately long, the branches flexuose. Male flowers in pairs with often a female between them. Stamens 8 to 12. Anthers linear, longer than the filament.—Extract from F. v. M. l.c.

Hab.: Mount Elliott, *E. Fitzalan*.

There is nothing in the above to separate the plant from *A. Alexandræ*, F. v. M., and I have never seen specimens.

3. **A. Cunninghamii** (after A. Cunningham), *Wendl. and Drude in Linnæa xxxix.* 214. "Wal-garri," Cairns, *Nugent*; "Piccabeen," Moreton Bay, *Watkins*. Stems cylindrical, usually from 60 to 70ft. high, not thick for the height. Leaves 6 to 8 or more ft. long, segments rather numerous and fairly regular, linear usually ending in long almost thread-like points but sometimes broad and irregularly torn or notched at the apex, length about 18in., width 1 to 1½in or

more, both sides green. Inflorescence, flowers and fruit like *A. Alexandra*.—*Seaforthia elegans*, Hook. Bot. Mag. t. 4961, not of R. Br.; *Ptychosperma Cunninghamii*, Wendl. in Bot. Zeit. 1858, 346; Benth. in Fl. Austr. vii. 141.

Hab.: A common southern palm although met with in the tropics, and a good distance inland.

I think also that *P. elegans*, of Fl. Austr. and Bot. Mag. t. 7345 belongs to this species.

Outer part of stem very hard and prettily marked, *Bailey's Cat. Ql. Woods*, No. 418.

The leaf-segments sometimes infested with the fungus blight, *Glaosporium palmarum*, Cooké.

4. **A. Jardinei** (after Frank L. Jardine), *Bail. Ql. Agri. Journ.* ii. 129. Described by Mr. Jardine as a tree of 32ft. in height, with a stem circumference of 12in. Leaves pinnate, glabrous, 5 to 8ft. long from top of sheath to apex, the petiole or portion without segments only about from 6 to 9in.; sheath probably long, but only 16in. of it upon the specimens to hand, without the torn, loose fibrous matter common to many palms, closely sheathing the stem and ending on the opposite side of the stem in an erect point 2 or 3in. long from a broad strongly striate base. Segments or pinnæ about 30 on each side of the rhachis, often distant, 18 to 25in. long, and sometimes 2in. broad at the centre, folded and attached at the base to the flange-like edge of the rhachis, the apex usually long-acuminate or abruptly jagged, and on one side elongating into a point which is at times toothed on the inner side and ending in a filiform point; terminal segments not confluent, green on both faces. Inflorescence below the leaves, 16 to 24in. long and broad, pendulous; the common peduncle  $1\frac{1}{2}$  to 3in. long, 1 to  $1\frac{1}{2}$ in. broad, rather slenderly clasping the stem, marked by 2 scars showing the attachment of fallen bracts; rhachis and branches thick, flattened; or more or less angular, puberulous, 1ft. or more of the branchlets bearing closely sessile flowers, solitary or 3 at each notch, a female with a male on either side. Male perianth-buds oblong, about 3 lines long, the outer segments imbricate, orbicular, about 1 line in diameter, margins ciliate, inner ones valvate, oblong, exceeding the outer by about 2 lines. Stamens 20 or more, about as long as the perianth, filaments shorter than the anthers. Anthers versatile, basal lobes somewhat spreading. Female perianth much shorter than the males, both series broad, the inner ones somewhat apiculate. Fruit not matured on the panicles seen, but the albumen seems to be very deeply ruminated.

Hab.: Somerset, Cape York Peninsula, *Frank L. Jardine*.

This plant differs from all other species of *Archontophœnix* and *Ptychosperma* hitherto met with in Australia.

#### 4. PTYCHOSPERMA, Labill.

(From *ptyche*, a fold or winding, and *sperma*, a seed, referring to the ruminated albumen.)

Spadices infrafoliar. Flowers monœcious, spirally disposed, 3-nate, the centre one female, or the upper ones solitary or in twos and male, with bracts and bracteoles. Male flowers symmetrical, ovoid or oblong. Sepals orbicular keeled on the back, gibbous or rounded, broadly imbricate. Petals ovate or oblong, acute, valvate. Stamens 20 to 30, fasciculate, filaments short or elongate straight at the apex; anthers oblong or linear, versatile, the rudimentary ovary styliform. Female flowers often smaller than the males, subglobose, the perianth enlarged after flowering. Sepals reniform or orbicular, broadly imbricate. Petals a little longer, orbicular, convolute-imbricate, acute at the apex, valvate or subvalvate. Staminodia 3 or more, minute. Ovary oblong, ovoid. Stigmas 3, short, sessile; ovule parietal, pendulous. Fruit ovoid or ellipsoid, sometimes rostrate, terete or sulcate, 1-celled, terminated by the stigma, pericarp often thick, fibrous, endocarp thin or crustaceous smooth. Seed erect, ovoid or oblong,

terete or deeply 5-sulcate, hilum extending from base to top, raphe branches oblique, descending in a loose reticulation, albumen more or less ruminant; embryo basal. Tall unarmed palms, stem marked by ring the scars of fallen leaves.

The species belong to Malay Archipelago, New Guinea and Australia.

1. **P. elegans** (elegant). Probably the true *Seafurthia elegans*, R. Br. Prod. A slender-stemmed, quite glabrous palm, about 20ft. high, bearing a crown of from 6 to 9 leaves, about 3ft. long; the sheaths cylindric, not swelling out, 9in. long, dark-green, striated, and ragged at the top; petiole 9 to 12in., smooth; segments about 18 on each side of the rhachis, those of the middle of the leaf  $1\frac{1}{2}$ in. broad in the centre, contracted at the base, very oblique and erose at the apex, except the terminal ones which have toothed broad truncate ends, and more or less confluent at the base; the rhachis sharply angled on the upper, obtusely angled or rounded on the under side. Inflorescence below the leaves; panicles about 20in. long and broad; common peduncle about  $1\frac{1}{2}$ in., flattened, with 3 circular scars marking the place from where the spatha had fallen; rhachis and lateral branches flattened or angular. Flowers numerous, sessile, solitary or in twos or threes. The male or hermaphrodite ones with bracteoles or sepals  $\frac{3}{4}$  line diameter, imbricated, scarious ciliate; petals oblong, 2 lines long; stamens more than 20, filaments very short; anthers not exerted. Ovary 1-celled, white, oblong, style long as the ovary, together not exceeding the stamens, both glabrous; stigma capitate. The smaller flower-buds in the same notch with those above described may be female, but I did not examine them when fresh, and cannot be sure of this from the dried buds. My impression when examining the fresh flowers was that they were truly hermaphrodite; and if such should prove to be the case, then this plant must be placed in another genus. No ripe or immature fruit was obtainable.

Hab.: Polo Creek, Somerset, *Bail.*, June, 1897.

A specimen received from Dr. Roth under the aboriginal name, off the Tully River of "Warkai," seems to belong to this species.

I rather favour the name *Seafurthia* for this palm but as I follow the *Gen. Pl.* of B. & H. have given it as above, not wishing to add to the already confusion in which the species is involved, I am of opinion that the *P. elegans* of the *Fl. Austr.* and *Bot. Mag.* 4961 and 7345 are all three *P. Cunninghamii*, of course judging from the descriptions published and plates. Dr. Robt. Brown, l.c. is not very clear but he seems to imply that a male hermaphrodite flowers is on each side of a female.

## 5. DRYMOPHLEUS, Zippel.

(From *drumos*, wood, and *phloios*, bark, application not stated).

Spadices infrafoliar; flowers monœcious in the same panicle, spirally disposed, 3-nate with the middle ones female or the upper ones male 2-nate, and solitary, with bracts and bracteoles. Male flowers symmetrical, ovoid or oblong. Sepals orbicular, rounded at the base or gibbous, broadly imbricate. Petals oblong or elliptic, coriaceous, acute or obtuse. Stamens numerous, filaments filiform, apex straight; anthers oblong or linear, versatile. Ovary rudimentary slender styli-form. Female flowers larger than the males, subglobose, perianth enlarging after flowering. Sepals uniform, very broadly imbricate. Petals slightly longer, orbicular, convolute-imbricate, apex acute, valvate or sub-valvate. Staminodia minute. Ovary oblong or ovoid, abruptly contracted at the base, 1-celled; stigmas sessile, recurved; ovule parietal, pendulous. Fruit ovoid, terminated by the stigmas, smooth or longitudinally sulcate, pericarp thickish fibrous, endocarp thin or crustaceous, smooth inside. Seed ovoid or oblong, terete, or 3 to 5 sulcate, hilum from base to top; albumen equable, embryo basal.—Slender stemmed unarmed palms. Leaves pinnatisect, segments cuneate-oblong or linear. broad rarely narrow oblique, premorse nerves few or many, rhachis often

furfuraceous 3-gonal, sheath elongated. Spadix various, peduncle short, branches very often slender; spathæ 2 or more lower bicristate, bracts and bracteoles squamiform.

Species belong to New Guinea, Australia, Pacific Island and Molucca.

1. **D. Normanbyi** (after the Marquis of Normanby), *Benth. and Hook. Gen. Pl.* iii. Black Palm. Stem stout, very hard and dark coloured, more or less enlarged at the base, attaining the height of 60 or more feet. Leaves 6 to 8ft. long, little or no petiole, the rhachis reaching to the top of the rather long sheath, very stout, covered with white mealy hairs; segments divided to the base, usually into 9 narrow lobes about  $1\frac{1}{2}$ ft. long and 1in. broad, toothed at the apex. The nerves numerous and prominent, underside whitish. Peduncle short, the panicle branches compressed. Flowers spirally disposed; males solitary or in twos, sessile but not immersed, the females on the lower part of the branches often solitary. Male flowers: Sepals roundly-cordate, about  $1\frac{1}{2}$  lines long. Petals valvate, ovate-lanceolate, connate at the base, 3 to 4 lines long. Filaments 1 to  $1\frac{1}{2}$  lines long, linear-setaceous; anthers 2-lobed at the base, the apex emarginate, connective rose-coloured, cells white; ovary fusiform-clavate, style filiform 3 lines long. Female flowers: Sepals and petals imbricate, about 2 lines long. Staminodia none. Fruit about  $1\frac{1}{2}$ in. long somewhat pear-shaped; the pericarp when fresh somewhat fleshy and reddish; seed about 1in. diameter.—*Areca Normanbyi*, F. v. M. *Fragm.* viii. 235, and *Benth. Fl. Austr.* vii. 142; *Saguerus australasicus*, Wendl. and Drude in *Linnæa* xxxix. 219; *Arenga* sp. *Benth. Fl. Austr.* vii. 143; *Cocos Normanbyi*, W. Hill, *Rep. Brisb. Bot. Gar.* 1874, p. 6.

Hab.: Daintree River, *W. Hill*; Goold Island, *J. Dallachy*; and other tropical scrubs.

Wood or the outer part of stem very hard, black beautifully marked; used for walking sticks, *Bailey's Cat. Ql. Woods*, No. 419.

## 6. CALYPTROCALYX, Blume.

(From *kalyptra*, an extinguisher, and *kalyx*, in allusion to the form of the outer perianth segments.)

Spadices interfoliar, simple, very long, flowers monœcious, on the same spadix spirally disposed, immersed in pits, 3-nate the centre one female, with bracts and bracteoles. Male flowers symmetrical. Sepals orbicular, cucullate, thick coriaceous, broadly imbricate. Petals slightly longer, broadly ovate, obtuse valvate. Stamens numerous, crowded at the base of the perianth, the inner ones imperfect, filaments of unequal lengths, subulate, straight, connate at the base; anthers linear, the base 2-fid, basifixed, versatile. Ovary rudimentary small. Female flowers smaller than the males, subglobose, the perianth enlarging after flowering. Sepals orbicular, broadly imbricate. Petals slightly longer, orbicular, convolute-imbricate, acute at the apex, connivent-valvate. Staminodia 6 or more. Ovary oblong-ovoid subtrigonal, 1-celled. Stigma thick, conical, 3-fid; ovule parietal. Fruit ovoid or oliveform, subrostrate, stigmas terminal umbonate; pericarp thick, fibrous and juicy; endocarp fibrous, adhering to the seed. Seed ovoid or subglobose, hilum lateral elongate, albumen deeply ruminant; embryo basal.—Slender unarmed palms.

1. **C. australasicus** (Australian), *Scheff. in Ann. Jard. Bot. Buitenz.* i. 181, 140, *B. and H. Gen. Pl.* iii. 903. Stems 12ft. high and 2in. or more in diameter. Leaves several feet long, the segments numerous, acuminate or slightly notched at the end, the rhachis slightly scurfy. Spikes simple rope-like, peduncles flattened, long as the spikes, about 15in. each, the rhachis 3 or 4 lines diameter, the notches spirally approximate with very prominent borders. Flowers male: very numerous, in twos closely pressed to each other, 3-angular, sepals glabrous; petals slightly smaller and somewhat silky. Filaments very

short, anthers as long as the petals. Flowers female; the sepals and petals under the young fruits are orbicular and about 1 or 2 lines diameter, and somewhat jagged at the top. Fruit red, ovoid, umbonate with the remains of the style, about 5 lines long, the pericarp not thick. Seeds closely adnate to the endocarp, with a terminal hilum. Albumen ruminatè.—*Laccospadix australasicus*, Wendl. and Drude in Linnæa, xxxix. 206; *Ptychosperma laccospadix*, Benth. Fl. Austr. vii. 140.

Hab.: Rockingham Bay, *J. Dallachy*; Bellenden-Ker, altitude 4,000ft., *Bail*.

7. BACULARIA, F. v. M.

(From *baculum*, a walking-stick.)

Spadices interfoliar, simple, slender, monœcious, on the same spadix, spirally disposed, 3-nate the middle one female, bracts and bracteoles minute. Male flowers symmetrical somewhat terete. Sepals roundish, obtuse imbricate, chartaceous-coriaceous. Petals ovate or linear-oblong, acute or obtuse, coriaceous, valvate. Stamens 6, or 10 to 12, filaments short subulate, connate at the base; anthers oblong or linear-sagittate, basifixed, erect, connective dilated. Ovary rudimentary or wanting. Female flowers much smaller than the males, ovoid, compressed at the back, perianth enlarging after flowering. Sepals orbicular, chartaceous-coriaceous, broadly imbricate. Petals long as the sepals, orbicular, convolute-imbricate, apex connivent, acute. Staminodia tooth-like. Ovary ovoid or subglobose, abruptly contracted at the base, 1-celled; stigmas minute, sessile, 3-gonal; ovule parietal, horizontal. Fruit small, elongate-ovoid, straight, subacute, terminated by the stigmas, pericarp thick coriaceous and fibrous, endocarp thin. Seeds elongate, terete, erect, hilum broad, basal. Albumen equable; embryo basal.—Dwarf slender-stemmed palms.

- |   |                            |
|---|----------------------------|
| Stems 6 to 12ft. high. Leaf-segments very irregular in number and width   |                            |
| Inflorescence almost infrafoliar, pendulous   | 1. <i>B. monostachya</i> . |
| Stems usually under 6ft. high. Leaf-segments usually numerous and mostly narrow. Inflorescence interfoliar, pendulous | 2. <i>B. minor</i> .       |
| Stems seldom exceeding 5ft. high. Leaf-segments in 1 or 2 pairs, often broad. Inflorescence interfoliar, erect        | 3. <i>B. Palmeriana</i> .  |

1. **B. monostachya** (spike single), *F. v. M. Fragm.* vii. 103. Walking-stick Palm. "Midgen," Brisbane, *Petrie*. Stems 6 to 12ft. high. Leaves 1½ to 4ft. long, the sheathing base broad, coriaceous, about 6in. long, produced into 2 stipule-like lobes, segments very irregular, acuminate, very variable in breadth and distance, adnate to the rachis or tapering at the base, the longest about 1ft. long. Inflorescence almost infrafoliar, a pendulous undivided slender spike of great length, the peduncle below the spathe 1½ to 2ft. long, enclosed at the base to nearly half its length in a sheath, the spike itself 1 to near 2ft. long, enclosed in a membranous spathe at length open along one side, the rachis slender; notches scarcely indented, the margins or bracts very slightly prominent, and not very close together. Male perianth when fully out 3 to 4 lines long, the outer broad segments about 1 line diameter. Stamens about 10, with very short filaments. Female perianth: Outer segments as in the male, inner as broad but larger. Ovary 1-celled, with 1 erect ovule. Fruit ovoid or nearly globular, about ½in. long, the succulent pericarp not very thick. Testa of the seed adhering to the endocarp.—*Areca monostachya*, Mart. Hist. Nat. Palm. iii. 178; *Linospadix monostachyos*, Wendl. and Drude in Linnæa, xxxix. 198; *Kentia monostachya*, *F. v. M. Fragm.* vii. 82; Benth. Fl. Austr. vii. 136.

Hab.: Cape York Peninsula, *Hann's Expedition*; Wide Bay, *Leichhardt*; Maroochie, *Bailey*.

2. **B. minor** (smaller), *F. v. M. Fragm.* xi. 58. "Jak-ar-ungle," Cairns, *Nugent*. Stems several from the same rhizome, 2 to 5ft. high, ½in. thick. Leaves attaining 3½ft.; segments 12 to 14, 6 to 10in. long, acuminate or more frequently



toothed or jagged at the end, the lower ones  $\frac{1}{2}$  to  $\frac{3}{4}$  in. broad, the upper ones broader, the terminal ones confluent at the base and about 2 in. broad. Spikes interfoliar, simple, slender, 6 to 9 in. long on a peduncle at least as long, scarcely above 1 line thick, with the scar of the fallen spatha a little below the spike, the rhachis not thicker, the notches slightly indented and close together. Male perianth about  $1\frac{1}{2}$  line long, the outer segments very short. Stamens about 12, the filaments not much shorter than the anthers. Female perianth shorter than in the males the inner segments about twice as long as the outer. Ovary oblong, fleshy, with 1 erect ovule. Fruit cylindrical, 8 lines long, 1 line thick, tapering at each end. Seed  $\frac{3}{4}$  in. long, the albumen not ruminant.—*Kentia minor*, F. v. M. Fragm. viii. 235; Benth. Fl. Austr. vii. 137.

Hab.: Moresby and Russell Rivers and Bellenden-Ker Range, *W. Hill*; Daintree River, *Fitzalan*.

3. **B. Palmeriana** (after Edward Palmer), *Bail. 3rd Suppl. Syn. Ql. Fl.* 77. Stem slender, seldom exceeding  $\frac{3}{4}$  in. diameter, generally much less than that; height not over 5 ft., usually 2 or 3 ft. when in fruit; leafy at the top, 6 to 10 forming the crown. Leaves, sheathing bases 3 or 4 in. long, prominently striated or ribbed, with thin scarious edges which do not form stipule-like lobes at the top; midrib forming a sharp projecting angle; petioles erecto-patent, 6 to 9 in. long, 1 to 2 lines broad, semi-terete; rhachis 4 to 7 in. long; segments 1 or 2 pairs, their bases broadly adnate to the rhachis and slightly decurrent, somewhat widened above the base, thence tapering to often a long acute point, the outer edge of the upper part with prominent teeth. Inflorescence interfoliar, erect, slender, numerous; peduncles flattened or semi-terete, 6 to 9 in. long; spike 3 to 5 in. long, enclosed at first in a membranous spatha, which is affixed immediately below the lowest flowers, open along one side. Flowers very small, but not gathered in a fit state to examine; young fruit cylindrical, somewhat fusiform or an elongated cone 4 to 6 lines long and 1 or 2 lines diameter. The whole plant more or less furfuraceous, those on the mountain top much more so than the others.

Hab.: Bellenden-Ker Range The specimens were gathered at the base of the leading spur, at about 2,000 ft. and from that to the summit of the south peak, an altitude of over 5,000 ft.

In inflorescence it resembles *Bacularia minor*, F. v. M., but is widely different in foliage, the leaves being often so like *Nengella flabellata*, Becc., that they might be taken as belonging to that plant. From Baron Mueller's remarks, Fragm. xi. 58 and x. 121, it is probable that examples of this species may have been forwarded to him in association with those of the *Bacularia* above referred to.

### 8. CARYOTA, Linn.

(A Greek name for the Date.)

Flowers monœcious in the same spadix, sessile in the notches of the long pendulous branches of the inflorescence, usually 2 males in each notch and a female one later developed in the same notch. Outer perianth in both sexes of 3 imbricate ovate segments, inner longer of 3 valvate segments. Stamens in the males numerous, inserted on a thick disk without any rudimentary ovary; filaments very short; anthers linear. Staminodia in the females very small, usually 3. Ovary usually 2 or 3-celled, but only 1 or rarely 2 with a perfect erect ovule in each. Stigmas terminal, at first erect in a cone, at length spreading. Berry or succulent drupe globular, with a thin endocarp. Seeds solitary and globular or 2 and hemispherical, the testa free from the endocarp. Albumen horny, ruminant. Embryo dorsal.—Tall palms, the caudex marked with annular scars. Leaves in a loose terminal crown, very large, twice pinnate, the segments rhomboidal or cuneate, often very oblique and irregularly toothed or jagged.

The genus consists of few species spread over tropical Asia; the Australian plant is a variety of one extending over the Malayan Archipelago to the eastern provinces of East India.

1. **C. Rumphiana** (after G. E. Rumph). Var. *Alberti*. A tall stout glabrous bipinnate palm. Leaves 16 to 18ft. long, and 10 to 14ft. broad. Leaf-segments very oblique, half fan-shaped, much plicate, 6 to 12in. long, thick, coriaceous, irregularly but usually toothed, sometimes more or less pointed, the lower point often produced into a long obtuse point, sometimes shorter than the next fold. Peduncles very stout, bearing a vast number of long—all about of equal length, say 3 to 4ft.—thong-like spikes of monœcious flowers, 2 males with a female between them; 3 outer segments of male perianth imbricate, rotund, ciliate, 2 lines diameter; 3 inner segments valvate, 6 lines long, very hard; stamens numerous. Fruit globular, exceeding 1in. diameter, white until quite ripe, when it becomes a deep purple.—*C. Alberti*, F. v. M.; Wendl. and Drude in Linnæa, xxxix. 221; Benth. Fl. Austr. vii. 144.

Hab.: Somerset, Cape York Peninsula.

## 9. NIPA, Wurmmb.

(Vernacular name in the Philippine Islands.)

Spathes many, sheathing. Spadix terminal, branched, erect, drooping in fruit; flowers monœcious, male in catkin-like lateral branches of the spadix, female in a globose terminal head, perianth glutinous. Male flowers minute mixed with setaceous bracteoles; sepals linear, with broad truncate inflexed tips, imbricate; petals smaller; stamens 3, filaments cuneate, anthers linear, basifixed; pistilode none. Female flowers much larger; sepals 6, rudimentary, displaced; staminodia none, carpels 3, tips free, each with an oblique stigmatic line; ovules 3 erect. Fruit large globose, syncarp of many obovoid hexagonal 1-celled 1-seeded carpels, with pyramidal tips and infra-apical stigmas, pericarp fleshy and fibrous, endocarp spongy and floury. Seed erect grooved on one side, testa coriaceous viscid within, and adherent to the endocarp, hilum broad; albumen equable, hollow; embryo basal, obconical.

1. **N. fruticans** (shrubby), var. *Neameana*, *Bail. Proc. Roy. Soc. Ql.* v. 147. Stem short, thick, from a stout creeping rhizome, which is much flattened and about 1ft. broad, with a thickness of about 6in., rooting from the upper surface only, the upper surface quite smooth. Leaves averaging about 6 or 7 to a plant, 4 usually living, and 2 or 3 decaying, pinnate, 25 to 30ft. long, the base very stout and clasping the very short erect stem. Pinnæ approximate, of from 50 to 60 pairs, 2 to 4ft. long, 2 to 3½in. broad, plicate, the midrib sharply angled beneath, the upper side bearing lanceolate dark-brown centrally attached scales, two prominent ribs on each side of the midrib, margins strongly nerved, the midrib confluent with the lower margin below the apex, forming an angular point of several inches in length. Peduncle 3 or 4ft. high, bearing 3 large and many small sheathing bracts; the lowest larger one very obtuse, having a strap-like appearance from the rather broad wings formed on either side, other bracts all pointed and much smaller, and 1 or 2 keeled; panicle of 5 branches, the lower lateral ones male, each much divided, the divisions ending in male catkins 1 or 2in. long and about ½in. in diameter, digitate, the terminal branch bearing a spherical head of from 1ft. to 16in. in diameter, composed of more or less angular fibrous drupes, each about 6in. long by 3in. broad, when ripe of a chestnut-brown and more or less glossy, each containing 1 round seed, which becomes very hard and ivory-like when old.

Hab.: Herbert River, *Arthur Neame*, 1880.

Mr. Neame states that the Herbert River natives make use of the seeds when in an unripe state for food, as is done in other countries where the *Nipa* is indigenous.

## 10 \*PHCENIX, Linn.

(An old Greek name of the Date Palm.)

Spadices usually several, interfoliar, erect or drooping in fruit, branched; spathe basal complete coriaceous; flowers small, yellowish coriaceous. Male flowers: calyx cupular, 3-toothed; petals 3, obliquely ovate, valvate; stamens 6 (3 to 9), filaments subulate, anthers erect, dorsifixed; pistil minute or wanting. Female flowers: globose, calyx of the males, enlarged after flowering; petals rounded, imbricate; staminodia 6, or a 6-toothed cup; carpels 3, free, stigma sessile, uncinatè, ovules erect. Fruit oblong, terete, 1-seeded, stigma terminal, pericarp fleshy, endocarp membranous. Seed oblong ventrally grooved; albumen equable or subruminate; embryo dorsal or subbasal.—Low or tall dioecious palms. Leaves pinnate; segments lanceolate or ensiform, sides induplicate.

Species belonging to Africa and Asia.

1. **P. dactylifera** (date-bearing), *Linn. sp. Pl.* 1188. Common Date Palm. Said to attain the height of 100ft., the trunk covered with the persistent bases of the old leaves, often producing near the base side shoots or suckers. Leaves 10 or more feet long, gray, segments or leaflets 8 to 16in. long, regularly distichous, often approximate in twos or threes on the same side as the rhachis. Flowers: Male on separate trees from the female, in large panicles. Fruit 1 to 3in. long, pulp very sweet.

Hab.: Africa.

This useful tree may be met with outside of cultivation where it has sprung up spontaneously from seed thrown away by persons who may have been eating the imported fruit.

## 11. LICUALA, Rumph.

(The name of one species in the Macassar language.)

Flowers hermaphrodite, in a loose panicle with sheathing bracts on the main rhachis and peduncle. Outer perianth 3-lobed, or 3-toothed; inner of 3-valved segments. Stamens 6, the filaments united in a cup or ring and very shortly free; anthers sagittate. Ovary laterally 3-lobed, the carpels readily separating, with 1 erect ovule in each; style columnar, with 3 small stigmas. Fruit globular, reduced by abortion to 1 carpel, the pericarp fleshy but at length hard, scarcely fibrous. Seed erect, the hilum somewhat lateral. Albumen horny with a deep irregularly branched excavation on the inner side, filled with a brown spongy tissue. Embryo dorsal.—Palms usually slender or low. Leaves large, fan-shaped but usually closed all around so as to appear peltate, the plicate lobes more or less truncate and toothed at the end. Panicles from among the leaves, often long, the partial panicles between the sheathing bracts usually divided into few spreading spikes. Flowers small.

The genus is widely spread over tropical Asia, the only Australian species is endemic.

1. **L. Muelleri** (after Baron Mueller), *Wendl. and Drude in Linnaea*, xxxix. 223; *Benth. Fl. Austr.* vii. 145. "Moor-goo-doo," Cairns, *Nugent*. "Moi-yur," Bloomfield River, *Roth*. "Chakoro," Tully River, *Roth*. Thirty to fifty feet high. Leaves closed all round so as to appear peltate, plicate, and divided to more than half the length into truncate lobes obtusely toothed and jagged and 2 to 3in. broad at the end, the whole leaf forming a flat stiff shield-like disk of 6½ or more feet across. Fruits crimson in large straggling panicles, ovoid-globular, 4 to 5 lines diameter. Albumen penetrated by a deep irregularly branched excavation. Embryo dorsal.—*Livistona Ramsayi*, F. v. M. *Fragm.* viii. 221.

Hab.: Dalrymple Gap, Rockingham Bay, *Dallachy*; Johnstone, Tully and Murray Rivers.

Outer part of stem hard and marked with narrow black lines.—*Bailey's Cat. Ql. Woods*, No. 420.

12. LIVISTONA, R. Br.

(After P. Murray, of Livistone.)

Flowers hermaphrodite, in a loose panicle, with sheathing bracts on the main rachis and peduncle. Outer perianth thin, 3-lobed or 3-toothed, inner longer, of 3 valvate segments. Stamens 6, distinct but contiguous; filaments broad and thick very shortly filiform at the top; anthers small, ovate. Ovary laterally 3-lobed, the carpels readily separating, with 1 erect ovule in each. Style shortly columnar, with a 3-toothed stigma. Fruit ovoid or globular, reduced by abortion to a single carpel, the pericarp not thick, hard when dry. Seed erect, the hilum somewhat lateral. Albumen with a deep broad excavation on the inner side, filled with a brown spongy tissue. Embryo dorsal.—Low or tall erect palms. Leaves fan-shaped, plicate, the lobes or segments acuminate and entire or 2-cleft, and frequently a small bristle or filament between the lobes. Panicles usually large and decomposed from among the leaves. Flowers very small, solitary or clustered along the slender rachis of the ultimate branches.

Besides the Australian species which are endemic, there are a very few from the Manlaya Archipelago or South China.

Leaf-lobes with a thread in the sinus.

- |  |                          |
|--|--------------------------|
| Petiole $3\frac{1}{2}$ ft. long, the margins armed half-way up with short curved prickles. Fruit oval, 6 lines long, pericarp wrinkled. . . . .                | 1. <i>L. Muelleri</i> .  |
| Petiole 5ft. long, the margins armed in the lower half with short curved prickles. Fruit somewhat pyriform or oval-oblong, 4 to 5 lines long, smooth . . . . . | 2. <i>L. Benthami</i> .  |
| Leaves glaucous, white. Fruit globular, 9 lines diameter . . . . .   | 3. <i>L. Marixæ</i> .    |
| Leaf-lobes without a thread in the sinus.  |                          |
| Petioles 5ft. long, the margins armed with curved prickles $\frac{3}{4}$ of the way up. Fruit globose about lin. diameter . . . . .                            | 4. <i>L. australis</i> . |

1. **L. Muelleri** (after Baron Mueller), *Bail.* "Bel-em-buna," Cairns, *Nugent*. Trunk 7 or 8ft., clothed to near the base by the old leaf-sheaths and portions of the petioles. Leaves very numerous, forming a dense head. Petioles without the sheath about  $3\frac{1}{2}$ ft. long, and from 2in. broad at the base to  $\frac{3}{4}$ in. at upper end, where the upper face forms rather a prominent ligula, smooth, edges rather acute, usually bordered in the lower half by small curved prickles; leaves of a very harsh texture, nearly orbicular in circumference, about  $2\frac{1}{2}$ ft. long and scarcely as broad, entire for about half the length, then divided into numerous narrow infolded segments, which at their extremities are more or less deeply forked, and each fork tapering to a thread-like end. The thread-like bristle between the segments at the first forking of the leaf short, and here the margins of the segments often minutely serrated. Inflorescence forming elongated panicles, numerous amongst the leaves, attaining about 4ft. in length, upon a peduncle of about 16in. Bracts closely embracing the rachis, the lower ones exceeding 1ft. long, the upper ones gradually smaller, striate, abruptly acuminate; secondary ones narrower, with a prominent finely serrated keel, ending in a longer acumen. Branchlets slender, flowers numerous, solitary or in small clusters, but none on the specimens to hand. Fruit not quite ripe, oval, about 6 lines long, the pericarp thin, wrinkled outside. Seed nearly globose, about 3 lines diameter, endocarp pitted.—*L. humilis*, R. Br. var.; *Bail. Ql. Agri. Journ.* ii. 130.

Hab.: Cairns, *E. Cowley*.

2. **L. Benthami** (after Geo. Bentham), *Bail.* "Dre-amberi," Batavia River, *Roth*. A tree of about 50ft. high, and a trunk circumference measurement of about 25in. Leaves (2 received) were cut off at the sheath. Petioles, the longest over 5ft., the upper end about  $\frac{1}{2}$ in. broad, ending on the inner side in a triangular ligula of about 1in. long, the lower end more than twice as broad as the upper; both faces clothed with whitish furfuraceous scales, the margins armed in

the lower half with strong, short, curved, or straight prickles, the upper end of the sheath decurrent on the face of the petiole, on both sides within the margin forming long, light-brown, woven fibres. Leaf-expansion about  $3\frac{1}{2}$  ft. long, and not so broad, not so orbicular, and of a more membranous texture than other Australian species of the genus; segments narrow, forking at about 4 or 5 in. from the base, and again at a little more than half-way up, tapering thence to long, fine points; a bristle in the lower, but seldom in the upper forks. Inflorescence an elongated panicle. The one received was 7 ft. long, base of common peduncle 2 in. broad, and as well as the secondary peduncles flat on the one side and rounded on the other. Bracts closely sheathing, obtuse at the end, branches 8, forked towards the extremities, and bearing numerous flexuose slender spikes of fruits (no flowers seen). Fruits on the specimen to hand not mature, pyriform or oblong-ovate, 4 or 5 lines long, pericarp smooth.—*L. humilis*, R. Br., var.; Bail. Ql. Agri. Journ. ii. 130.

Hab.: Somerset, Cape York Peninsula, *Frank L. Jardine*.

Leaves used for thatching humpies.—*Roth*.

Core of young stems eaten.—*Roth*.

The above two palms may probably have been taken by botanists for one or other of those doubtful species of Dr. Robt. Brown, viz., *L. humilis* and *L. inermis*. I gave them provisionally in the work above quoted as varieties of the former, but as doubts still exist regarding the identity of that species I have thought it better in the present case to give them specific rank bearing the names of the authors of the *Flora Australiensis*.

3. **L. Mariæ** (after Maria, Duchess of Edinburgh), *F. v. M. Fragm.* xi. 54. A tree of about 40 ft. high. Leaves very pale or glaucous; petioles almost lin. broad at the upper end, the upper face nearly flat, trigono-convex on the back, unarmed at least in the upper part; blade 3 to  $5\frac{1}{2}$  ft. long, almost pinnately contracted towards the base, the longer segments  $1\frac{1}{2}$  in. broad, split above the middle, the lobes finely attenuated, with a thread between the lobes. Fruit globose, about  $\frac{3}{4}$  in. diameter. Albumen somewhat lead-coloured. Embryo about 1 line long, white.—*F. v. M. l. c.*

Hab.: I have received a portion of a leaf from *F. L. Berney*, of Hellenslie, Campaspe River, which in all probability belongs to this inland palm.

4. **L. australis** (Australian), *Mart. Hist. Nat. Palm.* iii. 241; *Benth. Fl. Austr.* vii. 146. Cabbage-tree Palm. "Konda," Rockhampton, *Thozet*. Stems attaining 40 to 80 ft. Leaves in a dense crown, orbicular in circumscription when fully out, 3 to  $5\frac{1}{2}$  ft. diameter, decurved, divided to the middle or lower down into narrow plicate acuminate lobes either entire or 2-cleft at the apex; without threads or bristles between the lobes, at least of the adult leaves; petiole decurved, 5 ft. long, about lin. broad at the top, enlarging downwards, 2 in. broad before reaching the base, at the immediate base 5 in. broad, the margins  $\frac{3}{4}$  of the way up armed with close, short, stout, curved prickles, a few of which are curved upwards; ligula prominent. Panicle large, very much branched, quite glabrous, the primary branches thick, often angular, and usually much curved and flexuose, the ultimate branches or spikes 1 to 3 in. long. Spatha at the base of the panicle sheathing with a lanceolate point, 6 to 10 in. long. Inner perianth about  $1\frac{1}{2}$  line long, the outer fully  $\frac{1}{2}$  as long with very acute lobes. Fruit globular, 6 to 9 lines diameter, the pericarp hard and crustaceous when dry. Seed globular.—*Wendl. and Drude in Linnæa*, xxxix. 232; *Bot. Mag.* t. 6274; *Corypha australis*, R. Br. Prod. 267; *L. inermis*, *Wendl. a Drude*, l. c. 229.

Hab.: Many of the coastal scrubs south and here and there in the tropics.

Formerly the leaves of this palm were largely used in hat-making, the cabbage-tree hat being generally worn. The wood is also used by the natives for making spear-heads.—*E. Palmer*.

Wood, or outer part of the stem, moderately hard, of a dark-colour, and beautifully marked.—*Bailey's Cat. Ql. Woods*, No. 421.

18. CALAMUS, Linn.

(From the Arabic for reed.)

Flowers dicecious, distichous and sessile along the spike-like branches of the panicle. Outer perianth 3-lobed, inner of 3 segments, the lobes or segments all valvate in both sexes. Stamens in the males 6, round a rudimentary ovary. Staminodia in the females 6. Ovary 3-celled, with 1 erect ovule in each cell. Stigmas 3, sessile or on a very short style. Fruit globular, closely covered with reflexed imbricated shining scales.\* Seed usually 1 only, nearly globular, obliquely attached towards the base, testa thin. Albumen hard, entire. Embryo basal or nearly so.—Prickly palms, with weak stems often climbing to a great height. Leaves simply pinnate, the rhachis and sheaths usually armed with hooked or straight prickles, and in some species not Australian ending in a simple armed tendril. Flowers small, the spikes in partial panicles, few or numerous, in a loose general panicle proceeding from a narrow prickly sheath or spathe, and often from the base of the panicle or from a leaf-sheath below it proceeds a long prickly simple thong or *lorum*, probably an abortive branch of the inflorescence.

The genus is chiefly abundant in tropical Asia, extending also into tropical Africa. The Australian species are as far as known endemic.

- Leaf-segments acuminate and entire with smooth edges . . . . . 1. *C. obstruens*.
- Leaf-segments margined with minute distant teeth . . . . . 2. *C. moti*.
- Leaf-segments margined with numerous sharp prickles . . . . . 3. *C. jaboolum*.
- Leaf-segments more or less scabrous on the edges with minute distant prickles, and often sprinkled underneath with straight prickles or bristles.
- Leaf-segments acuminate and entire, under lin. broad . . . . . 4. *C. Muellervii*.
- Leaf-segments hooked or jagged at the end, 1 to 2in. broad. . . . . 5. *C. caryotoides*.

1. **C. obstruens** (obstructive), *F. v. M. Fragm.* v. 48. A slender climbing palm (*A. Cunningham*). Climbing to a great height (*F. v. Mueller*). Leaves often above 2ft. long, the rhachis armed underneath with short conical recurved prickles, scattered in the lower part, distant in a single row towards the upper end, the upper side of the petiole and lower part of the rhachis armed with straight prickles or bristles mostly turned upwards; segments 10 to 20, the lower ones often 1ft. long and 1¼in. broad, the upper ones smaller, all shortly acuminate and entire, the edges smooth and the surface without prickles. Panicles long and loose, the main rhachis armed with recurved prickles and long lora armed with recurved prickles, the partial panicles almost or quite recurved. Male spikes 1 to 1½in. long, the flowers closely distichous within broadly ovate acute bracts of about 1 line. Outer perianth thick, obtusely lobed, about 1½ line long, inner longer, on a short stipes, the segments narrow and thinner. Female spikes 3 to 4in. long, the flowers more distant. Fruit globular, 4 to 5 lines diameter.—Wendl. and Drude in Linnæa, xxxix. 197; *C. australis*, Mart. Hist. Nat. Palm. iii. 342; Benth. Fl. Austr. vii. 134.

Hab.: Fitzroy Island, *A. Cunningham*, *M'Gillivray*; Rockingham Bay, *Dallachy*.

I leave this description as given in Fl. Austr., but consider it likely that two other species are confused in it, I however think it better to keep Mueller's name. I have no specimens from the two localities given.

2. **C. moti** (aboriginal name), *Bail. Bot. Bull.* xiii. "Moti," Barron River, *E. Cowley*; "Mollukan," Atherton, *Roth*; "Bai-kal," Tully River, *Roth*. Stems reclining, but ultimately climbing to a great height. Leaves 6 or 7ft. long, including the petiole which without the sheath is about 2ft. Segments linear-lanceolate, 20in. long, 1in. broad, of 40 or more nearly opposite pairs;

longitudinal ribs 5, beset with fine dark setæ; margins with minute distant teeth. Rhachis and petiole armed with recurved prickles; those of the sheath long, flattish, of irregular length, dense or in more or less false whorls.

Hab.: Barron River, *E. Cowley*; Atherton and Tully River, *Roth*.

Butts of the young plants roasted, skinned and then hammered before eaten. —*Roth*.

3. **C. jaboolum** (aboriginal name), *Bail. Bot. Bull.* xiii. "Jaboolum," Barron River, *E. Cowley*. Stems reclining, but ultimately climbing to a great height. Leaves about 4ft., including the petiole, which is usually under 6in. long, flattish, bearing upon the margins and upper surface long thin needle-like prickles of a somewhat blackish hue, often glossy and attaining a length of 3in.; segments often nearly opposite, of about 25 pairs, 12 to 15in. long and 1½in. broad, narrow-lanceolate, longitudinal ribs often numerous, as many as 12 and very rarely bearing here and there an odd prickle, the margins armed with numerous sharp approximate prickles; sheaths densely covered with dark-brown or black needle-like prickles 1 or more in. long. Rhachis bearing stout recurved prickles.

Hab.: Barron River, *E. Cowley*.

4. **C. Muelleri** (after Baron Mueller), *Wendl. and Drude. in Linnæa*, xxxix. 198; *Benth. Fl. Austr.* vii. 135. Small Lawyer-cane. Stem covered with closely appressed or adnate leaf-sheaths very densely armed with straight slender prickles or bristles. Leaves from under 1ft. to 1½ft. long, with 10 to 16 segments, the longest 8in. long and ¾in. broad, all shortly acuminate, the margins scabrous with a few minute hooked prickles, and the under surface occasionally sprinkled with a few slender straight prickles or bristles, the rhachis armed with scattered hooked or reflexed prickles. Main rhachis of the inflorescence often very long slender and armed with recurved prickles, bearing a few distant simple panicles of 2 or 3in. each with 3 or 4 to 10 or 12 branches or spikes and almost or quite unarmed. Lora slender, 1 to 2ft. long, with numerous hooked prickles. Outer perianth-segments in the males 1 line, inner segments 2 lines long. Stamens inserted on a thick disk. Staminodia in the females of the shape of the perfect stamens, the filaments shortly united in a ring, the anthers without pollen. Fruit globular, 5 to 6 lines diameter.

Hab.: Very common in southern coastal scrubs.

5. **C. caryotoides** (Caryota-like), *Mart. Hist. Nat. Palm.* iii. 338; *Benth. Fl. Austr.* vii. 135. Ground Palm. Branches and adnate sheaths armed with straight prickles and bristles like those of *C. Muelleri*, but much shorter. Leaves the same length and similarly armed, but the segments mostly broader, some as much as 2in. broad, truncate and toothed or jagged at the end, the edges scabrous with minute prickles as in *C. Muelleri*. Inflorescence long and loose, but the partial panicles not distant as in that species. Fruits about 4 lines diameter.

Hab.: Common in the northern scrubs.

#### 14. BORASSUS, Linn.

(Said to be from the name given to the fruit of a palm by Dioscorides.)

Dioecious, the spadices very large, simply branched; peduncle sheathed with open spathes; males with stout cylindrical branches that are densely clothed with closely imbricating bracts, enclosing spikelets of flowers which hence appear as if sunk in cavities of the branch; female spadix sparingly branched, bearing few scattered solitary flowers. Male flowers small, mixed with scaly bracts, second in 2 series in a small spikelet, and protruding one by one from the cavities of the branch of the spadix as the rhachis of the spike elongates; perianth glumaceous; sepals 3, narrowly cuneate, tip inflexed truncate, imbricate; petals shorter than

the sepals, obovate-spathulate, imbricate; stamens 6, anthers subsessile, large, oblong; pistillodes of 3 bristles. Female flowers larger, globose; perianth fleshy, greatly accrescent; sepals reniform, imbricate; petals smaller, convolute; staminodes 6 to 9; ovary globose, subtrigonus, entire or 2 or 4-partite, 3 or 4-celled; stigmas 3, sessile recurved; ovules basilar erect. Fruit a large subglobose drupe with 1 to 3 obcordate fibrous pyrenes; pericarp thinly fleshy; stigmas terminal. Seeds oblong, top 3-lobed; testa adherent to the pyrene; albumen equable hollow; embryo subapical.—A very tall palm; trunk stout, unarmed. Leaves terminal, fan-shaped, plicately multifid; petiole spinous, ligula short.—Hook. Fl. Brit. Ind. vi. 481.

1. **B. flabellifer** (fan-formed or fan-bearing), *Linn.* Palmyra Palm. Trunk 60 to 70ft., very rarely branching, often swollen above the middle. Leaves 6 to 10ft. diameter, palmately fan-shaped, rigidly coriaceous; segments 2 to 4ft., linear, 2-fid margins spinulose. Spadix male and female several feet long and very stout. Male flowers small; female 1in. diameter. Drupe broadly obovoid, brown, 8in. diameter.—Hook. l.c.

Hab.: Cape York Peninsula.

For the Australian habitat of this noble palm I am entirely dependent upon Mr. Frank L. Jardine, who has a male tree growing near his house at Somerset, which he tells me he brought when it was quite young from a locality upon the Peninsula forty miles from the coast. He says there was quite a clump of the palms, some having very thick stems, but the one he brought away with him was the only young plant he saw. At the present time the tree stands between 20 and 30ft. high and from the numerous forked spikes of old inflorescence scattered upon the ground around the tree, it must flower freely. The petioles of the leaves of this tree are broad, pale-coloured, and the marginal prickles scanty and small. The home of this grand palm is generally considered to be Tropical Africa, although it has been long cultivated in India, where its leaves are used for writing on and for basketwork, umbrellas, &c. The outer wood is hard, heavy, and durable, and is said to weigh from 60 to 70lb. per cubic foot. The pulp of the fruit is eaten, and the sap is fermented into toddy or made into sugar.

## 15. COCOS, Linn.

(From the Portuguese word *coco*; the end of the nut resembling a monkey's head.)

Flowers monœcious in the same spadix, the upper ones male and densely crowded, the lower females few. Male perianth: Outer segments 3, imbricate, inner 3 much longer, valvate. Stamens 6, with thick filaments; anthers erect but attached above the base. Ovary rudimentary. Female perianth: Segments all nearly equal, broad, imbricate. Ovary 3-celled, with 1-erect ovule in each cell but 2 usually abortive. Stigmas 3, at first erect, at length spreading. Drupe large, ovoid or oblong, with a thick fleshy and fibrous exocarp; endocarp bony, marked at the base with 3 pits. Seed solitary, enveloped in pulp; hilum lateral; albumen not ruminate. Embryo basal.—Tall palms, the stem marked with annular scars and long retaining the scale-like base of the petioles. Leaves in a terminal crown, simply pinnate with numerous longitudinally plicate segments, Inflorescence from the base of the leaves, the spadix with numerous long simple branches. Spatha long and woody, with an open outer bract.

The genus comprises several South American species besides the Australian one, which is common in tropical Asia, chiefly near the seacoast, and is spread by cultivation over the tropical regions of the New as well as the Old World.

1. **C. nucifera** (nut-bearing), *Linn.*; *Kunth. Enum.* iii. 285; *Benth. Fl. Austr.* vii. 142. Cocoa-nut Palm. "Cooreemboola," Mackay, *Macartney*. Often 70 to 80ft. Leaves 12 to 16ft. long with numerous rigid segments. Spatha fusiform, thick and woody, 5 to 6ft. long, the spikes 1 to 2ft., the common peduncle 1ft., or more. Male perianth about 4 lines long, the outer segments scarcely 1 line. Filaments nearly as long as the anthers. Female



perianth very broad and coriaceous, the outer segments about lin. diameter, the inner rather smaller. Fruit ovoid, obtusely 3-angled, about 10in. diameter.— Mart. Hist. Nat. Palm. ii. 123, t. 88; Gærtn. Fruct, t. 4, 5; Roxb. Corom. Pl. t. 73.

Hab.: Common on the tropical coast; but I have some doubts of it being truly indigenous.

ORDER CXLIII. PANDANACEÆ.

Flowers diœcious, closely packed in dense spikes or heads, of which several in a terminal spike or raceme or rarely solitary with a leafy or coloured bract under each. Perianth none. Males consisting of numerous stamens covering the rhachis, the filaments all distinct or more or less collected or united in clusters. Anthers oblong or linear, 2-celled, the cells opening in longitudinal slits. Females: Ovaries numerous, sessile, covering the rhachis and often cohering or connate in clusters or syncarps or all together at least at the base, each ovary 1-celled, with 1 ovule erect from the base, or with numerous ovules superposed in 2 rows on 2 or 3 parietal placentæ. Stigma sessile on the apex of the ovary or of a thick conical style. Fruits drupaceous, densely crowded or more or less connate in globular ovoid or cylindrical heads. Seeds solitary or numerous, with a small embryo at the lower end of a fleshy or horny albumen.—Trees bushes or tall climbers. Leaves undivided, in spires at the top of the stem, or disposed along the branches.

The above character applies only to the typical tribe limited to the Old World and ranging over the tropical regions of Asia, Africa, and islands of the Mascarene group, Malayan Archipelago and South Pacific, the two Australian genera having the most extensive range within that area.

The clusters into which the drupes in some species are united have been sometimes described as many-celled drupes. It seems however more conformable to received terminology to restrict the term drupes to the single pyrenes resulting from the single ovaries, and if necessary to use the term syncarp for the clusters of drupes when perfectly connate.—*Benth.*

Stems arborescent or shrubby, the branches terminating in a triple spire of long leaves. Ovules solitary . . . . . 1. PANDANUS.  
Stems climbing, the branches leafy. Ovules numerous superposed in 2 rows on 3 parietal placentas . . . . . 2. FREYCINETIA

1. PANDANUS, Linn.

(From\* a Malayan word meaning conspicuous.)

Male flowers in dense spikes, sessile or pedunculate in the axils of leafy or coloured bracts, forming a terminal compound spike. Stamens either separate or more or less united in clusters. Female flowers: Ovaries densely packed in a globular or oblong head or spike, with 1 ascending ovule in each. Drupes crowded or connate in a globular or cone-like head, often separable into clusters.—Stem woody, usually arborescent and branching. Leaves long, coriaceous, spreading, prickly on the edges and often on the midrib, generally closely inserted towards the ends of the branches in 3 spiral series.

The genus is widely spread over the tropical regions of the Old World, chiefly near the sea. Of the four or five Queensland species one is common in a great part of the range of the genus, the others appear to be all endemic.

SECT. I. **Keura**.—*Filaments connate in clusters. Stigmas peltate or reniform, sessile on the flat convex or broadly conical apex of the ovaries. Drupes connate in clusters or rarely separate. Filaments united in a column longer than the free part.*

- Drupes connate in clusters, nearly flat on the apex. Male spike sessile . . . . . 1. *P. odoratissimus*.
- Drupes all free. Other characters of *P. odoratissimus* . . . . . 2. *P. aquaticus*.
- Drupes connate in clusters, each with a conical apex. Male spikes pedunculate . . . . . 3. *P. pedunculatus*.
- Drupes fewer in each syncarp, and less connate in the upper part . . . . . 4. *P. Solms-Laubachii*.

SECT. II. **Acrostigma**.—*Filaments free. Stigmas raised on the acute or acuminate apex of the ovary or style. Drupes free or equally connate at the base.*

Single Australian species. . . . . *P. sola*.

1. **P. odoratissimus** (very fragrant), *Linn. f. Suppl.* 424; *Benth. Fl. Austr.* vii. 148. Stems from a creeping base arborescent, branched, 15 to 20ft. high. Leaves 3 to 5ft. long or on young luxuriant individuals twice as long, 2 to 3in. broad, acuminate, bordered by small prickles turned upwards. Male inflorescence terminal, recurved, often above 1ft. long, consisting of about 6 to 20 dense spikes of  $1\frac{1}{2}$  to 3in., each one sessile in the axil of a leafy bract, the lowest of which are often 1ft. long and nearly resemble the smaller upper leaves, tapering into a long narrow point, the upper ones gradually smaller with shorter points and whiter, but all much longer than the spikes, the margins serrulate, scabrous but scarcely prickly. Stamens exceedingly numerous, densely covering the rhachis, but the filaments united 10 to 20 together in a column often  $\frac{1}{2}$ in. long, shortly free only at the ends, with linear anthers of  $1\frac{1}{2}$  to 2 lines. Drupes cuneate, hard and woody, 2 to 3in. long, very obtuse, connate in clusters of 8 to 20 and these collected in a globular head 6 to 8in. in diameter, the clusters flat and areolate at the top, the apex of each drupe scarcely prominent, and the remains of the stigmas quite flat, the pericarp when old splitting into fibres at the base.—*Roxb. Corom. Pl.* t. 94 to 96; *P. spiralis*, *R. Br. Prod.* 341, and the numerous synonyms quoted by *S. Kurz.* in *Seem. Journ. Bot.* 1867, 125, and in *Journ. Asiat. Soc. Bengal*, xxxviii. 149, under *P. verus*, a Rumphian designation used previous to the establishment of the Linnæan nomenclature.

Hab.: Islands of the Gulf of Carpentaria, *F. v. Mueller*; *Cairns, Nugent*.

This species is widely spread over tropical Asia and the Malayan Archipelago. The single drupes in *F. Mueller's* specimens as well as the clusters or drupes are much larger than in the usual Indian specimens as observed by *Dr. J. E. Balfour*, but they show no character to distinguish them specifically.—*Benth.*

2. **P. aquaticus** (aquatic), *F. v. M. Fragm.* v. 40 and viii. 220; *Benth. Fl. Austr.* vii. 149. "Ju-kee," *Cairns, Nugent*. "A-koo," *Mitchell River, Palmer*. Differs from *P. odoratissimus*, according to *F. v. Mueller* in the stem emitting no adventitious descending roots, and in the drupes in the head not cohering in clusters. The male inflorescence is in no respects distinguishable from those of *P. odoratissimus*, and the want of adventitious roots may occur in many species.—*Benth.*

Hab.: *Mitchell River, Palmer*; *Cairns, Nugent*.

3. **P. pedunculatus** (stalked), *R. Br. Prod.* 341; *Benth. Fl. Austr.* vii. 149. "Wynnum," *Moreton Bay, Watkins*. "Camboor," *Cairns, Nugent*. Stems emitting stolons at the base, arborescent. Leaves  $1\frac{1}{2}$  to 4in. broad, tapering into a long narrow point, the edges prickly. The male inflorescence large on long peduncles, otherwise resembling those of *P. odoratissimus*, the filaments similarly united in columns of about  $\frac{1}{2}$ in., the free part shorter than the anthers. Rhachis of the female spike or head very thick, obtusely triangular, 2 to  $4\frac{1}{2}$ in. long, on a thick peduncle of 5in. or more, with the remains of a few leaves or bracts under the head all split into shreds. Drupes in narrow clusters of 7 to 18, about 2in. long, very hard and smooth outside, splitting into fibres with age, the conical apices of the drupes very prominent at the top, each with the remains of a reniform stigma.

Hab.: *Port Denison, Henne*; *Rockhampton, Dallachy*; common along the coast.

Wood, or the firm outer part of the stem, of a light colour, and prettily marked. Aërial roots and leaves supply good fibre.—*Bailey's Cat. Ql. Woods*, No. 422.

4. **P. Solms-Laubachii** (after *Solms-Laubach*), *F. v. M. in der bot. Zeitung*, 1887. I have no copy of the work in which *Baron Mueller* published the description of this species, but in a letter he informed me that it grows to a height of 70ft., the stem much thicker than that of *P. pedunculata*, while the leaves and fruit are only half the size, the drupes fewer in each syncarp and less connate in the upper part.

Hab.: Given as a Queensland plant in *Muell. 2nd Syst. Cens. Austr. Pl.* 202.

5. ***P. monticola*** (found on hills), *F. v. M. Fragm.* v. 40, vii. 63, and viii. 220; *Benth. Fl. Austr.* vii. 150. "Yagul," Cairns, *Cowley*. Stem weak, half climbing, attaining 2in. diameter. Leaves placed as in other species, but very long, hanging, bordered by small prickles or serratures. Male inflorescence narrow, the spikes sessile along the rhachis, rather distant, 2 to 3in. long. Bracts at their base membranous but not seen perfect. Stamens crowded, irregularly collected in clusters, but the filaments free or scarcely united at the base. Anthers narrow, fully 3 lines long, finely mucronate. Fruit nearly globular, 3 to 4in. diameter including the styles. Receptacle ovoid, hollow. Drupes exceedingly numerous, closely packed and slightly cohering, about 5 lines long, the pericarp thick and produced into thick linear-conical or oblong shortly acuminate styles above  $\frac{1}{2}$ in. long, with small terminal stigmas. Seeds normal.

Hab.: In many of the tropical scrubs.

## 2. FREYCINETIA, Gaudich.

(After Captain Freycinet.)

Flowers diœcious in dense spikes, pedunculate or sessile in the axils of deciduous leafy or small bracts and usually 2 or 3 spikes together at the ends of the branches. Male flowers: Stamens crowded on the rhachis, the filaments all free; anthers small, ovate, adnate, with revolute valves, resembling little globular heads. Female flowers: Ovaries often surrounded by 2 or 3 short staminodia, densely packed on the rhachis, cohering by their membranous almost gelatinous bases, imperfectly divided by 2 or 3 projecting parietal placenta; stigmas or stigmatic lobes 2 or 3, sessile. Ovules numerous, superposed in 2 series on each placenta. Fruits small and numerous, in ovoid oblong or cylindrical heads, succulent at the top, connate at the base and bursting irregularly. Seeds numerous, oblong, bearing on one or both sides a longitudinal loosely cellular appendage or strophiole.—Straggling or climbing perennials or shrubs with leafy branches. Leaves with numerous parallel veins, their sheathing bases closely embracing the branches and often torn up into shreds or filaments, the floral leaves usually smaller and coloured.

The genus comprises but few species, spread over the islands of the Malayan Archipelago and the Pacific, New Zealand and New Guinea.

Leaves about 6in. long, shortly acuminate . . . . .	1. <i>F. Gaudichaudii</i> .
Leaves 8in. to 1ft. long, tapering into a long subulate point . . . . .	2. <i>F. excelsa</i> .
Leaves $1\frac{1}{2}$ to 4ft. long, 1 to $1\frac{1}{2}$ in. broad, acuminate . . . . .	3. <i>F. insignis</i> .

1. ***F. Gaudichaudii*** (after C. Gaudichaud), *Br. and Benn. Pl. Jav. Rav.* 31, t. 9; *Benth. Fl. Austr.* vii. 151. Stems very long, straggling or climbing and rooting, more or less covered with the short sheathing bases of the leaves, the membranous margins of the sheaths often torn up into shreds or filaments. Leaves mostly about 6in. long and  $\frac{1}{2}$  to 1in. wide, shortly acuminate, with numerous parallel veins, the midrib more prominent, often minutely aculeate as well as the edges. Bracts nearly white, very deciduous, the outer ones not exceeding 2in. in length, the inner ones much smaller, very narrow, and quite membranous. Spikes in the Queensland specimens (female) ovoid-oblong or sometimes short and almost globular, the longer ones 1 to  $1\frac{1}{2}$ in. long when in fruit, on peduncles of  $\frac{1}{2}$  to 1in., about 3 together at the ends of the branches. Ovaries very numerous, closely pressed and cohering by their membranous bases, free in the upper half, with a small terminal area divided more or less distinctly into 2 or 3 stigmas. Fruits bursting irregularly. Seeds numerous, oblong, about  $\frac{1}{2}$  line long, the rich brown smooth testa contrasting with the white oblong cellular longitudinal appendages or strophioles, the inner one as large as the rest of the seed the outer one much narrower.—*Proc. Roy. Soc.* Ql. xi.

Hab.: East coast within the tropics, *A. Cunningham*; Cape York Peninsula, *Hann's Expedition*; Rockingham Bay, *Dallachy*; Rockhampton, *O. Shanesy*, *Thozet*; Port Mackay, *Nerust*; Emmundi (female inflorescence), *Bail*; also in the Malayan Archipelago and New Guinea.

2. **F. excelsa** (tall), *F. v. M. Fragm. v. 39*; *Benth. Fl. Austr. vii. 151*. Leaves 8in. to 1ft. long, mostly 3 or 4 lines broad but dilated at the base into short broad imbricate sheaths, tapering into long subulate points, the edges serrulate-spinulose towards the base as well as the margins of the sheaths. Male inflorescence; outer bracts nearly as long as the leaves, which they resemble except for their broad, coloured sheathing bases, which surround the base of the inflorescence. The other bracts are collected into 3 bundles and are, except for their green tips, of a deep red colour, and form a star of 3 rays several inches in diameter, bearing in its centre the spike of stamens, the filaments of which are short, and bear pale-coloured 2-celled, obtuse anthers.—*Proc. Roy. Soc. Ql. xi.*

Hab.: Rockingham Bay, *Dallachy*; Glasshouse Mountains, Moreton Bay, *W. Hill*; Eumundi, (male inflorescence), *Bail.*

3. **F. insignis** (remarkable), *Blume in Rumphia, i. 158, Plate 42*. Stem tall climbing, thickly clothed with leafy branches, cylindrical. Leaves approximately spiral, dilated and membranous at the base, 2 to 4ft. long, 1 to 1½in. wide, the midrib showing beneath only towards the apex, margins towards base and apex not spiny, leathery, rigid, terminal ones crowded beneath the inflorescence. Inflorescence terminal, very beautiful, consisting of 3 or 5 spadices close together of unequal length, green, scale-like, petaloid, widely ovate, at first closely imbricated. The inner bracts small but very thick, whitish, arched, entire, silky at the back, curved or erect alternately; some triangular-ovate, acuminate, pale-reddish, concave beneath, spreading above; outer ones larger, purple, with points; and also here and there prickles. Spadices of female flowers, 1½ to 2½in. long, and 1in. wide, with peduncles of ½in., afterwards increasing considerably in size, rough, semi-terete, white, fleshy. Female flowers very much crowded, with the styles in threes or fours, surrounded by minute staminodia, the subulate filaments united at the base. Anthers apical, adnate, extrorse, oblong-cordate. Ovaries as long as they are broad, expanding prismatically, apices truncate, stigmas disciform, smooth at the margins, in the centre 2 or 3-porous, very minutely papillose, the apex ultimately forming a neck, stigma terminal, bifid, or ternate, sometimes umbilicate, or tuberculate; sometimes the disk itself with the margins thickened on both sides towards the axis. The ovary contains 2 to 3 placentas, longitudinal, parietal, which support the minute, anatropous, elongated-ellipsoid ovules, each attached by a short umbilical funicle, 2-seriate mainly. Fruit-bearing spadices elongate-ellipsoid, with berries very densely aggregated, obconical, lateral, with succulent pulp, the inner substance homogeneous. Seeds in gelatinous sporophores, many-sided, cylindrical, at both ends a little obtuse, straightish, or somewhat curved longitudinally, striate, with a very short umbilical funicle, with appendages resembling costa, apex incurved towards the base. Chalaza coloured brownish, and at times conspicuous.—*Blume, l.c.*

Hab.: Queensland, *F. v. M.*

## ORDER CXLIV. TYPHACEÆ.

Flowers unisexual, very closely packed in separate heads or spikes along a common rhachis, the upper ones males, the lower females, intermixed in the spikes with linear or spatulate scales or long hairs, often forming more or less definite perianths round the stamens or ovaries. Stamens 3 or fewer to each flower; anthers erect, narrow, the cells placed back to back and opening in longitudinal slits. Ovary of a single carpel, containing a single pendulous ovule, and tapering into a simple style, with an adnate unilateral stigma. Fruit a small 1-seeded nut, with a membranous or drupaceous pericarp. Seed pendulous, with

a membranous testa, and mealy albumen. Embryo axile, linear, straight, with a superior radicle.—Reed-like marsh or aquatic herbs, with long-linear parallel-veined leaves, sheathing at the base.

The Order is limited to the two genera represented in Queensland and both of them widely distributed over the globe, especially in temperate regions.

Flowers in cylindrical spikes, the females enveloped in a soft dense copious down formed of numerous long capillary bristles . . . . . 1. *TYPHA*.

Flowers in globular heads, the ovaries surrounded by about 6 linear scales or perianth-segments . . . . . 2. *SPARGANIUM*.

### 1. *TYPHA*, Linn.

(From the habitat of the plant; found in marshes.)

Spikes cylindrical, the upper male portion contiguous with the lower female portion, or separated from it by a bare interval. Stamens in the male portion intermixed with filiform or slightly spathulate scales. Ovaries in the female portion surrounded by tufts of long hairs, affixed to the stipes, falling off with the fruit and assuming the aspect of a pappus at its base.

The genus consists of very few species widely spread over the temperate regions of the globe, especially in the northern hemisphere, and found also within the tropics both in the New and the Old World.

1. *T. angustifolia* (leaves narrow), *Linn.*; *Kunth. Enum.* iii. 9; *Benth. Fl. Austr.* vii. 159. Bullrush. Stems erect, 2 to 8ft. high. Leaves often as long as or longer than the stems, mostly about 3 lines but sometimes above 4 lines broad, the dilated margins of the lower ones forming a sheath of 6in. to 1ft. Female spike a soft dense brown cylindrical cushion, 3 to 5 or rarely 6in. long, 3 or 4 lines diameter at the time the male is in flower, thickening out to  $\frac{3}{4}$  or nearly 1in. diameter as the fruit ripens. Male spike usually at an interval of  $\frac{1}{2}$  to 1in. from the female, very rarely close above it. Male flowers consisting of 2 or 3 linear anthers sessile on a short common stipes, the cells crowned by the hemispherical end of the connective, the flowers surrounded by filiform or slightly spathulate scales shorter than the anthers. Ovaries in the female spike fusiform, concealed as well as the fruits among the long hairs irregularly inserted on the short stipes, and tapering into a style rarely as long as those hairs. Fruits small, obovoid or fusiform, contracted into a stipes, the thin membranous pericarp free from the seed.—*R. Br. Prod.* 338; *Hook. f. Fl. Tasm.* ii. 39.

*Hab.*: Moreton Island, *M'Gillivray*; Rockhampton, *Thozet* and others; common throughout the State in still water.

Young leaves and roots eaten by natives of Mitchell River; they also use the stems for reed spears.—*Palmer*.

In the early days of South Australia the females spikes were collected and sold under the name of "Murray Down" for stuffing pillows, etc.—*Bail*.

The species is generally distributed over the area of the genus.

### 2. *SPARGANIUM*, Linn.

(Referring to the ribbon-like leaves.)

Flowers in globular heads distant from each other along the rhachis one or more upper ones male and sessile, the lower ones female and sessile or the lowest pedunculate. Stamens in the males though very closely packed yet more or less distinctly in threes, surrounded by about 6 linear or spathulate scales; anthers small, oblong or linear, on filaments longer than the scales. Ovaries in the females nearly sessile, each surrounded by about 6 linear scales, tapering into a

style projecting beyond the scales. Fruits obovoid or fusiform, contracted at the base and usually falling off with the surrounding scales. Pericarp drupaceous, with a thin epicarp and hard indehiscent endocarp.

The genus, like *Typha*, consists of a small number of species widely spread over the northern hemisphere, but the Australian species which is also in New Zealand, though nearly allied to one of the northern ones, appears to be distinguishable by characters that may be regarded as specific.—*Benth.*

1. **S. angustifolium** (leaves narrow), *R. Br. Prod.* 338, *not of Michx.*; *Benth. Fl. Austr.* vii. 160. Stems from a shortly creeping rhizome erect, not very stout, 1 to 2ft. high or rarely more. Lower and radical leaves very long, mostly 1 to 2 lines broad, the midrib acutely prominent underneath, the lower portion expanding into long many-nerved rather narrow sheaths. Inflorescence simple or with one short branch in the axil of the uppermost leaf, with leafy bracts under several of the lower heads. Heads few or numerous, all sessile or the lowest one pedunculate. Filaments of the males about twice as long as the scales. Ovaries in the females tapering into a thick style, with the stigma decurrent about halfway down. Fruits sessile or nearly so, broadly obovoid, very obtuse, mucronate with the persistent remains of the style.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller* and many other southern localities.

ORDER CXLV. AROIDEÆ.

Flowers unisexual or sometimes hermaphrodite, closely packed in a dense simple spike or *spadix*, with a convolute or rarely flat coloured or leaf-like bract or *spatha* at its base. Stamens and ovaries either in different parts of the spadix without perianth or bracts, or stamens 6 or fewer round each ovary, with or without a small scale-like perianth segment under each stamen; anthers usually 2-celled, sessile or on a thick filament, the cells opening in terminal pores or outwards in longitudinal slits. Ovaries sessile, 1 to 3-celled, with 1 or more ovules in each cell variously attached; stigma sessile or on a short simple style. Fruit a berry. Seeds 1 or few, surrounded by pulp, with an appressed testa; albumen usually copious with an axile embryo, or in a few genera albumen none with a thick embryo and prominent plumula in a terminal groove as in *Naiodea*.—Herbs with a perennial tuberous or creeping rhizome and radical leaves and scapes, or with long creeping or climbing or rarely erect stems. Leaves entire or variously divided, sometimes very large, the veins usually pinnate or reticulate, or rarely grass-like leaves with parallel veins.

The order is chiefly tropical, in both the New and the Old World, but is also represented in more temperate regions, especially in the northern hemisphere.

SERIES A. Flowers monœcious. Perianth none.

TRIBE I. **Arineæ**.—*Spadix with a flowerless top (appendage). Stamens free; anther-cells larger than their connective. Female flowers without staminodia. Ovary 1-celled, ovules orthotropous.*

Terrestrial tuberous herb. Leaves various and flowers coetaneous (on the plant at the same time).

Ovules basal . . . . . 1. TYPHONIUM.

TRIBE II. **Pythoniæ**.—*Spadix with appendage. Stamens free, anther-cells broader than their connective. Ovary 1 or more celled; ovules anatropous or semianatropous. Tuberous herbs, often flowering before leafing. Leaves 3-sect, segments pinnatifid.*

Appendage naked; neuters none . . . . . 2. AMORPHOPHALLUS.

TRIBE III. **Colocasieæ**.—*Spadix with or without an appendage, usually shorter than the spatha. Anthers sessile, densely crowded, prismatic or broad, free or connate, connective very thick. Leaves undivided, often peltate.*

\* Tube of spatha enclosing the fruit. Spadix wholly free from the spatha.

Limb of spatha erect; ovules many parietal . . . . . 3. COLOCASIA.

Limb of spatha erect; ovules few basal . . . . . 4. ALOCASIA.

SERIES B. Flowers hermaphrodite, a few rarely unisexual. Perianth none.

TRIBE IV. **Calleæ**.—*Spadix without an appendage. Stamens distinct; filaments flat, anther-cells terminal. Ovary truncate, stigma central. Mostly climbers.*

Spadix sessile; ovary 1 to 2 celled, many ovulate, or if to include *Epipremnum* 2 or rarely 1. Berries confluent . . . . . 5. RHAPHIDOPHORA.

SERIES C. Flowers hermaphrodite. Perianth of 4 to 6 segments.

\* *Spadix flowering upwards; ovary 1 to 3-celled.*

TRIBE V. **Orontieæ**.—*Spadix without an appendage.*

Flowers 6-merous. Leaves distichous, the laminae articulate on a phyllo-lineous petiole . . . . . 6. POTIOS.

Flowers 4-merous. Leaves radical, grass-like . . . . . 7. GYNOSTACHYS.

1. TYPHONIUM, Schott.

(From *typho*, to burn, referring to the acrid juice in the plant.)

Spatha contracted above the convolute base, the lamina broad, spreading or recurved. Flowers unisexual, the females at the base of the spadix, with subulate neutral organs immediately above them, the males separated by a bare interval, the spadix terminating in a long thick fleshy appendage. Perianth none. Anthers 2-celled, sessile in pairs, appearing like 4 1-celled anthers, the cells opening in terminal pores, or in some species in slits continued to the base. Ovary sessile or nearly so, 1-celled, with a single erect ovule; stigma peltate, sessile or shortly stipitate. Berry 1-seeded. Albumen copious.—Herbs with a hard tuberous rhizome. Leaves entire or 3-lobed, radical as well as the scape.

The genus is generally spread over the warmer regions of the Old World. The Australian species are, as far as known, endemic.

Leaves entire.

Leaves ovate or lanceolate, 3 or 4in. long . . . . . 1. *T. alismifolium*.

Leaves 3-lobed.

Lobes lanceolate or ovate-acuminate, often broad . . . . . 2. *T. Brownii*.

Lobes linear, 7in. long, 1 to 1½ line long . . . . . 3. *T. angustilobum*.

Lobes attenuated middle one 9in. long, 1in. broad near centre . . . . . 4. *T. Millari*.

1. **T. alismifolium** (Alisma-leaved), *L. v. M. Fragm.* viii. 186; *Benth. Fl. Austr.* vii. 153. A smaller plant than the other Australian species, the tuber apparently smaller and not so hard. Leaves undivided, ovate-lanceolate or lanceolate, acuminate, rounded or scarcely cordate at the base, 3 to 4in. long. Spatha dark purple or almost black inside, 4 to 5in. long, tapering to a long point and not 1½in. broad in the broadest part. Flowers in the same relative position as in the other Australian species, the terminal appendage rather long. Berry ovoid-globular, about 2 lines diameter.

Hab.: Rockingham Bay, *Dallachy*.

2. **T. Brownii** (after Dr. R. Brown), *Schott. Aroid.* 11, t. 15; *Benth. Fl. Austr.* vii. 154. "Gin-bur," Morehead River; "Rur-oon-ba," Musgrave; "Kam-mi," Cooktown; *Roth*. "Merrin," Rockhampton, *Thozet*. Leaf-petiole 6in. to 1ft. long, the lamina divided nearly or sometimes quite to the base into 3 narrow or broad lanceolate lobes or segments, the lateral ones horizontally divaricate, 4 to 6in. long, either nearly equal on both sides or more or less dilated at the base on the lower side, the middle lobe usually rather longer and narrower. Scapè shorter than the petiole. Spatha with the convolute base ovoid, the lamina 4 to 5in. long, very broad, of a deep purple inside. Female spike at the base of the spadix ovoid, about ½in. long. Neutral organs filiform, recurved. Male spike after a bare interval of about 1in. cylindrical, about ½in.

long; terminal appendage very oblique at the base, rather thick and about lin. long in the typical form.—F. v. M. *Fragm.* viii. 187; *Bot. Mag.* t. 6180; *Arum orixense*, R. Br. *Prod.* 336, but not of Roxb.

Hab.: Burnett River, *F. v. Mueller*; Rockhampton and neighbourhood, *Thozet*, *Bowman*; Rockingham Bay, *Dallachy*; and many other localities.

Roots eaten after preparation.—*Roth* and *Thozet*.

3. **T. angustilobum** (lobes narrow), *F. v. M. Fragm.* x. 66; *Benth. Fl. Austr.* vii. 154. "Wanjallo," Mitchell River, *Palmer*; "Wu-ri," Batavia River, *Roth*. Leaf-lobes 3, narrow-linear, 5 to 7in. long and 1 to 1½ line broad. Terminal appendage of the spadix 2 to 3in. long.

Hab.: Gilbert River, *Armit*; Mitchell River, *F. Palmer*.

Tubers roasted and broken with a stone, pounded a good deal and roasted several times before eaten.—*Palmer & Roth*.

4. **T. Millari** (after T. Barclay Millar), *Bail. Bot. Bull.* 2. Rhizome attaining to 4 to 6in., flattish and irregular in shape. Leaves glaucous, about 6 to a plant; petioles 6 to 10in. long, finely striate, the broadish sheathing base occupying about 2 or 3in., border of sheath tinged with purple; lamina divided nearly to the base into 3 narrow attenuated lobes, the middle one of the largest leaves about 9in. long and 1in. broad at the widest part, lateral lobes somewhat shorter, usually with an upward tendency, but sometimes horizontally spreading; midrib and veins prominent on the under surface, the veins few, distantly anastomosing. Flower inodorous, usually on a very short scape. Spatha with a glaucous, smooth, striated, ovoid, convolute base, of about 1¾in.; lamina 8 to 12in. long, very broad but tapering to an acuminate apex, bright-green with prominent distant anastomosing veins on the outside, the inside of a uniform dull purple colour, when fully expanded turning an olive-green in the course of a day, almost campanulate, the long tapering upper part of the spatha being thrown back. Spadix terminated by a helmet-shaped, fleshy, smooth, copper-coloured appendage 1½ to nearly 2in. long, the base obliquely truncate; immediately below this is a smooth velvety-brown terete neck of about 3 lines, the next ½in. is occupied by the rosy male organs, after which is a bare interval of about 1in. of a deep glossy purple, when fresh this is covered by papillæ, between this and the female portion is a ring of recurved filiform neutral organs, the base of the spadix for about ½in. is occupied by the sessile ovaries. Stigma sessile. Berry speckled, 1-seeded.

Hab.: Walsh River, *T. Barclay-Millar*.

*T. Millari* differs from *T. Brownii* in its prominently striated petioles, the sheathing bases being widely spread over; in the venation of the leaf-segments being very oblique and not half so numerous; in its much larger quite scentless flowers.

## 2. AMORPHOPHALLUS, Blume.

(From *amorphos*, deformed, and *phallos*, a mace; alluding to the inflorescence.)

Spatha campanulate, marcescent, tube short, convolute, limb often broadly expanded, margins often undulate. Spadix stout, often very stout, the appendage large. Inflorescence cylindrical, male and female contiguous; neuter organs none. Anthers densely crowded in groups of 2 to 4, sessile, cells oblong, pores apical. Ovaries 1 to 4-celled. Style short or long, stigma capitate, lobed; ovules solitary in each cell, subbasilar, anatropous. Berries sub-globose, obovoid or ovoid. Seeds large, endosperm none, embryo macropodous.—Tuberous herbs, flowering before leafing, or together. Leaves tripartite, segments pinnatisect, veins pinnate, meeting in an intermarginal one.

The species, of which there are about 50, belong to the tropics of Asia and Africa, the Malay Archipelago, Islands of the Pacific, New Guinea and Australia.

Ultimate division of leaf exceeding 5in. long and broad . . . . . 1. *A. galbra*.

Ultimate division of leaf scarcely 2in. long, and 2 lines broad . . . . . 2. *A. angustilobum*.



1. **A. galbra** (an aboriginal name), *Bail. Bot. Bull.* vii. "Galbra," (plant), "Jambolla" (inflorescence), Cairns, *Cowley*. Leaf solitary, expanding to a diameter of over 2ft. Petioles mottled, about 2ft. high, with 2 membranous sheathing scales, branching at the top into 3 bifurcate limbs which are pinnate below the first fork, the ultimate branches pinnatifid, divided nearly to the rachis into lanceolate lobes, with long often thread-like points, attaining the length of 5 or more inches. The veins numerous, parallel, joining in an inter-marginal one rather distant from the edge. Scape about 26in. long, mottled, somewhat resembling the markings of the carpet snake. Spatha about 11in. long and about 1½in. broad in the lower part, tapering to a rather long acuminate point, much mottled on the outside with dark coloured spots and markings interspersed with splotches and spots of white. Towards the tip and outside edges lightly tinged with palest purple, inside white. Spadix about 5in. long, of a pure sulphur colour, and a little over ½in. occupied by the female flowers, 1½in. by the male flowers, and the remainder by a narrow terminal appendage of a yellow colour, mottled and slightly tinged with green. Inflorescence highly fragrant.

Hab.: Barron River, *E. Cowley*.

This is a very showy plant and well worthy of garden culture, and the flowers fragrant. Growing with this species is one having a green unmottled petiole; this may prove a distinct variety, but so far no flowers have been seen.

2. **A. angustilobum** (leaf-lobes narrow), *Bail.* "Pun-ti-li," Annan River, *Roth*. Tubers seen about 2in. in diameter, depressed globose. Leaves on slender petioles about 12in. high; the lamina spreading to about 7in. wide, tripartite, the branches dichotomous, ultimate divisions numerous, narrow-linear, mostly under 2in. long and seldom exceeding 2 lines in breadth, filiform at the apex. Peduncle slender, longer than the petiole; sheaths linear about 9in. long and 1in. broad, membranous. Spatha probably 3in. long and narrow, but the specimens to hand in a bad state of preservation. Spadix (old), seemed much shorter than the spathe. Berries ovoid, about 5 lines long.

Hab.: Annan River, *W. E. Roth*.

### 3. COLOCASIA, Schott.

(The Greek name for the rhizome of *C. antiquorum*).

Spatha with a convolute persistent base, the lamina long lanceolate deciduous. Flowers unisexual, the females at the base of the spadix separated from the males by short ovoid neutral organs without any bare interval, the barren terminal appendage above the males usually very short and sometimes obsolete. Perianth none. Anthers usually 4 or 2, 2-celled (or 8 or 4, 1-celled) the cells opening in terminal pores. Ovary 1-celled, with few ovules, on a parietal placenta; stigma peltate, on a very short thick style, or almost sessile. Berries small, enclosed in the persistent base of the spatha, with several often numerous seeds. Albumen copious.—Scapes and leaves radical, the lamina often very large, cordate or peltate, undivided.

The genus consists of very few species from the warmer regions of the Old World. The Australian species is widely dispersed in tropical Asia and very extensively cultivated.

1. **C. antiquorum** (ancient), *Schott. Meletem.* 18; *Prod. Syst. Arid.* 138; *Benth. Fl. Austr.* vii. 155. Taro. "Pen," Middle Morehead River, *Roth*; "Pa-nu," Cooktown, *Roth*. Leaves ovate, more or less peltate and cordate; often above 1ft. long and broad, the primary veins pinnate and pedate at the base of the leaf, the transverse veinlets arcuate and confluent in the centre of each interval. Persistent convolute base of the spatha ovoid-oblong, usually about 1½in. long, the lamina 6in. long or more. Spadix much shorter, the female base ¾ to 1in. long, the neutral part shorter, the male portion rather





longer, the terminal appendage much shorter and sometimes obsolete. Stigmas almost sessile.—F. v. M. Fragm. viii. 187; Wight, Ic. t. 786; *Caladium acrv*, R. Br. Prod. 336.

Hab.: Endeavour River, *Banks and Solander*; Rockingham Bay, *Dallachy*.

The species is much cultivated in tropical Asia and Africa, and often gathered as wild, but its real native country is not well ascertained.

#### 4. ALOCASIA, Schott.

(From *a*, without, and *Colocasia*; allied to *Colocasia*).

Characters of *Colocasia*, but ovules few, basal, erect.

1. **A. macrorrhiza** (long rooted), *Schott. Prod. Sys. Aroid.* 146. "Dhoo-ee," Burnett, *Keys*. "Mur-gan," Mt. Cook, *Roth*. "Koom-bi," Tully River and Atherton, *Roth*. "Hakkin," Rockhampton, "Bangangan" or "Nargan," Cleveland Bay, *Thozet*; "Cunjevoi, Brisbane. Stems stout, several ft. high and usually 4 to 6 in. in diameter. Leaves 2 to 3 ft. long, 12 to 18 in. broad, nerves 10 to 12 pairs, very broadly hastate-cordate. Spatha 6 to 8 in. long, hooded and cuspidate at the top. Spadix as long as the spatha. Anthers usually 2, 2-celled (or 4, 1-celled) to each flower or cluster. Ovary 1-celled, with few ovules attached at or near the base of the cavity. Stigma nearly sessile, broad, peltate or slightly lobed. Berries ovoid, 2 or 4 lines long, usually ripening 3 or 4 seeds.—*Caladium macrorrhizon*, R. Br. Prod. 336; *Colocasia macrorrhiza*, Schott. Meletem, 18; Benth. Fl. Austr. vii. 155.

Hab.: Ipswich, *Nernst*; Rockhampton, *Thozet*; Rockingham Bay, *Dallachy*; Port Denison, *Fitzalan*; common in all scrubs.

Roots after preparation eaten.—*Roth*, l.c.

Var. *brisbanensis*. Plants smaller in all its parts; petioles mottled.

Hab.: Brisbane River scrubs.

#### 5. RHAPHIDOPHORA, Hassk.

(Bearing raphides.)

Spatha open to the base, usually very deciduous. Flowers hermaphrodite or the lower ones without stamens, in a cylindrical spike covering the whole of the spadix. Perianth none. Stamens 4 to 6, adnate to the sides of the ovary, or the anther-cells free, opening outwards in longitudinal slits. Ovary with a thick angular fleshy truncate apex filled with raphides inside, and a small basal cavity, 1-celled or imperfectly 2-celled, with few ovules; stigma adnate to the centre of the truncate apex. Seeds albuminous.—Stems climbing on trees and rooting in the lower part. Leaves large and deeply pinnatifid or in some species smaller and entire.

Species few, belonging to tropical Asia, Australia and Polynesia.

Spatha very deciduous, 3 to nearly 4 in. long. Ovary conical on the top, stigma linear. Seeds numerous. . . . . 1. *R. australasica*.  
Spatha not deciduous, 8 or 9 in. long. Ovary flat-topped. Stigma linear, sunk in the ovary . . . . . 2. *R. Lovellei*.

1. **R. australasica** (Australian), *Bail. Ql. Agric. Journ.* i. Pt. 6. Stems climbing often to a considerable height, angular, not often bearing the fibrous remains of the old leaf-sheaths, usually quite naked, cane-like emitting roots from the underside: internodes short, seldom exceeding 1 in. diameter. Leaves near the inflorescence entire, 10 to 15 in. long, 3 to 5½ in. broad in the centre, lanceolate or ovate-lanceolate, costa prominent, lateral nerves numerous. Petiole more or less winged, 7 to 9 in. long from the base to the geniculation, and about 1 in. from there to base of lamina. Inflorescence appears terminal, erect, solitary, or sometimes two near together with little or no network of old leaf-sheaths to support them. Peduncles 6 to 7 in. long, terete, under ¼ in. diameter, soft. Spatha deciduous, 2½ to almost 4 in. long, acuminate, rather spreading. Spadix

cylindrical, sessile, at first rather slender, attaining a diameter of over 1in. when in fruit,  $2\frac{1}{2}$  to  $3\frac{1}{2}$ in. long. Stamens only seen in very bad condition, slightly elevated above the ovary. Ovary somewhat compressed, angular, the apex conical with a linear stigma. Seeds numerous, 26 in one fruit examined, oblong, cuneate, slightly tuberculate.

Hab.: Scrubs on range about Cairns, *F. Cowley*; and other tropical scrubs.

2. **R. Lovellæ** (after the Hon. Miss Lovell), *Bail. Ql. Agric. Journ.* i. Pt. 6. "Naja," Tully River, *Roth*. A lofty climber. Stem compressed, 2in. or more in diameter, emitting roots from the underside which adhere to the bark of the tree over which it climbs like the Ivy; clothed particularly in the leafy parts with a network formed of the fibrous remains of the stipular sheaths. Leaves near the inflorescence pinnatisect,  $2\frac{1}{2}$ ft. long, the segments 1-costate, irregular as to length and breadth, often 15in. long, ensiform and somewhat falcate, usually obliquely-truncate at the end, about 15 on each side of the stout midrib, the lamina of the broader segments sometimes perforated with elongate openings, the 2 or perhaps 3 basal segments often confluent and thus 2 or 3-costate. Petiole channelled, stout, 18 to 20in. long without the 2in. between the geniculation and the lamina. Inflorescence appearing terminal, erect, crowded, often as many as half-a-dozen representing all stages from the opening of the spathe to the ripening of the fruit, all bound together by the beautiful network of the old stipular sheaths. Peduncle stout, 5 or 6in. long, over  $\frac{1}{2}$ in. diameter, often hard. Spatha about 9in. long, at first nearly white, then yellow on both sides, thick, cymbiform, closing round the end of the spadix and ending in an elongated acuminate point. Spadix sessile, very stout, cylindrical, about 8in. long, pale yellow. No perianth. Stamens 4, filaments flattened, anthers exerted above the ovary. Ovary truncate, 4-angled. Stigma linear, rather sunk in the ovary, the ovules seem to be 2. Berry very juicy.

Hab.: About 20 miles from Cooktown, *Miss Lorell*; ranges about Cairns, *F. Cowley*.

The few ovules would place this species in *Epipremnum*, Schott, which Hooker in Fl. Brit. Ind. considers should be merged in *Rhaphidophora*.

The above 2 species composed the *R. pinnata* of the *Flora Australiensis*.

Stem used for food.—*Roth*.

## 6. POTHOS, Linn.

(The name of a species in Ceylon.)

Spatha ovate or lanceolate, concave or flat, at length reflexed or deciduous. Flowers hermaphrodite, covering the whole spadix. Perianth of 6 obovate or cuneate concave segments or scales, in 2 series. Stamens 6 or fewer, opposite the segments; filaments flattened; anthers terminal, 2-celled, the cells opening outwards. Ovary ovoid or obovoid, 3-celled, with 1 erect ovule in each cell; stigma sessile. Berry often 1-seeded by abortion. Seed without albumen, the testa membranous but rather thick. Embryo thick and hard, with a cavity in the upper end enclosing a prominent plumula and a small cotyledonous end curved over it.—Tall climbers. Leaves usually distichous with the lamina articulate on a phyllodineous petiole. Spikes (or spadices) cylindrical or globular, terminal, or if axillary the peduncle enclosed at the base in 2 or more sheathing bracts.

The genus as now limited extends over tropical Asia to South China and westward to Madagascar, the only Australian one proving to be the same as one from the Philippine Islands and South China.—*Benth*.

1. **P. Loureiri** (after J. de Loureiro), *Hook. and Arn. Bot. Beech. Voy.* 220; *Benth. Fl. Austr.* vii. 158. "Ku-yu," Atherton; "Koi-yo," Tully River, *Roth*. A glabrous climber, clinging to the stems of trees and sometimes covering the tallest of them. Leaves exceedingly variable in the Australian specimens, the phyllodineous petiole sometimes linear-lanceolate 5 or 6in. long, not 3 lines

wide and rounded at the end, without any or only a very small lamina, and passing gradually from that to oblanceolate,  $1\frac{1}{2}$  to 4 in. long, 3 to 9 lines broad at the upper end, where it is rounded or truncate or broadly or deeply obcordate, the lamina from ovate-acuminate to lanceolate, almost always shorter than the petiole but sometimes longer by 2 in., narrower or rarely broader than the petiole, rounded or narrowed at the base. Spikes shortly pedunculate, cylindrical, 1 to 2 in. long when in flower, sometimes nearly 3 in. when in fruit. Spatha lanceolate, varying from shorter to rather longer than the spadix. Berry red, oblong or ovoid, 5 to 6 lines long.—Schott, Aroid. 23, t. 49; *P. longipes*, Schott. Aroid. 23, t. 47 (there placed in the wrong section from not having seen the fructification, but correctly transferred in Prod. Syst. Aroid. 568); *P. cylindricus*, Presl. Schott. Aroid. 23, t. 48; *P. australasicus*, F. v. M. Fragm. i. 62.

Hab.: Moreton Bay, *F. v. Mueller*; Pine River, *W. Hill*; Port Mackay, *Nernst*; Rockingham Bay, *Dallachy*; Mount Dryander, *Pitzalan*; a very common scrub climber.

Fruit eaten after roasting at Atherton, but raw on Tully River.—*Roth*, l.c.

### 7. GYMNOSTACHYS, R. Br.

(Referring to the spikes being naked or wanting a spathe.)

Flowers hermaphrodite, loosely packed in slender spikes without any or with a very minute spathe. Perianth of 4 scale-like segments in 2 series. Stamens 4, opposite the segments; filaments short, thick, somewhat compressed; anthers 2-celled, terminal, the cells opening outwards. Ovary oblong, 1-celled, with 1 ovule suspended from the apex; stigma sessile. Berry ovoid or globular. Seed with an appressed rather thin testa. Embryo short, in the axis of a rather hard albumen; radicle superior.—Herb with tuberous roots and very long grass-like radical leaves. Spikes clustered in the axils of leafy bracts along a tall otherwise leafless scape.

The genus is limited to the single species endemic in Australia.

1. **G. anceps** (two-edged). *R. Br. Prod.* 337; *Benth. Fl. Austr.* vii. 157. "Boorgay," Russell River. Roots swollen into fusiform tubers. Radical leaves erect, rather rigid, strongly nerved, 1 to 3 ft. long, and usually 3 to 4 lines broad. Scapes nearly as tall, much flattened, with acute smooth or serrulate-scabrous edges. Clusters of spikes usually 3 or 4, distant from each other in the upper part of the spike, the leafy bract subtending the cluster rigid erect and shorter than the spikes. Spikes usually 2 or 3 rarely more in each cluster, on short peduncles with 2 or 3 sheathing scales at the base of each peduncle, the slender spikes very unequal, the longest often 2 to 3 in. Flowers small, sessile but not closely packed. Perianth-segments or scales obovate, truncate, not exceeding the ovary. Berries 3 or 4 lines long.—Schott. Gen. Aroid. t. 97; F. v. M. Fragm. viii. 187.

Hab.: Moreton Bay, *Backhouse*, *F. v. Mueller* and others; Condamine River, *Hartmann*; Rockhampton, *Bowman*, *Thozet*; common on the borders of scrubs.

This plant produces an excellent strong fibre.

### ORDER CXLVI. LEMNACEÆ.

Floating plants, without distinct stems or real leaves, but consisting of small sometimes minute leaf-like fronds, either separate or cohering 2 or 3 together by their edges, emitting in most species one or more fibres from their under surface into the water, and multiplying by similar fronds growing out of their edges. Flowers very rare, appearing from a fissure in the edge or upon the upper surface of the frond, and consisting of a minute membranous bract or spathe, enclosing 1 or 2 stamens and a single ovary. Perianth none. Filaments usually shortly

exserted, anther 1 or 2-celled. Ovary 1-celled, with 1 or more ovules. Style short, with a slightly thickened stigma. Fruit a minute utricle. Seeds 1 or more, with or without albumen.

The Order, is limited to two genera; the genus represented in Queensland is widely spread over the globe in ponds or standing waters.

### 1. LEMNA, Linn.

(Referring to the scale-like fronds.)

Fronds emitting one or more root fibres from their under surface. Flowers issuing from a fissure in the margin of the frond. Anthers with 2 distinct cells, each opening in two valves, at the end of a distinct filament. Style short or more or less lengthened.

Geographical distribution that of the Order.

Root-fibres one to each frond.

Fronds very thin, oblong or narrowed at one end, the young ones often projecting on each side at both ends. Ovules 1 . . . . . 1. *L. trisulca*.

Fronds broadly ovate, rather thin, slightly convex underneath, the young ones soon detached from one side. Ovule 1 . . . . . 2. *L. minor*.

Root-fibres several in a cluster under each frond.

Fronds thin, oval or oblong, rarely above 2 lines long . . . . . 3. *L. oligorrhiza*.

1. ***L. trisulca*** (3-furrowed), *Linn.*; *Hegelm. Lemn.* 134, t. 5, 6; *Benth. Fl. Austr.* vii. 162. Fronds oblong or lanceolate, often  $\frac{1}{2}$  in. long and about half that breadth, thin, narrow and minutely toothed at one end and ending in a little stalk at the other, with 2 young ones usually growing from opposite sides and remaining long adherent, and emitting a single root from underneath. Stamens usually 2. Ovary with 1 ovule and a very short style.—*R. Br. Prod.* 345; *Hook. f. Fl. Tasm.* ii. 38; *F. v. M. Fragm.* viii. 188; *Griff. Sc. Pl. Asiat.* t. 262.

Hab.: Darling Downs. Common in the northern hemisphere.

2. ***L. minor*** (smaller), *Linn.*; *Hegelm. Lemn.* 142, t. 9, 10; *Benth. Fl. Austr.* vii. 163. Fronds usually broadly ovate, about 2 lines long, rather thin, emitting a single root from the under surface, the young frond growing from one side, becoming soon detached. Stamens usually 2. Ovary with a single ovule.—*R. Br. Prod.* 345; *Hook. f. Fl. Tasm.* ii. 38; *F. v. M. Fragm.* viii. 188.

Hab.: Rockhampton, *O'Shanesy, Bowman*; Brisbane, *Bailey*.

The commonest species in most parts of the area of the genus.

3. ***L. oligorrhiza*** (roots few), *Kurz.*; *Hegelm. Lemn.* 147, t. 16; *Benth. Fl. Austr.* vii. 163. Fronds thin, oval or oblong, resembling those of *L. minor*, but usually rather larger though rarely much above 2 lines long, 3 or 5-nerved, and emitting from the underside a cluster of several roots or fibres, usually 2 to 5 but sometimes more. Fructification unknown.—*L. pleiorrhiza* and *L. melanorrhiza*, *F. v. M.*; *Kurz* in *Seem. Journ.* 1867, 115.

Hab.: Common.

The species appears to be spread over East India and the Malayan Archipelago.

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