



**QUEENSLAND HERBARIUM  
DEPARTMENT OF PRIMARY INDUSTRIES  
BRISBANE**

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# **AUSTROBAILEYA**

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Editor:- L. Pedley



## FOREWORD

The genus *Austrobaileya* was first described by C. T. White in 1933 from fragmentary material collected by S. F. Kajewski on the Atherton Tableland in north Queensland. Descriptions of two species, both rainforest lianas and both endemic to very restricted areas in north Queensland, have been published. The genus has provided a challenge to many eminent phylogenetic botanists who have variously ascribed it to a number of primitive families. Current thought places it in a family of its own, Austrobaileyaceae, with rather obscure affinities.

*Austrobaileya* was named in honour of two Baileys, F. M. Bailey the noted Queensland botanist, and I. W. Bailey, U.S.A. (S. L. Everist, *pers. com.*). The association of the name *Austrobaileya* with F. M. Bailey and C. T. White, the doyens of the first century of Queensland botany, the endemic nature of the genus and the challenge it has presented the botanical world make *Austrobaileya* a very apt title for this new journal.

The emergence of "*Austrobaileya*" sees the demise of "Contributions from the Queensland Herbarium". During the past decade, at irregular intervals, twenty issues of the latter series were published. Each contribution covered a single taxonomic subject, some of a very restricted nature, others extensive, some in great detail. Such a format is not suited to the publication of shorter notes which may be of great taxonomic interest. The new journal has been devised to allow greater flexibility in publication and each part may contain a varied collection of papers, mainly of taxonomic interest.

Dr. S. T. Blake and, in later years, Mr. L. Pedley have maintained in "Contributions" a high standard of presentation and publication. The task of guiding "*Austrobaileya*" lies with Mr. Pedley and, I believe the first part makes a major contribution towards better understanding of the Queensland flora.

R. W. JOHNSON, Director.

Queensland Herbarium, Brisbane.  
10 March 1977.





## FOUR NEW SPECIES OF EUCALYPTUS

By S. T. Blake\*

Queensland Herbarium, Brisbane

### Summary

Three new species of *Eucalyptus* from Queensland, *E. brassiana*, *E. henryi* and *E. melanoleuca*, and one from Malesia, *E. urophylla*, are described and their relationships and distribution discussed.

**Eucalyptus brassiana** S. T. Blake, sp. nov. affinis *E. tereticorni* sed cortice trunci plus persistenti, alabastris majoribus, fructu majore disco angustiore differt. **Typus:** Blake 20194.

**Arbor** 15-20 m alta, corona sparsa et ramulis  $\pm$  pendulis praedita. **Cortex** dimorphus in trunco (saltem sub medio) persistens cinereus sulcatus vel rimosus usque ad 1.2 cm crassus, alibi griseus vel caesius vel cremeus, laevis in schedis taeniformibus tenuibus decorticans. **Ramuli** tenues, angulati juvenes compressi. **Folia** alterna raro subopposita petiolis tortis 1.2-2.2 cm longis anguste lanceolata  $\pm$  falcata gradatim acuta, ad basam saepe obliquam angustata, subtus primo pallidiora tantem concoloria vel fere concoloria, crebre punctata, plerumque 10-17 cm longa 1-2.8 cm lata, pro more 7-15-ies longiora quam lata; costa supra leviter impressa subtus prominens, nervi tenues haud conspicui, laterales primarii utrinsecus costam 25-30 sub angulo 30°-50° abeuntes nervus intra marginalis a margine 0.7-2 mm distans reticulationes obscurae. **Umbellae** in axillis superioribus sitae saepe etiam speciminibus terminales, singulae, pedunculis 1-2 cm longis, 4-7 florum; pedicelli 5-10 mm longi, graciles, sursum sub fructu incrassati. **Alabastra** angustis ovoidea  $\pm$  acuta vel acuminata, 14-17 mm longa, 6-7 mm lata, tenuiter rugulosa; tubus calycis late cyathiformis, parte superiore libra operculum conicum, acutum atque leviter acuminatum vel leviter curvum, tubo equitatum et 3-3.5-ies longius. **Stamina** ca 1 cm longa, omnia fertilia; antherae versatiles, obovato-oblongae, cellulis parallelis in rimis longitudinalibus dehiscentibus; glans magna dorsalis. **Ovarium** semisuperum, pars superior a tubo calycis distans; breviter cylindricus apice late conicum; discus tenuis partem ovarii cylindricum tegens. **Fructus** ambitu latissime ellipticus vel circularis, circa 10-13 mm longus 9-11 mm latus; tubus cyathiformis calyci dimidiam longitineum formans, fere laevis, margine angustus planusque; discus tenuis, vittaeformis, altus, capsulae adpressus; capsula semiexserta; valvae 4-5 omnes exsertae, subdeltoideae, incurvae, dimidiam partem exsertam capsulae adaequantes interdum style cuspidatae. **Plantulae** glabrae, caule acutissime tetraquetra  $\pm$  alato; folia juvenilia 5-8 jugata in petiolis brevibus angustatae discoloria, anguste elliptica vel anguste elliptica ovata usque angustissime ovata 3-7-ies longiora quam latiora  $\pm$  obtusa; folia intermedia (e surculis orta) alterna, petiolata, ovata, usque 15 cm longa et 7-3 cm lata, duplo longiora quam lata.

**Trees** 15-20 m tall, crown sparse and branchlets pendulous. **Bark** with two forms, on the trunk persistent up to about the middle, ash grey, furrowed or with numerous fissures, to 1.2 cm thick, elsewhere grey, lavender-blue or cream, smooth, decorticating in thin ribbon-like sheets. **Branchlets** thin, angular, flattened when young. **Leaves** alternate rarely sub-opposite with twisted petioles 1.2-2.2 cm long, narrowly lanceolate  $\pm$  falcate gradually acute, often obliquely narrowed at the base, at first paler below becoming concolorous or nearly so,

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\* Died 24 February 1973.

closely punctate, mostly 10–17 cm long, 1–2.8 cm wide, commonly 7–15 times longer than wide; midvein slightly impressed above prominent below, fine veins inconspicuous, with 25–35 primary veins on each side subtending at between 30°–50°; intermarginal vein 0.7–2 mm from the margin; reticulations obscure. **Umbels** solitary in the upper axils and also terminal in some specimens, with peduncles 1–2 cm long; 4–7 flowers on slender pedicels 5–10 mm long not thickened below the fruit. **Flower buds** narrow ovoid  $\pm$  acute or acuminate, 14–17 mm long, 6–7 mm wide, somewhat finely wrinkled; calyx tube broadly cyathiform, superior part free; operculum conical, acute and slightly acuminate or curved, as wide as the tube and 3–3.5 times longer. **Stamens** ca 1 cm long, all fertile, anthers versatile obovate-oblong, cells parallel dehiscing by longitudinal slits, glands large and dorsal. **Ovary** semisuperior, the superior part separated from the calyx tube, shortly cylindrical, broadly conical at the apex; narrow disc partly concealing the cylindrical part of ovary. **Fruit** very broadly elliptical or circular in outline about 10–13 mm long, 9–11 mm wide, calyx cyathiform the tube making up half the length, nearly smooth, margin narrow and flat; disc thin, bandlike, raised, adpressed to the capsule; capsule semi-exsert; valves 4–5 all exsert subdeltoid, incurved, included and exserted parts of capsule about equal, sometimes with pointed style. **Seedling** glabrous; stem very acutely tetraquetrous  $\pm$  winged; juvenile leaves 5–8 in pairs tapered into short petioles, discolourous, narrowly elliptical or narrowly elliptic-ovate to most narrowly ovate, 3–7 times longer than wide  $\pm$  obtuse; intermediate leaves (and reversion growth) alternate, petiolate, ovate, to 15 cm long and 7.3 cm wide, twice as long as wide.

**Type:** Cooktown, 28 Jan 1958, S. T. Blake 20194 (BRI, holo; NSW, FRI, K, iso).

**NEW GUINEA:** **West New Guinea:** Along track to Keliki, Aug 1941, *Anta* 245. **Papua:** Wassi Kussa R., Feb 1890, *McGregor*; Tarara, Wassi Kussa R., Dec 1936, *Brass* 8402; Tarara, Jan 1937, *Brass* 8719; Daru I., Apr 1936, *Brass* 6428, Dec 1950, *Jackson* NGF 2748; Feb 1953, *Hart* NGF 5022A; Dagwa, Oriomo R., Mar 1934, *Brass* 5947, 6004, 6005, Dec 1950, *Jackson* NGF 2729, Mar 1953, *Hart* NGF 5022; Wuroi, Oriomo R., Mar 1934, *Brass* 6020; 8°50'S 143°15'E, Jan 1959, *Gray & White* NGF 10435. **Queensland:** Cook District: Weipa, Jul 1962, *Baxter* 2441; Wenlock, 13°06'S 142°57'E, Jul 1968, *Pedley* 2763; McIlwrath Range, Silver Plains Stn, Aug 1966, *Volck*; near Finch Bay, Cooktown, Jun 1968, *McKern*; Bloomfield R., *Petrie*; Lankelly Ck. 8 miles NE Coen, Oct 1969, *Webb & Tracey* 8357; between Portland Roads and Iron Range, Oct 1968, *Webb & Tracey* 8356.

This species is found on river levees outside riverain forest often in pure stands or in "savannah" forests usually associated with other species of the genus.

*E. brassiana* resembles *E. tereticornis* Sm. more closely than any other in its foliage, long operculum, partly superior ovary and capsule, the lower part of the free portion covered by the disc, the claw-like incurved valves and seeds, but the trunk has much greater development of persistent thick bark, the leaves show a tendency to be discolourous, the buds and fruit are larger and the disc in the fruit is thinner, not domed and does not extend over the rim of the calyx tube. The fruits resemble those of *E. exserta* F. Muell. of eastern Queensland but this species usually has much smaller buds and fruits with a relatively shorter operculum, less of the disc on the free portion of the ovary and the valves of the capsule  $\pm$  excurved at the base before incurving upwards so that the outline of the fruit is not circular, very narrow intermediate leaves and brown rather than red wood. The rough persistent bark often extends into the crown of the larger trees but  $\pm$  shrubby states are known with a comparatively small amount of persistent bark.

*E. brassiana* differs from both *E. tereticornis* and *E. exserta* in the tendency to flower only in the upper axils; frequently with an umbel apparently terminating the twigs so that the flowers appear to be on the crown rather than within it.



Figure 1. *Eucalyptus brassiana* S. T. Blake. Drawing supplied by the Director, Division of Botany, Department of Forests, Lae, Papua New Guinea.

**Eucalyptus henryi** S. T. Blake, species nova affinis *E. maculatae* Hook. et *E. citriodora* Hook., sed alabastris unicostatis, operculo calycis tubo aequilato subaequilongo rugosulo, foliis intermediis multo majoribus glabris rarissime peltatis praecipue differt. **Typus:** Blake 19889.

**Arbor** magna trunco lacunis crebris impressa, cortice laevi deciduo  $\pm$  maculato oblecta; ramuli acute angulati  $\pm$  tetraquetri. **Folia juvenilia** circa 10, omnia alterna, longe petiolata, sparsim setosa, ovata 1–2 supra interdum peltata, discoloria, venorum lateralium paribus 4 vel pluribus praedita. **Folia intermedia** alterna, breviuscule petiolata, ut plurimum 1–2 infima peltata, vel oblonga vel ovata vel ovato-lanceolata,  $\pm$  caudato-acuminata, glaberrima, viridia, plurivenosa, rigida, usque ad 30 cm longa et 15 cm lata, superiora  $\pm$  concoloria. **Folia adulta** alterna, petiolata, glaberrima, minime discoloria; petioli robusti 1–2.5 cm longi; laminae lanceolatae, longe acuminatae leviter falcatae vel fere rectae, 16–28 cm longae, 2.7–4.5 cm latae, 5–7-ies longae quam latae, venis utrinsecus costam 45–55 ex angulo 35°–50° progredientibus rectis sursum leviter incurvis vel subflexuosis in nervem intramarginalem 0.5–0.9 mm a margine distantem concurrentibus. **Flores** in paniculis umbellarum 3-florarum axillaribus vel lateralibus dispositi, ramis ramulisque brevibus crassique; pedicelli 3–4 mm longi,  $\pm$  3 mm crassi. **Alabastris** ellipsoideo-obovoidei acuminati, 1-cotati, punctulati, circa 12–13 mm longi, 7–8 mm lati; operculum duplex, late subconicum breviter acuminatum, rugulosum, nitidulum, circumcissum, calycis tubum  $\pm$  adaequans et eo aequilatum. **Stamina** omnia fertilia, exteriora circa 15 mm longa; antherae versatiles, obovato-oblongae, cellulis parallelis per totam longitudinem rima dehiscentibus, glandula dorsali magna praeditae. **Fructus** suburceolati lignosi, verrucosi (an semper?) breviter pedicellati, circa 2 cm longi et 1.6 cm lati, ore 0.8 mm crassi; capsula profunde inclusa 3-valvis. **Semina** fertilia irregulariter ovata, compressa, nec marginata nec alata.

**Large tree** with many depressions on trunk, bark smooth, deciduous  $\pm$  maculate; branchlets acutely angled  $\pm$  square. **Juvenile leaves** about 10 all alternate, with long petioles, sparsely setose, ovate, 1–2 upper ones sometimes peltate, discolorous, having 4 or more equal lateral veins. **Intermediate leaves** alternate; somewhat petiolate, at the most the lowest 1–2 peltate, oblong, ovate or ovate lanceolate  $\pm$  caudate-acuminate, glabrous, green, many veined, rigid to 30 cm long and 15 cm wide, upper ones  $\pm$  concolorous. **Adult leaves** alternate, petiolate, glabrous, very rarely discolorous; petiole robust 1–2.5 cm long; lamina lanceolate acuminate, slightly falcate or almost straight, 16–28 cm long, 2.7–4.5 cm wide 5–7 times long as wide, veins 45–55 on each side of the midvein at an angle of 35°–50°, straight, below slightly incurved or subflexuose concurrent with the intramarginal vein at a distance of 0.5–0.9 mm from the margin. **Flowers** in panicle of 3-flowered umbels, axillary or laterally arranged, branches and branchlets short and thick; pedicels 3–4 mm long  $\pm$  3 mm thick. **Flower buds** ellipsoid-obovoid, acuminate, single ribbed, punctulate, about 12–13 mm long, 7–8 mm wide; operculum double, broadly subconical, shortly acuminate, rugulose, shiny, circumciss, the calyx tube  $\pm$  equal to it and equally wide. **Stamens** all fertile, outside ones about 15 mm long; anthers versatile, obovate-oblong, cells parallel dihiscent by splitting the total length, each with a large dorsal gland. **Fruit** suburceolate, woody, verrucose, shortly pedicellate about 2 cm long and 1.6 cm wide, rim 0.8 mm thick; capsule with three valves deeply included. **Fertile seed** irregularly ovate, compressed without margins or wings.

**Type:** Stafford near Brisbane, 8 Jan 1956, S. T. Blake 19889 (BRI, holo; NSW, FRI, CANB, K, iso)

**Queensland.** Moreton District: Parish of Bunya, *Massie* 17; Stafford, in 1953, *Blake* 19233; near Gold Creek, Feb 1956, *Stevens*; near Goodna, Aug 1942, *Richards* (hb. Forestry School, Canberra), in 1953, *Henry*; Mt Gravatt, Aug 1926, *White* 926; Kuraby, Jan 1922, *White*; Brisbane, cultivated seedlings, Mar 1954, *Blake* 19252.

All the localities are within or close to the boundary of the City of Greater Brisbane, but I have seen from the train trees of what appears to be the same species southward from Brisbane almost to Grafton, New South Wales. It is a constituent of *Eucalyptus* forest on stony or shallow soil and has been regarded as a broad-leaved form of *E. maculata* Hook., a species widely spread in SE Queensland in similar habitats. These two species resemble one another in bark, but the much larger leaves of *E. henryi* give to the crown a heavier and denser appearance. Herbarium specimens are coarser in every way. The operculum is almost or quite as long as the calyx-tube and about as wide as it instead of decidedly shorter and broader as in *E. maculata* while the whole bud bears a narrow rib or angle from pedicel to the tip of the operculum. Young plants of the new species are very different from those of *E. maculata* and *E. citriodora*. Seedlings of the latter two are strongly setose with leaves that are peltate except for the first few, the peltate setose leaves being rather numerous and found also on coppice growth and reversion shoots on mature trees. On seedlings of *E. henryi* peltate leaves are rare, the scanty bristles soon disappear, and the relatively enormous stiff intermediate leaves are very characteristic of older seedlings and coppice shoots; growth is also very slow compared with the others. In the adult leaves, the angle of divergence of the lateral veins is slightly wider in *E. henryi*. The latter is figured under *E. maculata* in Maiden, Crit. Rev. Eucalyptus 5: (1922) pl. 178, figs. 2a-c; the buds in 2b are immature.

*E. maculata* and *E. citriodora* resemble each other very closely, much more closely than either resembles *E. henryi*. On the whole, *E. citriodora* has somewhat narrower, rather more acute intermediate leaves, scarcely dimpled trunk, and somewhat smaller flowers with relatively slender pedicels as long or as longer than the calyx-tube. They were placed in the Corymbosae-Peltatae by Blakely, but with *E. henryi* they differ from the Corymbosae as defined by me in Aust. J. Bot. 1: 229-30 (1953) by the alternate juvenile leaves, the less regular lateral veins of the adult leaves at a more acute angle to the midrib, axillary (not terminal) panicles, few (not several) flowers in each umbel, and sharply circumciss opercula. The usually complete absence of opposite leaves from the seedlings is noteworthy, but a single pair following the cotyledons is sometimes found; I have not been able to find 4-5 pairs in *E. citriodora* as described by Maiden, *op. cit.* 8: 184 (1933) and Blakely Key, Eucalyptus 93 (1934), nor the 5-6 pairs for *E. maculata* described by Blakely on p. 94. Maiden, *l.c.*, Col. Pl. 4-5, figs 29a, 30, 31, figured no opposite leaves on either species. From the examples seen, there is a tendency in *E. maculata* for the early juvenile leaves to be broader on seedlings raised from seed from southern New South Wales and Victoria than those seedlings from seed from northern New South Wales and Queensland.

My interest in *E. henryi* was roused by the field observations of Mr. N. Henry of the Queensland Department of Forestry. Thanks to him and other officers of this department, much more material of the group became available for the study, including nursery-raised seedlings of the three species. The fine series of seedlings preserved at the Australian Forestry School referred to above demonstrate the range of variability in *E. maculata*. *E. henryi* is also represented.

**Eucalyptus melanoleuca** S. T. Blake; species nova affinis *E. paniculatae* Sm., sed floribus fructibusque minoribus, operculo quam calycis tubo multo brevior, capsulae valvis profunde inclusis, foliis fere concoloribus juvenilibus angustioribus subsessilibus distinguenda. **Typus:** Blake 18975.

**Arbor** usque ad 30 m alta trunco ramisque majoribus cortice atro duro crasso aspero profunde sulcato obtectis, ramis minoribus ramulisque albidis laevibusque; ramuli primo angulosi mox subteretes. **Folia juvenilia** per paria circa 5 opposita, sessilia vel brevissime petiolata, lanceolata, discoloria, glabra, margine  $\pm$  crenulata circa 3.5–5 cm longa, 0.5–0.9 cm lata. **Folia intermedia** alterna, breviter petiolata, ovata, usque ad 10 cm longa et 4 cm lata. **Folia adulta** dissita, longe petiolata, leviter discoloria, glabra, marginibus interdum angustissime recurvis saepius  $\pm$  crenulata; petiolus tenuis 1.2–2.3 cm longus; lamina lanceolata, sensim acute acuminata,  $\pm$  falcata plerumque circa 8–15 cm longa, 1.5–2.5 cm lata, plerumque 4–7.5-ies longior quam lata, nervis lateralibus haud conspicuis 15–18 utrinsecus costam ex angulo 40–45° progredientibus, nervo intra-marginali 0.5–1.1 mm a margine distanti. **Inflorescentia** paniculata terminalis vel interdum subterminalis, foliis multo brevior; umbellae plerumque 4–6-florae; pedicilli sub flore angulosi valde compressi, circa 2–5 mm longi, sub fructu minus compressi circa 2–3.5 mm longi. **Alabastris** subobovoides in pedicellum sensim attenuati, 2–3-costati, circa 5–6 mm longi, circa 3–3.5 mm lati; operculum conicum acutum calycis tubo fere obconico subduplo brevius et eo angustius. **Stamina** usque 4 mm longa, exteriora plura ad filamenta subulata redacta; antherae subcuneatae, truncatae, ad apicem filamenti oblique affixae, apice poris dehiscentes, haud glanduligerae. **Fructus** truncato-obovoides in pedicello attenuati,  $\pm$  2–3-costulati, rugulosi, circa 5–6 mm longa 4–5 mm lata, oris margine plani circa 0.7 mm crassi disco obscuro; valvae capsulae pro more 4 profunde inclusae. **Semina** fertilia nigerbrunnea polyhedra vel subovata, compressa, tenuissime reticulata vix striolata, 1–1.4 mm longa, 0.8–1.05 mm lata; semina sterilia multo minora pallidioraque, polymorpha, angulata.

**Tree** up to about 30 m tall with trunk and larger branches covered with black, persistent, thick, rough, deeply furrowed bark; smaller branches and branchlets white and smooth; branchlets at first angular soon subterete. **Juvenile foliage** for about 5 pairs opposite, sessile or very shortly petiolate lanceolate discolorous, glabrous, with margin  $\pm$  crenulate, about 3.5–5 cm long, 0.5–0.9 cm wide. **Intermediate foliage** alternate, shortly petiolate, ovate to 10 cm long and 4 cm wide. **Adult foliage** well spaced with long petioles, slightly discolorous, glabrous, margins sometimes very narrowly recurved often  $\pm$  crenulate; petioles thin, 1.2–2.3 cm long; lamina lanceolate, acuminate  $\pm$  falcate usually about 8–15 cm long, 1.5–2.5 cm wide, usually 4–7.5 times longer than wide, primary veins not conspicuous, 15–18 on each side of the midvein at an angle of 40–45°; intra-marginal vein 0.5–1.1 mm in from the margin. **Inflorescence** paniculate terminal or sometimes subterminal, leaves much shorter, umbels usually 4–6 flowered; pedicels strongly compressed and angled below the flowers, about 2–5 mm long, less compressed below the fruit 2–3.5 mm long. **Flower buds** subobovoid gradually attenuated into the pedicel, 2–3 ribbed, about 5–6 mm long; about 3–3.5 mm wide; operculum conical, acute, calyx tube almost obconical, less than half as long and narrower than the operculum. **Stamens** up to 4 mm long, many outside filaments reduced to fine point; anthers subcuneate, truncate, attached obliquely to the top of the filament dehiscing by apical pore, without glands. Fruit truncate-obovoid on slender pedicels  $\pm$  2–3 ribbed, rugulose, about 5–6 mm long 4–5 mm wide margin flat about 0.7 mm thick, disc obscure; capsule usually with 4 valves deeply included. **Fertile seed** dark brown, many sided or sub-ovate, compressed, finely reticulate rarely with fine linear markings 1–1.4 mm long, 0.8–1.5 mm wide; sterile seeds much smaller and paler, variable in shape, angular.

**Type:** 6–7 miles N of Yarraman, Jul 1952, Blake 18975 (BRI, holo; CANB, NSW, FRI, K, iso)

**Queensland.** Burnett District: Nanango,  $\pm$  390 m, May 1940, *Blake* 14202. Moreton District: Cooyar Range, 6–7 miles N of Yarraman,  $\pm$  435 m, July 1952 *Blake* 18975; Yarraman, Sep 1924, *Cameron* Y45.

This ironbark belongs in Blakely's section *Terminales* and is most closely allied to *E. paniculata* Sm. from New South Wales from which it differs as given in the diagnosis above. The smooth white bark of the smaller branches is in strong contrast with the black deeply furrowed bark on the rest of the tree and this contrast with the dense dark green crown fairly readily distinguishes the species in the field. *E. decorticans* (F. M. Bail.) Maiden and *E. sideroxylon* A. Cunn. ex Maiden are other ironbarks in the area with smooth upper branches; the former has all or most of the branches white, *E. sideroxylon* has duller, less conspicuous smooth branches, while both have much larger buds and fruits and narrow juvenile and intermediate leaves. Most of the leaves of *E. melanoleuca* have somewhat undulate to distinctly crenulate margins, but some of the crenulations are the result of insect damage; if this margin is a regular feature of undamaged leaves, it will provide a useful diagnostic character.

A few stands of the species are to be found near Yarraman and, according to Cameron, it is found in rain-forest margins. It is also associated with other species of *Eucalyptus* in open forest.

The species epithet refers to the strongly contrasted black and white bark.

***Eucalyptus urophylla*** S. T. Blake, species nova affinis *E. albae* Reinw. ex Blume sed cortici persistenti aspero rimoso squamoso-fibroso et foliis dorsiventralibus valde discoloribus supra sine stomatibus differt. **Typus:** *Turnbull* 210 (FRI, holotypus)

**Arbor** altitudinem fere 50 m altigens trunco  $\pm$  excurrente. **Cortex** saltem in trunco saepissime persistens asper rimosus squamoso-fibrosus, badius vel griseus in ramulis saepe etiam in rami raro etiam in parte trunco deciduis, laevis griseus in lamellis longis decorticans. **Ramuli** angulati. **Folia** dissita dorsiventralia valde discoloria longe petiolata; petioli supra sulcati pro more 1.2–3 cm longis et pro more  $\frac{2}{3}$ – $\frac{3}{4}$  laminae latitudinis aequantes; laminae rectae vel leviter falcatae vulgo anguste utique angustissime ovatae interdum ovatae, caudato-acuminatae, basi cuneatae interdum obliquae, aetate  $\pm$  coriaceae, maginibus leviter incrassatis leviter recurvis, supra saturate virides nitides sine stomatibus, infra multo pallidae opacae, untrique dense punctulatae; pro more 7–20 cm longae acumine longo incluso 0.7–3 cm latae, sine acumine circa (2)3–6-plo longiores quam latiores; vena intra marginalis tenuius a margine circa 0.6–1 mm distans; venis lateribus primariis tenuibus fere rectis plerumque subparallelis utrisectus costae 16–18 sub angulis plerumque 45°–65° abeuntibus. **Umbella** in axillis superiores situs, solitaria, 5–8 floribus; pedunculus rectus vel fere rectus, compressus  $\pm$  ancipitius, basem versus  $\pm$  tenuem sursum dilatatus, 8–22 mm longus; pedicelli angulati  $\pm$  compressi sub fructibus vix mutati, 4–10 mm longi. **Alabastra** ellipsoidea vel admodum obovoidea breviter acuminata vel apiculata vel rotundata teretia in pedicellos abrupte discinentes, 10–14 mm longa, 6–10 mm lata, saepe conspicue punctata; calycis tubus  $\pm$  cyathiformis supra ovarium valde productum equans longus et latus vel sapius paullo brevior quam latus; operculum calycis tubum subaequilongum vel paullo longius, et distincte latius. **Stamina** omnia fertilia exteriores 6–8 mm longa; anthera versatiles obovato-oblongae cellulis parallelis in rimis longitudinalibus omnino dehiscentibus; glans magna ellipsoidea dorsalis. Ovarium omnino inferum apice leviter convexo. **Fructus** a pedicello bene distincto, cyathiformis  $\pm$  obconicus aequae longus et latus vel paulo brevior quam latior, valvis exclusis 6–10 mm longus 7–12 mm latus, saltem supra medium pro more ecostatis fere laevis, pariete externo saepius subtenui et margine acuto, raro margine usque lato interne descendente disco inconspicuo; operculi cicatrix leviter depressa usque 2 mm lata; capsula 3–4 loculata; valvae  $\pm$  inclusa vel partem exserta. **Semina** fertilia ambitu irregulariter 4–6 angulati vel  $\pm$  semicirculari, turgida vel irregulariter compressa, marginibus alarum  $\pm$  rotundatis, alais acutis margine obscure denticulato, faciebus tenuiter striatis et trabeculatis  $\pm$  1.1–1.5 mm longo 0.8–1 mm lato; hilum parvum subbasale. **Plantulae** glabrae; lignotuber pravam vel 0; cotyledones circa duplo latiores quam longiores fere et medium bilobae; folia in paria circa 6–7 disposita, anguste elliptica-oblonga vel elliptica usque anguste ovata obtusa, cuneata conspicuo petiolata, discoloria. **Folia juvenilia** glabra, subopposita, ovata vel admodum elliptica, acuta interdum apiculata vel brevissime acuminate circa 6.5  $\times$  3.5 – 15  $\times$  5.5 cm.

**Tree** attaining height of about 50 m, trunk more or less excurrent. **Bark** at least on the trunk usually persistent, rough, fissured, scaly-fibrous, reddish brown or pearl grey; deciduous on the small branches and rarely on part of the trunk; smooth, grey decorticating in long strips. **Stems** angular. **Leaves** dorsiventral and well spaced, markedly discoloured and with long petioles. **Petioles** grooved above, usually 1.2–3 cm long and usually  $\frac{2}{3}$ – $\frac{3}{4}$  of the width of the leaf. **Lamina** straight or slightly falcate, commonly narrow or very narrowly ovate, sometimes ovate, caudate acuminate, cuneate at the base sometimes oblique, coriaceous when mature with slightly thickened and recurved margins, shining deep green and without stomates above, markedly duller and paler below, densely punctate on both sides, usually 7–20 cm long including tapering point 0.7–3 cm long, 0.7–3 cm wide; without the point about (2)–3–6 times longer than wide with a fine intramarginal vein about 0.6–1 mm from leaf margin and 16–28 fine almost straight and parallel primary lateral veins on each side of the midrib usually making an angle of about 45°–65°. **Inflorescence** a single umbel with 5–8 flowers above the axil on a straight or nearly straight, compressed  $\pm$  two angled peduncle 8–22 mm long usually slender at the base and broadened upwards. **Pedicels** angular,  $\pm$  compressed 4–10 mm long, nearly uniform below fruit. **Flower buds** ellipsoid or fully obovoid, shortly acuminate, apiculate or rotund, terete, abruptly contracted into the pedicel, 10–14 mm long, 6–10 mm wide, often conspicuously punctate. **Calyx tube**  $\pm$  cyathiform, strongly elongated above the ovary, uniformly as long as wide or more often a little shorter than wide. **Operculum** about equal or slightly longer than the calyx tube and distinctly wider than it. **Stamens** 6–8 mm long, all the outer ones fertile; anthers versatile, obovate to oblong; cells parallel with longitudinal grooves, all dehiscent; glands large, ellipsoid, dorsal. **Ovary** always inferior, apex slightly convex. **Fruit** easily distinguished from pedicel, cyathiform or  $\pm$  obconic as long as wide or a little shorter than wide excluding the valves, 6–10 mm long, 7–12 mm wide, always without ribs above the middle, nearly smooth, mostly with relatively thin walls and a thin acute or rarely wide rim depressed inwards; disc inconspicuous; operculum scar slightly depressed all round, 2 mm wide; capsule 3–4 loculi; valves  $\pm$  included or partly exserted. **Fertile seeds** irregular in outline, 4–6 angulate or  $\pm$  semicircular, turgid or irregularly compressed, margins of the wing  $\pm$  round; wings acute with the margins  $\pm$  obscurely denticulate faces finely striated and cross hatched 1.1–1.45 mm long, 0.8–1 mm wide; hilum small, subbasal. **Seedling** glabrous; lignotuber small or none; cotyledons about twice as wide as long, usually bilobed about the centre; leaves arranged in pairs for about 6–7, narrowly elliptically oblong or elliptical to narrowly ovate, obtuse, cuneate, conspicuously petiolate, discoloured. **Juvenile foliage** glabrous, subopposite, ovate or fully elliptical, acute, sometimes apiculate or very shortly acuminate about (6.5  $\times$  3.5)–(15  $\times$  5.5) cm.

**Type:** Timor: 20.8 km S of Dili on road to Maubisse, 8°38'S 125°37'E, Aug 1971, Turnbull 210 (FRI, holotype).

**Habitat:** On the mountains usually above 500 m of the Indonesian Islands of Timor, Wetar, Flores, Lamblem and Alar. Seed has been distributed under the names of *Eucalyptus 'decaisneana'* and *Eucalyptus 'alba'* for cultivation mainly as a timber source to many parts of the tropical world.

**Timor:** Bioba,  $\pm$  1400 m, Mar 1939, *Bloembergen* 33; Eban,  $\pm$  800 m, Mar 1924, *Therik* 15; Koeamoea,  $\pm$  800 m, Mar 1924, *Fangidoe* 3; 5 km W of Eban, N of Soe, 1230 m, Aug 1968, *Larsen* 32; Moetis Ra., Fatoe Emnasi Forest Reserve,  $\pm$  1400 m, Apr 1937, *de Grijp* (4 sheets); Fatoe Emnasi,  $\pm$  1500 m, Feb 1938, *Mas Nasiran* 7; Kipeana  $\pm$  1300 m, Mar 1939, *Bloembergen* 37, 37a; Mar 1939, *Bloembergen* 38, 38a, 38b, 39; Bisila 1200 m, Sep 1933, *Damanoe* 25; Hole Kenoetoe,  $\pm$  1000 m, Mar 1939, *Bloembergen* 40; Saeo, 1020 m, Feb 1927, *Toengga*; ca 10 km from Ermera towards Bobenaro, 1140 m,



Jul 1963, *Larsen*; ca 35 km from Dili towards Ermera, 540 m, Aug 1968, *Larsen* 39; near Dili, 480 m, July 1963, *Jacobs* T11, 12 km from Dili towards Maubisse, 600 m, Jul 1968, *Larsen* 11 and 18; 14 km from Dili towards Maubisse, 720 m, Jul 1968, *Larsen* 14; 21 km from Dili towards Maubisse, 960 m, Jul 1968, *Larsen* 15; 25 km from Dili towards Maubisse, 1140 m, Jul 1968, *Larsen* 16; 26 km from Dili towards Maubisse, 1140 m, Jul 1968, *Larsen* 17; 28 km from Dili towards Maubisse, 960 m, Jul 1968, *Larsen* 2; ca 35–40 km from Dili towards Maubisse, 1200 m, Jul 1968, *Larsen* 4; S of Dili near Aileu, 900 m, Jul 1963, *Jacobs* T9; near Aileu, 660 m, Jul 1963, *Jacobs* T10; between Aileu and Maubisse, 1200 m, Jul 1963, *Jacobs* T14; near (N of) Maubisse, 1200 m, July 1963, *Jacobs* T8; Maubisse on road to Turisca, 1410 m, Jul 1968, *Larsen* 7; divide between Maubisse Turisca, N facing slope, 1500 m, Jul 1963, *Jacobs* T2; Turisca, 1530 m, Jul 1963, *Jacobs* T1; near (SW of) Maubisse, 1800 m, Jul 1963, *Jacobs* T6; near Hato, about SW of Maubisse towards Ainaro 2100 m, Jul 1963, *Jacobs* T5; Mt Tatamailu, ca 2400 m, Jan 1954, *van Steenis* 18434, 18435; Mt Tatamailu, 2600 m, Jan 1954, *van Steenis* 18436; Mt Tatamailu, 2800 m, Jan 1954, *van Steenis* 18410, 18430, 18488; Mt Tatamailu, ca 2900 m, Jan 1954, *van Steenis* 18455; Mt Tatamailu, summit 2950 m, Jan 1954, *van Steenis* 18462; above halfway between Maubisse and Betano 1380 m, Jul 1963, *Jacobs* T4; Mt Mundo Perdido, ascent from Ossu 700–1000 m, Dec 1953, *van Steenis* 18242. **Wetar.** Laroe Leng Forest, 1000 m, Jul 1924, *Sastrodihardjo* 13, 14; Kali M. Lera, N of Ilwaki 900 m, Apr 1939, *Bloembergen* 110 and 112. **Flores.** Mt Lewu Tobi, Hokeng, 420 m, Jul 1968, *Larsen* 30; Maumere, Egon Mtns, 600 m, Sep 1936, *de Voigd* 2804, 2805; Oct 1936, *de Voigd* 1 and 2; Mt Egon,  $\pm$  1703 m, Jun 1923, *Sastrodihardjo* 8; Leivowerang,  $\pm$  700 m, Feb 1927, *Djawa* 123; Mt Larantoeha, *Teijsmann* H.B. 7952. **Lomblen.** Leivo Lera,  $\pm$  600 m, Jun 1924, *Sastrodihardjo* 4; Leve Wehe,  $\pm$  940 m, Jun 1924, *Sastrodihardjo* 5. **Alor.** Kaka,  $\pm$  500 m, Aug 1924, *Sastrodihardjo* 32; Pido, 1350 m, Jul 1924, *Sastrodihardjo* 27; Sigeker, 1100 m, Feb 1922, *Sastrodihardjo* 25; Bare, 960 m, Aug 1924, *Sastrodihardjo* 30.

**Cultivated Plants.** **Malaya:** Cameron Highlands, 1410 m, June 1953, *Tapah in Kepong* FN 69452. **Sumatra:** Tapiannoelli, 10 km N of Siborong, 1100 m, Sep 1931, *Huitema* 133. **Bogor:** Garoet, Leuviliang, Jan 1939, *Kartaatmadja* Ja 4681. **Celebes:** Makassar, *Nasiran*. **Flores:** 34 km E of Ende, 660 m, Jul 1968, *Larsen* 28.

*E. urophylla* differs from *E. alba* Reinw. ex Bl. in that the trees are mostly straight with a  $\pm$  excurrent trunk, brown fissile wood, rough persistent bark, more angular twigs with shorter internodes, narrow caudate acuminate often  $\pm$  falcate discoloured leaves with stomata restricted to the lower surface, shorter petioles, smaller  $\pm$  elliptic coppice leaves and on the whole a thinner, sharper rim to the fruit and more deeply inserted valves.

In the middle part of its altitudinal range on Timor, the rough bark tends to extend well into the crown with only the smaller twigs having smooth deciduous bark. In the upper altitudes about 2000 m and upwards there seems to be a strong tendency for the smooth bark to extend to the larger branches and even to the trunk itself. These "half barked" trees as they would be somewhat fancifully called in Australia are also found where the two species meet and sometimes as strays well below the usual lower limits of the range—in other words in more extreme habitats. These trees have acquired distinctive local names and have been presumed that they are hybrids between the two species. Hybrids undoubtedly occur and at least some of them are intermediate in growth form and timber as well as having leaves  $\pm$  intermediate in form, faintly discoloured, stomata on both surfaces but definitely fewer on the upper surface. *Bloembergen* 38 (bb 27094–5) from a "half barked" tree has leaves, buds, flowers and fruit much more like the general run of *E. urophylla* (and with stomata restricted to the lower surface of the leaf) than his 37–37a (bb 27092; 27093) without fruit from an entirely rough barked tree which has unusually narrow leaves and unusually small buds and flowers. His 31 (bb 27084) from another "half barked" tree with leaves with about  $\frac{1}{4}$  of the stomata on the upper surface and surely represents a hybrid.

On Flores it appears that there is a strong tendency for the smooth bark to extend over the whole tree.



## MISCELLANEOUS NOTES ON AUSTRALIAN PTERIDOPHYTES. I.

By S. B. ANDREWS

Queensland Herbarium, Brisbane

**Blechnum articulatum** (F. Muell.) S. B. Andrews, comb. nov. Based on *Lomaria articulata* F. Muell., *Fragm.* 5:187 (1866). **Type:** Queensland, Head of Mackay River (Tully River), *Dallachy*, MEL 59536 (seen).

Mueller first described the Queensland fern *Lomaria articulata*, distinguishing it from *Lomaria euphlebia* Kunze. The latter is now correctly known as *Plagiogyria euphlebia* (Kunze) Mett. but the former is a species of *Blechnum* as pointed out by E. B. Copeland in his *Ferns of Fiji*: 58 (1929). See also Philip. J. Sci. 38:384 (1929). Baker, in *Synopsis Filicum*: 183 (1868), combined the two under *Lomaria euphlebia* and he was followed by various authors including F. M. Bailey in *Lith. Ferns Qd*: 87 (1892) and *Qd Flora*: 1965 (1902). C. Christensen in *Index Filicum*: 495 (1906) and Domin in *Bibl. Bot.* 85:147 (1913), each combined them under *Plagiogyria euphlebia*. Subsequently in *Suppl. 3* of the *Index Filicum* the combination *Plagiogyria articulata* (F. Muell.) Ching was made, deleting the name of the Queensland fern as a synonym of *P. euphlebia*.

Professor R. E. Holttum kindly located Mueller's specimen of *Lomaria articulata*, at Kew, bearing Ching's label *Plagiogyria articulata*. In a personal communication he states "This is the origin of the reference to *Plagiogyria*; it was simply reported to Christensen who entered it with Ching's name in the third Supplement of *Index Filicum*; there is nothing else published about the transfer.". He continues, "The specimen most certainly represents a species of *Blechnum* (*Lomaria*). It has exactly the indusia of *Lomaria* and also similar sporangia; spores are monolete and smooth; perhaps they are young". I found the spores on mature plants to be verrucate.

I have examined the holotype and other specimens kindly sent on loan by the Director of the Royal Botanic Gardens and National Herbarium, Melbourne in addition to specimens held in the Queensland Herbarium.

A description will be included in the forthcoming Handbook to the Ferns and Fern-allies of Queensland.

**Christella subpubescens** (Bl.) Holtt. 'Keffordii' comb. nov. Based on *Aspidium molle* Sw. forma *keffordii* F. M. Bail., *Qd Agric. J.* 20:242 (1908).

*Aspidium truncatum* (Poir. in Lam.) Gaud. var. *keffordii* (F. M. Bail.) F. M. Bail., *Compreh. Cat. Qd Pl.*: 645 (1913).

I have examined the type of the above and found it to belong to *Christella subpubescens* (Bl.) Holtt. It is not a forma or variety in the sense of the International Code of Botanical Nomenclature but rather a cultivar, although collected in the wild.

As a preliminary to the publication of a checklist and handbook of the ferns and fern-allies of Queensland, the following new combinations are made.

**Crypsinus simplicissimus** (F. Muell.) S. B. Andrews, comb. nov. Based on *Polypodium simplicissimum* F. Muell., *Fragm.* 7:120 (1870); 156 (1871). **Type:** Queensland, mountains near Rockingham Bay, *J. Dallachy* (not seen).

**Ctenopteris fuscopilosa** (F. Muell. & Bak.) S. B. Andrews, comb. nov. Based on *Polypodium fuscopilosum* F. Muell. & Bak., *J. Bot.* 163 (1887). **Type:** Queensland: Bellenden Ker Range, *Sayers & Davidson* (not seen).

**Ctenopteris gordonii** (Watts) S. B. Andrews, comb. nov. Based on *Polypodium gordonii* Watts, *Proc. Linn. Soc. N.S.W.* 39:792 (1915). **Type:** Queensland: Tully Falls, *Watts & Gordon* (not seen). Isotypes BRI 182219, BRI 114724 (seen).

**Ctenopteris maidenii** (Watts) S. B. Andrews, comb. nov. Based on *Polypodium maidenii* Watts, *Proc. Linn. Soc. N.S.W.* 39:793 (1915). **Type:** Queensland: Evelyn Scrub, *R. F. Waller* (not seen).

**Ctenopteris walleri** (Maiden & Betche) S. B. Andrews, comb. nov. Based on *Polypodium walleri* Maiden & Betche, *Proc. Linn. Soc. N.S.W.* 35:799 (1910). **Type:** Queensland: Herberton District, *F. Waller* (not seen). Isotype: BRI 182218 (seen).

**Microsorium superficiale** (Bl.) Ching var. **australiense** (F. M. Bail.) S. B. Andrews, comb. nov. Based on *Polypodium superficiale* Bl. var. *australiense* F. M. Bail., *Qd Bull.* 13 (Bot. Bull. 4) 21 (1891). **Type:** Queensland: Atherton, *C. J. Wild* BRI 182653 (seen).

**Oenotrichia dissecta** (C. T. White & D. A. Goy) S. B. Andrews, comb. nov. Based on *Leptolepia dissecta* C. T. White & D. A. Goy, *Vict. Nat.* 54:149 (1938). **Type:** Queensland, Mt. Spurgeon. C. T. White BRI 26561 (seen).

The above combination was listed in Check List N. Qd Ferns, N. Qd Nat. Club, Publ. No. 3:5 (1946). There is no indication there that a new combination was intended or of the name(s) of the author(s) making the change. There is no reference to the basionym or place of publication of a description or diagnosis of the fern. It seems to me very doubtful that the new combination was validly published in the place cited (or anywhere else as far as I can trace) and therefore make it above.

**Pteridium semihastatum** (Wall. ex Ag.) S. B. Andrews, comb. nov. Based on *Pteris semihastata* Wall., *List*: no. 102 (1829), nomen nudum; Agardh, *Rec. Pterid.* 48 (1839). **Type:** Singapore (not seen).

## NOTES ON SOLANUM (SOLANACEAE) IN AUSTRALIA

By R. J. F. Henderson

Queensland Herbarium, Brisbane

### Summary

*Solanum callium* sp. nov. ( $2n=48$ ) occurs in north eastern New South Wales and south eastern Queensland. Typification of *S. villosum* Miller, *S. americanum* Miller and *S. gracile* Dunal is discussed.

*Solanum callium* C. T. White ex R. J. F. Henderson, species nova *S. superficiali* Adelbert affinis sed floribus paucioribus magnioribus, in inflorescentia supra-axillari portatibus, fructibus magnioribus in pedicellos longiores nutantes portatibus, foliis papyraceis tenuioribus differt. **Typus:** 28° 27'S, 152° 42'E; ca 35 km NW of Kyogle, New South Wales, Dec 1968, *Henderson* H489 (flowers) (holotypus BRI 178893, isotypus BRI 178894, isotypi distribuendi K, NSW, CANB); 28° 18'S, 152° 55'E, Levers Plateau, Qld/N.S.W. border, ca 90 km SSW of Brisbane, Apr 1972, *Henderson* H1289 (fruits) (paratypi BRI 198961/2, isoparatypi distribuendi K, NSW, CANB).

Frutex inermis, usque ad 5 m altus; caules glabri usque ad 5 cm diam. Folia solitaria vel aliquando bina (ubi subaequalia vel disparia), anguste lanceolata vel anguste elliptica, utrinque opacoviridia sed subtus leviter pallidiora; in planta viva textura papyracea, margine  $\pm$  undulata, et nervis lateralibus subtus elevatis, in speciminibus siccis textura tenuiter papyracea (paene membranacea) et nervis praecipuis tenuibus et  $\pm$  utrinque similibus; apice acuta, basi cuneata in petiolum angustata; supra glabra, infra glabra praeter pilis simplicis paucis secus costam et venas principales vel tantum in junctura costae venis primariis vel omnino decalvata, guttis numerosis minutis  $\pm$  elevatis opacis saepe praeditis; lamina (2.5-)8-16(-23.5) cm longa, (1.3-)3-6(-8.5) cm lata; petiolus 0.5-4 cm longus. Inflorescentiae supra-axillares, cincinnorum simplicium (vel raro compositorum ordinis primi), floribus ca 9(-15 vel -30 ubi pedunculum furcatum) sed flores plerumque cadentes cicatrices conspicuae pedunculis relinquentes; pedunculi simplices (vel raro 1-furcati) erecti vel ascendentes, 0.5-1 cm longi ad florescentiam in fructo usque ad 3 cm longi; rhachis recurva, internodiis condensatis; pedicelli usque ad 1 cm, usque ad 3 cm longi post florescentiam elongati et in fructo nutantes, expansi abrupte apicem versus sed subtus fructum  $\pm$  constricti. Calyces ad florescentiam campanulati, in fructo applanati fructus subtendentes; tubus brevis, ca 2 mm longus; lobi  $\pm$  semicirculares, obtuse, 0.4-1 mm longi, 1.4-1.6 mm lati. Corollae albae; tubus 2-3 mm longus; lobi ovati-lanceolati, venatione reticulata conspicua, acuti, ca 5-7 mm longi, 3-4 mm lati, glabri, aliquantum coriacei, apicem versus cucullati papilloso. Ovarium glabrum, stylus rectus, 5-6 mm longus, 2-3.5 mm antheras excedens. Stamina 3-4 mm longa; antherae 2.6-3.7 mm longae, atro-aurantiacae, in ambitu ellipticae. Pollina (19-)20-24  $\mu$  diam. Baccae 1-5 in infructescentiis omnis, globosae, atro-aurantiacae, polyspermae, carnosae, aliquantum nitidae, 1-1.5(-2) cm diam.; semina oblique reniformia, plana, 3-4 mm longa, 2-3 mm lata, straminea. Chromosomatum numerus  $2n=48$ .

Shrub without prickles, up to 5 metres tall; stems slender, glabrous, up to 5 cm diameter. Leaves solitary or sometimes two together (where sub-equal or unequal in size), narrowly lanceolate or narrowly elliptic, on both sides dull green but slightly paler below, in the living plant thin textured, the margins  $\pm$  undulate and the lateral nerves raised on the undersurface, in dried specimens papyry textured (almost membranous) with main nerves fine and  $\pm$  similar on both surfaces; apex acute; base cuneate, drawn out narrowly along the petiole;





upper surface glabrous, lower surface glabrous except for a few simple hairs alongside the midrib and principal nerves or only at the junction of midrib and principle nerves or becoming completely glabrous, often marked with numerous minute  $\pm$  raised opaque spots; lamina (2.5–)8–16(–23.5) cm long, (1.3–)3–6(–8.5) cm broad; petiole 0.5–4 cm long. Inflorescences supra-axillary, of simple (or rarely first order compound) cincinnal cymes, *ca* 9 (–15 or –30 when peduncle branched)–flowered, but flowers mostly caduous leaving conspicuous scars on the rhachis; peduncle simple (or rarely once forked), erect or ascending, 0.5–1 cm long in flower, to 3 cm long in fruit; rhachis recurved, internodes condensed; pedicels to 1 cm in flower, in fruit to 3 cm long, nutant, abruptly thickened towards the top but somewhat constricted under the fruit. Calyx in flower campanulate, in fruit flattened and subtending the fruit; tube short, *ca* 2 mm long; lobes  $\pm$  semi-circular, obtuse, 0.4–1 mm long, 1.4–1.6 mm broad. Corolla white; tube 2–3 mm long; lobes ovate-lanceolate, conspicuously reticulately veined, acute, *ca* 5–7 mm long, 3–4 mm broad, glabrous, coriaceous, at the tip cucullate, papillose. Ovary glabrous; style straight, 5–6 mm long, exceeding the tips of the anthers by 2–3.5 mm. Stamens 3–4 mm long; anthers 2.6–3.7 mm long, dark golden yellow, elliptic in outline. Pollen (19–)20–24  $\mu$  across. Berries 1–5 in each infructescence, globose, orange-yellow, many seeded, fleshy, somewhat shining, 1–1.5(–2) cm in diameter; seed obliquely reinform, flat, 3–4 mm long, 2–3 mm across, stramineous. Chromosome number  $2n=48$ .

This species appears to belong to *Solanum* subgenus *Solanum* section *Leiodendra* Dun. (Dunal, Sol. Syn. 20:1816).

QUEENSLAND. **Moreton District:** Riverview, Mar 1957, *Philp* 57/217 (BRI); Levers Plateau on Qld/N.S.W. border, *ca* 90 km SSW of Brisbane, Apr 1972, *Henderson* H1289, H1300 (BRI). NEW SOUTH WALES. **North Coast:** Lismore, Feb 1891, *Bauerlen* NSW 72067 (NSW); Alstonville, Nov 1910, Apr 1913, *Tomlins* NSW 72070, NSW 72071 (NSW); Marshall Falls, Alstonville, Dec 1911, *Tanner* 65 (NSW); Sandiland Ranges, Nov 1904, *Boorman* NSW 72072 (NSW); Toonumbar, near Kyogle, Mar 1944, *C. T. White* 12557 (BRI), Dec 1946, *Hayes* (BRI); Toonumbar State Forest, Apr 1947, *Constable* NSW 71565 (NSW); Whian Whian, near Lismore, Jun 1945, *C. T. White* 12855 (BRI), Mar 1966, *W. T. Jones* 3166 (BRI); Mount Glennie slopes, Macpherson Range, Jan 1953, *Constable* (BRI); 28° 27'S, 152° 42'E, *ca* 20 miles NW of Kyogle, Dec 1968, Feb 1972, *Henderson* H489, H1259 (BRI).

Specimens from the National Herbarium of New South Wales, Sydney, have been examined through the courtesy of the then Director, Mr. K. Mair. They are designated by (NSW) in the citations above.

This species was recognized by C. T. White, a past Government Botanist in the Queensland Herbarium, and was tentatively named *S. callium* and described in manuscript by him. The name remained unpublished since his death in 1950 and only now is published in the light of my researches and promising results obtained from chemical analyses carried out on the plant by Prof. J. Swan and colleagues at Monash University, Melbourne (*Bird et al.*, 1976). Though the epithet "callium" was proposed by White, the description above is solely mine. It is probably derived from the Greek Καλλος (*Kallos*) meaning beauty, probably an allusion to the fine stature and appearance of the plant.

*S. callium* is very closely related to *S. superficiens* described from Java and southern Sumatra in Indonesia, and when that species is better known, may be found to represent only a subspecies of it. I have received on loan through the courtesy of the Director, Rijksherbarium, Leiden, the holotype and paratypes cited by Adelbert (1948) and three other specimens subsequently identified as *S. superficiens* but not by Adelbert. These latter three are so different from the rest that they appear to be misidentified.





Plate 2. A paratype of *Solanum callium* C. T. White ex R. J. Henderson.



Of the six type sheets, the holotype (*Smith* 641) is atypical of the set in a number of characteristics (and is noted as such in two instances in the protologue by *Adelbert*), though they all possibly belong to the one species. Our plants are morphologically most like the holotype specimen (unfortunately only in very young bud and with only two fruits) but differs from it principally in the fewer flowers in supra-axillary usually simple cincinnal cymes, in the fruiting stage often leaf opposed or at least well away from the leaf axils, the larger fruits on longer, pendulous pedicels and the thinner textured leaves. On the little evidence available, *S. callium* may have a different flowering period from *S. superficiens* (flowers December–March, fruits February–June in *S. callium*; in buds and fruits in September in *S. superficiens* (type)) though the geographic distance and differences in latitude separating them perhaps make comparisons unwarranted. *S. callium* seems to differ from *S. superficiens* also in chromosome number. From mitoses in anther tissue (voucher H489, BRI 178893/4) I have established a somatic chromosome number of 48 in our species whereas *Gerasimenko* and *Reznikova* (1968) record  $2n=24$  for *S. superficiens*. However, I have not examined any vouchers for the identity of their material grown from seed from Bogor, Java (*Vilar* accession No. 36212).

The similarity of *S. callium* material to certain specimens of *Solanum* from Mexico and Central America in NSW was pointed out to White by the late Mr. R. H. Anderson of the New South Wales National Herbarium. This may have accounted for White's failure to proceed with formal description of his material but on examination of the specimens referred to by Anderson, I find that though a close similarity does exist with one of them (*Pringle* 6837 [NSW 85255] from Barranca near Cuernavaca, Mexico, identified as *S. triste* Jacq. but most likely a specimen of *S. nudum* H.B.K. ex Dun. or *S. antillarum* O. E. Schulz) our plant differs significantly from it in a number of characters especially the fewer larger flowers, the longer anthers with larger pollen grains ( $15-20\ \mu$  across in *Pringle* 6837,  $19-24\ \mu$  across in *S. callium*), the lack of branched hairs on the leaves and the glabrous ovary. Our plants fit neither description of the above species in D'Arcy's account of Solanaceae in Panama (D'Arcy, 1974) and Dr. D'Arcy, who has seen material of our plant, states (in correspondence) that it does not resemble anything he has seen from Central or northern South America. Mr. D. Blaxell, who at my request compared duplicates of my collections (sent as *S. superficiens*) in K and ones sent to K by C. T. White (as *S. callium*, C. T. White 12855) with holdings of *Solanum* at BM stated in correspondence that "there is nothing in the BM Caribbean material which even remotely resembles the *S. superficiens* from Australia". The type specimen of *S. nudum* (P, not seen; IDC 6209-2.61 : I.5) appears to have shorter broader more thickly textured leaves and smaller fruit on shorter pedicels than in our plant. I have not seen any of the syntypes of *S. antillarum*.

The origin of *S. callium* remains in some doubt. Because of its similarity to *S. superficiens* and to other species of *Solanum* from Central America, its relatively restricted distribution and the lack of any seemingly closely related Australian species, it might be considered an introduction of unknown origin that has been able to persist in certain habitats in northern New South Wales and southern Queensland. If this is in fact the case, it may have been described previously. On the other hand, where seen in the field, *S. callium* occurs in small but definite populations, usually only on north-facing slopes at altitudes above about 500 m, in essentially undisturbed rainforest margins and clearings which show few, if any, signs of incursion by naturalized

weedy species. It seems as much a part of the natural vegetation as the native *S. aviculare* Forst. f. does in such habitats. If introduced, it has not, in the three quarters of a century or more it has been here, spread as might be expected of a persistent weedy introduction in such habitats with high moisture supply, moderate temperatures, fertile soils and abundant available light.

Its occurrence as late as 1957 at Riverview (presumably in the largely settled area between Ipswich and Brisbane where the habitat would be most atypical for *S. callium*) is inexplicable. If label data has been correctly interpreted, it may point to the species being introduced. However, cuttings grown in the glasshouse and later transplanted outdoors in Brisbane failed to prosper and died quite rapidly.

The species most likely to be confused with *S. callium* in Australia are *S. aviculare* Forst. f. and its allies (including *S. vescum* F. Muell. and *S. linearifolium* Herasimenko), *S. pseudocapsicum* L. and perhaps *S. viride* R.Br. From the former group it is clearly distinguished by its pure white flowers and light green entire leaves and stem tips (as opposed to lilac to purple flowers and dark green to purplish stems and usually conspicuously lobed leaves at least in the first two species). *S. viride* from North Queensland is distinguished from it by the lilac flowers in large usually compound cymes with petals always stellate pubescent on the outer surface and the smaller pisiform fruit. *S. pseudocapsicum*, an introduced, widely naturalized species with white flowers and orangy-red fruits, is much smaller in stature (in Australia rarely attaining more than 1.5 m in height) and has only one or two flowers per inflorescence each succeeded by a fruit about 1.5 cm across but borne on an erect pedicel and subtended by a calyx with subulate lobes.

***Solanum villosum* Miller, Gard. Dict. ed. 8 : no. 2 (1768).**

In my recent account of this and related species in Australia (Henderson, 1974 p. 54), I misquoted details regarding the nomenclatural type of the above species. There is a sheet with a specimen of *S. villosum* in the British Museum (Natural History) to which I referred, which carries the following labels:—

- (a) A rectangular label on which is written by an unknown hand "692. *Solanum officinarum* acinis puniceis C.B. 166. 1735". [C.B. 166=Caspar Bauhin, *Pinacis Theatri Botanici* etc. p. 166, 1623. This specimen 692 was grown and collected in 1735. See also Britten, 1913].
- (b) A printed label attached to (a) stating "Plants from Chelsea Physick Garden sent to the Royal Society in accordance with Sir Hans Sloane's Deed of Conveyance to the Apothecaries Company 1722-96."
- (c) A label on which is printed "Type Specimen" and carrying the following handwritten unsigned notation:  
"Solanum officinarum, acinis puniceis of Miller, Chelsea Garden 1735, which became *Solanum villosum* (non L.) Miller Dict. no. 2, 1768".
- (d) An annotation pencilled in an unknown hand  
"..... *miniaturum* Bernh.  
*Solanum villosum* Mill. Dict no. 2!"

In addition the sheet is stamped "Chelsea Garden" on the reverse.

This specimen is obviously therefore not from Miller's herbarium as I stated but one of the specimens sent from the Chelsea Physic Garden under Sir Hans Sloane's Deed of Conveyance during Miller's time there. In spite of this, it need not necessarily be excluded from consideration as type of a Miller name as Britten (1913) would have all such specimens.

Dr. W. T. Stearn of the British Museum (Natural History) stated (per. comm.) that these specimens are an indication of plants growing in the Chelsea Physic Garden during Miller's curatorship and as such warrant careful consideration when seeking to typify Miller's species names (see also Stearn's published comments to Barclay regarding typification of Miller's *Datura* names (Barclay, 1959) and Stearn, 1972).

Miller stated in the preface to the seventh (1759) edition of his Dictionary that "... here it is but doing Justice to the Work, to observe, that the Descriptions given of the Plants are not copied from Books, but are taken from Nature. The far greater Number are from the growing Plants, which the Author has under his Care, and the others are from dried Samples, which are well preserved; of which he has, perhaps, as large a Collection as can be found in the Possession of any private Person." There is no reason to doubt that the same applied to edition eight and for that matter any of the earlier editions of his Dictionary.

Thus, nomenclatural types of Miller's names are specimens (if such exist) and not illustrations or plates (or specimens on which these were based) or descriptions in the works of other authors.

Specimens in Miller's own herbarium are of first consideration for in his own (printed) words, these could have been the actual specimens from which his descriptions were drawn up.

Miller's specimens in the Sloane herbarium are of second consideration for these are of plants grown under his care which according to Dandy (p. 167) and Britten (p. 134), Sloane stated were "gathered, dried and fastened by Miller". There is however, no certainty that they formed the basis for the description in his dictionaries.

Of third and perhaps least importance are the Chelsea plants sent at Sloane's direction to the Royal Society during Miller's time there (i.e. up to no. 2400 which was transmitted in 1769). There is no guarantee that Miller actually saw these particular plants but at least they are of plants grown in the Garden under his care which he said formed the principal basis for his descriptions.

Britten (1913) detailed the history and fate of the Miller herbarium which is now housed in the general collection of the British Museum (Natural History).

With regards typification of *S. villosum*, I believe there is no specimen labelled as such or as *Solanum officinarum*, *acinis puniceis* from the Miller herbarium in BM. According to Mr. D. Blaxell, there are no specimens labelled with either of the above names in the Sloane Herbarium either. Chelsea plant 692 above now comes under consideration for typification of *S. villosum*. It is labelled as *Solanum officinarum acinis puniceis* and was collected in 1735. In edition 2 of Miller's Dictionary (1733), the second species dealt with under *Solanum* was *Solanum officinarum acinis puniceis*. It seems logical to believe that the identification of a Chelsea Garden specimen collected only two years after the appearance of the Dictionary would have been correct. It is not discordant with the protologue description.

Strictly speaking this specimen can only be chosen as lectotype if it is certain that Miller actually saw the specimen (ICBN: Guide for the Determination of Types 4a). Since this will never be known, it is probably more precise to designate it as a neotype. I here reaffirm selection of this specimen as type but redesignate it neotype.

***Solanum gracile*** Dunal in DC., Prodrumus 13 (1):54 (1852).

With respect to Australian plants identified as *S. gracilius* Herter in my previous account (Henderson, 1974), typification of Dunal's *S. gracile* was critical. In my paper, published on 2 September 1974, I nominated a specimen grown in the Montpellier Gardens and preserved in the De Candolle herbarium as lectotype (IDC 800-61.2063:III.7). In his account of Solanaceae for the Flora of Panama, issued on 3 July, 1974, D'Arcy cited as type of *S. gracile* Dunal, "Hort. Monsp. 1831 (MPU)", without any explanation as to what kind of type this specimen was or any discussion on the material.

In the protologue to *S. gracile* (excluding *S. gracile* var. *microphyllum*) Dunal cited five specific herbarium collections (four in "h. Mus. Paris" (=P) and one in "h. DC."), and stated that the species was grown from seed "in hort. Monsp. et Genev." He further stated at the end of the species description that he had studied dried material "in h. DC. h. Mus. Paris-" and had seen living plants. Dunal cannot be credited with nominating a holotype (citation of "hort Berol. e sem. hort. Monsp". after the name is merely an indication of the origin of the name, a fact which is verified by a note on one of the syntypes in G-DC (Henderson, 1974 p. 48)). All specimens cited and referred to in the protologue are therefore syntypes. I cannot see that any herbarium material in MPU whether collected, labelled or determined by Dunal can strictly qualify for syntype status. At best they may be proved to be iso-syntypes.

The 1972 International Code of Botanical Nomenclature (ICBN)—Guide for Determination of Types states under 4a that "a lectotype must be chosen from among elements that were definitely studied by the author up to the time the name of the taxon was published *and included in the protologue*" (*italics mine*), and under 4c that "... If no holotype was designated by the original author and if syntypes exist, one of them must be chosen as the lectotype" (see also Article 7).

For these reasons I reject D'Arcy's citation as an incorrect citation of the type of *S. gracile* Dunal. This may seem trivial since D'Arcy (*l.c.*) synonymized *S. gracile* Dunal (and *S. douglasii* Dunal) under *S. nigrescens* Mart. & Gal. in his account. From my experimental work (Henderson, *l.c.*) living plants of *S. douglasii* (as typified by the holotype in G-DC) and those of *S. gracilius* (= *S. gracile* as typified by my previous lectotypification) are clearly of morphologically distinct species and can be distinguished even in the dried state. I have stated why I do not accept *S. nigrescens* for plants of *S. douglasii*.

In addition, D'Arcy (1974b) formally described specimens of plants cultivated in New Zealand, as *S. americanum* var. *baylisii* and indicated that this is the taxon that Baylis in 1958 considered was *S. gracile* Dunal. From his protologue they appear identical with ones I grew from seed sent from Professor Baylis as *S. gracile* (BRI) which I considered were conspecific with Dunal's species (as Baylis did) and the specimen selected by me as lectotype of *S. gracile* Dun. The characteristics given by D'Arcy to distinguish his variety from *S. americanum* var. *americanum* are well within the normal range of variation of *S. gracilius*. I therefore treat *S. americanum* var. *baylisii* as a synonym of *S. gracilius*.

***Solanum americanum*** Miller, Gard. Dict. ed. 8 : no. 5 (1768).

In my recent account of *S. nigrum* and related species in Australia, I considered Australian plants of *S. nodiflorum* Jacq. subsp. *nodiflorum* were taxonomically distinct from those of *S. americanum* as lectotypified by Edmonds (1972). My reasons for this were fully explained.

D'Arcy (1974a, 1974b) apparently ignored Edmond's lectotypification of *S. americanum* for he cited as type "authentic specimens Herb. Sloane 295, 14", without any discussion or comment.

The ICBN-Guide for the Determination of Types (1972) states under 4f that "the first choice of a lectotype must be followed by subsequent workers unless the original material is rediscovered, or unless it can be shown that the choice was based upon a misinterpretation of the protologue, or if the choice was made arbitrarily (e.g., by a mechanical system) and without understanding of the group concerned."

From the protologue to *S. americanum* it is impossible to say conclusively that Edmond's lectotypification was incorrect under any of these categories and therefore cannot be set aside. As stated previously the material in Miller's own herbarium is of first consideration in typification of Miller's names, that in the Sloane herbarium is of secondary consideration. I therefore reject D'Arcy's citation of the type as being incorrect.

### Acknowledgements

I wish to acknowledge the assistance received from Mr. D. F. Blaxell of the National Herbarium of New South Wales (NSW) while Australian Botanical liaison officer at Kew (K) in 1974/75. Mr. Blaxell compared specimens and supplied promptly photocopies of protologues and relevant literature. Mr. D. McGillivray, also of NSW, kindly arranged for photocopies of certain protologues while Liaison officer at K in 1968/69. Mr. D. Symon (ADW) and Mr. L. Pedley (BRI) also kindly compared specimens of *S. callium* with specimens in K at my request and commented on their findings.

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## THE DELETION OF PENTAPANAX SEEM. FROM THE FLORA OF AUSTRALIA

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### Summary

The two Queensland species currently referred to *Pentapanax* are shown to be members of *Polyscias*. Appropriate new combinations are made: *Polyscias willmottii* (F. Muell.) Philipson and *Polyscias bellendenkerensis* (F. M. Bailey) Philipson.

The genus *Pentapanax* Seem. (Araliaceae) is currently considered to occur in South America, India, China, South-east Asia and Taiwan, with an outlier on two volcanic peaks in east Java, and in addition two species attributed to this genus occur in Queensland. Hutchinson (1967) proposed a more restricted application of the genus, reviving *Coudenbergia* Marchal. for the South American species, and erecting a new genus, *Parapentapanax* Hutch., to include species with their flowers arranged racemosely. The position of the two Queensland species, however, was not affected.

*Pentapanax* is placed in the Aralieae, a Tribe characterized by the imbricate arrangement of the petals when in bud. Indeed, *Pentapanax* is closely related to *Aralia* L. from which it differs principally by having the style arms united into a column. The importance of the aestivation of the corolla in subdividing the family has long been recognized and is still upheld.

The first Australian species attributed to *Pentapanax*, *P. willmottii* F. Muell., was described from material which bore fruit but neither petals nor stamens, and when the Queensland Flora (Bailey, pt 2, 1900) was published, no further information appears to have been available. A second species, *P. bellendenkeriensis* F. M. Bailey, was also described from fruiting material. So far as can be ascertained, no information about the corolla of either Australian species has been published, so that the attribution to *Pentapanax* could be no more than tentative. In view of the disjunct distribution, and the atypical facies of the two Queensland species, collections of flowering material of both species were borrowed from the Queensland Herbarium and carefully examined. It was evident by dissection that the petals were valvate in bud, and this was confirmed by examining serial sections of the corolla-buds. No trace of overlapping of the margins of the petals occurred. In the light of this additional evidence the position of the two species in *Pentapanax* can no longer be upheld. Indeed, they must be placed in another Tribe, the Schefflereae, where they agree in every respect with the genus *Polyscias* Forst. (in the broad sense of Bernardi, 1971: in a narrower sense they

would come within the genus *Kissodendron* Seem.). Their geographical distribution and general facies are in accord with this, as are such technical characters as the pinnate (or bi-pinnate) leaves and the articulated pedicel. The necessary new combinations follow:

**1. *Polyscias willmottii* (F. Muell.) Philipson, comb. nov.**

*Pentapanax willmottii* F. Muell., Australas. J. Pharmacy, 2:125 (1887);  
F. M. Bailey, The Queensland Flora: 2:730 (1900).

**2. *Polyscias bellendenkerensis* (F. M. Bailey) Philipson, comb. nov.**

*Pentapanax bellendenkeriensis* F. M. Bailey, Queensland Agric. J. 15:491 (1904); and in Meston, A, Queensland Dept. Agric. Report of Govt. Expedition to Bellenden-Ker Range, (1904).

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## NOTES ON LEGUMINOSAE. I.

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### Summary

The species known generally as *Acacia ligulata* is a subspecies of *A. bivenosa* DC. and the combination *A. bivenosa* subsp. *wayi*, based on *A. salicina* Lindl. var. *Wayae* Maiden, is made. *A. bivenosa* subsp. *bivenosa* and subsp. *wayi* are not sharply differentiated. *A. elliptica* A. Cunn. ex Benth. and *A. bivenosa* var. *borealis* Hochr. are synonyms of *A. bivenosa* subsp. *wayi*. *A. mimula* Pedley is a new name for *A. propinqua* Pedley non A. Rich. *A. dissonaura* F. Muell. is a synonym of *A. dineura* F. Muell.

*Prosopis glandulosa* Torr., *P. juliflora* (Sw.) DC., *P. juliflora* (Sw.) DC.  $\times$  *P. velutina* Woot. and *P. limensis* Benth. are naturalized in Australia. A key to distinguish them is given.

A key to the five species of *Lysiphyllum* found in Australia is provided. New combinations are *L. carronii* (F. Muell.) Pedley based on *Bauhinia carronii* F. Muell., *L. hookeri* (F. Muell.) Pedley, based on *B. hookeri* F. Muell., and *L. gilvum* (F. M. Bailey) Pedley based on *B. cunninghamii* Benth. forma *gilva* F. M. Bailey.

*Caesalpinia robusta* (C. T. White) Pedley is a new combination based on *Mezoneuron robustum* C. T. White and *C. subtropica* is a new name for *C. brachycarpa* (Benth.) Hattink non (A. Gray) Fisher.

*Daviesia flava* Pedley and *D. discolor* Pedley are described and distinguished from *D. arborea* W. Hill, *D. latifolia* R.Br. and *D. mimosoides* R.Br. *D. corymbosa* does not occur in Queensland.

A key to the six Queensland taxa of *Mirbelia* is given. *M. speciosa* subsp. *ringrosei* (F. M. Bailey) Pedley, based on *M. ringrosei* F. M. Bailey, is a new combination. *M. confertiflora* Pedley is a new species that has previously been confused with *M. aotoides* F. Muell.

*Stylosanthes sundaica* Taub. is conspecific with *S. humilis* H.B.K. which is naturalized in Queensland.

Three new names in *Tephrosia* are: *T. spechtii* Pedley, *T. rufula* Pedley and *T. benthamii* Pedley based on *T. purpurea* (L.) Pers. var. *axillaris* Baker fil., *T. purpurea* var. *rufescens* Benth. and *T. rosea* F. Muell. ex Benth. var. *angustifolia* Benth. respectively. *T. delestangii* and *T. virens* are described as new.

### MIMOSOIDEAE

#### ACACIA MILL.

##### 1. A note on *A. bivenosa*

The species generally known as *Acacia ligulata* is one of a group of related taxa widely spread in arid and semiarid areas of Australia. In the eastern part of its range it is a well defined species but in the Northern Territory and Western Australia it exhibits a considerable range of variation, complicated in Western Australia by the presence of a number of related species. In an attempt to determine the extent of the variation within the species and to distinguish it from allied species, specimens of the following taxa were examined: *A. bivenosa* DC.,

*A. cupularis* Domin, *A. elliptica* A. Cunn. ex Benth., *A. ligulata* A. Cunn. ex Benth., *A. pallidiramosa* Maiden & Blakely, *A. rostellifera* Benth., *A. salicina* Lindl. var. *wayae* Maiden, *A. scirpifolia* Meisn., *A. sclerosperma* F. Muell., *A. tysonii* Luehm. and *A. xanthina* Benth.

Some of the taxa are well defined, but considerable integrating occurs among others and there are many intermediates. Detailed consideration of all species is beyond the scope of this note, especially as my experience of *Acacia* in Western Australia is more or less confined to the study of herbarium specimens. I am grateful therefore to Mr. B. R. Maslin (PERTH) who has commented on the species of *Acacia* in the vicinity of Shark Bay and on the identity of the types of *A. ligulata* and *A. elliptica* which he examined at Kew. His opinions have been helpful and have influenced me, but I am solely responsible for the treatment of *A. bivenosa* below.

The following key is merely a guide to the identification of the taxa studied:

1. Phyllodes rather thin (not coriaceous), not coarsely wrinkled when dry, rather narrow and elongate, obscurely penninerved, a second longitudinal nerve often faintly developed.  
*A. rostellifera*  
Phyllodes thick, coriaceous, coarsely wrinkled when dry, a second longitudinal nerve developed when phyllode more than (7-)10 mm wide. 2.
2. Phyllodes narrow, thick, uninerved; pod much contracted between and convex over the seeds, valves hard.  
*A. sclerosperma* & *A. scirpifolia*  
Phyllodes broader, not as thick, sometimes with more than one nerve; pods neither convex over seeds nor woody. 3.
3. Phyllodes broad, 2-nerved, yellowish or glaucous; racemes more than 5-branched; flowers large, calyx 1 mm or more long.  
*A. xanthina*  
Phyllodes 1- or 2-nerved, yellowish or glaucous; racemes with fewer than 5 branches or peduncles axillary; the calyx less than 1 mm long. 4.
4. Plants tomentose (hairs spreading); heads always on axillary peduncles. *A. tysonii*  
Plants glabrous or with sparse appressed hairs, heads on axillary peduncles or in axillary racemes. *A. bivenosa*

### *Acacia ligulata*

*A. ligulata* A. Cunn. ex Benth., Lond. J. Bot. 1:362 (1842) **Syntypes:** Dirk Hartog I., Jan 1822, *Cunningham* (K); New Holland, *Fraser* (K, not seen).

I have seen one syntype (*Cunningham*), a fragmentary specimen with less wrinkled and shorter phyllodes than is usual in the plant usually known as *A. ligulata*. It bears two pods and the structure of the inflorescence is difficult to determine. It is apparently a raceme of heads. The label of the specimen lacks the collecting details usually found on *Cunningham*'s specimens and has only a pencilled label "4/323" on one twig. From *Cunningham*'s manuscripts it was found that it was collected on King's 4th voyage on Dirk Hartog Island and should bear the number 326 (Maslin, *in litt.*). I have not seen *Fraser*'s specimen but a specimen labelled "N. Holld. Fraser" determined by Benthham as *A. salicina* was located by Maslin under *A. salicina*. It is probably the other syntype. Maslin has tentatively referred this specimen to *A. rostellifera*, and has suggested that *Cunningham*'s specimen might also be referred to *A. rostellifera* or to a taxon somewhat intermediate between *A. "ligulata"* and *A. rostellifera*.

Benthham (1864) treated *A. ligulata* as a synonym of *A. salicina*. Black (1920) discussed the matter and concluded that *A. ligulata* and *A. salicina* were not conspecific. It is now likely that *A. ligulata* and *A. rostellifera* might be conspecific, though their relationship to *A. bivenosa* is obscure.

### **Acacia bivenosa**

Herbarium material shows variation in three characters, all of which contribute to the general facies of the plant. The characters are: (a) dimensions of phyllodes; (b) number of longitudinal nerves of the phyllode; (c) arrangements of heads, in racemes or single on axillary peduncles.

Narrow phyllodes have a single nerve, broader ones two, or rarely, three; and there is a highly significant correlation between the width of the phyllode and the development of the second nerve. The width at which the transition from 1- to 2-nerved phyllodes occurs is 7–10 mm; that is, phyllodes more than 10 mm wide have two nerves; phyllodes less than 7 mm wide have one; while phyllodes 7–10 mm wide can have one or two nerves. Uni- and binerved phyllodes sometimes occur on one twig.

The arrangement of heads also varies. Plants with narrow phyllodes tend to have heads in racemes, but there is no absolute correlation between the width of phyllodes and the development of racemes. Plants with broad, binerved phyllodes sometimes have racemose heads. Axillary heads and racemes of heads are sometimes found on the one plant. Racemes sometimes grow out into leafy branches so that the peduncles become lateral on vegetative shoots.

Because of the range of variation delimitation of taxa is difficult but, because the variation of one character is correlated with variation of other characters, at least in the majority of cases, and because there is some geographical segregation of combinations of characters it is possible to distinguish two subspecies.

*A. bivenosa* from the north-western coast of Western Australia and what is currently known as *A. ligulata* from western New South Wales have been treated as subspecies. There is clinal variation from south-east to north-west with a distinct steepening of the cline towards the north-west. The recognition of two subspecies may be somewhat artificial but as the zone of intergrading between the two is small it enables all but a small proportion of plants to be referred to one or other of the subspecies.

The subspecies are distinguished as follows:

Phyllodes 2-nerved, 2–5 cm long, (0·7–)0·8–2·2 cm wide, usually less than 3·5 times as long as wide; heads on axillary peduncles more than 12 mm long, or less commonly in axillary racemes, or rarely inflorescences of both types. *A. bivenosa* subsp. *bivenosa*.

Phyllodes usually 1-nerved, 2–10 cm long, 0·3–1(–1·6) cm wide 3–7 times as long as wide; heads in axillary racemes, the branches less than 12 mm long. *A. bivenosa* subsp. *wayi*.

**Acacia bivenosa** DC., Prod. 2:452 (1852), Leg. Mem. 448 (1827) ("binervosa").

**Type:** Nouv. Hollande côte orient., Mus. de Paris, 1821 (G-DC, holo; BM, iso)

*A. elliptica* A. Cunn. ex Benth., Lond. J. Bot. 1:347 (1842) **Lectotype:** Bay of Rest, Feb  $\frac{158}{1818}$ , Cunningham (K)

*A. bivenosa* DC. var *borealis* Hochr., Candollea 2:376 (1925). **Type:** Broome, Feb 1905, Hochreutiner 2828 (G, holo)

#### **A. bivenosa** subsp. **bivenosa**

Phyllodes usually 2-nerved, 2–5 cm long, (7–)8·5–22 mm wide, usually less than 3·5 times as long as wide. Heads on axillary peduncles more than 12 mm long or less commonly in axillary racemes, or both.

*A. bivenosa* subsp. *bivenosa* is not sharply differentiated from *A. bivenosa* subsp. *wayi*, but the circumscription of the subspecies allows the inclusion of plants with unusual combinations of characters. Definition of a taxon in such an arbitrary way may be theoretically undesirable but it enables a name to be applied to plants somewhat intermediate between *A. bivenosa* subsp. *wayi* (narrow phyllodes and heads in racemes) and most plants of *A. bivenosa* which have broad phyllodes and heads on axillary peduncles. It is also necessary so that there is no doubt about the application of the name *A. bivenosa* the type of which which is itself rather intermediate.

The type specimen is clearly labelled "côte orient" and was cited by de Candolle as such in both the *Prodromus* and the *Memoires sur la Famille des Legumineuses*, where the species was referred to in error as *Acacia binervosa*. It is not at all likely that the specimen came from eastern Australia. It was collected by Baudin's expedition which visited both the east and west coasts of Australia. Considering the difficulties encountered by the expedition it is not surprising that that specimens were wrongly labelled. At the British Museum (Natural History) there is a specimen with the label "Nouv. Hollande. Côte occidentale, ile des amiraus", on which the name Leschenault has been added in pencil. One or both of these specimens could be isotypes. Labillardiere never visited the north-western coast.

The holotype has glabrous wrinkled phyllodes 30–42 mm long, 7–11 mm broad with two longitudinal nerves. It has 20-flowered heads in glabrous axillary 3-branched racemes, the axis 22 mm and the branches 12 mm long. The axis of the inflorescence is produced into a leafy shoot.

Selection of a lectotype of *A. elliptica* presented some difficulty. Several twigs are mounted on one sheet segregated as a type in herb. Kew. There is one label: "Bay of Rest, Exmouth Gulf, and Dampiers Archipelago, Feb  $\frac{158}{1818}$ , Dirk Hartog's Island, Jan  $\frac{330}{1822}$ ". Two twigs in the lower half of the sheet have broad binerved phyllodes and lack flowers or fruits. One of them has a "slip-on" label indicating that it was from Dirk Hartog's Island. It is coarser than other specimens of *A. bivenosa* I have seen and it is referred with some doubt to *A. xanthina*. Another twig bears a small label showing that it came from Dampiers Archipelago. It is presumed that one or both of the remaining twigs came from the Bay of Rest and constitutes the lectotype. Despite the indefiniteness of the lectotypification the application of the name *A. elliptica* is clear.

The holotype of *A. bivenosa* var. *borealis* has 2- or sometimes 3-nerved phyllodes 3.5–4.5 cm long, 11–17 mm wide and the heads were apparently on axillary peduncles. It bears fruit not flowers. The specimen may have come from a young plant as one phyllode has a pair of pinnae at the top. Lazarides 6549 from Cable Beach, Broome is a good match for Hochreutiner's specimen.

**Acacia bivenosa** subsp. **wayi** (Maiden) Pedley, comb. et. stat. nov. Based on *A. salicina* Lindl. var *wayi* Maiden, Trans. Roy. Soc. Sth Aust. 32:277 (1908) ("Wayae"). **Syntype:** Marion Bay, Sep 1907, Rogers (K, iso) *A. cupularis* Domin, Mem. Soc. Sci. Boheme 1921-2. 2:45 (1923). **Type:** Bridgetown to Kajonup and Slab Hut Gully, in 1910, Dorrien-Smith (K, holo).

*A. pallidiramosa* Maiden & Blakley, J. Roy. Soc. W. Aust. 13:12 (1927)

**Type:** No locality, date or collector (K, iso).

Phyllodes usually 1-nerved, (2.5–)3.5–10 cm long, 3–8.5 mm wide, usually more than 3.5 times as long as wide. Heads in axillary racemes, the branches usually less than 12 mm long.

Bentham (1864) regarded *A. ligulata* as being conspecific with *A. salicina* Lindl. Black (1920) recognised that two species had been included under the name *A. salicina*, *A. salicina* sens. strict. and what he considered to be *A. ligulata*. Black's application of the name *A. ligulata* has generally been followed since but, as noted above, examination of type material indicates that Black's application of the name is not correct and that *A. ligulata* is probably conspecific with *A. rostellifera*.

Maiden had already recognised the heterogeneity of *A. salicina* and he described *A. salicina* var. *wayae*. Maiden named the plant in honour of Sir Samuel Way, and the feminine form "wayae" is corrected here to "wayi". The single isosyntype I have seen has narrow elongated phyllodes and is representative of the plant usually known as *A. ligulata* in the south-eastern part of its range.

The holotype of *A. cupularis* also has narrow phyllodes and the inflorescence is reduced to a single head, though there are indications that it is the remnant of a reduced raceme. Other specimens from south-western Western Australia have 2-3 branched racemes as well as single heads.

*A. pallidiramosa* is referred to *A. bivenosa* subsp. *wayi* with some doubt. The isotype examined consists of two sterile twigs and a packet of seeds from which the plant which bore the twigs was grown. There is a small label on which is written "Mohrunga Cannsigon". I do not know the significance of the words. The specimen is similar to some of *A. bivenosa* subsp. *wayi* and *A. pallidiramosa* should be referred to this taxon.

2. **Acacia mimula** Pedley, nom. nov. Based on *Acacia propinqua* Pedley, Contrib. Qd Herb. 15:4 (1974), nom. illeg. non A. Richard (1846).

The name *Acacia propinqua* Pedley is illegitimate, being a later homonym of *A. propinqua* A. Richard. It is regretted that the earlier name was overlooked previously.

3. **A. dissoneura** F. Muell., South Sci. Record (July 1882). **Syntypes:** Port Darwin, *Schultz* 336 (MEL); Liverpool River, *Gulliver* (MEL).

Mr. B. R. Maslin (*in litt.*) suggested after examining type material that *A. dissoneura* should be referred to *A. dineura* F. Muell. Since then I have also seen type material and agree with his suggestion.

#### PROSOPIS L.

The identification of naturalized plants is often difficult mainly because one is usually not acquainted with the plants in their native country and adequate herbarium material is rarely available for comparison. *Prosopis* is a particularly difficult genus to deal with as the taxa introduced are believed to come from both North and South America and there is no modern treatment of the genus which includes species from both continents.

I have consulted Benson (1941), Graham (1960) and Johnston (1962) (for the North American species), Burkart (1940) (the South American species) and Rowell (1969). Material at the Herbarium, Royal Botanic Gardens, Kew (K) was examined. Burkart determined some South American material but inexplicably neglected some sheets, and no one has critically examined all the American material.

From the literature it is evident that there is considerable range of variation within species and intergrading of species. *P. laevigata*, *P. glandulosa*, *P. articulata* and *P. velutina* could well be treated as subspecies of *P. juliflora*, though this does

not solve the problem of determination. It merely moves it a lower level in the classification. Benson and Johnston differ somewhat in their treatment of the same taxa. Benson recognized *P. juliflora* var. *glandulosa*, *P. juliflora* var. *torreyana* and *P. juliflora* var. *velutina* as occurring in the United States, while Johnston excluded *P. juliflora* but treated the same taxa as Benson as *P. glandulosa* var. *glandulosa*, *P. glandulosa* var. *torreyana* and *P. velutina* respectively. Johnston believed that the "morphic intermediacy of some individuals" was the result of hybridization among formerly more discrete taxa, mainly due to the expansion of the ranges of the taxa since the advent of domesticated grazing animals. He wrote of "the blurring of a formerly more precise geographic distribution pattern".

If several introductions of *Prosopis* have been made to Australia it is possible that some plants intermediate between described taxa (that is, plants "atypical" of any described taxon) would have been introduced. Assigning naturalized plants to described taxa without any knowledge of these taxa in their native countries is therefore difficult.

In the taxonomic treatment of the North American species workers have emphasised foliage characters, though mature pods may also be useful. Pods swell considerably during development and, not knowing the exact stage of the development of the fruits on specimens, I have been cautious in applying characters of the pod. On the whole the collections in Australia herbaria are poor. Most are either in flower or fruit, but few collectors noted anything of the plant and most specimens have been poorly preserved.

Some material from BRI was determined by Dr. H. S. Irwin of the New York Botanical Gardens in 1962. He stated (*in litt.*) that he relied heavily on Johnston's paper though there appear to be some inconsistencies in his determinations.

#### Key to taxa of *Prosopis* naturalized in Australia.

Leaflets more than 5 times as long as broad, or more than 20 mm long, widely spaced on the single pair of pinnae, the intervals about as wide as the leaflets themselves or wider

1. *P. glandulosa* var. *glandulosa*

Leaflets 2–5 times as long as broad, up to 12 mm long, not widely spaced on the rhachis

Pinnae 1 pair, rarely 2 (always predominantly 1 on all specimens examined); leaflets 12–18 pairs (25 on one specimen); raceme to 6 cm long, shorter than leaves

2. *P. juliflora*

Pinnae 2–3 pairs, occasionally 5, rarely 1; leaflets 10–15 pairs, rarely 18. Spike 10–12 cm long, longer than the leaves.

Pinnae 2 pairs; leaflets 12–15 (–18) pair, 7–12 mm long, glabrous except for long hairs on margins or with short hairs on upper surface; pedicels 0.5 mm long; calyx 1.1–1.2 mm long, corolla 3–3.8 mm long

3. *P. juliflora* × *P. velutina*

Pinnae 2–5 pairs (rarely 1); leaflets 10–15 pairs, 4–9 mm long, with scattered long hairs or moderately pubescent on both surfaces; pedicels often 0.2–0.3 mm long, sometimes 0.5 mm; flowers smaller—calyx 0.6–0.9 mm long, corolla to 3 mm long

4. *P. limensis*

#### 1. *P. glandulosa* Torr.

**Western Australia:** Carnarvon, Jul 1953, *Coleman* 169 (PERTH). **Queensland.** PORT CURTIS DISTRICT: Bushley (near Rockhampton), Dec 1953, *Taylor* (BRI); Gladstone, Oct 1957, *Taylor* (BRI). BURNETT DISTRICT: Gayndah, Nov 1952, *Crocker* (BRI). DARLING DOWNS DISTRICT: Yandilla, Mar 1955, *Rea* (BRI); Brookstead, Nov 1956, *Offner* (BRI); Millmerran, May 1960, *Winston* (BRI); May 1959, *Taylor* (BRI); Pittsworth, Apr 1959, *Pittsworth Shire Council*. **New South Wales:** Barham, April 1969, *McGowan* (NSW).

This is *Prosopis glandulosa* var. *glandulosa*. There is one specimen of *P. glandulosa* var. *torreyana* (L. Benson) M. C. Johnston, Port Augusta Sports Ground, Jun 1960, *Symon* 486 (ADW), which, judging from the locality and the absence of any later specimens or collectors' notes, is probably not naturalized.

## 2. *Prosopis juliflora* (Sw.) DC.

A shrub, usually spiny; branchlets with scattered long hairs or moderately densely pubescent, glabrescent. Pinnae 1 or occasionally 2 pairs, petiole 0.5–3.5 cm long, it and rachis, glabrous, with scattered long hairs or moderately densely pubescent; leaflets 12–18 pairs (25 on one specimen); 5–12 mm long, 1.5–2.5 mm broad, 2.5–5 times as long as broad; indumentum varying from glabrous on upper surface with a few hairs on margins and midribs beneath to subglabrous above with moderately dense long hairs on lower surface, especially prominent on margins. Racemes *ca* 6 cm long; pedicels 0.4–0.6 mm long, sometimes with long hairs; calyx 0.8–1 mm long sometimes with long hairs outside; corolla 2.5–2.8 mm long; stamens 4–4.5 mm long. Pod flat when immature, somewhat contracted between seeds, up to 15 cm long, 1 cm broad when mature, as thick as broad, somewhat moniliform.

**New South Wales:** Rosewood H.S., 95 km NW of Ivanhoe, Jun 1975, *Pickard* 2577 (NSW); Broken Hill, Jun 1969, *Symon* 6736 & 6748 (ADW, NSW), Jul 1961, *Green* (NSW); Broken Hill South, May 1969, *Garrick* (ADW—2 specimens); towards Broken Hill, Sep 1962, *O'Neill* (ADW), 10.5 miles from Silverton on Silverton-Broken Hill road, May 1969, *Garrick* 2 (ADW); 4–5 miles from Broken Hill on Cockburn side, May 1969, *Garrick* 1 (ADW); ± 17 miles E of Cockburn, May 1969, *Garrick* 3 (ADW); 5 miles E of Cockburn, Jun 1963, *Larwood* (AD); Cockburn, Jun 1969, *Symon* 6730 & 6749 (ADW); Urana, Dec 1959, *Shire Clerk* (NSW).

Duplicates of two specimens from Broken Hill were identified by Burkart as *Prosopis juliflora*, probably of Caribbean origin. The specimens from the Cockburn-Broken Hill area are on the whole less pubescent than those from Urana.

Burkart's identification of Broken Hill material is in line with Johnston's treatment of *P. juliflora*. The more pubescent material possibly indicates some intergrading with *P. velutina*. The ranges of the two do not meet in North America, but there is a specimen of *P. velutina* from what appears to be a cultivated tree near Menindee (Old Henley Station garden, Dec 1949, *Henderson* 478 (NSW)), so that it is possible that hybridization could have occurred in cultivation.

## 3. *P. juliflora* (Sw.) DC. × *P. velutina* Woot.

Shrub (?) with spines up to 1.5 cm long or none; branchlets glabrous or with scattered long hairs. Pinnae 2 pairs; petiole 0.5–3 cm long, it and rachis glabrous or with moderately dense long hairs; leaflets 12–15, occasionally, 18 pairs, 7–12(–14) mm long, 2.5–3.5(–4.5) mm broad, 2.5–5 times as long as broad, glabrous except for long hairs on margins or with short hairs on upper surface. Raceme up to 11 cm long; pedicel 0.5 mm long; calyx 1.1–1.2 mm long, sometimes with a few long hairs outside; corolla 3–3.7 mm long, rather more densely pubescent inside than in other forms; stamens 4.5–5.5 mm long. Pod thick up to 17 cm long and 1 cm broad.

**Western Australia:** Carnarvon, Jul 1953, *Coleman* 170 (PERTH), Aug 1956, *Meadly* (PERTH, BRI); Gasgoyne River flats, Carnarvon, May 1962, *Aplin* 1552 (PERTH); 2 miles S of Carnarvon, Oct 1958, *Menzies*, Nov 1964, *Donovan* (PERTH).

Irwin determined *Meadly* s.n. (BRI) as "*P. velutina* Woot. > *P. articulata* S. Wats.". These two species intergrade (Johnston p. 86) but it seems that whenever a plant has some indumentum on the foliage *P. velutina* is assumed to be one of its parents. It keys to *P. velutina* in both Benson and Johnston but is not like undoubted *P. velutina* from Arizona (*Brass* 14342, BRI).

#### 4. *Prosopis limensis* Benth.

Tree with spines up to 2 cm long, sometimes absent; branchlets with scattered long hairs becoming glabrous. Pinnæ 2–3 pairs (up to 5 pairs in specimens from Northern Territory and rarely 1 in specimens from Geraldton); petiole 1–2 cm long; it and rachis with scattered long hairs (ca 0.3 mm long); leaflets 10–15 pairs, 4–9 mm long, 1.5–3 mm broad, usually ca 3 times as long as broad but ranging from 2–5 mm, with scattered long hairs or (in Geraldton material) moderately pubescent on both surfaces. Raceme 10–12 cm long; pedicel 0.2–0.3 mm long (0.5, in Geraldton material); calyx 0.6–0.9 mm long; corolla 2.5–3 mm long. Pod thick, curved, up to 15 cm long and 1 cm broad, broader in Geraldton specimens.

**Western Australia:** Geraldton, Jan 1955, *Marr* (PERTH), Feb 1963, *Saffrey* 46 (AD, PERTH); De Grey Station homestead, Jul 1936, *Anderson* (PERTH). **Northern Territory:** Elsey, *sine coll.* NT 11867 (NT); Elliott, May 1965, *Newton* NT 11787 (NT); Ranken, Alexandria, Nov 1961, *Paine* NT 8521 (NT); Coniston, Feb 1955, *Chippendale* NT 190 (NT). **Queensland:** BURKE DISTRICT: 34 miles S of Burketown, *Tracey* (BRI); Cloncurry, Aug 1958, *Sillar* (BRI), Oct 1958, *Sullivan* (BRI); Hughenden, Jul 1963, *Everist* 7288 & 7289 (BRI); Winton, Nov 1954, *Winton Shire Council* 7 (BRI, CANB). COOK DISTRICT: Karumba, Aug 1973, *J. S. Johnson* NSW 107431.

The Geraldton specimens are referred here with some doubt. As well as the differences noted in the description the leaflets have rather prominent secondary veins.

Irwin identified this taxon as both *Prosopis chilensis* (Mol.) Stuntz (*Winton Shire Council* 7 and *Sillar*) and *P. limensis* Benth. (Sullivan). He also identified specimens from a tree cultivated in the Brisbane Botanic Gardens (*White* 2390 & 8642, BRI, GH) as *P. chilensis*, both of which were cited by Johnston under *P. pallida* (Willd.) HBK.

*P. pallida* has been something of a puzzle. Burkart did not mention it and it is evidently close to *P. limensis*. I have followed Benthams (1842) in treating it as being glabrous.

#### 5. *Prosopis flexuosa* DC.

**Queensland:** WARREGO DISTRICT: "Comongin", about 10 miles NE of Quilpie, Nov 1957, *Everist* 5902 (BRI).

The species is not included in the key as it is known from only one locality in Queensland. It forms large clumps in the vicinity of "Comongin" homestead but has evidently not spread though there are evidently large areas of country suitable for its growth.

It differs from *P. juliflora* in having narrower pods and more pubescent branches.

### CAESALPINIOIDEAE

#### LYSIPHYLLUM (BENTH.) DE WIT

De Wit (1956) in his treatment of the tribe Bauhinieae in Malesia recognized seven genera, one of them *Lysiphyllum* which had been originally described by Benthams as a section of *Bauhinia*. The rather narrow circumscription of genera was rejected by Hutchinson (1964) who referred all genera recognized by de Wit to *Bauhinia*. Brennan (1967) and Schmitz (1972) however followed de Wit's treatment of *Bauhinia* sens. lat.

The 5 species of *Lysiphyllum* that occur in Australia are distinguished as follows:

Receptacle (disk-bearing base of calyx) cylindrical; sepals 4–10 mm long; leaflets 2.5–4.5 cm long, 16–32 mm wide, 1.3–1.8 times as long as wide,  $\pm$  oblong, broadest at the base, tapering gradually to the rather broad, obtuse apex.



- Scandent shrub; tendrils circinnate but caducous; calyx lobes 4–5 mm long; pods up to ca 3 cm wide *L. binatum*
- Trees without tendrils; calyx 7–10 mm long; pods 3–4 cm wide *L. hookeri*
- Receptacle turbinate or campanulate; sepals 2–5 mm long; leaflets 7–22 mm wide, 1.2–3.5 times as long as wide, either broadest below the middle and tapering gradually to rather narrow acute apex or broadest about the middle and tapering equally to base and apex.
- Leaflets broadest about the middle, equally tapering to each end, 1.2–1.7 times as long as wide; calyx lobes with marginal- and sometimes mid-nerve, buds therefore ribbed *L. cunninghamii*
- Leaflets broadest below the middle and tapering to narrow apex, 1.5–3.5 times as long as wide; calyx lobes and buds not ribbed.
- Indumentum of outside of calyx red-brown; pod 2.5–4 cm wide *L. carronii*
- Indumentum of outside of calyx yellowish; pod 1–2.5 cm wide *L. gilvum*

The transfer of *L. binatum* and *L. cunninghamii* from *Bauhinia* to *Lysiphyllum* was made by de Wit. The other new names required are:

***Lysiphyllum hookeri*** (F. Muell.) Pedley, comb. nov. Based on *Bauhinia hookeri* F. Muell., Trans. Phil. Inst. Vict. 3:51 (1858). **Type:** Gilbert River, Mueller (MEL)

*L. hookeri* (F. Muell.) de Wit ex Schmitz, Bull. Jard. Bot. Nat. Belg. 43:407 (1973), *nom. inval.*

Schmitz attributed the name *L. hookeri* to de Wit, but de Wit did not make the combination, nor can it be attributed to Schmitz as he cited no basionym.

***Lysiphyllum carronii*** (F. Muell.) Pedley, comb. nov. Based on *Bauhinia carronii* F. Muell., Trans. Phil. Inst. Vict. 3:49 (1858). **Type:** Burdekin River, Mueller (MEL, Lectotype, designated here)

***Lysiphyllum gilvum*** (F. M. Bailey) Pedley, stat. nov. Based on *Bauhinia cunninghamii* Benth. forma *gilva* F. M. Bailey, Qd Ag. J. 25:287 (1910) **Type:** Georgina River, Bick (BRI, holo)

*B. cunninghamii* Benth. forma *rosea* F. M. Bailey, *loc. cit.* **Type:** Georgina River, Bick (BRI, holo)

*B. leichhardtii* F. Muell. var. *cinarescens* F. Muell. in Winnecke, Explor. Report (1884). **Type:** Central Australia, Winnecke (MEL, holo)

**Northern Territory:** 8 miles [13 km] NE of Abadaba Bore, Lake Nash, Oct 1955, Chippendale NT 1813. **Queensland:** BURKE DISTRICT: Nonda, between Hughenden and Cloncurry, Feb 1931, Hubbard & Winders 7293; Flinders River, Aug 1916, White. GREGORY NORTH DISTRICT: Georgina River, 8 miles [13 km] NW of "Headingly", Sep 1954, Chippendale NT 254; Georgina River, Urundangie, Sep 1954, Chippendale NT 253; Glenormiston, Jan 1935, Boyle. GREGORY SOUTH DISTRICT: 38 miles [61 km] W of Windorah, Sep 1966, Boyland 151; [E of Windorah] 25°23'S 143°41'E, Jun 1969, Trapnell E50; "Morney Plains", ca 80 miles [130 km] W of Windorah, Sep 1949, Everist 4111. MITCHELL DISTRICT: 56 miles [90 km] S of Prairie, 21°36'S, Jun 1969, Trapnell E73; between Emerald & Longreach, Oct 1913, Jarvis. WARREGO DISTRICT: Thargomindah (cultivated), Nov 1954, Smith 6056; Charleville, Oct 1945, Clemens. **New South Wales:** Warroo via Bourke, Nov 1936, Morris.

#### CAESALPINIA L.

The uniting of *Mezoneuron* with *Caesalpinia* by Hattink (1974) appears to be justified. He transferred only two of the three Australian species of *Mezoneuron* to *Caesalpinia* and the name of one of these is illegitimate in *Caesalpinia*.

The following new names are necessary:

***Caesalpinia subtropica*** Pedley, nom. et comb. nov. Based on *Mesoneuron brachycarpum* Benth., Fl. Aust. 2:278 (1864)

*Caesalpinia brachycarpa* (Benth.) Hattink, Reinwardtia 9:53 (1974), *nom. illeg.* non *C. brachycarpa* (A. Gray) Fisher (1893). **Type:** New South Wales: Richmond River, *Moore* (K, lecto, selected by Hattink, not seen)

*Caesalpinia robusta* (C. T. White) Pedley, comb. nov. Based on *Mezoneurum robustum* C. T. White, Contrib. Arn. Arb. 4:43 (1933). **Type:** Cook District: Boonjie, Sep 1929, *Kajewski* 1206 (BRI, iso)

Herbarium material of the species is poor, but it can be distinguished from *C. scortechinii* and *C. subtropica* by its larger leaflets and extremely prickly stem.

### PAPILIONOIDEAE\*

#### DAVIESIA SM.

Though *Daviesia corymbosa* Sm. has been recorded from Queensland, it is apparently restricted to the central coast of New South Wales. Most of the specimens previously identified as *D. corymbosa* from Queensland should be referred to *D. mimosoides* R.Br. which is widely spread in south-eastern Queensland. In the south-eastern part of the Darling Downs District near Stanthorpe, *D. latifolia* R.Br. may sometimes be confused with *D. mimosoides* but is distinguished by its broader leaves with prominent veins and racemes with pedicels almost to the base of the axis. Intermediates between the two species do occur rarely. *D. arborea* W. Hill is also similar to *D. mimosoides* but is usually a larger plant, developing into a small tree, with less coriaceous leaves gradually attenuate to the acute apex and flowers usually with a purplish keel.

Two species *D. discolor* and *D. flava* described here as new have previously been referred to either *D. mimosoides* or *D. arborea*. They may be distinguished from *D. mimosoides* by the following key:

Leaves 2.5–9.5 cm long, less than 6 times as long as wide

Leaves 1.5–3.3 cm wide with conspicuous anastomosing veins; inflorescence a raceme  
*D. latifolia*

Leaves 1–1.4 cm wide, thinner in texture with less conspicuous venation; inflorescence a corymbose raceme  
*D. mimosoides*

Leaves 5–15 cm long, more than 8 times as long as wide

Leaves discolorous; axis of raceme up to 1 cm long; shrub  
*D. discolor*

Leaves not discolorous; axis of raceme usually 2 cm or more, rarely 1 cm long; small trees or shrubs

Calyx  $\pm$  truncate or emarginate; leaves thin in texture, acute, attenuate to the apex; small trees  
*D. arborea*

Calyx lobed; leaves not thin in texture, obtuse, mucronulate, not gradually tapered to apex  
*D. flava*

**Daviesia discolor** Pedley, species nova affinis *D. arboreae* W. Hill foliis venatione promientiore leviter discoloribus, racemis brevioribus et habito differt. Typus: *Henderson et al.* H1026 (BRI, holotypus; A., CANB, K, L, NSW, PR, isotypi)

\* For note on name of subfamily see Brenan (1967).

Frutex usque ad 1 m altus; ramuli angulares glabri; stipulae obscurae. Folia plana vel margine leviter incurvata, acuta aliquantum discoloria, reticulatim nervata aliquantum prominente, subsessilia, 7–15 cm longa, (4–)6–8 mm lata, 10–20(–33)-plo longiora quam lata. Racemi singulare vel binatim in superis axillis dispositi; axis 5–10 mm longus; bractea minus quam 1 mm longa praeditus; carina aliquantum brevior quam vexillum et alae. Legumen immaturum.

Shrub to 1 m tall; branchlets angular glabrous; stipules inconspicuous. Leaves flat or the margin slightly incurved, acute, slightly discolorous with somewhat prominent reticulate nerves, subsessile, 7–15 cm long, (4–)6–8 mm wide, 10–20(–33) times longer than wide. Racemes arranged singly or in pairs in the upper axils; axis 5–10 mm long; bracts less than 1 mm long; calyx 2.7–3 mm long with fimbriate lobes 0.7–0.8 mm long; keel a little shorter than the standard and wings. Pod immature.

LEICHHARDT DISTRICT: Blackdown Tableland, ca 23°50'S 149°E, Sep 1937, *Simmons* (sterile); Aug 1964, *Gittins* 926; Sep 1971, *Henderson*, *Durrington* & *Sharpe* H1026; Apr 1971, *Henderson*, *Andrews* & *Sharpe* 860 (sterile).

**Daviesia flava** Pedley, species nova; a *D. mimosoidis* R.Br. foliis elongatioribus, a *D. arboreae* W. Hill foliis apicem versus minus attenuatis, pedicellis-que plerumque longioribus calycis saepe brevioribus, ab amobus lobis superis claycis magis divisis, carina alas et vexillum aequanti differt. Typus: *Webb & Tracey* 5929 (BRI, holotypus; CANB, K, isotypi).

Frutex usque 1.5 m altus; ramuli angulares glabri; stipulae 0.6–1 mm longae. Folia plana lineares vel anguste oblonga, obtusa mucronulata, 5–12 cm longa, 3–13 mm lata, 8–20-plo longiora quam lata; petiolus circa 1 mm longus. Racemi glabri 1–3, in axillis superis dispositi; axis (1–)2–4.5 cm longus; bractea ca 1.5 mm longa; pedicelli plerumque in parte supera axis portati, 6–12 mm longi, versus apicem axis breviores. Flores flavi 5–6 mm longi, calyx 2.5–3.5 mm longi lobis fimbriatis 0.7–0.8 mm longis superis circa 2/3 unitis praeditus; carina petala cetera  $\pm$  aequans. Legumen in parte latissima 1 cm latum.

Shrub to 1.5 m tall; branchlets angular, glabrous; stipules 0.6–1 mm long. Leaves flat, linear or narrowly oblong, obtuse mucronulate, 5–12 cm long, 3–13 mm wide, 8–20 times as long as broad, very obliquely reticulately pinninerved, prominently so when broad; petiole ca 1 mm long. Racemes 1–3, in the upper axils, glabrous; axis (1–)2–4.5 cm long; bracts ca 1.5 mm long; pedicels mostly in upper half of axis, 6–12 mm long shorter towards top of axis. Flowers yellow 5–6 mm long; calyx 2.5–3.5 mm long with fimbriate lobes 0.7–0.8 mm long the upper ones about 2/3 united; keel about as long as other petals. Pod ca 1 cm wide at broadest part.

COOK DISTRICT: Great Dividing Range on Cooktown road, in 1970, *Wyatt*; Clohesy River area, Feb 1963, *Wyatt* 23; Koah, Clohesy River, Nov 1967, *Brass* 33735; Kuranda-Mareeba road, Feb 1962, *Webb & Tracey* 5929. NORTH KENNEDY: Conjuboy Road, Oct 1972, *Althofer* 328; 4 miles SW of Mt Garnet, Jun 1971, *Hyland* 502.

#### MACROPTILIUM URB.

**Macroptilium bracteatum** (Nees & Mart.) Marechal & Baudet.

Previously (Pedley 1973) the combination *Macroptilium bracteatum* was attributed to Urban. At that time the combination had in fact not been made. Since then *Phaseolus bracteatus* has been transferred to *Macroptilium* by Marechal and Baudet (1974). The correct citation of the name is therefore as given above.

## MIRBELIA SM.

Key to *Mirbelia* in Queensland

Upper surface of leaf conspicuously reticulate; ovules 2. *M. rubitfolia* (Andr.) G. Don.

Upper surface of leaf smooth or occasionally tuberculate, not conspicuously reticulate; ovules either 2-4 or 10-12.

Flowers in racemes, terminal or in upper axils, sometimes much reduced; ovules 2 *M. confertiflora* Pedley

Flowers single in the axils

Calyx lobes as long as the tube; ovules 10-12 *M. speciosa* DC.

Leaves 1-2 cm long (rarely longer); bracteoles shorter than calyx tube *M. speciosa* subsp. *speciosa*

Leaves 2-3 cm or more long (those subtending flowers sometimes shorter); bracteoles longer than calyx tube

*M. speciosa* subsp. *ringrosei* (F. M. Bailey) Pedley

Calyx lobes shorter than the tube; ovules 2-4

Leaves with a straight pungent point; ovary pubescent; ovules 4

*M. pungens* A. Cunn. ex G. Don

Leaves with a hooked point; ovary glabrous ovules 2

*M. aotoides* F. Muell.

***Mirbelia confertiflora* Pedley, sp. nov.**

Misapplied name: *Mirbelia aotoides* auct. non F. Muell; Thompson, Contrib. N.S.W. Nat. Herb. Fl. Ser. 101:19 (1961).

Frutex usque ad 2 m altus; ramuli pilis sparsis appressis sericeis vestiti; stipulae nullae. Folia alternata vel irregulatim verticellata, linearia, acuta, mucronata, revoluta, supra glabra vel minute tuberculata, infra glabra vel pilis paucis appressis secus costam vestita, 1.5-2.5 cm longa, usque 1.5 mm lata; petiolus 1.5 mm longus. Flores in racemis (saepe valde contractis) terminalibus vel axillis superis dispositi; bractae anguste lanceolatae 3.5 mm longae marginibus leviter incurvis, infra pilis longis adscendentibus albis fuscisve vestitae; calyx 6-7 mm longus pilis densis albis adscendentibus vestitus, lobis 3.5-4 mm longis fere aequilongis, superis usque ad 1 mm ab apice connatis; petala unguiculata aurantiacea; vexillum leviter retusum, 4-5.5 mm longum, 10 mm latum ungue 2.5 mm longo, circa 12 mm lato; alae basi auriculatae, oblongae obtusae, 5.6 mm longae, 2.5 mm latae leviter gibbosae versus basem, ungue 2.5 mm longo et 1.2 mm lato; carina 3.5-4.5 mm longa, 2-3 mm lata, in latere prope basem gibbosa. Stamina filamenta 4-5 mm longa, versus apicem attenuata. Ovarium glabrum circa 2.5 mm longum; stylus uncinatus aliquantum crassus; ovula 2. Legumina dehiscentia ca 4.5 mm longa; endocarpium post maturitatem ab exocarpio secedens. Typus: *Pedley* 1539 (BRI, holo).

Shrub to 2 m tall; branchlets with sparse appressed silky hairs; stipules none. Leaves alternate or irregularly whorled, linear, acute mucronate, revolute, glabrous or minutely tuberculate above, glabrous or with a few appressed hairs along the midrib below, 1.5-2.5 cm long, up to 1.5 mm wide; petiole ca 1.5 mm long. Flowers in racemes (often much contracted) terminal or in upper axils; bracts narrow lanceolate 3.5 mm long with slightly incurved margins with dense long white or brown ascending hairs beneath; bracteoles on the pedicel, 3.8 mm long, lanceolate, with dense brown hairs; calyx 6-7 mm long with dense white ascending hairs, the lobes 3.5-4 mm long, nearly equal in length, the upper united to ca 1 mm of the apex; petals unguiculate, orange; vexillum slightly retuse, 4-5.5 mm long, 10 mm wide with a claw 2.5 mm long, ca 1.2 mm wide, alae auriculate at the base, oblong obtuse, 5.6 mm long, 2.5 mm wide, slightly gibbose towards the base, with a claw 2.5 mm long and 1.2 mm wide, keel 3.5-4.5 mm long, 2-3 mm wide, gibbose on the side near the base. Staminal filaments 4-5 mm long, attenuate towards the apex. Ovary glabrous, ca 2.5 mm long; style hooked, rather thick; ovules two. Pods dehiscent ca 4.5 mm long; endocarp separating from epicarp after maturity.

QUEENSLAND: Jolly's Falls ca 8 km N of Stanthorpe, Oct 1956, *Shea* S42; Oct 1963, *Pedley* 1539; The Summit, Sep 1958, *Michener*; Girraween Nat. Park, near Wyberba, Nov 1971, *Ryan* 43. NEW SOUTH WALES: Boonoo Boonoo, Feb 1905, *Boorman*; Gibraltar Range; May 1961, *Constable* NSW 56665.

Mueller based his description of *M. aotoides* on a single plant collected from the Burnett Ranges but later he referred another specimen (Mt Mitchell, N.S.W., *Beckler*—duplicate at Kew) to it. In this he was followed by Benthams, and the name *M. aotoides* came into general use for the Mt Mitchell plant which is in fact a distinct species, *M. confertiflora*.

*M. aotoides* is widely spread in Queensland but is nowhere common. It is so like a species of *Aotus* in all characters except the longitudinal dissepiment in the ovary and seed that one might speculate on the desirability of uniting the genera *Aotus* and *Mirbelia*.

***Mirbelia aotoides*** F. Muell., Trans. Phil. Inst. Vict. 3:53 (1859), Fragm. 4:12 (1863); Benth., Fl. Aust. 2:35 (1864). **Type:** Burnett Ranges, *Mueller* (MEL, holo; BRI, photo)

NORTH KENNEDY DISTRICT: Paluma Range, 19°S 145°5'E, Sep 1963, *Vessey*. MITCHELL DISTRICT: between Torrens Creek and Pentland, Oct 1935, *Priest* (North Queensland Naturalists' Club 824). LEICHHARDT DISTRICT: Mt Playfair Station, in 1956, *Biddulph* 38; Glinghinda, ca 60 km N of Taroom, Oct 1963, *Speck* 1873; Carnarvon Range, Oct 1933, *White* 9464. DARLING DOWNS DISTRICT: Miles, Jun 1946, *White* Herb. Aust. 1159, Sep 1961, *Pedley* 887; Chinchilla area, Sep 1954, *Emerson*. BURNETT DISTRICT: Hungry Hills between Eidsvold and Mt Perry, Jul 1956, *Coaldrake*.

***Mirbelia speciosa*** Sieb. ex DC. subsp. ***ringrosei*** (F. M. Bailey) *Pedley*, comb. et stat. nov. Based on *M. ringrosei* F. M. Bailey, Qd Ag. J. 16:189 (1905). **Type:** Herberton, Aug 1905, *Ringrose* (BRI, holo)

COOK DISTRICT: Mt Windsor, Mar 1941, *Carr*. LEICHHARDT DISTRICT: Blackdown Tableland, ca 23°50'S 149°E, Apr 1971, *Henderson*, *Andrews* & *Sharpe* H609 & H744, Sep 1971, *Henderson*, *Durrington* & *Sharpe* H1207; Carnarvon Ranges, Jul 1937, *Young*. DARLING DOWNS DISTRICT: Fairyland S.F.R. 42, Jul 1948, *Anderson*. MORETON DISTRICT: Crows Nest, Oct 1921, *White*, Sep 1922, *Kenny*, May & Oct 1924, *Brass* 18; Helidon-Ravensbourne road, Sep 1961, *Hockings* & *Cockburn*; 6 miles [10 km] N of Helidon, Aug 1963, *Pedley* 1380, Sep 1963, *Pedley* 1400.

#### STYLOSANTHES SWARTZ

Following a revision of *Stylosanthes* by Mohlenbrock (1958) and a review of Malaysian species by Nooteboom in van Meeuwen *et al* (1961) there has been some controversy about the identity of *S. sundaica* Taub. Mohlenbrock treated *S. sundaica* as a synonym of *S. humilis* HBK., Townsville stylo. Nooteboom not only treated the two as distinct, but placed them in different sections of the genus, *S. sundaica* in sect. *Stylosanthes* and *S. humilis* in sect. *Stylosanthes*. Mohlenbrock (1963), without any discussion, accepted Nooteboom's interpretation of *S. sundaica*. More recently 't Mannetje (1968) received the problem and suggested that detailed taxonomic studies be carried out.

Through the courtesy of the Director of Herbarium Bogorense I examined Malaysian material of *S. sundaica* and material of *S. humilis* from Australia and New Guinea in the Queensland Herbarium.

Plants from Malesia (excluding Papua) usually have two inner bracteoles, and in one case (*van Steenis* 7357) a rudimentary floral axis. In all other characters (vegetative, floral and fruiting) the Malesian and Australian plants are indistinguishable. In general appearance plants of *S. sundaica* grown in the open at Brisbane look very like the "Katherine" and "Pretty Beach" strains of *S. humilis* grown under controlled environmental conditions at Canberra (*Downes et al.*, 1967). When grown in the open at Gayndah (latitude 25.5°) and Brisbane *S. sundaica*, or at least the strain grown, does not flower. This is not inconsistent with the behaviour of the late maturing types of Townsville stylo naturalized in Australia (*Cameron*, 1967).

I agree with Nooteboom's observations on *S. sundaica* and on the deficiencies of Mohlenbrock's (1958) paper, but I do not believe that the evidence presented justifies the recognition of *S. sundaica* as a distinct taxon. It is merely a variant of the extremely variable *S. humilis*, not worthy of even varietal rank. Mohlenbrock's description of *S. humilis*, however, should be amended to include plants which often have two bracteoles and rarely a caducous rudimentary floral axis. It may then be regarded as being somewhat transitional between the two sections, as Mohlenbrock has already treated *S. sericeiceps* S. F. Blake. The fact that the presence of a rudimentary floral axis and a second inner bracteole is used to distinguish the two sections of *Stylosanthes* does not give these characters any special properties and make them any less liable to variation at least within some species.

*Stylosanthes humilis* which is well adapted to dispersal by animal and man was probably introduced from eastern Brazil into Malesia in post-Columbian times, probably by Portuguese in the 16th century. Merrill (1954) discussed the significance of the Portugal-Brazil-Cape of Good Hope-East Indies trade route. *S. humilis* is an extremely plastic species, as is demonstrated by the behaviour of the plants naturalized in Queensland (*Cameron*, 1965) which probably have been derived from few introductions and the variant with the rudimentary floral axis and second bracteole could either have been the original strain introduction to Malesia or it could have arisen since.

#### TEPHROSIA PERS.

The genus *Tephrosia* in Australia is in need of revision. Some preliminary studies have been made and it is intended that eventually at least a review of the Australian species will be prepared. In the interim the following new combinations are made and species described:

***Tephrosia spechtii*** Pedley, nom. et stat. nov. Based on *T. purpurea* (L.) Pers. var. *axillaris* Bak. f., J. Bot. 64:91 (1926). **Type:** Groote Eylandt, Brown '4115' (K, isosyn)

NORTHERN TERRITORY: Hemple Bay, Groote Eylandt, May 1948, *Specht* 373; Bickerton I., Jun 1948, *Specht* 620.

***Tephrosia rufula*** Pedley, nom. et stat. nov. Based on *T. purpurea* (L.) Pers. var. *rufescens* Benth., Fl. Aust. 2:210 (1864). **Type:** Gorman Creek, Moreton Bay, *Stuart* (ex herb. Mueller) (K, lecto, designated here)

*T. brachyodon* Domin var. *rufescens* (Benth.) Domin, Biblio. Bot. 89:198 (1926). Based on *T. purpurea* var. *rufescens* Benth.

QUEENSLAND: LEICHHARDT DISTRICT: Springsure, Oct 1933, *White* 9451; Isla Gorge, ca 28 km SW of Theodore, Aug 1973, *Sharpe & Hockings* 515. BURNETT DISTRICT: Dillarnel, Dec 1939, *Smith* 637; "Narayan", Feb 1967, *Tothill* N339; Crawford Hill, Nov 1947, *Michael* 3038. MORETON DISTRICT: Petrie, Nov 1931, *Blake* 2893; Pine Mountain, 27°29'S 152°44'E, Jul 1972, *Durrington & Thomas* 724; Goodna, Jun 1930, *White* 6770; Enoggera near Brisbane, Oct 1930, *White* 7342.

***Tephrosia benthamii*** Pedley, nom. et. stat. nov. Based on *T. rosea* F. Muell. ex Benth. var. (?) *angustifolia* Benth., Fl. Aust. 2:2111 (1864). **Type:** between Darling and Cooper Creek, *Neilson* (K, holo)

QUEENSLAND: GREGORY NORTH DISTRICT: "Coolane" ca 32 km W of Winton, Oct 1956, *Bisset*. WARREGO DISTRICT: "Curragh" near Cunnamulla, Jan 1931, *Hubbard & Winders* 6216; Charleville, Oct 1945, *Clemens*.

***Tephrosia delestangii*** Pedley, species nova affinis *T. polyzygae* F. Muell. ex Benth. foliolis paucioribus latoribus, inflorescentiis densioribus et leguminibus angustioribus differt. Typus: *Latz* 1535 in NT 31511 (BRI, holotypus).

Suffrutex ramosissimus foliaceus griseus usque 0.5 m altus; ramuli indumento pilorum rectorum appressorum argenteorum usque 1 mm longorum obsiti; stipulae lineares persistentes 3–6 mm longae. Folio (9–)13–29-foliolata; rhachis (25–)35–75 mm longa (petiolo 7–12 (–10) mm longo incluso), dense pubescens; foliola obovato-oblonga vel cuneata, obtusa, truncata vel leviter retusa, 8–16 mm longa, 3–6 mm lata, 2.3–2.8-plo longiora quam lata, foliolo terminali interdum 9 mm lata et 1.5-plo longiora quam lata, discoloria indumento pilorum brevium debillium erectorum sparsorum supra indumento pilorum longiorum appressorum argenteorum plerumque densorum infra obsita, 4–5 nervis lateralibus conspicuis, praecipue conspicuis in pagina supero praedita. Flores in pares in pseudoracemis 4–7-nodis terminalibus vel in axillas superas dispositi; pedicelli 2–2.5 mm longi; calyx dense appresse pubescens tubo quam lobus inferus longiore, 1.5–2 mm longo, lobo supero (bifido ad circa medium) et laterale 1.5–1.8 mm longo, lobo infero 2–2.5 mm longo instructus. Corolla aurantiaca; vexillum tomentosum dorsale, 4 mm longum, 4–4.5 mm latum, ungue 1.2–1.5 mm longo; alae quam carina longiores 4 mm longae, 2 mm latae unguibus 1–2 mm longis; carina interdum leviter pubescens apicem versus circa 3 mm longa, 1.5–2 mm lata, ungue eum alarum aequanti; ovarium dense appresse pubescens, 8–10-ovalatum; stylus glaber planus. Legumen rectum vel apice interdum sursum, appresse pubescens, 35–40 mm longum; 3–3.5 mm latum. Semina brunnea subcylindrica 2–2.2 mm longa, 1.7–2 mm diam; arillus nullus.

Much-branched leafy grey subshrub to 0.5 m tall; branchlets with dense indumentum of straight silvery hairs to 1 mm long; stipules linear persistent 3–6 mm long. Leaves (9–)13–29-foliolate; rachis (25–)35–75 mm long (including petiole 7–12 (–20) mm long), densely pubescent; leaflets obovate-oblong or cuneate, obtuse, truncate or slightly retuse, 8–16 mm long, 3–6 mm wide, 2.3–2.8 times as long as wide, the terminal leaflet sometimes 9 mm wide and 1.5 times as long as wide, discolorous, upper surface with indumentum of sparse weak short erect hairs, lower with indumentum of usually dense appressed longer silvery hairs, 4–5 lateral nerves conspicuous, especially on upper surface. Flowers in pairs in 4–7-noded terminal pseudoracemes 5–9 cm long or rarely in pairs in upper axils; pedicels 2–2.5 mm long; calyx densely appressed pubescent, the tube shorter than the lower lobe, 1.5–2 mm long, upper lobe (bifid to about the middle) and lateral lobes 1.5–1.8 mm long; lower lobe 2–2.5 mm long. Corolla orange; standard tomentose on the back, 4 mm long, 4.5–5 mm wide on claw 1.2–1.5 mm long; wings longer than the keel, 4 mm long, 2 mm wide, on claw 1–2 mm long; keel sometimes slightly pubescent near the apex, ca 3 mm long, 1.5–2 mm wide on claw as long as that of the wings; ovary densely appressed pubescent, 8–10 ovulate; style flat, glabrous. Pod straight or sometimes upturned at the apex, appressed pubescent, 35–40 mm long, 3–3.5 mm wide. Seeds brown, subcylindrical 2–2.2 mm long, 1.7–2 mm diam.; aril none.

**Northern Territory:** Stuart Highway, Daly Waters turn-off, Feb 1969, *Must* 432 (BRI); Daly Waters, Mar 1972, *Byrnes* 2501 (BRI); 50 miles [80 km] S of Borroloola road junction, McArthur River, ca 17°18'S, 135°37'E, Jun 1971, *Latz* 1535 (BRI). **Queensland:** BURKE DISTRICT: Adels Grove, 130 km NNE of Camooweal, Feb 1946, *de Lestang* (BRI).

*T. delestangii* has been collected in only three rather widely separated localities. It occurs on skeletal soils on hillsides.

**Tephrosia virens** Pedley, sp. nov. affinis *T. spechtii* Pedley et *T. macrocarpae* Benth. ab illa foliolis paucioribus grandioribus a hac foliolis saepe paucioribus infra pubescentibus sine mucrone nervis paucioribus lateralibus et inflorescentiis axillaribus differt. Typus: *Lavery* 19 (BRI, holotypus).

Frutex virella usque 2 m altus; ramuli angulares mox teretes sericei vel interdum glabrati; stipulae lineares 2-4 mm longae. Folia 3-vel minus plerumque 5-foliolata; axis sericeus, 6-18 (-28) mm longus (petiolo 5-13 (-16) mm longo incluso) folioli anguste obovati vel obovati, obtusi vel aliquando retusi, 20-35 mm longi, 5-15 mm lati, 2-4-4-plo longiora quam latum, foliolo interdum grandiori, supra glabri vel indumento pilorum sparsorum brevium appressorum et infra pilorum brevium appressorum obsita; 4-8 nervi laterales conspicui; petiolulus 1.5-2.5 mm longus dense sericeus. Flores 1-7 in gricibus axillaribus apparenter sessilibus vel perspicue racemosis, axe post lapsum florum manifeste cicatricata, 1-4 mm longo. Corolla aurantiaca vel aurantiaco-ruber; vexillum dorsale tomentosum, 4.5-6 mm longum, 7-10 mm latum ungue 1.5-3 mm longo; alae carinam fere aequantes 4-6 mm longae, 2.5-4 mm latae ungue 2-2.5 mm longo; carina 4-5 mm longa, 2-3 mm lata ungue 2-3 mm longo. Calyx appresse pubescens; tubus 1.8-2 mm longus, lobus inferus  $\pm$  subulatus, 2.5-4 mm longus, lobi laterali 2-2.5 mm longi et lobus superus 2-3 mm longus ad circa medium bifidus. Ovarium sericeum, 8-9 ovulatum; stylus planus glaber. Legumen planum sursum apice sparse pubescens 5-6 cm longum, 4-5 mm latum, 6-9 sperum. Semina lenticula circa 3-4 mm longa, 2-2.5 mm lata, sine arillo.

Greenish shrub to 2 m tall; branchlets angular becoming terete, sericeous or sometimes glabrate; stipules linear 2-4 mm long. Leaves 3- or less commonly 5-foliolate; axis sericeous, 6-18 (-28) mm long (including petiole 5-12 (-16) mm long), leaflets narrowly obovate or obovate, obtuse or occasionally retuse, 19-35 mm long, 5-15 mm wide, 2-4-4 times as long as wide, the terminal one sometimes larger, upper surface glabrous or with indumentum of sparse short appressed hairs, lower surface always with indumentum of sparse appressed hairs, 4-8 lateral veins conspicuous; periolule 1.5-2.5 mm long, densely sericeous. Flowers in groups of 1-7 in the axils apparently sessile or distinctly racemose the axis conspicuously scarred after flowers have fallen, 1-4 mm long. Corolla orange or orange-red; standard tomentose on the back, 4.5-6 mm long, 7-10 mm wide on claw 1.5-3 mm long; wings as long as, or slightly longer than, the keel, 3-4-6 mm long, 2.5-4 mm wide on claw 2-2.5 mm long; keel 4-5 mm long, 2-3 mm wide on claw 2-3 mm long. Calyx appressed pubescent; tube 1.8-2 mm long, lower lobe  $\pm$  subulate, 2.5-4 mm long, lateral lobes 2-2.5 mm long and upper lobe, 2-3 mm long bifid to about the middle. Ovary sericeous, 8-9 ovulate; style flat glabrous. Pod flat upturned at end, sparsely appressed pubescens, 5-6 cm long, 4-5 mm wide, 6-9 seeded. Seeds lenticular, ca 3-4 mm long, 2-2.5 mm wide, without an aril.

**Western Australia:** Liveringa, Fitzroy River, Apr 1927, *Ewart* comm. *Gardner* (K). **Northern Territory:** 61 km from Tanami towards Gordon Downs, 19° 41' S, 129° 25' E, Aug 1971, *Gittins* 2369 (BRI, K); 21 miles NW of Wavehill police station, Jun 1949, *Perry & Lazarides* 2854 (BRI, K); 52 miles N of Tennant Creek, Apr 1948, *Perry* 634 (BRI, K); Limbunya, 17° 15' S, 129° 45' E, Apr 1974, *Dunlop* 3510 (BRI). **Queensland:** BURKE DISTRICT: 107 miles (170 km) from Camooweal on road to Burketown, Jun 1966, *Pedley* 2055 (BRI, K); Mt. Isa, Mar 1949, *McFarlane* (BRI), Oct 1974, *Specht & Rogers* 96 (BRI), Jan 1958, *Lavery* 19; Adels Grove, 130 km NNE of Camooweal, Feb 1947, *de Lestang* 197 (BRI); 14 miles SW of "Kamileroi" Stn, Aug 1953, *Lazarides* 3973 (BRI, K); Lawn Hill, May 1940, *Jensen* 66 (BRI).



In the eastern part of its range *T. virens* occurs on shallow soils with high levels of copper but collectors' notes indicate that in the Northern Territory it is found on shallow soils derived from sandstone and limestone, unlikely to be high in copper.

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### Addendum

Burkart's treatment of *Prosopis* (J. Arnold Arbor. vol. 57. 1976) differs to some extent from the one presented here. *P. pallida* HBK. and *P. limensis* Benth. are treated as being conspecific, with *White* 2390 being cited under *P. pallida*. *Everist* 5902 which I have referred to *P. flexuosa* is cited by Burkart under *P. velutina*. The specimen (in fruit) is however a good match for *Wedermann* 455 (K, in flower) referred by Burkart to *P. flexuosa*.

**ALLOSYNCARPIA TERNATA, A NEW GENUS AND  
SPECIES OF MYRTACEAE SUBFAMILY  
LEPTOSPERMOIDEAE FROM NORTHERN AUSTRALIA**

By S. T. Blake\*

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**Summary**

*Allosyncarpia* S. T. Blake with one species *A. ternata* S. T. Blake has flowers partly fused into small heads, circumsciss calyx-tube, many free stamens, 2-celled ovary with horizontal ovules, 1-seeded capsules, large seeds with large much convoluted cotyledons and unique branched septate hairs.

In 1955 Mr. W. Bateman then Forest Officer at Darwin collected a specimen with flowers partly connate in small heads and old infructescences of a tree in the northern part of the Northern Territory that could not be reconciled with any known genus of the Myrtaceae to which family the species certainly belonged, but the "fruits" appeared so abnormal that it could not certainly be determined whether the mature fruit was dry or fleshy; these structures eventually proved to be the connate lower parts of the calyx-tubes from which seed and endocarp had fallen away. Bateman collected other material including wood samples but this did not resolve the doubt. The structure of the wood also could not be reconciled with that of any known genus. Mr. L. Beens who succeeded Mr. Bateman collected abundant flowering material from another locality in 1965 but it remained for Mr. N. Byrnes to collect good fruiting specimens with seed in 1972 before the relationships of the species could be satisfactorily studied.

As byproducts of the search for relationships the nature of the hairs found in some genera was examined, a reinvestigation of the floral structure of *Eucalyptopsis* was carried out, and embryos from some genera were studied.

***Allosyncarpia*** S. T. Blake; genus novum ob flores fructusque sessiles in capitulis partim connatos *Syncarpium* Ten. revocat, ob calycis tubum supra ovarium circumscissum atque stamina pernumerosa partim deflexa atque seminis solitarii formam *Eucalyptopsem* C. T. White simulans, quoad ovula seminaque horizontalia, folia terna ab utraque differt et ob inflorescentiam elongatum pilis ramosis dense indutam insigna.

Flores hermaphroditi. Tubus calycis  $\pm$  turbinatus supra ovarium productus, post anthesin pars libera circumscissa; lobi 5 herbacei latissime triangulares. Petala 5 trullato-ovato basi latiuscula subcuneata vix unguiculata, sepalis longiora. Stamina pernumerosa libera in seriebus pluribus dense congesta petalis longiora exteriora in alabastro interiora semper deflexa; antherae subquadratae versatiles connectivo parvo loculis parallelis longitudinaliter dehiscentibus. Ovarium omnino adnatum apice leviter convexum glabrum circum

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\* Died 24 February 1973.

stylum haud depressum, 2-loculare; ovula 6-10 campylotropa, crassa, horizontalia, peltata; placenta lata haud crassa in medium dissepimentum fere omnino adnata. Stylus teres calycem haud superans glaber; stigma parvum. Fructus semisuperus capsularis apice dehiscens 2 valvis loculo altera fere semper abortivo; post dehiscentiam exocarpii pars libera mox tandem etiam endocarpium totum secedentia. Semen unicum depresso ovoideum, horizontale, peltatum hilo magno; tertia tenuis; embryo semen implens; cotyledones cornei, crassi inaequales; radícula brevissima.—Arbor sempervirens perulis carens; folia terna, dorsiventralia, pellucido-punctata, pinnatim nervosa vena intra-marginali distincta; flores parvi sessiles 3(-5) nim capitata parte inferiore connati, capitulis pedunculatis in racemis laxis elongatis vel paniculis angustis terminalibus vel etiam axillaribus dispositis; inflorescentia tota pilis minimis ramosis septatis dense tomentosa.

Species typica adhuc unica *A. ternata* S. T. Blake Australiae septentrionales incola.

Flowers hermaphrodite. Calyx-tube  $\pm$  turbinate, produced above the ovary, the free part circumsciss after flowering; lobes 5 herbaceous very broadly triangular. Petals 5 trullate ovate with a relatively broad subcuneate base, longer than the sepals. Stamens very numerous closely packed in several series, longer than the petals, all deflexed in bud, the inner ones persistently so; anthers subquadrate, versatile, with a small connective and parallel cells opening throughout in longitudinal slits. Ovary entirely adnate, slightly convex and glabrous on top, not depressed around the style, 2-locular; ovules 6-10 campylotropous, thick, horizontal, on an adnate scarcely thickened placenta about the middle of the dissepiment. Styles terete not exerted, glabrous; stigma small. Fruit semisuperior, capsular loculicidally dehiscent at the apex into 2 valves, one cell usually abortive; endocarp of the free part soon falling at length followed by the separation of the entire endocarp. Seed 1, depressed ovoid, horizontal, peltate with a large hilum; testa thin; embryo filling the seed; cotyledons horny thick, unequal; radicle very short; plumule undeveloped.—Evergreen tree without bud scales; leaves ternate, dorsiventral, punctate, pinnately veined with a distinct intramarginal vein; flowers small, sessile, connate by their lower parts into heads of 3, the heads pedunculate, in long loose terminal or also axillary racemes or panicles, the whole inflorescence densely tomentose with very small irregularly branched septate hairs.

Type and only species: *A. ternata* S. T. Blake from northern Australia.

***Allosyncarpia ternata*** S. T. Blake, species nova adhuc unica. Typus: *Beens* 30 prope Oenpelli in Australia boreali lectum (BRI, holotypus) atque *Byrnes* 2443 (BRI paratypus).

Arbor usque ad 18 m alta cortice griseo rimoso induta, surculis perjuvenilibus inflorescentiaque exceptis glabra. Folia ternata breviter vel brevissime petiolata; petiolis 1-10 mm longis; laminae coriaceae, anguste ovate vel anguste  $\pm$  ellipticae, acutae vel acuminatae, basi acutae, supra  $\pm$  nitidae infra pallidiores obscurioresque, vena intramarginali a margina incrassato 0.5-0.9 mm distanti atque utrinsecus costam nervis lateralibus primariis 16-22 praeditae hi cum costa angulum 50°-60° facientes fere recti atque venis secundariis minus regularibus et reticulationibus prominentibus interpositi, pro more 7.5-11 cm longae 1.2-2.8 cm latae et 3.5-6 mm longiores quam latiores. Inflorescentia angusta, laxa, racemiformia vel paniculata, 10-17 mm longa, pilis minutis, ramosis septatis cano albido-tomentosa; rami pedunculique inferne temi sursum oppositi bracteati bracteis caducissimis; pedunculi 5-10 mm longi apicem versus par bractearum primo gerentes; bracteolae (?) minimae ad flores laterale adnatae. Flores sessiles 3-ni uniseriati, ad apicem ovariorum connati. Calyx turbinato-campanulatus,  $\pm$  4 mm longus, tomentosus, supra ovarium longius productus post anthesin circumscissus; sepala 5 latissime triangularia acuta et  $\pm$  acuminata, 1.2-1.3 mm longa  $\pm$  1.5 mm lata. Petala 5 late trullato ovata, tomentosa et ciliata, punctata, venulosa sepalis longiora 1.5-2 mm longa. Stamina 5 seriata, 2-4 mm longa in alabastro omnia deflexa, exteriora longiora tandem erecta vel patentia antherae subquadratae 0.4 mm longae lataeque, dorso fere ad apicem glandula parva gerentes. Ovarium apice leviter convexum glabrum. Capitula frugifera 3-1 fructus gerentia vel 3-loba vel transverse ellipsoidea vel irregulariter globosa,  $\pm$  10 mm alta, usque ad 15 mm lata  $\pm$  5 mm crassa.

Fructus semisuperior parte libera fere semiglobosa sed compressa verrucosa, loculo altero abortivo altero monospermo. Semen horizontale, a dorso visum irregulariter ovatum, a latere visum subreniforme,  $\pm$  7-7.5 mm longum, 5-6 mm latum, 4-5 mm crassum; testa brunnea admodum rugulosum; cotyledones pallidi, punctati.

Tree up to 18 m high with grey fissured fibrous bark glabrous except for the inflorescence and the very young shoots. Leaves ternate, shortly or very shortly petiolate; petioles 1-10 mm long; blades coriaceous narrowly ovate or narrowly  $\pm$  elliptic acute or acuminate, acute at the base, somewhat shining above, paler and duller beneath, primary lateral veins in about 16-22 pairs at an angle of  $50^{\circ}$ - $60^{\circ}$  with the midrib running nearly straight to the intramarginal vein, with several less regular secondary laterals and prominent reticulations between the intramarginal vein 0.5-0.9 mm from the outside edge of the thickened margin, mostly 7.5-11 cm long and 1.2-2.8 cm wide, mostly 3.5-6 times as long as wide; reversion shoots? subsessile, only 3 times as long as wide.

Inflorescence narrow, racemiform or paniculate 10-17 cm long densely whitish tomentose with minute branched septate hairs; branches and peduncles ternate or sometimes opposite above with very early caducous bracts near the top and two pairs of minute bracteoles (?) nearly entirely adnate to calyx tube of the lateral flowers; no terminal peduncle. Flowers sessile 3-nate in a linear series connate for about  $\frac{1}{2}$  their length (to the top of the ovaries). Calyx turbinate campanulate  $\pm$  4 mm long, 3.5-4 mm wide at top, tomentose, the tube produced above the ovary for 1-1.5 mm and circumsciss at the level of the ovary after anthesis; sepals 5 very broadly triangular acute and  $\pm$  acuminate,  $\pm$  1.2-1.3 mm long,  $\pm$  1.5 mm wide. Petals 5 broadly trullate ovate, tomentose, ciliate, dotted and venulose, longer than the sepals, 1.5-2 mm long.

Stamens in about 5 series, 2-4 mm long, all deflexed in bud, the inner 2 series remaining so at anthesis. Anthers 0.4 mm long and wide with a small subapical gland at the back. Ovary slightly convex and glabrous on top; style slightly swollen in the middle half. Fruiting heads  $\pm$  3-lobed when 3 fruits mature or transversely ellipsoid or irregularly globose when 1 or 2 fail to mature,  $\pm$  10 mm high up to 15 mm wide,  $\pm$  5 mm thick. Fruits semisuperior, the free part about semiglobose but compressed laterally, one cell abortive, the other with one seed, at length falling from the calyx tube after the seed has been shed leaving only the united bases of the calyx tube, persistent on the peduncle.

Seed horizontal depressed ovoid as viewed from above, somewhat reniform in side view,  $\pm$  7-7.5 mm long, 5-6 mm wide and 4-5 mm thick, testa brown, somewhat rugose; cotyledons pallid, dotted.

**Northern Territory:** DARWIN & GULF DISTRICT: 16 miles NE of Oenpelli, bank of Birraduk Ck, in fringing forest, 60 m, Nov 1965, *Beens* 30 (wood sample W.107), (1. fl., bk.); Waterfall Ck, South Alligator R., on creek bank, Jan 1972, *Byrnes* 2443, (fr); springs along headwaters of South Alligator R., Jun 1956, *Bateman* (old infructescences) and same loc.? in 1955, *Bateman* (1. fl., weathered remains of fr.); South Alligator R. (?same loc.) Nov-Dec 1959, *Bateman* (1. fl.).

The outstanding characters of *Allosyncarpia* are the elongated panicles or racemes of small heads of partly connate flowers with the calyx-tube produced above the ovary and this free part circumsciss after anthesis falling with the entire sepals and the very numerous free stamens in several continuous series the outer of which are about as long as the petals, the 2-celled ovary with comparatively few horizontal ovules, the semi-superior connate loculicidally dehiscent usually 1-seeded fruits with finally deciduous endocarp and upper part of exocarp and plump peltate but horizontal seed with large broad much

contorted cotyledons nearly hiding the short radicle, and the peculiar branched septate hairs in the inflorescence unlike any other hairs observed or reported for the Myrtaceae. The partly connate capitate flowers with free sepals and petals and connate fruits recall *Syncarpia* and the calyx tube circumsciss above the ovary, stamens densely packed in several series with the inner ones persistently deflexed, 2-celled ovary and usually solitary large plump peltate seed suggest some relationship with *Eucalyptopsis*, while the ovary is not depressed around the style in any of them. *Syncarpia* and *Eucalyptopsis* have opposite leaves, very different inflorescences, simple non-septate hairs or none at all and erect seeds, while *Syncarpia* also has a persistent calyx, 1–2 seriate stamens, 3-locular ovary, many ovules erect from a basal placenta, narrow seeds with a basal hilum and radicle about half as long as the cotyledons, and conspicuous bud-scales. On the other hand *Eucalyptopsis* has the flowers free in the head with entirely adnate sepals shed together with the tightly appressed petals as a calyptra, peltate placenta, less twisted cotyledons, (?) persistent pericarp and no intramarginal vein in the leaves.

*Eucalyptopsis* C. T. White, J. Arnold Arb. 32:139-141, Pl. I (1951), was described as having an irregularly lobed calyx, no petals and stamens in four groups, but it is now clear that the single flower available has split during drying. The material now available shows that the sepals are entirely adnate in the bud as a very short broad calyptra which is somewhat irregularly circumsciss immediately above the stamens and often remains attached by a small part to one side of the expanded flower; there are four imbricate petals tightly appressed to one another and to the sepals and falling with them. The structure of the operculum and its adherence in the open flower recalls that of *Eucalyptus terminalis* and related species. The very numerous stamens are crowded in about five continuous series. White suggested that its closest ally was *Pleurocalyptus* Brogn. & Gris. from New Caledonia which has a somewhat similar calyptrate calyx tending to split into irregular lobes, but the calyx-tube is persistent and the petals persist on the open flower while the arrangement of the stamens in one series opposite the sepals and more than one opposite the petals, the almost superior (perigynous) 4–5-celled ovary with a depression around the style and bifid basal placentas with marginal ovules as well as the alternate leaves set this genus apart from any of the others considered in this paper; the hairs are simple and non-septate.

*Eucalyptopsis* is perfectly glabrous but *Syncarpia* is more or less pubescent at least on very young shoots and the top of the ovary with simple non-septate hairs. *Choricarpia* Domin, based on *Syncarpia leptopetala* F. Muell. and originally distinguished from *Syncarpia* because of the free though densely packed flowers with only 20 stamens and 2-celled ovary with a solitary erect (base) ovule in each cell has 2-armed hairs with a short central stalk (malpighiaceae hairs) as in the South American *Calypttranthes* and *Marlieria* of the Myrtoideae. Bentham followed Mueller's placement of *Syncarpia* with some misgiving and with the suggestion that it might prove to be generically distinct, in Benth. & Hook., Gen. Pl. 1:709 (1865), Fl. Aust. 3:266 (1867) and J. Linn. Soc. Bot. 10:145-6 (1867). Baillon referred the species wrongly determined as *Syncarpia laurifolia* to a new monotypic section of *Metrosideros*, *Metrosideros* sect. *Sarcynpia* Baill. Hist. Pl. 6:362, 363 (1877). A second species *C. subargentea* (C. T. White) L. Johnson (*Syncarpia subargentea* C. T. White and *S. subargentea* C. T. White var. *latifolia* C. T. White) has similar 2-armed hairs but I have not seen ripe fruits or seeds of either. The genus further differs from *Syncarpia* in having no bud-scales.

## THE GENUS VERTICORDIA (MYRTACEAE) IN NORTHERN AUSTRALIA

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### Summary

Two new species of *Verticordia*, *V. decussata* and *V. verticillata* from Northern Australia are described and some notes on distribution are given.

The genus *Verticordia* is generally restricted to the south western part of Australia and in "Flora Australiensis", Bentham listed only one species, *V. cunninghamii* Schau. north of latitude 18°S. A further two taxa have been found north of this latitude.

***Verticordia decussata*** S. T. Blake ex N. Byrnes, sp. nov. affinis *V. cunninghamii* Schau. sed foliis decussatis valde confertis et floribus parvioribus differt. Typus: Dunlop 3652 (BRI, holotypus; DNA, isotypus).

**Frutex** patulus usque ad 2 m altus. **Folia** decussata, valde conferta, sessilia, coriacea, rectangularia, 1-2.5 mm longa ca 0.4 mm lata, obtusa, punctata, supra profunde canaliculata. **Flores** albi, axillares in pedicellos breves. **Bracteolae** caducae, alabastrum includentes ca 3 mm longae, unaquae que carina distincta in acumen desinens. **Calycis tubus** costis 10 interdum haud prominentibus. **Lobi calycis** ad 5 mm longi, divaricate ramosi. **Petala** late ovata, irregulariter serrata, ca 3 mm longa. **Stamina et staminodia** ca 2 mm longa. **Stylus** conicus, ca 5 mm longus, annulo ciliorum infra apicem. **Ovarium** uniloculare placentatione basilari et ovulis 8-10. **Fructus** ignoti.

**Shrub** to 2 m high, spreading. **Leaves** decussate, very crowded, sessile, coriaceous, rectangular, 1-2.5 mm long, about 0.4 mm wide, obtuse, deeply channelled above, punctate. **Flowers** white on short axillary pedicels. **Bracteoles** enclosing bud, about 3 mm long, each with a distinct keel ending in a point, caducous. **Calyx tube** with 10 ribs, sometimes indistinct. **Calyx lobes** to 5 mm long, divaricately branched. **Petals** broadly ovate, irregularly serrate, about 3 mm long. **Stamens and staminodes** about 2 mm long. **Style** conical, about 5 mm long with a ring of cilia below the apex. **Ovary** unilocular with 8-10 ovules borne basally. **Fruit** unknown.

**Northern Territory:** Edith R., 14° 09' S 132° 18' E, Sep 1974 Dunlop 3652 (BRI, holo; DNA, iso); above UDP Falls, Jul 1973, Gittins 2693 (BRI); ½ mile W of Nourlangie Rock, Jul 1972, Martensz AE 168 (DNA); Nourlangie Rock, Jun 1974, Fox 495 (DNA) & Jul 1972, Byrnes 2760 (DNA); Nourlangie Rock area, Nov 1972, McKean B776 (DNA); Oenpelli, Oct 1948, Specht 1112 (PERTH).

**Range.** This species is confined to the Northern Territory and to date has not been found south of 15°S latitude.

**Habitat.** Sandstone areas usually growing in crevices or on shallow sandy soils.

This species has been known for a considerable time but only recently have sufficient collections been made to give a reasonable representation of the species. Dr. S. T. Blake suggested the name and intended to describe the species (Specht & Mountford, Am.—Aust. Exp. to Arnhem Land 3:273. 1958) but did not continue with the work. The very tightly packed decussately arranged leaves enable determination of sterile material.

**Verticordia verticillata** N. Byrnes sp. nov. affinis *V. cunninghamii* Schau. sed foliis verticillatis, staminodiis brevioribus et stylo longiori differt. **Typus:** *Dunlop* 3089 (BRI, holotypus; DNA, isotypus).

*Verticordia cunninghamii* Schau. var. *longistyla* C. A. Gardner.

**Frutex** ad 5 m altus. **Folia** verticillata, linearia, plerumque falcata, triquetra, apiculata, sessilia 1–3 cm longa, ad 1 mm lata, punctata inconspicue. **Flores** albi, axillares in pedicellis ad 1 cm longus plerumque in panicula frondoso dispositi. **Bracteolae** caducae, alabastrum includentes, ca 5 mm longae, carina in acumen distincta desinens. **Calycis tubus** costis 5 haud prominentibus. **Lobi calycis** 6–8 mm longi, divaricate ramosi. **Petala** ovata, irregulariter serrata, 4–6 mm longa. **Stamina** ca 3 mm longa; staminodia ca 2 mm longa et ambo longitudine  $\frac{1}{2}$  partem superantia in tubum conata. **Stylus** 1–1.2 cm longus, pilis apicem versus. **Ovarium** uniloculare, placentatione basilari et ovulis 8–10 in annulo. **Fructus** ex calyce leviter aucto semine uno continens constatus.

**Shrub** to 5 m high. **Leaves** verticillate, linear, usually falcate, triquetrous, apiculate, sessile, 1–3 cm long and up to 1 mm wide, inconspicuously punctate. **Flowers** white, axillary on pedicels to 1 cm long and usually in a leafy panicle. **Bracteoles** enclosing the flower buds, about 5 mm long, each with a keel ending in a distinct point, caducous. **Calyx tube** with 5 indistinct ribs. **Calyx lobes** 6–8 mm long, divaricately branched. **Petals** ovate, 4–6 mm long, irregularly serrate. **Stamens** about 3 mm long; staminodes about 2 mm long, both fused together into a tube for more than  $\frac{1}{2}$  of their length. **Style** 1–1.2 cm long with hairs below the apex. **Ovary** unilocular with 8–10 ovules borne basally in a ring. **Fruit** a slightly enlarged calyx containing a single seed.

**Northern Territory.** Eva Valley Stn, 14° 14' S 133° 00' E, Oct 1973, *Dunlop* 3089 (BRI, holo; DNA, iso); Groote Eylandt, May 1948 *Specht* (BRI); Oenpelli, Sep 1948, *Specht* 1041 (BRI, PERTH); East Alligator R. area, Aug 1973, *Parker* 174 (BRI, DNA) & Jul 1972, *Lazarides* 7576 (BRI); ca 1.5 miles NW of Cannon Hill Airstrip, Aug 1972, *Martensz* AE 248 (BRI); Springvale, *Giles* (BRI); Adelaide R., Jun 1943, *Tyack Bake* (BRI); Katherine, *Musspratt* SS0396 (DNA); 20 miles W of Katherine, Sep 1961, *Speck* 1661 (BRI, PERTH); Eva Valley Stn, Oct 1973, *Robinson* EV70 (DNA). **Western Australia.** 15° 45' S 128° 44' E, Sep 1970, *Scarth-Johnson* 557 (BRI); Deception R., *Langfield* 391 (PERTH); Wyndham Rd., Sep 1970, *Scarth-Johnson* 560 (PERTH); near Mt. Hann, Jul 1921, *Gardner* (PERTH) (holotype of *V. cunninghamii* var. *longistyla*); 14 miles from Kununurra on Wyndham Rd., Oct 1966, *Thompson* 15 (PERTH).

**Range.** The northern part of the Northern Territory and the Kimberley area of Western Australia.

**Habitat.** On a wide range of well drained soils in monsoonal areas.

This species closely resembles *V. Cunninghamii* in the field and has been confused with it in herbaria but differs from it in having verticillate leaves with indistinct oil glands, a much longer style and comparatively shorter staminodes. Details of these characters were examined on the type material of *V. cunninghamii* (Cunningham's collection) at Kew by A. Kanis (pers. comm.). This enabled the clarification as to which taxon was the undescribed species.

In C. A. Gardner "Bot. Notes, Kimberley Div. of W.A. 74 (1923)" *V. cunninghamii* var. *longistyla* was described. Examination of the type material revealed that it belongs to this taxon.

Originally the generic description (de Candolle, Prod. 3:208. 1828) included only opposite leaves. Bentham (Fl. Aust. 3:16, 1866) expanded the description to include alternate leaves and now an addition needs to be made to include this species with its verticillate leaves. It is typical of the genus in all other characters examined.

*V. cunninghamii* is the most common species in Northern Australia and has the greatest range, extending from the Queensland border near the Nicholson R. to the western Kimberley area of Western Australia.



## POLYCARPAEA (CARYOPHYLLACEAE) IN AUSTRALIA

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### SUMMARY

Diagnoses and a key to the twelve species occurring in Australia are given. Taxa described for the first time are:—*P. arida*, *P. fallax*, *P. microphylla*, *P. corymbosa* var. *minor*, *P. corymbosa* var. *torrensis* and *P. spirostylis* subsp. *compacta*. New combinations are: *P. breviflora* var. *gracilis* (based on *P. synandra* var. *gracilis* Benth.), *P. spirostylis* subsp. *densiflora* and subsp. *glabra* (based on *P. synandra* var. *densiflora* Benth. and *P. glabra* White & Francis respectively). Other names placed in synonymy are: *P. brevianthera* Ewart & Cookson, *P. burtonii* F. M. Bailey, *P. gamopetala* Berhaut, *P. longiflora* var. *leucantha* Benth., *P. parviflora* Domin, *P. pumilio* Domin, *P. spirostylis* var. *intercedens* Domin var. *intricata* Domin, and var. *resulans* Domin, *P. synandra* F. Muell., *P. triloba* Ewart & Cookson and *Reesia erecta* Ewart. The name *P. breviflora* F. Muell. has been misapplied to the taxon described as *P. corymbosa* var. *minor*. The record of *P. spicata* Arn. from Australia is considered doubtful.

Some species of *Polycarpaea* are of interest to geobotanists (White & Francis 1926, Cole 1965) and in recent years there has been a demand for the correct identification of Australian material of the genus. Bakker (1957) provided an account of Malesian species, but there has been no treatment of the genus in Australia since Bentham (1863).

The taxonomy and nomenclature of Australian species proved to be somewhat confused. These notes fall short of a full revision, mainly because of the brief descriptions which lack detail about the ovary, capsule and seeds.

### Key to taxa

1. Corolla lobes free or united into tube less than 0.5 mm long; staminodes\* sometimes present, sepals less than 5 mm long, sometimes without distinct midribs 2  
Corolla lobes united into a tube more than 0.5 mm long; staminodes absent; sepals up to 13 mm long with distinct midribs 13
2. Leaves less than 2 mm long, as long as the internodes 2 *P. microphylla*  
Leaves more than 4 mm long, usually shorter than internodes 3
3. Staminodes present as linear projections inside petals; sepals 4-5 mm long with definite midribs 4  
Staminodes absent; sepals often without definite midribs 6
4. Stems glabrous; sepals tinged with red, glabrous; capsule ca  $\frac{1}{2}$  as long as corolla 1 *P. violacea*  
Stems sparsely pubescent; sepals white; capsule at least  $\frac{1}{2}$  as long as corolla 5

\* See Bakker for discussion on morphology of staminodes

5. Sepals *ca* 4 mm long, hirsute towards base 2 *P. staminodina*  
 Sepals 4.5–5.5 mm long, not hirsute, slightly fimbriate 3 *P. fallax*
6. Several stems from a rosette of broad obovate or oblong radical leaves or simple stem with a pair of basal  $\pm$  orbicular leaves 7  
 Stems simple, or if much branched then without rosette of broad leaves 9
7. Single stem with pair of broad basal leaves; corolla 1.3 mm long with a distinct fold inside at base 6 *P. diversifolia*  
 Much branched with basal rosette; corolla *ca* 3.5 mm long, corolla without fold 8
8. Plant pubescent; heads sessile, surrounded by herbaceous floral leaves; sepals without midribs 7 *P. involocrata*  
 Plant glabrous; heads pedunculate with scarious bracts; sepals with midribs \**P. spicata*
9. Capsule 1-seeded; much branched herbs; leaves with fine setaceous points *ca* 0.5 mm long 8 *P. holtzei*  
 Capsule with at least 5 seeds; sparingly branched; leaves usually with shorter points 10
10. Inflorescence subtended by floral leaves longer than the inflorescence 5 *P. arida*  
 Inflorescence not subtended by floral leaves 4 *P. corymbosa*. 11
11. Sepals with  $\pm$  distinct midribs; capsule 1.4–2 mm long; leaves as long as or longer than the internodes 4b. *P. corymbosa* var. *torrensis*  
 Sepals without midribs; capsule to 1.6 mm long; leaves shorter than internodes 12
12. Sepals often reddish at base to *ca* 2.5 mm long; petals 0.7–1.1 mm long 4b *P. corymbosa* var. *minor*  
 Sepals white; 2.5–3.5 mm long; petals 0.6–1.4 mm long 4a *P. corymbosa* var. *corymbosa*
13. Stems pubescent; calyx white or suffused with pink, 5–9 mm long; corolla 2.8–7.5 mm long 10 *P. longiflora*  
 Stems glabrous; calyx with pink or purplish midrib, not white or suffused with pink 14
14. Sepals less than 4 mm long and corolla less than 2.6 mm long 12 *P. breviflora* 15  
 Sepals more than 4.5 mm long and corolla more than 3.4 mm long 11 *P. spirostylis* 16
15. Sepals ovate, white (midrib not coloured), inflorescence rather open 12a *P. breviflora* var. *breviflora*  
 Sepals narrowly ovate, white with distinct purplish midrib, inflorescence rather compact 12b *P. breviflora* var. *gracilis*
16. Inflorescence open, pedicels more than 0.8 mm long; sepals 6–13 mm long 17  
 Inflorescence compact, pedicels less than 0.8 mm long; sepals 4.5–7 mm long 18
17. Sepals 7–13 mm long with purplish midribs; petals only shortly bifid; staminal filaments shorter than the corolla 11a *P. spirostylis* subsp. *spirostylis*  
 Sepals 6–7 mm long with red-brown midribs; petals deeply bifid (1 mm or more); staminal filaments longer than the corolla 11b *P. spirostylis* subsp. *glabra*
18. Sepals 6–7 mm long with purplish midribs, acute 11c *P. spirostylis* subsp. *densiflora*  
 Sepals 4.5–5 mm long with red-brown midribs, not noticeably acute 11d *P. spirostylis* subsp. *compacta*

1. *Polycarpaea violacea* (Mart.) Benth., Fl. Aust. 1:165 (1863). Based on *Aylmeria violacea* Mart., Nov. Acta Physcio-Med. Nat. Cur. 13:277 (1826). **Type:** Crokers I., April  $\frac{267}{1818}$ , *Cunningham* (BRI, K, MEL, iso?)—see below).

*Achyranthes violacea* (Mart.) Spreng., Syst. Cur. Post. 102 (1827). Based on *Alymeria violacea*.

*Alymeria rosea* Mart., Nov. Acta Physcio-Med. Nat. Cur. 13:277 (1826). **Type:** *Ex herb. Lambert* (K, iso).

*Achyranthes rosea* (Mart.) Spreng., Syst. Cur. Post. 103 (1827). Based on *Alymeria rosea*.

Stems glabrous erect with rather short internodes. Leaves glabrous, rather broad. Bracts white without prominent midribs, 2-3 mm long; pedicels *ca* 2 mm long, pubescent. Sepals 5 mm long tinged with red, with prominent midrib rather broad in basal 2 mm; petals obtuse or obtusely bifid, up to 2 mm long; anthers shorter than corolla; staminodes not prominent. Capsule *ca*  $\frac{1}{2}$  as long as corolla.

**Range:** Extreme northern part of the Northern Territory.

**Northern Territory:** Crokers I., Apr  $\frac{267}{1818}$ , *Cunningham* (BRI, K, MEL); near Darwin, Mar 1914, *Allen* 122 (K): 14 miles [22 km] E of Darwin, Mar 1964, *Adams* 909 (CANB, K); Humphy Doo, Mar 1961, *McKee* 8315 (K); Delissaville, Cox's Pen., Mar 1948, *Specht* 78.

Two sheets are segregated at K as types. One is *Cunningham* 267. On the other, one fragment labelled *Alymeria violacea* Mart. which was sent by Martius is probably also part of the *Cunningham* collection. The other fragment on the same sheet is merely labelled *Aylmeria rosea* Mart. "ex herb Lambert". This may be an isotype of *A. rosea*.

2. *Polycarpaea staminodina* F. Muell., Rep. Babbage Exp. 8 (1858). **Type:** Head of Sturt Creek, Feb 1856, *Mueller* (MEL, holo).

Sparingly pubescent erect herb. Leaves recurved, pubescent. Bracts at base 2.5-3.5 mm long, often bilobed at apex; pedicel pubescent. Sepals usually hirsute at base, with a definite midrib, *ca* 4 mm long; petals *ca* 1.2 mm long, shortly bilobed; staminodes linear  $\frac{1}{4}$ - $\frac{1}{3}$  as long as petals. Capsule about half as long as petals.

**Range:** North-western part of the Northern Territory.

**Northern Territory:** Victoria River, Apr 1856, *Mueller* (K); Cullen & Ferguson River, in 1927, *Allen* (K); 12 miles [20 km] SW of Katherine, Jun 1949, *Perry* 1975 (BRI, CANB, K, MEL).

3. *Polycarpaea fallax* Pedley, sp. nov. affinis *P. staminodinae* F. Muell. sepalis glabris brevioribus et petalis longioribus differt. **Typus:** *Specht* 708 (Holotypus: BRI; isotypus: K, MEL).

Herb erecta ad 0.5 m alta caulibus sparsim pubescentibus. Folia 1-2 cm longa concava; stipulae subulatae *ca* 4 mm longae. Inflorescentiae terminales  $\pm$  compactae; bracteae *ca* 5 mm longae, anguste ovatae, bifidae laciniatae apice, fimbriatae basi; pedicelli pubescentes. Sepala 4.8-5.5 mm longa costis  $\pm$  prominentibus lanceolata ovatae leviter fimbriata prope basin; petala 1.8-2 mm longa *ca* 0.4 mm lata leviter erosa vel obtusa apice. Stamina: filamenta *ca* 1.6 mm longa; antherae oblongae vel sagittatae 0.4 mm longae. Capsula globosa *ca* 1.8 mm longa.

Erect herb to 50 cm high with sparsely pubescent stems. Leaves 1–2 cm long, concave; stipules subulate, *ca* 4 mm long. Inflorescences terminal  $\pm$  compact; bracts *ca* 5 mm long, ovate lanceolate, bifid or laciniate at the apex, fimbriate at the base; pedicels pubescent. Sepals 4.8–5.5 mm long with  $\pm$  prominent midribs, lanceolate or ovate slightly fimbriate near the base; petals 1.8–2 mm long, *ca* 0.4 mm wide, slightly erose or obtuse at the top. Stamens: filaments *ca* 1.6 mm long; anthers oblong or sagittate, 0.4 mm long. Capsule globose, *ca* 1.8 mm long.

**Range:** Northern part of the Northern Territory and the lower part of the Ord River basin in Western Australia.

**Western Australia:** 27 miles [43 km] NNE of "Denham River", Jul 1949, *Perry* 2537 (BRI, CANB, MEL); near Kununurra, 15° 45'S, 128° 44'E., Sep 1970, *Scarath-Johnson* 559 (BRI, K). **Northern Territory:** Port Darwin, in 1884, *Holtze* 417, and Jul 1886, *Tenison-Wood* (MEL); Port Bradshaw, Jul 1948, *Specht* 708 (BRI, MEL); Yirrakala, Jul 1948, *Specht* 681 (BRI, MEL); Arnhem Land, *Brown* (MEL) and Apr-Jun 1928, *Basedow* (K).

*P. fallax* has been confused with *P. longiflora* (Section *Planchonia*) but the presence of staminodes points to a relationship with *P. staminodina* in section *Aylmeria*.

#### 4. *Polycarpaea corymbosa* (L.) Lam., Taber. Encycl. Meth. Bot. 2:129 (1797).

Based on *Achyranthes corymbosa* L., Sp. Pl. 1:205 (1753). **Type:** not seen.

Pubescent, sometimes glabrescent; leaves  $\pm$  glabrous up to 2.5 cm long. Bracts often fimbriate, usually 2-lobed, 2–4.5 mm long; peduncles hirsute. Sepals with or without distinct midribs, white or slightly thickened and reddish at the base, 1.8–3.7 mm long; petals  $\pm$  acute, obtuse or slightly erose, 0.6–1.4 mm long,  $\frac{1}{3}$ – $\frac{1}{2}$  as long as the sepals; anthers usually shorter than the petals. Capsule 1–2 mm long.

##### 4a. *P. corymbosa* var. *corymbosa*

Sepals 1.9–3.7 mm long; petals 0.6–1.4 mm long; capsules 1–1.6 mm long. Leaves not as long as internodes; calyx without reddish tinge towards the base.

**Range:** Coastal and subcoastal districts of Australia north of about 22°S lat. in both Western Australia and Queensland.

**Western Australia:** Between Ashburton and Yule Rivers, *Clement* (K); between De Grey R. and Lagrange B., in 1879, *Forrest and Carey* (MEL); Derby, Apr 1927, *Ewart* (MEL); near the Ord River, in 1886, *O'Donnell* (MEL). **Northern Territory:** Victoria River, Feb 1856, *Mueller* (MEL); 12 miles [20 km] SW of Hooker Creek, Apr 1959, *Chippendale* NT 2230 (MEL); Katherine, Apr 1964, *Adams* 952 (MEL); Newcastle Waters, in 1887, *Giles* (MEL); Arnhem Land, Apr-June 1928, *Basedow* 17 (K). **Queensland:** BURKE DISTRICT: Adels Grove, Jun 1950, *de Lestang* 476 (BRI); Sweers I., Jun 1901, *J. F. Bailey* (BRI); Einasleigh River, *Armit* 547 (MEL); "Chudleigh Park", 110 miles [174 km] N of Hughenden, Feb 1931, *Hubbard & Winders* 7609 (BRI, K). COOK DISTRICT: 2.5 miles [4 km] S of Somerset, May 1948, *Brass* 18696 and 19481 (BRI, K); 8 miles [13 km] W of Musgrave T.O., 13°48'S 143°22'E, Jun 1968, *Pedley* 2657 (BRI); near Tolga, Apr 1962, *McKee* 9406 (BRI, K); Lizard I., Aug 1848, *Macgillivray* 392 (K). NORTH KENNEDY DISTRICT: Cleveland Bay, in 1896, *Mattingley* (MEL); Don River, Edgcombe Bay, in 1886, *Birch* (MEL). SOUTH KENNEDY DISTRICT: Upper Belyando, in 1883, *Emmerson* (MEL). PORT CURTIS DISTRICT: Rosedale, May 1930, *Dovey* D75 (BRI).

##### 4b. *P. corymbosa* var. *minor* Pedley, var. nov. a *P. corymbosa* var. *corymbosa* floribus parvis (sepala 1.8–2.2 mm longa; petala 0.7–1.1 mm longa at capsula 0.1–1.1 mm longa) et sepalis area incrassata triangulare rubra saepe basi instructis dignoscenda. **Typus:** *Pedley* 1234 (BRI, holo; K, MEL, iso).

**Misapplied name:** *P. breviflora* auct. non F. Muell: Benth., Fl. Aust. 1:166 (1863).

Distinguished from *P. corymbosa* var. *corymbosa* by the smaller flowers. (Sepals 1.8–2.2 mm long; petals 0.7–1.1 mm and capsule 0.8–1.6 mm long) and the sepals often with a reddish triangular thickened area at the base.

**Range:** Coastal and semi-arid areas of north-eastern Northern Territory, Queensland and north-eastern New South Wales. One specimen from New Guinea.

**Northern Territory:** Bulman, 13° 38'S 134° 25'E, Apr 1963, *Cole* Bulman 10 (K); "Beswick" [14° 30'S 133°E], Apr 1962, *Nelson* 261 (MEL). **Queensland:** BURKE DISTRICT: N of "Riversleigh", Jun 1963, *Gittins* 807 (BRI). COOK DISTRICT: Gilbert River, *Bick* (BRI); Palmer River, in 1895, *Field* (MEL); Yorkey's Knob beach near Cairns, May 1962, *McKee* 9477 (BRI). NORTH KENNEDY DISTRICT: "Cashmere", Mar 1875, *Armit* 154 (MEL); Herbert River, Rockingham Bay, Sep 1869, *Dallachy* (MEL); Edgumbe Bay, *Michael* 1185 (BRI). MITCHELL DISTRICT: Jericho, Mar 1946, *Clemens* (BRI, K). SOUTH KENNEDY DISTRICT: Cape River, *Bowman* (MEL); Port Mackay, *Dietrich* 2480 (MEL). LEICHHARDT DISTRICT: 9 miles [14 km] E of "Mantuan Downs", Apr 1946, *Everist* 2541 (BRI); Springsure, *sine coll.* (BRI, MEL); Gracemere, Mar 1871, *O'Shanesy* 1296 (MEL). WIDE BAY DISTRICT: Burnett Heads, *Michael* 1752 (BRI). MORETON DISTRICT: Islands of Moreton Bay, Aug 1855, *Mueller* (K, MEL). DARLING DOWNS DISTRICT: 12 miles [20 km] W of Westmar [27° 55'S 149° 35'E], Apr 1963, *Pedley* 1234 (BRI, K, MEL). **New South Wales:** Warialda, Jul 1905, [*Rupp?*] (MEL); Crow Mtn, Barraba, Jul 1913, *Rupp* (MEL); Narrabri, Jan 1883, *Betche* (MEL). **Papua:** CENTRAL DISTRICT: Bootless Bay near Port Moresby, Jun 1960, *Womersley & Thorne* NGF 12858.

**4c. *P. corymbosa* var. *torrensis*** Pedley, var. nov. a *P. corymbosa* var. *corymbosa* foliis internodia sequantibus vel eis longioribus et sepalis costis ± manifestis instructis dignoscenda. Sepals 2.5–3 mm longa; petala 0.7–1.1 mm longa. Capsula 1.4–2 mm longa pilis paucis longis basi vestitis. **Typus:** Badu I., *Bick* 83. (BRI, holo).

Distinguished from *P. corymbosa* var. *corymbosa* by the leaves as long as or longer than the internodes and sepals with ± distinct midnerves. Sepals 2.5–3 mm long; petals 0.7–1 mm long. Capsule 1.4–2 mm long with a few long hairs at the base.

**Range:** The northern part of Cape York Peninsula and islands of Torres Strait.

COOK DISTRICT: Albany I., Aug 1855, *Mueller* (K, MEL); Badu I., May 1911, *Bick* 83 (BRI); Thursday I., in 1878, *Chalmers* (MEL); Cape York, *Daemel* (K, MEL); Somerset, June 1897, *Bailey* (BRI).

*Polycarpaea corymbosa*, a pantropical species exhibiting a considerable range of variation, should properly be examined throughout its range if a satisfactory classification is to be arrived at. The following observations may assist other workers on the species.

On the whole, specimens from Australia resemble South American ones more closely than they do ones from Africa. Brennan and Taylor (Kew herb. records) noted that *P. brasiliensis* Comb. appeared to be different, but not specifically so from *P. corymbosa* from Asia and Africa, and that Chodat and Hassler had made the combination *P. corymbosa* var. *brasiliensis* for Paraguayan specimens. They considered the plant described as *P. nebulosa* by Lakela (1963) to be a slight variant of *P. brasiliensis*.

In view of the wide distribution and the complexity of the variation of the species I am reluctant to complicate the taxonomy of the species by describing two more infra-specific taxa, but within Australia both are sufficiently distinct to warrant at least varietal rank.

*P. corymbosa* var. *torrensis* is well defined in both foliar and capsular characters. The well defined rib of its sepals distinguishes it from the other varieties. Both Bentham (1863) and Bakker (1957) regarded the absence of a rib on the sepals as distinctive character of *P. corymbosa*, but accounts of the species vary from country and there are often inconsistencies between descriptions and illustrations. For example, Rohrbach (1872) stated that the midrib of *P. corymbosa* was hardly prominent ("vix prominente") but it is well enough defined in the plate. The plant drawn is remarkably similar in general appearance to *P. corymbosa* var. *torrensis*.

*P. corymbosa* var. *minor* is not as well defined as var. *torrensis*. I have applied the name to a variant found on sand in inland and coastal localities that varies more in general appearance than in any single character. It has somewhat smaller flowers and its sepals are tinged with red at the base. The taxon has been generally wrongly referred to as either *P. breviflora* or *P. corymbosa* var. *breviflora*. The misidentification is discussed under *P. breviflora* (p. 60).

**5. *Polycarpaea arida* Pedley, sp. nov. affinis *P. corymbosae* (L.) Lam. inflorescentiis foliis floralibus longis  $\pm$  subtentis differt. **Typus:** *Everist* 3964 (BRI, holo; K, MEL, iso).**

Herba perennis ad 10 cm alta; caules pubescentes pilis albis crispis vestiti; stipulae anguste ovatae integrae vel profunde laciniatae, foliis breviorae. Folia linearia 5–10 mm longa, mucronulata glabra, ea inflorescentiam condensam corymbosam subtentia inflorescentiam aequantia vel eam longiora. Bracteae sine costis sepala  $\pm$  aequantes; pedicelli pubescentes. Sepala 2.5–3.5 mm longa sine costis sed basibus crassis cartilagineis ca 0.3–0.5 mm longis; petala 0.6–1.1 mm longa obtusa integra; stamina petalis breviora filamentis 0.3 mm longis et antheris globulis 0.2 mm diam. Capsula 2 mm longa.

Perennial to 10 cm tall; stems pubescent with white crisped hairs; stipules narrowly ovate, entire or deeply laciniate, shorter than the leaves. Leaves linear 5–10 mm long, mucronulate glabrous, those subtending the condensed corymbose inflorescence as long as or longer than the inflorescence. Bracts without midribs, about as long as the sepals; pedicels pubescent. Sepals 2.5–3.5 mm long without midribs but with thick cartilaginous bases ca 0.3–0.5 mm long; petals 0.6–1.1 mm long, obtuse, entire; stamens shorter than the petals with filaments 0.3 mm long and globular anthers 0.3 mm in diameter. Capsule 2 mm long.

**Range:** Arid parts of northern Australia.

**Western Australia:** "Mt House", Apr 1955, *Lazarides* 5160 (BRI); Mt Squires, Barrow Ra., Aug 1891, *Helms* (MEL). **Northern Territory:** Glen of Palms, in 1872, *Giles* (MEL); James Range, in 1886, *Schwartz* (MEL); Finke River, in 1879, *Kempe* (MEL); Coglin River, near Charlotte Waters, May 1926, *Basedow* 9 (K). **South Australia:** Vicinity of Lake Eyre, *Andrews* comm. *Schomburgk* (K). **Queensland:** GREGORY NORTH DISTRICT: ca 100 miles [160 km] W of Windorah, Jun 1949, *Everist* 3964 (BRI, K, MEL); Thylungra, May 1963, *Macdonald* 432 (K). WARREGO DISTRICT: "Offham", 40 miles [64 km] W of Cunnamulla, Apr 1947, *Geary* (BRI). **New South Wales:** Mt Poole, near Wilcannia, in 1887, *Bauerlen* (MEL); Wankeroo Hills, 20 miles [32 km] N of Broken Hill, Jun 1928, *Morris* 2048 (BRI, K).

**6. *Polycarpaea diversifolia* Domin, Biblioth. Bot. 89:102 (1925). t. 20 f. 8–15**  
**Type:** between Ashburton and Yule River, *Clement* (PR, holo; K, iso).

Annual with a pair of persistent orbicular basal leaves, ca 12 mm and 9 mm wide. Stems pubescent with crisped hairs. Upper leaves linear ca 2 mm long and 1 mm wide. Inflorescence rather loose; bracts ca 3.5 mm long. Sepals without midribs, 2.5–3 mm long; corolla 1.2–1.3 mm long with obscure folds inside at the base; staminal filaments 0.4 mm long. Capsule depressed globular, 0.4 mm long, 0.6 mm in diameter.

**Range:** North-western Australia.

**Western Australia:** between Ashburton and Yule Rivers, *Clement* (K, PR). **Northern Territory:** C.S.I.R.O. Research Station, Katherine, Apr 1964, *Adams* 952 (K).

I have seen only two collections of *P. diversifolia*. It appears to differ from *P. corymbosa* in being an annual and in having obscure folds inside the petals at the base, but the two may prove to be conspecific.

7. ***Polycarpaea involucrata*** F. Muell., Rep. Babb. Exped. 9 (1858). **Type:** Sturts Creek and Upper Victoria River, Mar 1856, *Mueller* (MEL, holo; K, iso?).

Similar to a species of *Alternanthera* in general appearance. Much branched; stems pubescent. Lower leaves rosulate, spatulate; upper  $\pm$  sessile, 5–9 mm long and 2 mm wide with crisped hairs on midribs below; stipules *ca* 3–4 mm long. Flowers  $\pm$  sessile in heads subtended by leaves *ca* 7 mm long; sepals 3.5–4.5 mm long, the outer ones thickened at the base; corolla 1.2 mm long, rather stout; staminal filaments 0.6 mm long. Capsule top-shaped with stout capitate stigma.

**Range:** Known only from type and one other locality in the Northern Territory.

**Northern Territory:** O.T. Station, 16°37'S 153°03'E, May 1947, *Blake* 17663 (BRI); Victoria River, May 1968, *Byrnes* NB 710 (BRI).

8. ***Polycarpaea holtzei*** Maiden & Betche in Ewart & Davies, Fl. North. Terr. 109 (1917). **Type:** Pine Creek, Feb 1914, *Allen* (K, iso).

*P. pumilio* Domin, Biblioth. Bot. 89:102 (1925). **Type:** between Ashburton and Yule River, *Clement* (PR, holo; K, iso).

Much branched; stems with hairs *ca* 0.4 mm long. Leaves appearing verticillate, linear, glabrous, with a fine point *ca* 1 mm long; stipules white lacinate almost as long as the leaves. Flowers in terminal cymes; bracts *ca* 3 mm long, fimbriate; pedicels *ca* 0.8 mm long, sparsely hairy; sepals glabrous, without ribs 1.7–2.8 mm long, fimbriate or deeply and rather irregularly bifid; petals brown, obtuse, 0.4–0.6 mm long; anthers longer than the filaments. Capsule 0.8 mm long obovoid, 3-valved, 1-seeded.

**Range:** Along north-western coast of Western Australia through the Kimberley region to the north-western part of the Northern Territory.

**Western Australia:** Harding River, in 1895, *Cusack* 101 (MEL); between Gasgoyne & Fortescue Rivers, in 1885, *King* (MEL); Nickol Bay, in 1876, *Crouch* (MEL); near "Mt House", Apr 1955, *Lazarides* 5160 (K, MEL). **Northern Territory:** Port Darwin, in 1890, *Holtze* 1011 (MEL); Darwin, Nov 1929, *Bleeser* 179 (MEL); [18 km] S of Batchelor, Mar 1961, *Chippendale* NT 7729 (K); Edith River, Jan 1965, *Wilson* 246 (K).

The flowers of the type of *P. holtzei* are smaller than those of the type of *P. pumilio*, but there is little doubt that the two are conspecific. *P. holtzei* is unusual in *Polycarpaea* in having a 1-seeded capsule. It could well constitute a distinct section.

9. ***Polycarpaea microphylla*** Pedley, sp. nov.; a speciebus Australiae bene distincta, antem facie et habitu *P. hassleranae* Chod. ex America australi similis.

**Typus:** *Brass* 415 (BRI, holo).

Herba ramosissima perennis usque ad 15 cm alta caulibus hirsutis foliis in verticillum 3-foliatum dispositis. Folia acicularia 1.5–2 mm longa internodia aequantia; stipulae folia aequantes. Flores singulatim vel in fasciculis paucifloris in extremitatibus ramulorum dispositi;

bracteae ovatae integrae acuminatae vel profunde bifidae fimbriatae vel margine minute serrato, 1–2 mm longae; sepals lanceolata vel ovata acuminata 2.5 mm longa interdum subtiliter pubescentia, petala lanceolata obtusa 1.5–2 mm longa; filamenta staminea 0.5–1 mm long, antherae elongatae sagittatae ca 0.5 mm longae; ovarium glabrum sessile 3-valvatum ca 1 mm longum, stylus tenuis 0.6–1 mm longus.

Branched perennial herb to 15 cm high with hirsute stems. Leaves acicular 1.5–2 mm long in whorls of three, as long as the internodes; stipules as long as the leaves. Flowers single or in few-flowered fascicles at the end of the branches; bracts ovate entire acuminate or deeply bifid, fimbriate or minutely serrate on the margins, 1–2 mm long; sepals lanceolate or ovate acuminate 2.5 mm long sometimes finely pubescent; petals narrow lanceolate, obtuse, 1.5–2 mm long; staminal filaments 0.5–1 mm long, anthers elongate, sagittate ca 0.5 mm long; ovary glabrous, sessile, 3-valved, ca 1 mm long, style slender 0.6–1 mm long.

**Range:** Sporadically distributed from Katherine in the Northern Territory to the extreme north-west of Queensland.

**Northern Territory:** Katherine Gorge, May 1968, *Byrnes* NB 679 (DNA); Robinson River, Jul 1925, *Brass* 415 (BRI). **Queensland:** BURKE DISTRICT: N of "Riversleigh", Jun 1963, *Gittins* 807 (BRI).

*Polycarpaea microphylla* is remarkably similar in general appearance to *P. hasslerana* Chod. which is confined to south-western Brazil (Matto Grosso) and Paraguay. It has larger flowers and shorter leaves however. It is possible that both species have evolved from *P. corymbosa*.

**10. *Polycarpaea longiflora*** F. Muell., Rep. Babbage Exped. 8 (1858). Syntypes: two specimens—Victoria River, May 1856, *Mueller* (MEL; K, iso?).

*P. longiflora* var. *leucantha* Benth., Fl. Aust. 1:165 (1863). **Type:** Victoria River, *Mueller* (K, holo; MEL, iso).

*Reesia erecta* Ewart, Proc. Roy. Soc. Victoria 26 (n.s.): 9 (1913); Willis, Vict. Nat. 61:175 (1945). **Type:** near Pine Creek, Aug 1904, *Niemann* (MEL, holo).

Erect perennial rather woody at the base, stems pubescent. Leaves subglabrous to pubescent, shorter than the internodes. Bracts acuminate 6–7 mm long, fimbriate in the lower part. Pedicels 2–5 mm long, pubescent. Sepals oblong acute fimbriate in the lower part, with a definite midrib, (5–)6–8(–9) mm long ca 2 mm wide; petals united at base into a tube.

**Range:** The north-western part of Western Australia and the northern part of the Northern Territory.

**Western Australia:** Barrow I., Nov 1953, *Hill* 430 (K); between Ashburton & Yule R., *Clement* (K); Nickol Bay, in 1874, *Crouch* (MEL); Dampier Arch., in 1875, *Walcott* (MEL); Yule River, in 1878, *Forrest* (MEL); Roebuck Bay, in 1889, *Tepper* (MEL); Greville I., Aug 149/1821, *Cunningham* (K); Cambridge Gulf, in 1886, *Ranford & Nynlasy* (MEL). **Northern Territory:** 40 miles [64 km] W of Wavehill Police Station, Jun 1949, *Perry* 2272 (BRI, MEL). Port Darwin, in 1879, *Forrest* (MEL); 57 miles [91 km] SE of Adelaide River, Mar 1963, *Lazarides* 6842 (K); 9 miles [14 km] S of Batchelor, Mar 1961, *Chippendale* NT 7745 (K); 66 miles [105 km] NE of "Creswell", Jul 1948, *Perry* 1664 (BRI, K); Settlement Creek, Apr 1922, *Brass* 147 (BRI). **Queensland:** BURKE DISTRICT: near mouth of Settlement Creek, Jun 1948, *Perry* 1242 (BRI, K).



There is an intergrade from plants with white sepals through those tinged with pink to plants with violet sepals. The width of leaves of no taxonomic significance so that recognition of *P. longiflora* var. *leucantha* is not justified. Willis has discussed the identity of *Reesia erecta*.

**11. *P. spirostylis* F. Muell., Rep. Babb. Exped. 8 (1858).**

Erect herb up to 40 cm high branched at the base, glabrous except for a few hairs sometimes in the axils of the leaves and bracts. Leaves linear mucronulate 1–3 cm long. Inflorescence terminal, corymbose, open or compact; bracts narrowly ovate to ovate, sometimes amplexicaule, sometimes ciliolate or lacinate towards the top; pedicels up to 2 mm long. Sepals with brownish, reddish or purplish midribs 4.5–13 mm long, narrowly ovate; corolla 3.4–10 mm long, occasionally as long as the sepals, the tube 2.5–6 mm long the lobes sometimes deeply bifid; staminal filaments shorter than to longer than the corolla.

**11a. *P. spirostylis* subsp. *spirostylis*.**

**Type:** Tropical Australia, *Mueller* (MEL, holo; K, iso)

*P. burtonii* F. M. Bailey, Proc. Roy. Soc. Qd 1:85 (1884). **Syntypes:** Walsh Range, between Tate River & Thornborough, *Burton* 3 (BRI; MEL, iso); Herberton, *Stuart* (BRI)

*P. spirostylis* var. *burtonii* (F. M. Bailey) Domin, Biblioth. Bot. 89:99 (1925). Based on *P. burtonii*.

*P. spirostylis* var. *rosulans* Domin, *op. cit.* 100 (1925). **Type:** Locis subrudis in xerodrymio apud opp. Chillagoe, Feb 1910, *Domin* (PR, holo).

*P. spirostylis* var. *intercedens* Domin, *op. cit.* 100 (1925). **Type:** Apud fl. Walsh R., prope opp. Chillagoe, Feb 1910, *Domin* (PR)

Inflorescence open with pedicels 0.8–2 mm long. Sepals with purplish midribs, 7–13 mm long; petals shortly bifid 7–10 mm long united into a tube 4–6 mm long; staminal filaments shorter than the corolla.

**Range:** South-eastern Cape York Peninsula, headwaters of Gilbert, Flinders and Burdekin Rivers south to about 20°S.

BURKE DISTRICT: "Mt Sturgeon", N of Hughenden, Feb 1931, *Hubbard & Winders* 7572 (BRI, K). COOK DISTRICT: Gilbert River, Mar 1925, *Brass* 448 (BRI); Einasleigh River, *Armit* 1072 (MEL); Mt Molloy, Apr 1932, *Brass* 2450 (BRI); Hodgkinson River, in 1882, *Gulliver* (MEL); ca 20 miles [32 km] SE of Chillagoe, Jun 1970, *Leroy* (BRI); Granite Creek, ca 8 miles [13 km] W of Mareeba, Apr 1967, *Pedley* 2247 (BRI); Stannary Hills, Jun 1962, *Gittins* 537 (BRI). NORTH KENNEDY DISTRICT: Millstream Falls, Ravenshoe, Jun 1913, *Bick* (BRI); Rockingham Bay, Jun 1866, *Dallachy* (MEL); 100 miles swamp, Herbert River, Mar 1875, *Armit* 123 (MEL). SOUTH KENNEDY DISTRICT: Collinsville, 147°51'E, 20°34'S, Oct 1969, *Zimmerman* (BRI).

*P. spirostylis* subsp. *spirostylis* sometimes grows on soils containing high concentrations of copper and zinc and has been used as an indicator of copper deposits. It often grows on country without any sign of mineralization.

*P. spirostylis* var. *rosulans* and *P. spirostylis* var. *intercedens* were based on rather young plants of *P. spirostylis* subsp. *spirostylis*.

**11b. *P. spirostylis* subsp. *glabra*** (White & Francis) Pedley, stat. nov. Based on *P. glabra* White & Francis, Proc. Roy. Soc. Qd 37:152 (1926). **Type:** Mt Isa, Dugald Silver Lode, Apr 1924, *Miller* (BRI, holo).

*P. synandra* F. Muell., Rep. Babb. Exped. 8 (1858). **Type:** not seen—see below.

*P. spirostylis* var. *intricata* Domin, Bibl. Bot. 89:100 (1923). **Type:** Burketown, *Ball* (PR, holo).

Inflorescence open with pedicels more than 0.8 mm long. Sepals with red-brown midribs 6–7 mm long; corolla (4–)5–6 mm long united into a tube 2.5–3.2 mm long, the lobes bifid (1 mm or more); staminal filaments longer than the corolla.

**Range:** The extreme north-western part of Western Australia, the Northern Territory, western Queensland and northern South Australia.

**Western Australia:** 17°17'S 123°05'E, in 1879, *Carey* (MEL); near the Ord River, in 1886, *O'Donnell* (MEL). **Northern Territory:** Victoria River, *Mueller* (MEL); Plum Tree Creek, S. Alligator River, Feb 1969, *Byrnes* 1371 (BRI, DNA); Settlement Creek, Apr 1922, *Brass* 148 (BRI); near Central Mt. Stuart, Jun 1924, *Ewart* (MEL); Ingallana Creek, 21 miles [34 km] NW of "Anningie" (ca 21°35'S 133°E), Jul 1958, *Chippendale* NT 4713 (BRI, MEL). **Queensland:** BURKE DISTRICT: Lawn Hill, May 1940, *Jensen* 68 (BRI); Mt Isa, Feb 1931, *Winders* in *Hubbard* 7397 (BRI, K); 20 miles [32 km] W of Cloncurry, 20° 42'S 140°12'E, Apr 1971, *Beaumont* 7055 (BRI). MITCHELL DISTRICT: near the Alice River, *Birch* (MEL). GREGORY SOUTH DISTRICT: Near Eyre Creek, in 1877, *Kayser* (MEL). **South Australia:** Wonamulla [Woolnomulla Bluff, 136°14'S 30°10'E], *Mueller* (MEL).

*P. spirostylis* subsp. *glabra* has smaller flowers than *P. spirostylis* subsp. *spirostylis* with deeply bifid lobes and staminal filaments longer than the corolla. There are intermediates where the ranges of the two meet and subspecific rank is appropriate. Bakker (1957) observed under *P. spirostylis* that *Hubbard* 7397 "differs in having bifid petals and filaments slightly longer than the petals".

White and Francis noted in the protologue to *P. glabra* that it grew on silver-lead lodes. Cole (1965) has demonstrated the plant's ability to grow in such situations is due to its low uptake of minerals on heavily mineralized soils.

I have taken *P. glabra* as the basionym because the plant has been generally referred to in geobotanical literature as *P. glabra* and because there are some difficulties in the typification of the earlier *P. synandra*. The type of *P. synandra* has not been located. The type locality was given by Mueller as Wirrawirraloo, which is the name of a creek near Woomera, South Australia. No specimen with this locality was found at either Kew or Melbourne. At MEL there is a sheet (MEL 49121) on which are mounted two whole plants and three fragments. All represent one species. The sheet bears a label (initialled by Bentham) written by Mueller—"Polycarpaea synandra ferd. Mueller/Victoria River. ferd Mueller". The fragments are in two packets attached to the sheet. On one is written "Polycarpaea synandra Victoria River"; on the other "Polycarpaea synandra Wonamulla". The last locality is, from the coordinates given in the introduction to the Report of Babbage's Expedition, the same as or close to Woolnomulla Bluff which is about 150 km north-west of the type locality given by Mueller.

In the absence of a specimen from the type locality the fragments in the packet marked Wonamulla are taken as representative of *P. synandra*. They were collected by Mueller close to the type locality and were seen by Bentham.

**11c. *P. spirostylis* subsp. *densiflora*** (Benth.) Pedley, comb. et. stat. nov. Based on *P. synandra* var. (?)*densiflora*, Benth., Fl. Aust. 1:165 (1863).

**Lectotype:** Cape Flinders, Jul  $\frac{131}{1819}$ , *Cunningham* (K)

*P. gamopetala* Berhaut, Bull. Mus. Nat. Hist. Natur. 25 (ser. 2): 212 (1953). **Type:** Senegal, Ex herb. DC., Herb. *Moquin-Tandon* (P, holo).

Inflorescence compact with pedicels less than 0.8 mm long. Sepals with purplish midribs, 6–7 mm long; corolla 4.5–5.5 mm long united into a tube 3–4 mm long, the lobes entire or slightly bilobed; staminal filaments about as long as the corolla.

**Range:** Arnhem Land (?) and Cape York Peninsula.

**Northern Territory**, 4 miles [6 km] NE of "Mountain Valley", Apr 1962, *Nelson* 188 (BRI, DNA, MEL). **Queensland:** COOK DISTRICT: Mapoon, May 1911, *Bick* 109 (BRI); Musgrave Tele. Office, Mar 1893, *Jacobsen* (BRI); Kennedy road, 44 miles [70 km] beyond (N of) Laura, Jul 1965, *Gittins* 975 (BRI, MEL)

*P. spirostylis* subsp. *densiflora* and *P. spirostylis* subsp. *spirostylis* differ in the slightly smaller flowers and more compact inflorescences of the latter. The ranges of the two are distinct. I have some doubt about the identity of some specimens from the Northern Territory, but they belong here rather than with other subspecies.

There are two syntypes of *P. synandra* var. *densiflora* at Kew and possibly another at Melbourne. One at Kew has been chosen as lectotype: the others from Port Denison and Rockhampton are referred to *P. spirostylis* subsp. *compacta*.

Berhaut expressed doubt that *P. gamopetala* was native to Africa. He recognised that it belonged to section *Planchonia* but was unable to place it and therefore described it as new. Berhaut's doubts were justified. The specimen at Paris should be referred to *P. spirostylis* var. *densiflora*.

**11d. *P. spirostylis* subsp. *compacta*** Pedley, subsp. nov. Inflorescentia compacta pedicellis minus quam 0.8 mm longis instructa. Sepals 4.5–5 mm longa costis porphyreis ornata; corolla 3.5–4 mm longa lobis non profunde incisuratis instructa, in tubum conjunctis; filamenta staminea corolla breviora. **Typus:** *Speck* 4720 (BRI, holo; K, MEL, iso).

Inflorescence compact with pedicels less than 0.8 mm long. Sepals 4.5–5 mm long usually with reddish-brown midribs; corolla 3.5–4 mm long with lobes not deeply notched united in a tube ca 2.5 mm long; staminal filaments shorter than the corolla.

**Range:** South-eastern Gulf of Carpentaria to central Queensland.

BURKE DISTRICT: 16 miles [26 km] W of Croydon, Jul 1960, *Trapnell* 206 (BRI). COOK DISTRICT: Cumberland, Gilbert River [18°15'S 143°30'E], May 1937, *Brass* 8830 (BRI). NORTH KENNEDY DISTRICT: Port Denison, *Fitzalan* (K, MEL, syntype of *P. synandra* var. *densiflora*). MITCHELL DISTRICT: near the Alice River, in 1884, *Birch* (MEL). SOUTH KENNEDY DISTRICT: "Cerito" [21°13'S 147°45'E], May 1964, *Adams* 970 (BRI, CANB). PORT CURTIS DISTRICT: Rockhampton, [*Thozet*] (MEL). LEICHHARDT DISTRICT: Lake Elphinstone, *Dietrich* (MEL)

*P. spirostylis* subsp. *compacta* resembles *P. spirostylis* subsp. *densiflora* (and *P. breviflora* var. *gracilis*) in having compact heads but differs from the other subspecies in having smaller flowers.

**12. *P. breviflora* F. Muell., Rep. Babb. Exped. 9 (1858).**

Perennial herb glabrous except for a few long hairs in axils of leaves and bracts. Bracts acute or acuminate sometimes lacinate in lower half, 2–3 mm long. Sepals white with prominent midrib, (2.5–)3–4 mm long, white with white or purplish midribs; corolla (1.2–)1.5–2.6 mm long with a tube 0.5–1.0 mm long and bifid lobes. Stamens almost as long as the corolla.

**12a. *P. breviflora* var. *breviflora*.**

**Type:** Gulf of Carpentaria, *Mueller* (MEL, holo; K, iso).

*P. corymbosa* var. *breviflora* (F. Muell.) Domin, Biblioth. Bot. 89:10 (1925), based on *P. breviflora*.

*P. brevianthera* Ewart & Davies, Fl. North. Terr. 109 (1917). **Type:** Roper River, in 1911, *Baldwin Spencer* (MEL, holo).

*P. triloba* Ewart & Cookson in Ewart & Davies, *op. cit.* 109 (1917). **Type:** Georgina River, 1888, *Henry* (MEL, holo).

*P. parviflora*, Domin, Biblioth. Bot. 89:100 (1925). **Type:** Locis subnudis in xerodrymio apud opp. Cloncurry, Feb 1910, *Domin* (PR, holo).

Inflorescence spreading; sepals white, ovate.

**Range:** North-eastern part of Arnhem Land, north-western to central inland Queensland.

**Northern Territory:** Katherine Gorge, Mar 1971, *Dunlop & Byrnes* 2162 (DNA); 7 miles [11 km] NW of "Alexandria", Mar 1956, *Chippendale* NT 1945 (BRI, MEL); Manners Creek", May 1955, *Chippendale* NT 1141 (BRI, MEL); 25 miles [40 km] NE of "Tarlton Downs", May 1955, *Lazarides* 5239 (BRI, MEL). **Queensland:** BURKE DISTRICT: 14 miles [22 km] N of Turn-off Lagoon, Jun 1966, *Pedley* 2076 (BRI); Doomadgee Mission, *Whitehouse* (BRI); Mt Isa, Feb 1931, *Winders* in *Hubbard* 7417 (BRI, K); Cloncurry, in 1883, *Palmer* 77 (MEL). GREGORY NORTH DISTRICT: "Oban", ca 62 miles [100 km] SE of Mt Isa, Dec 1947, *Everist* 3349 (BRI); Diamantina Lakes, Oct 1941, *Walker* (BRI). MITCHELL DISTRICT: Prairie, Feb 1931, *Hubbard* 7074 (BRI, K); near Blackall, Feb 1938, *Everist* 1588 (BRI).

**12b. *P. breviflora* var. *gracilis* (Benth.) Pedley, comb. nov. Based on *P. synandra* var. *gracilis* Benth., Fl. Aust. 1:165 (1863) **Lectotype:** Port Essington, Apr  $\frac{268}{1818}$ , *Cunningham* (K; MEL, iso).**

Inflorescence rather compact; sepals narrowly ovate, white with distinct purplish midrib.

**Range:** Coastal parts of Arnhem Land.

**Northern Territory:** Arnhem's Land, *Brown* (MEL); Croker I., Mar 1883, *Foelsche* 69 (MEL); Melville Bay, 12°11'S 136°35'E, Aug 1948, *Specht* 917 (BRI, MEL); Port Bradshaw, 12°27'S 136°42'E, Jul 1948, *Specht* 729 (BRI, MEL); South Bay, Bickerton I., 13°45'S 136°06'E, Jun 1948, *Specht* 581 (BRI, MEL).

In general appearance *P. breviflora* var. *gracilis* resembles *P. spirostylis* subsp. *densiflora* but its flowers are distinctly smaller. Its narrower sepals with prominent purplish midribs and more compact inflorescences distinguish it from *P. breviflora* var. *breviflora*.

*P. breviflora* is distinguished from other species of section *Planchonia* in having small flowers. It resembles *P. corymbosa* and its allies (section *Polycarpaea*) but the corolla is united into a short but definite tube. Flowers of *P. breviflora* sometimes have only rudimentary anthers and are functionally female. The flowers may also be heterostylous. As can be seen from the figures with the original descriptions, one of the differences between *P. brevianthera* and *P. triloba* is the somewhat smaller anthers of *P. triloba*. This difference is of no taxonomic significance.

The type specimen of *P. breviflora* is extremely poor and it is not surprising that the name has been misapplied. In the protologue Mueller noted that "A plant closely allied to this species and possibly only a variety of it occurs on Moreton Island". Bentham (1863) referred Mueller's specimen ("Islands of Moreton Bay") to *P. breviflora* without comment, and, because of the scrappiness of the type material, since then the name *P. breviflora* has been incorrectly applied to the taxon represented by this specimen. Domin in making the combination *P. corymbosa* var. *breviflora* recognised the position of Mueller's Moreton Bay specimen, but his combination must apply to *P. breviflora* sens. strict. not to the Moreton Bay plant which is referred to *P. corymbosa* var. *minor*.

Because the name *P. breviflora* has been misapplied for a long time, certainly for the last fifty years, some authors (for example, Burt 1973) would reject it under Article 69 of the International Code of Botanical Nomenclature as being a long persistent source of error. If this were done either the name *P. brevianthera* or *P. triloba* would have to be applied to the species. The taxonomy and nomenclature of almost all Australian species of *Polycarpaea* have been in confused state for so long however, that the misapplication of one name is of little significance among a large number of misidentifications. I have therefore retained the name *P. breviflora* for the species to which it was applied by Mueller.

### Excluded species

#### *P. spicata* Arn.

There is one specimen at Kew labelled "N.W. Coast, Bynoe". I have seen no other material from Australia and until further specimens are collected I regard the record as a doubtful one. The species occurs in N.E. Africa and India but is absent from Malesia.

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## NOTES ON QUEENSLAND ORCHIDACEAE, I.

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### Summary

Two new species of Orchidaceae from Cape York Peninsula are described. These are: *Dendrobium tozerensis* P. Lavarack sp. nov. and *Oberonia carnosus* P. Lavarack sp. nov. The following five orchids previously unrecorded in Australia are here recorded for the first time: *Bulbophyllum masdevalliae* Kranzlin, *B. leratii* (Schlechter) J. J. Smith, *Taeniophyllum malianum* Schlechter, *Eulophia pulchra* (Thouars) Lindl. and *Schoenorchis sarcophylla* Schlechter, while *Didymoplexus pallens* Griff. is recorded in north Queensland for the first time.

In the course of field work carried out on Cape York Peninsula during 1973-76 several interesting species of Orchidaceae were discovered. One is previously unrecorded in Queensland and five previously unrecorded in Australia, while two are here described as new species.

**Didymoplexus pallens** Griff., Calc. J. Nat. Hist. 4:383, t. 17 (1884); J. J. Sm., Orchid Java Fig. Atlas 1 f. 51 (1908); Dockr., Aust. Indig. Orchids 1:218 (1969).

COOK DISTRICT: Tully-Mission Beach Road, about 15 km from Tully, Jan 1975, Lavarack N. P. 2600.

This small saprophytic orchid has not previously been recorded from Queensland, although it has been collected in the Northern Territory and other locations from Indonesia to India. For some time a species of *Didymoplexus* has been known to occur in the coastal lowlands of the Cardwell area in Northern Queensland, but its identity remained unknown. This species showed little agreement with the figure in J. J. Smith's Figure Atlas of "Die Orchideen von Java" (copied by Dockrill in his "Australian Indigenous Orchids"). Recently some fluid-preserved material of the North Queensland species was sent to Mr. D. Blaxell (then Australian Botanical Liaison Officer at Kew) and he reported that the figures quoted above are misleading and that these specimens are a good match with the type drawing.

*D. pallens* is a small, delicate saprophyte which apparently flowers after the first soaking summer rains in December or January. It is a plant of the coastal Melaleuca-dominated forests and commonly occurs on small tussocks in areas which are otherwise swampy after heavy rain. It has been collected twice by the author in the area between Ingham and Tully in North Queensland, but possibly is a quite widespread plant in the humid tropics as it is very easily overlooked.

Each plant produces several flowers only one of which is open at any given time. The flowers are glistening white with a yellow-orange group of calli on the mid-line of the labellum. (See Figure 2a.)

**Bulbophyllum masdevalliaceum** Kränzlin, Bot. Jahrb. Syst. 34:251 (1904).

COOK DISTRICT: Cape York Peninsula, 4 km west of Hunter Point, 11°30'S; 142°47'E, Aug 1973, *Lavarack* N.P. 2509 (BRI 193838).

A locally abundant epiphyte in simple notophyll vine forest where it commonly occurs on trees with a fibrous or papery bark—notably *Acmena hemilampra* (F. Muell. ex F. M. Bailey) Merr. & Perry.

Plant consisting of a creeping rhizome with pseudobulbs about 2–3 cm apart. Pseudobulbs 2–4 cm long and 0.5–1 cm in diameter, tapered towards the apex and strongly grooved. Leaves lanceolate 6–12 × 2 cm with a petiole about 2–3 cm long. Inflorescence erect 10–16 cm, single flowered. Lateral sepals connate at the base, 5 cm long and 1 cm at the widest, produced into filiform “tails” 3 cm long; red-purple with a cream-yellow margin. Dorsal sepal 3 × 5 cm shortly caudate, the margins densely ciliate. Petals 5 mm, falcate, apiculate. Labellum delicately hinged with a smaller basal portion about 2–3 × 2 mm consisting of 2 short lateral lobes, purple in colour with a yellow throat; midlobe filiform 5–6 mm, yellow with a purple tip. Column erect 2–3 mm long and about 2 mm in diameter with 2 slender pointed stelia projecting above the anther.

This species belongs to the section *Sestochilus*. It is easily separated from the other Australian member of this section (*B. baileyi*) by the elongate lateral sepals and very small petals. It has been recorded from New Guinea, but not previously from Australia as the area in which it occurs has only recently become accessible.

*B. masdevalliaceum* Kränzlin is very similar to *B. blumei* (Lindl.) J. J. Smith var. *longicaudatum* J. J. Smith and Smith is of the opinion that “*B. masdevalliaceum* Kränzlin appears to me to be a large flowered form of the very variable *B. blumei*” (Smith 1911). However Schlechter disagrees with this stating “This plant (i.e. *B. masdevalliaceum*) is definitely distinct and not, as J. J. Smith suggests, a large variety of *B. blumei* (Lindl.) J. J. Smith.” (Schlechter 1928).

The Jardine River plants appear to agree well with the descriptions of both taxa. Mr. Don Blaxell of Sydney, while acting as Australian Botanical Liaison Officer at Kew compared a specimen of this plant with specimens of *B. masdevalliaceum* from New Guinea and the Solomon Islands and found them to be identical. For this reason and because of Schlechter's opinion quoted above, I have elected to place the Jardine River species in Kränzlin's *B. masdevalliaceum*.

Flowering time is uncertain, plants were collected in flower in August. (See figure 2b.)

**Bulbophyllum leratii** (Schlechter) J. J. Smith, Bull. Jard. Bot. Buitenzorg Ser. 28:25 (1912).

*Cirrhopetalum leratii* Schlechter, Repert. Spec. Nov. Regni Veg. 9:216 (1911).

COOK DISTRICT: Cape York Peninsula, Tozer Range, 12°45'S; 143°13'E; Sep 1975, *Lavarack* N.P. 3502 (BRI 201382).

A rather rare epiphyte growing in dense rainforest at an altitude of about 400 m.



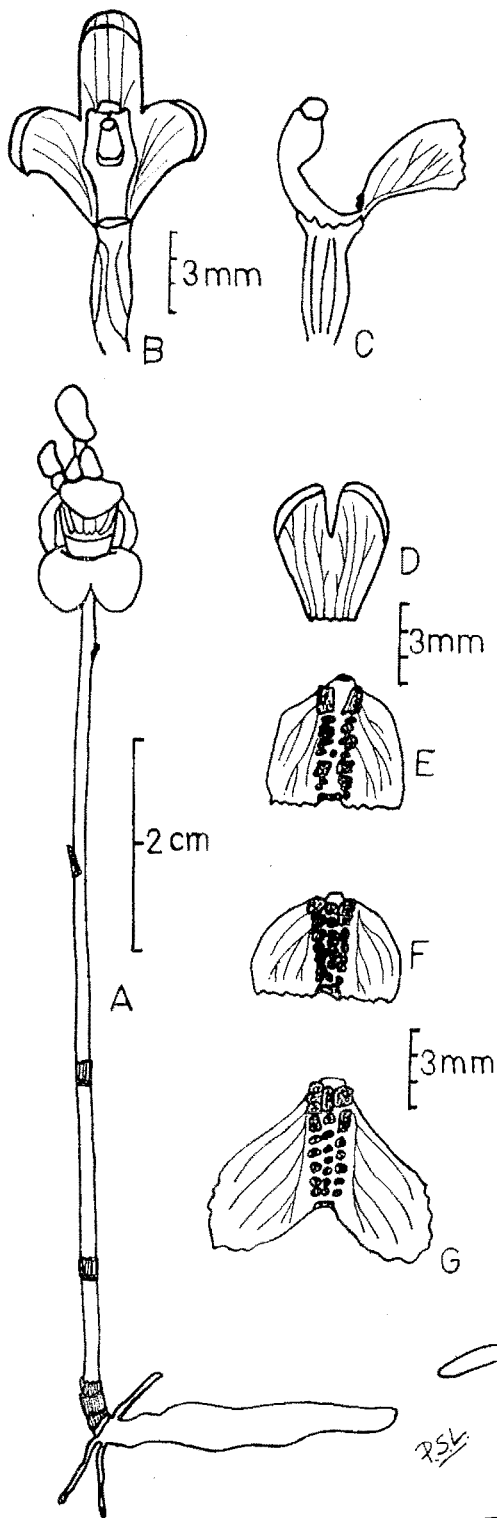


Figure 2a. *Didymoplexus pallens* Griff. A. Plant. B. Flower from the front, labellum removed. C. Flower from the side, petals and sepals removed. D. Lateral sepals. E, F, G. Labella from 3 plants, flattened out.

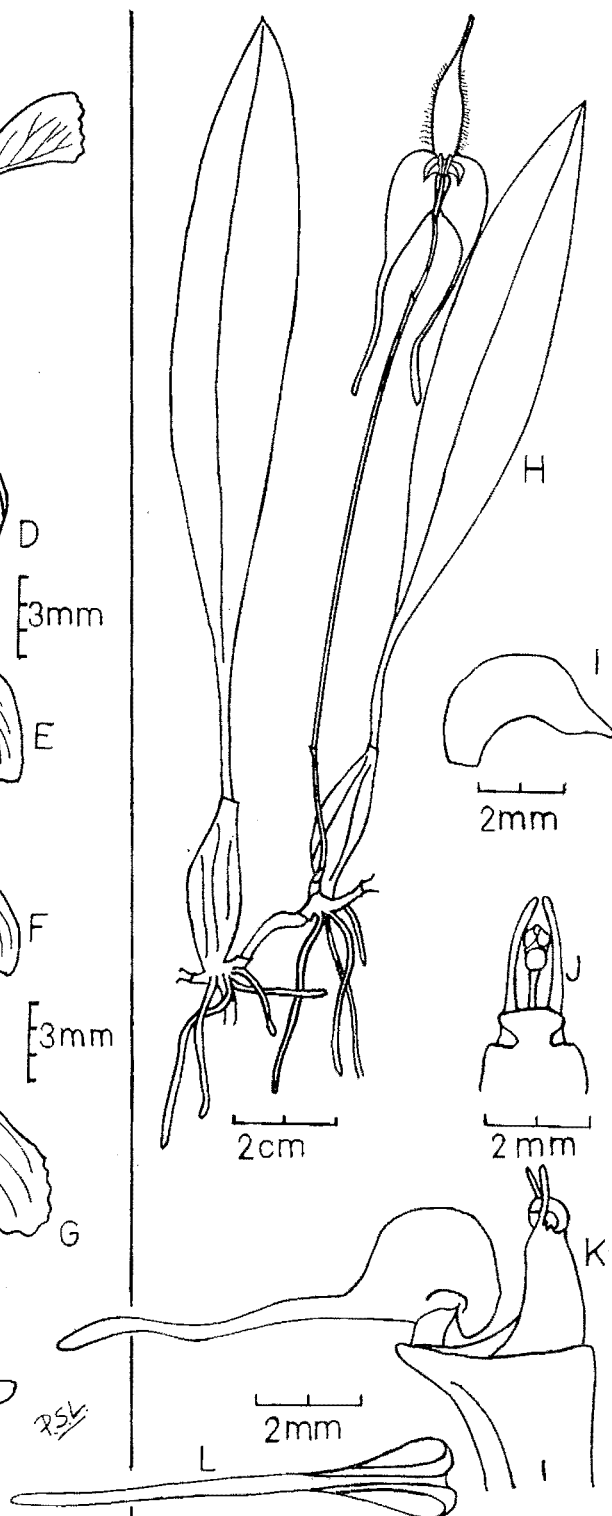


Figure 2b. *Bulbophyllum masdevallaceum* Kränzlin. H. Portion of plant. I. Petal. J. Column from the front. K. Flower from the side, petals and sepals removed. L. Labellum from above.

Plant consisting of a creeping rhizome with pseudobulbs 5–10 mm apart, 12–18 mm long and 10–15 mm in diameter, with 4 or 5 prominent angles. Leaves erect, oblong, shortly petiolate,  $6-8 \times 2-3.5$  cm, rather thick. Inflorescence 15–25 cm long, umbellate with 6–10 flowers arranged in a circle. Lateral sepals purple-red, connate for the basal 5 mm, 16–22 mm long and 1.5 mm wide at the dilated base, the apices drawn out into long filiform tails. Dorsal sepal purple-red, consisting of an ovate cuculate basal part  $2.5 \times 2$  mm fringed with moderately long cilia, and an apical filiform appendage 2 mm long. Petals purple-red,  $6 \times 1$  mm at the broadest, with a filiform apical appendage, and with moderately long cilia on the basal half. Labellum white-cream, articulate on the column foot, recurved, fleshy, about 2 mm in length. Column 2 mm in length, with a prominent foot 2 mm long, steldia present only as two short teeth near the apex.

The author is indebted to Dr. Gunnar Seidenfaden of Copenhagen, Denmark for assistance in the identification of this species. Dr. Seidenfaden, the author of a recent work on the Cirrhopetalum section of the genus *Bulbophyllum* (Seidenfaden 1973) writes in a letter to the author: "I have been somewhat doubtful about this taxon (i.e. *B. leratii*) of which I did not succeed in getting the type specimen or other material. I felt that he (i.e. Schlechter) might just have a small specimen of *B. gracillimum* at hand. But clearly the flowers you sent me have lateral sepals that are only half as long as what is usual for *B. gracillimum* and it also seems from the picture that the leaves are relatively broader. So if these seem to be constant in the plants you now have living, I believe it would be reasonable to give Schlechter's plant specific status." Previously recorded from New Caledonia, this species appears to be limited in Australia to the Tozer and Janet Ranges, where it is by no means common. Vegetatively it is very similar to the other Australian member of the section Cirrhopetalum—*Bulbophyllum longiflorum* Thouars (*B. clavigerum* (R. D. Fitzg.) F. Muell.) but may be distinguished when in flower by the much more slender lateral sepals.

Most plants seen were growing low down on the trunks of rainforest trees in deep shade, but a few plants, including one in full flower, were seen on a windswept ridge growing on rather stunted trees. It appears to flower quite freely, each pseudobulb producing several inflorescences.

Flowering time is uncertain. Plants were collected in flower in September and have flowered in cultivation in February. (See Figure 3a.)

**Taeniophyllum malianum** Schlechter, Repert. Spec. Nov. Regni Veg. Beih. 1:1022 (1914) and fig., op. cit. t. 363 No. 1404 (1928).

COOK DISTRICT: Cape York Peninsula, McIlwraith Range,  $13^{\circ}52'S$ ;  $143^{\circ}25'E$ ; Sep 1975, Lavarack N.P. 3501 (BRI 201383).

A locally abundant epiphyte in rather open rainforest from about sea level to about 500 m altitude.

Plant consisting of a short stem (10–20 mm), with the leaves reduced to small bracts which in time split to leave a covering of short stiff hairs; roots green, about 1.5 mm thick, somewhat flattened about 20 cm long. Inflorescence 2–4 cm; peduncle long, glabrous; rachis short, glabrous with very small, deltoid, densely packed bracts. Up to 15 flowers opening singly, each borne on a very short pedicel. Sepals and petals similar, yellow, oblong, obtuse about  $4.5 \times 1$  mm, the sepals slightly longer and broader than the petals. Labellum ovate, obtuse, indistinctly 3-lobed,  $4 \times 3$  mm, yellow; spur  $4.5 \times 1.5$  mm diameter at the widest, somewhat dilated at the distal end, almost in line with the midlobe.

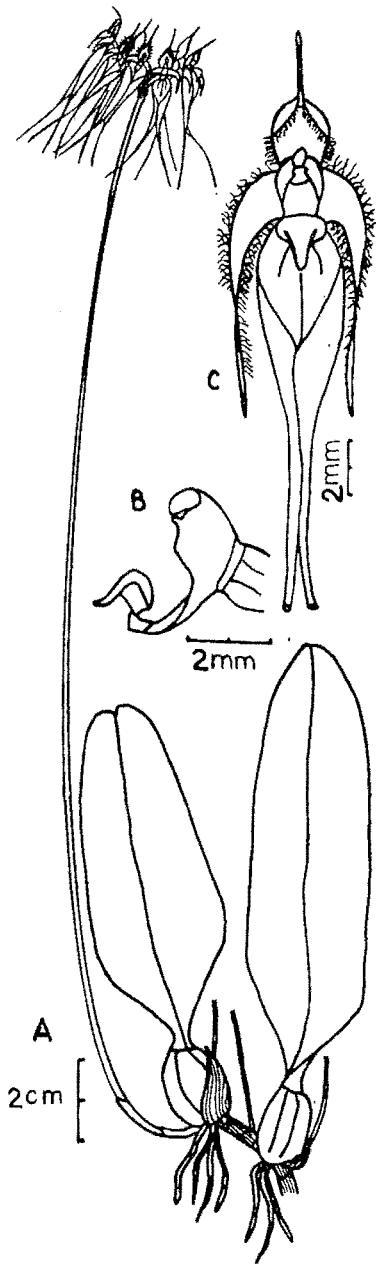


Figure 3a. *Bulbophyllum leratii* (Schlechter.) J. J. Smith. A. Portion of plant. B. Flower from the side, petals and sepals removed. C. Flower from the front (note: only half of lateral sepals shown).

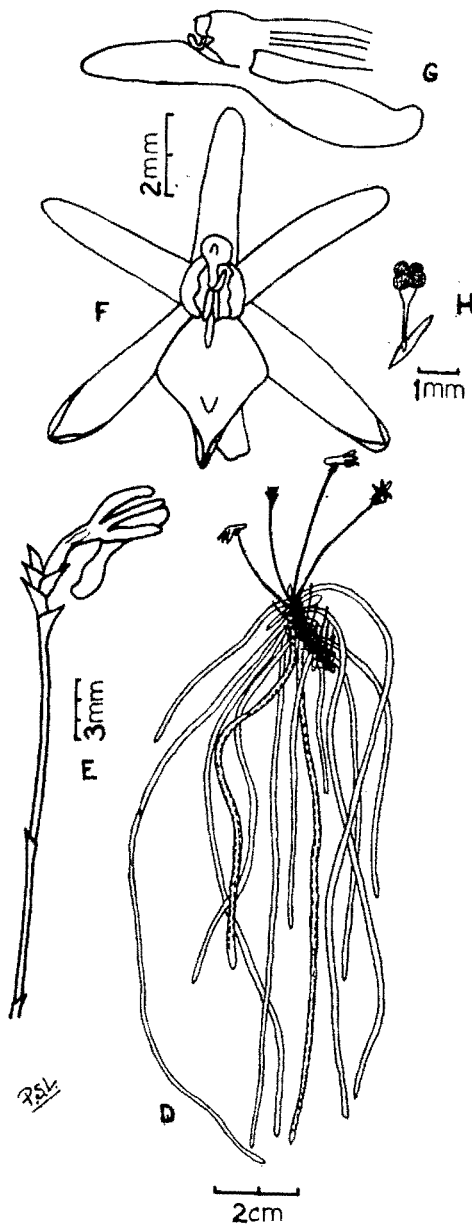


Figure 3b. *Taeniophyllum malianum* Schlechter. D. Plant. E. Inflorescence. F. Flower from the front. G. Flower from the side, petals and sepals removed. H. Pollinarium.

Column about 1 mm long with short acute stelidia. Anther with a prominent straplike rostrum about 0.8 mm long and sharply curved up. Pollinia 4, stripe about 1 mm, with a relatively large (about 1 mm) retinaculum.

This epiphyte of the low to moderate elevations of the McIlwraith Range usually grows low down on the tree trunks or on smaller branches, often forming a dense tangle of unattached or partly attached green roots. The flowers are yellow and no more than one per inflorescence opens at a given time. A large plant will produce 5 or 6 inflorescences.

*T. malianum* is quite similar to *T. flavum* Dockr. but may be distinguished by its generally much larger flowers and short, glabrous rachis.

Flowering appears to be spasmodic throughout the year with a possible emphasis on summer. (See Figure 3b.)

***Eulophia pulchra*** (Thouars) Lindl., *Genera & Species Orchid. Plants*: 182 (1833).

*Limodorum pulchrum* Thouars, *Orch. Iles Austr. Afr. tt.* 43, 44 (1822).

*Eulophia macrostachys* Lindl. loc. cit. 183 (1833).

*Eulophidium pulchrum* (Thouars) Summerhayes, *Bull. Bt. Jard. Bruxelles* 27:400 (1957).

COOK DISTRICT: Cape York Peninsula, Nesbit River Area, 13°27'S; 143°28'E; Sep 1974, Lavarack 1077 (BRI 220604).

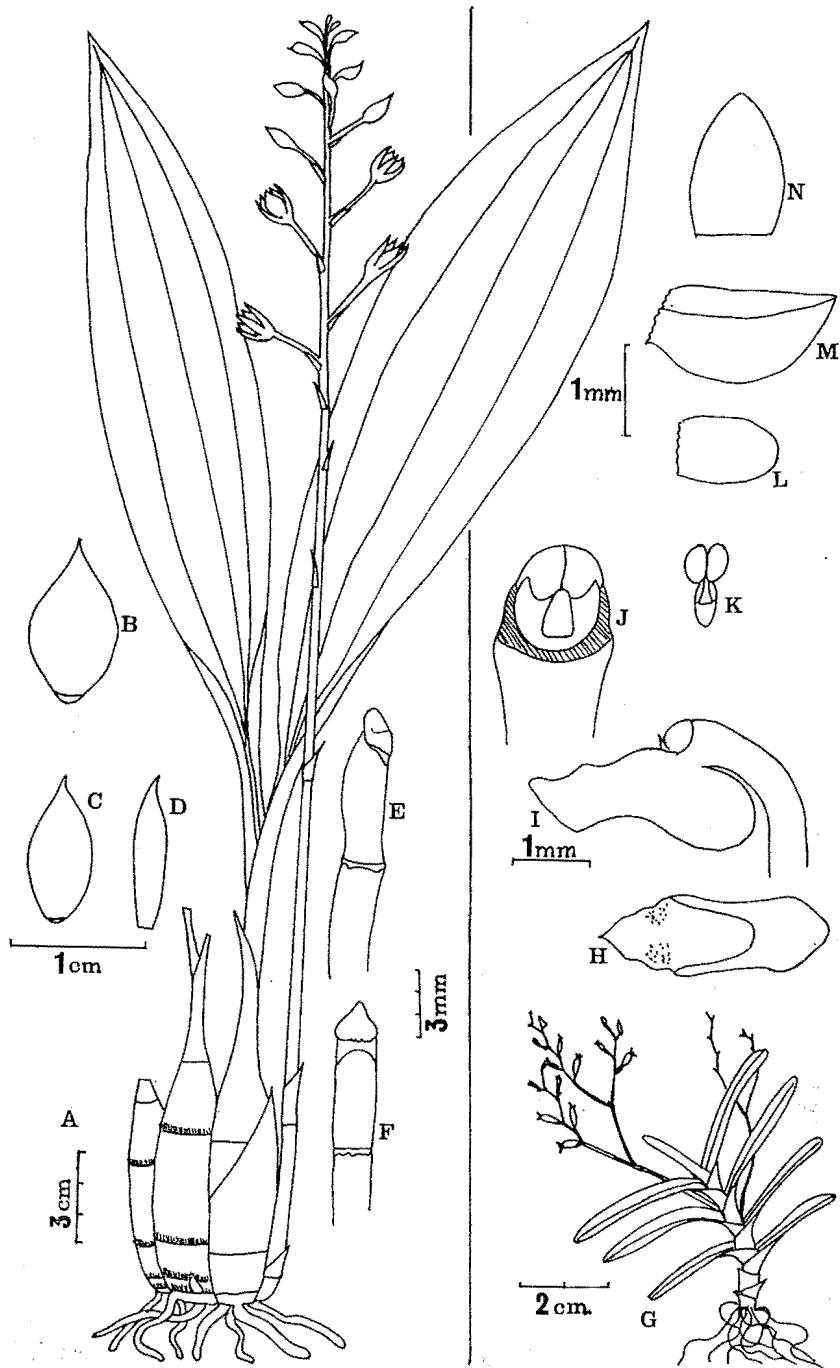
An uncommon terrestrial orchid occurring on hillsides in the dense shade of closed forests at low altitudes.

Pseudobulbs to about 15 cm long and 2 cm diameter tapering upwards. Leaves 2, lanceolate; lamina to 30 cm long and 10 cm broad, with 3 prominent veins; petiole to 10 cm long. Inflorescence arising from near the base of the pseudobulb up to 80 cm tall, of which the rachis makes up about half. Flowers numerous (at least 15 in the specimens examined) not opening widely, predominantly green with a few small areas of brown markings. Dorsal and lateral sepals similar, lanceolate 10–12 × 2.5–3 mm. Petals ovate 10–12 × 5 mm. Labellum, in the Australian specimens examined, similar to the petals, but slightly broader with a very shallow saccate base. (In overseas specimens the labellum is described as having a short spherical spur, a 3-lobed blade with the side lobes erect; midlobe much broader than long, broadly cleft, a divided callus at its base) Column 5 mm long × 2 mm with no apparent column foot.

The plants from which this description was compiled were collected on the western slopes of the Macrossan Range in 1974 and subsequently flowered in cultivation. Two inflorescences have been examined and both had flowers anomalous in that the labellum was undivided and, in most regards, represented a third petal while there was no indication of the production of pollinia. I am indebted to Mr. Peter Taylor of Kew who confirmed my suspicions about the identity of this species saying: "I have examined your material and compared it with material of *Eulophia pulchra* (Thou.) Lindl. (*E. macrostachya*), and in my opinion they belong to that species but are abnormal in having a slightly malformed column and third petal in lieu of a lip." (P. Taylor *in litt.*)

Whether all Australian plants of this species have these abnormalities remains to be proven. It was apparent that the flowers on the two inflorescences examined were self-pollinating.

*E. pulchra* is a widespread species having been previously recorded from Madagascar, Ceylon, India, Malaya, Philippines, New Guinea, New Caledonia and Fiji. Flowering appears to be confined to the winter months, about May to July. (See Figure 4a.)



**Schoenorchis sarcophylla** Schlechter, Repert. Spec. Nov. Regni Veg. Beih. 1:1022 (1914) and fig., op. cit. t. 347, No. 1340 (1928).

COOK DISTRICT: Cape York Peninsula, Leo Creek, 13°45'S; 143°23'E; Aug 1948, *Brass* 18848 (BRI 080716).

A rare epiphytic orchid at least in the Australian part of its range. Collected only from the outermost branchlets of *Tristania exiliflora* F. Muell. overhanging the fast-flowing Leo Creek at an altitude of 400 m.

Stems 1–5 cm long about 0.25 cm wide, branched in the larger specimens. Leaves linear, fleshy, channelled above, clasping the stem, up to 30 mm long and 4 mm wide. Inflorescence a sparsely branched panicle up to 5 cm long, with numerous very small flowers. Flowers white about 3 mm long. Dorsal sepal elliptical, obtuse, about 1.5 mm long and 1 mm wide; lateral sepals ovate about the same size as the dorsal sepal; petals smaller, oblong about 1 mm long and 0.75 mm wide. Labellum oblong 3 mm long, about 1 mm wide, with a well-developed spur about 0.8 mm long which is in line with the midlobe of the labellum. Lateral lobes small and not well defined, midlobe about 1 mm long. Column short and broad 0.8 mm long and 0.5 mm wide with a pair of minute sharply pointed stelia immediately below the anther. Pollinia 4, ellipsoid, attached by a short stipe to the retinaculum.

This small epiphyte has previously been recorded from New Guinea. Its range in Australia appears to be restricted, as it has only been seen in the vicinity of Leo Creek in the McIlwraith Range. *S. sarcophylla* may be readily distinguished from the other Australian member of the genus (*S. densiflora* Schlechter) by the position of the spur, which in *S. sarcophylla* forms a straight line or a very small angle with the midlobe of the labellum. In *S. densiflora* this angle is approximately 90°.

Flowering time is uncertain but plants have been collected in flower in August. (See Figure 4b.)

**Dendrobium tozerensis** P. Lavarack, species nova.

Epiphyticum, *D. baileyi* F. Muell. simile. Caules 20–60 × 0.1–0.2 cm internodiis circa 0.6–1.2 cm longis. Folia multa lineari-lanceolata, 3–8 × 0.4–0.8 cm apice inaequaliter biloba, retusa. Flores albi binatim. Sepala dorsalia et petala anguste triangularia, circa 15 × 2 mm, ad apicem acutum angustata. Sepala lateralia similaria praeter bases latiores. Labellum 8–10 × 4 mm lobis lateralibus deltoideis 3 × 1 mm, midlobo anguste triangulari 5 × 1.2 mm margine crenulato praedito et pilis sparsim oblecto, disco crista longitudinali unica praedito. Columna circa 4 × 1.5 mm pede circa 4 mm longo instructa. **Typus:** Cook DISTRICT: Tozer's Gap, Cape York Peninsula 12°43'S; 143°12'E, Aug 1975, *Lavarack* 990 (BRI 220603, holotypus).

Plants epiphytic, growing into large clumps. Stems 20–60 × 0.1–0.2 cm, leafy in the upper half, the lower half covered with the remains of the sheathing bases of the leaves; internodes about 0.6–1.2 cm long; leaves numerous, linear-lanceolate, tapering gradually towards the apex, 3–8 × 0.4–0.8 cm, apex unequally bilobed, base sheathing. Flowers white in all parts, borne in pairs on a short peduncle of about 0.5 cm and a pedicel of about 0.5 cm, from one to 3 pairs of flowers opening at any one time on any stem. Dorsal sepal, lateral sepals and petals all similar, narrowly triangular, tapering to an acute tip, about 15 × 2 mm, the lateral sepals slightly broader at the base. Labellum 8–10 × 4 mm; lateral lobes broadly triangular but with a rounded apex 3 × 1 mm; midlobe narrowly triangular 5 × 1.2 mm with a crenulate margin and sparsely covered

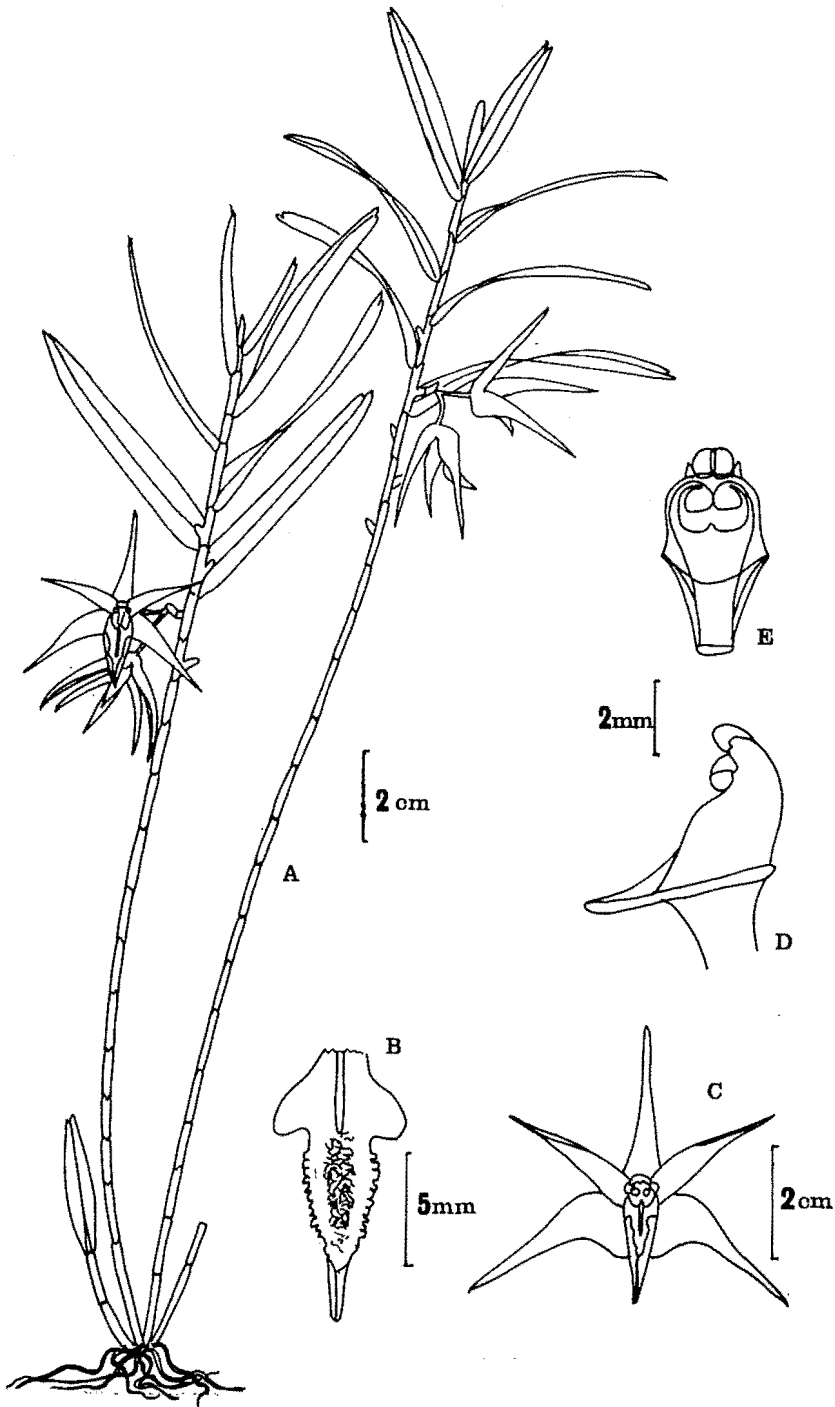


Figure 5. *Dendrobium tozerensis* P. Lavarack, sp. nov. A. Plant. B. Labellum from above (flattened out). C. Flower from the front. D. Column from the side. E. Column from the front.

in short hairs; disc with a single longitudinal crest. Column short, about  $5 \times 2.5$  mm; with a column-foot about 4 mm long; stigma scutiform. Another about  $1 \times 1$  mm, about 0.5 mm high, rostrum not developed.

In all the specimens examined (about 15 plants collected from localities as much as 5 or 6 km apart) three anthers were present, the two lateral anthers being in all regards similar to the median anther.

Vegetatively this plant closely resembles *D. baileyi* F. Muell. but may be separated from this when not in flower by the leaf tips which, in *D. tozerensis* are markedly unequally bilobed, while in *D. baileyi* they are only minutely so. Florally there are major differences in the shape of the floral segments. Flower colour is quite different being pure white for the former and yellow spotted with red or purple in the latter.

*D. tozerensis* has so far been collected only in the vicinity of Tozer's Gap where it is relatively common on the scattered trees growing on open rocky areas which occur in the midst of the rainforest. It occasionally grows on rocks. The flowering time appears to be during the summer in cultivation, but plants were collected in flower in September and it is possible it flowers spasmodically throughout the year. The flowers last for one day only before withering. (See Figure 5.)

***Oberonia carnosa* P. Lavarack, species nova.**

Folia 4-6,  $0.5-2.5 \times 0.3-0.8$  cm, carnosa triangularia ab base ad apicem acutum obtusumve angustata. Inflorescentia 30-60 mm longa aurantiaca. Flores multi minuti aurantiaci circa 1 mm longi. Sepala  $0.6 \times 0.5$  mm reflexa. Petala ovata margine crenulati-erosa,  $0.8 \times 0.6$  mm. Labellum  $1 \times 0.7$  mm, 3-lobatum, lobis lateralibus trapeziformibus  $0.2 \times 0.2$  mm, midlobo  $0.8 \times 0.5$  mm, margine laevi usque emarginato instructo. Columna  $0.4 \times 0.3$  mm late alata. Anthera  $0.2 \times 0.2$  mm rostra brevi sed prominenti praedita. **Typus:** Cook DISTRICT: Tozer's Gap, Cape York Peninsula  $12^\circ 43' S$ .  $143^\circ 12' E$ , Aug 1975, Lavarack 991 (BRI 220602, holotypus).

Plant epiphytic growing into small clumps. Leaves 4-6,  $0.5-2.5 \times 0.3-0.8$  cm, ovate to deltoid usually tapering from the broad base to an acute or obtuse apex, fleshy and light green in colour. Inflorescence orange, 30-60 mm; the peduncle much shorter than the rachis with minute bracts arranged in whorls. Flowers numerous, minute about 1 mm long, also in irregular whorls; floral bracts about 0.8 mm long, ovary and pedicel about the same length. Sepals  $0.6 \times 0.5$  mm, ovate, reflexed. Petals  $0.8 \times 0.6$  mm, ovate, margins crenulate-erose. Labellum  $1 \times 0.7$  mm, 3-lobed; lateral lobes  $0.2 \times 0.2$  mm, trapeziform; midlobe  $0.8 \times 0.5$ , oblong; margin smooth to minutely crenulate, base saccate, apex obtuse or occasionally emarginate. Column  $0.4 \times 0.3$  mm broadly winged below the anther. Anther  $0.2 \times 0.2$  mm with a short but prominent rostrum. Pollinia 4, in 2 pairs, each pair elliptical.

This plant has been collected only from the rocky areas at Tozer's Gap which were previously described. It is strictly epiphytic often growing adjacent to *Dendrobium tozerensis*.

While it is generally similar to one or two New Guinea species, *O. carnosa* appears to be most closely related to *O. brachystachya* Lindl. from South East Asia.

Flowering time appears to be from about February to June. (See Figure 6.)



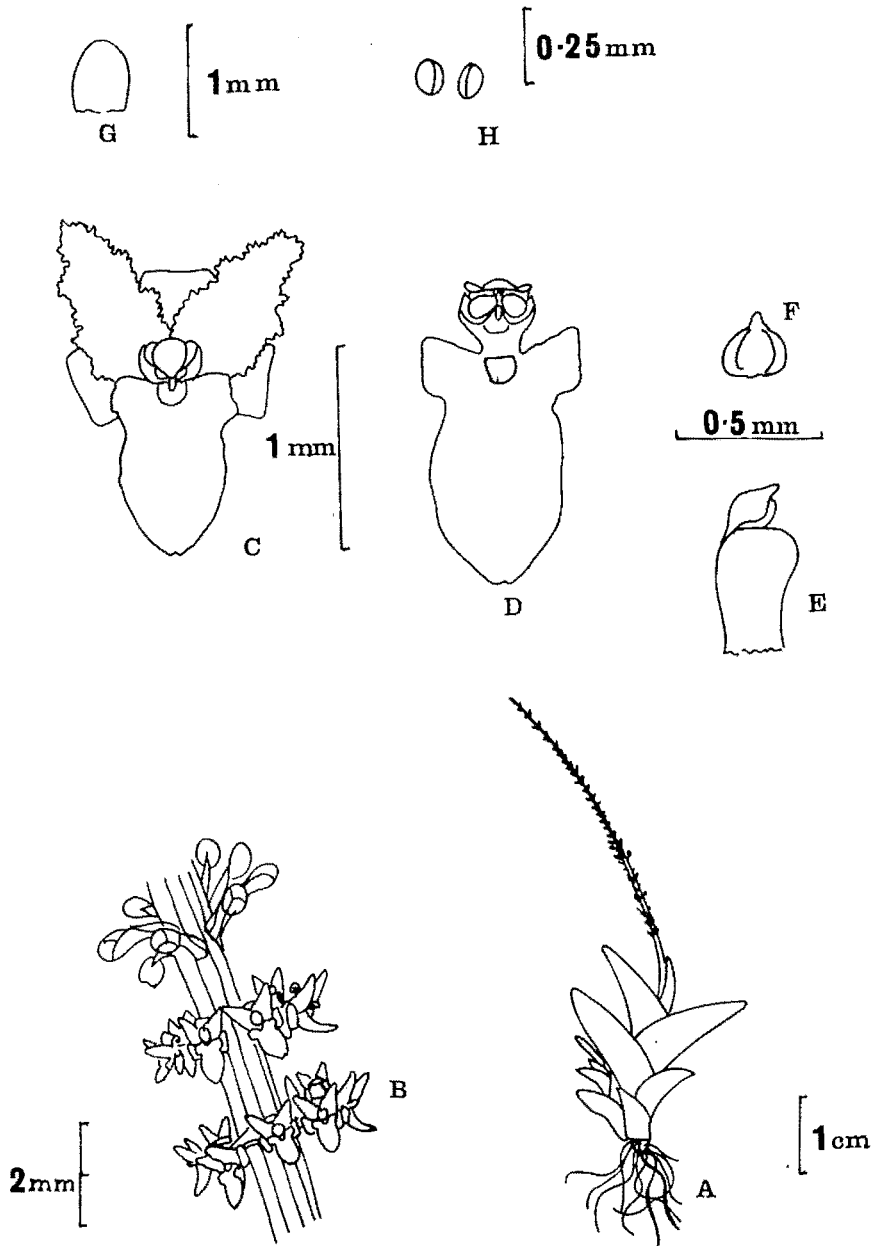


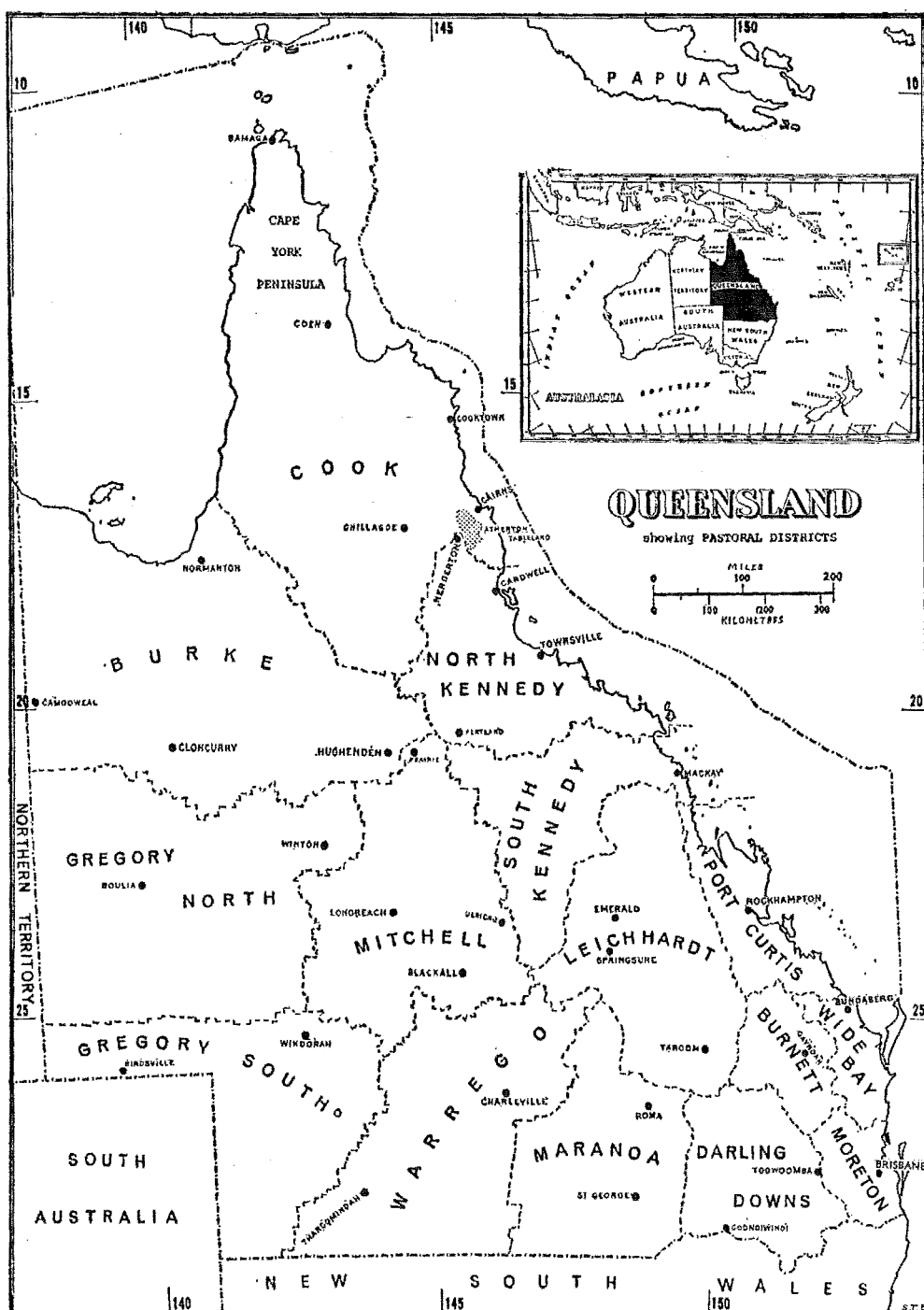
Figure 6. *Oberonia carnosa* P. Lavarack, sp. nov. A. Plant. B. Portion of inflorescence. C. Flower from the front. D. Labellum and column from the front. E. Column from the side. F. Anther from above. G. Petal. H. Pollinia.

### Acknowledgements

The author is indebted to the following people for help with certain of the identifications: Mr. D. F. Blaxell of Sydney, Dr. G. Seidenfaden of Copenhagen, Dr. L. A. Garay of Harvard University and Mr. P. Taylor of Kew. Mr. L. Pedley of the Queensland Herbarium prepared the Latin diagnoses for *Dendrobium tozerensis* and *Oberonia carnosa*. I also wish to express my appreciation to Mr. B. Gray and the Rev. R. Collins, both of Atherton who ably assisted me in the field and, in some cases, made the initial discoveries. The field work during which these collections were made was financed by the Queensland Government Department of Forestry, the National Parks and Wildlife Service of Queensland and the Australian Orchid Foundation.

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In the citation of specimens from Queensland, the localities are grouped according to the Pastoral Districts shown above. The boundaries of these Districts mostly follow watersheds except for those between North Kennedy District and South Kennedy District and between Gregory North District and Gregory South District.

Compiled from maps issued by the Survey Office, Department of Lands, Brisbane; based on State Map 4a.

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