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# FLORA OF AUSTRALIA

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*Volume 25*  
*Melianthaceae to*  
*Simaroubaceae*



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# FLORA OF AUSTRALIA

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Volume 25 of *Flora of Australia* contains 7 families of plants. The largest is Sapindaceae, with 30 genera and 193 species. Many of these are rainforest plants of Queensland and New South Wales, but a number occur elsewhere in Australia. The family contains the large genus *Dodonaea* (native hops), which occurs widely in drier regions.

Also in Volume 25 is Anacardiaceae, with 9 genera and 13 species in Australia. These are mostly tropical plants but include several trees naturalised in southern regions.

The other families are Simaroubaceae (4 genera, with 5 native species and 1 naturalised species), Burseraceae (2 genera, 5 native species), Melianthaceae (1 genus, 2 naturalised species), Akaniaceae (1 native species) and Aceraceae (1 naturalised species).

In all, the volume contains 48 genera and 221 species.

The volume includes descriptions, keys for identification, notes and maps on distribution, and bibliographic information. A number of species are illustrated by line drawings or colour photographs.

**Cover:** *Dodonaea viscosa* subsp. *spatulata* (Smith) J. West. Painting by Rosemary Woodford Ganf. Reproduced by courtesy of J. G. West.

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arranged according to the system of A.Cronquist (1981).**

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# FLORA OF AUSTRALIA



*Dodonaea viscosa* subsp. *spatulata* (Smith) J. West. Painting by Rosemary Woodford Ganf, reproduced by courtesy of J.G. West.

BUREAU OF FLORA AND FAUNA, CANBERRA

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# FLORA OF AUSTRALIA

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*Melianthaceae to Simaroubaceae*

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Chairman, 1981–1984,  
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# INTRODUCTION

Seven families of the order Sapindales in the Cronquist phylogenetic system make up Volume 25 of the *Flora of Australia*. By far the largest is Sapindaceae, represented by 30 genera and 195 species in Australia. The genus *Dodonaea* contains 61 species, most of which occur in the drier regions of the continent. By contrast the other genera of Sapindaceae each contain less than ten species, most of which grow in rainforests of northern Australia, especially Queensland.

The other families are represented by few species in Australia —Anacardiaceae (9 genera, 10 native and 3 naturalised species); Simaroubaceae (4 genera, 5 native and 1 naturalised species); Burseraceae (2 genera, 5 native species); Melianthaceae (1 genus, 2 naturalised species); Akaniaceae (1 native species); and Aceraceae (1 naturalised species).

New taxa are described in Sapindaceae and Burseraceae.

The Volume contains a total of 48 genera and 223 species.

In the endpapers to this Volume there are two changes in the families recorded for Australia. Alseuosmiaceae in the Rosales is now included following recent work by C.G.G.J. van Steenis (*Blumea* 29: 387–394, 1984). Marantaceae in the Zingiberales has been deleted since there is no record of it being naturalised.

## Scope and Presentation

The geographical area covered by the *Flora* includes the six Australian States, the Northern Territory, the Australian Capital Territory, immediate offshore islands and Macquarie Island. Other Australian and State-administered territories such as Christmas Island and Lord Howe Island are excluded, but the occurrence in those territories of species included in the *Flora* is added to the notes on distribution. A complete *Flora* of those territories is in preparation.

Descriptions and discussion in the *Flora* are concise and are supplemented by important references, synonymy, and information on type collections, chromosome numbers, distribution, habitat, and illustrations published elsewhere. Descriptions are based on Australian material except for some taxa not confined to Australia for which the collections in Australian herbaria are inadequate. Synonymy is restricted to names based on Australian types or widely used in Australian literature. Misapplied names are given in square brackets together with an example of the misapplication. Alien taxa which are established in one or more localities, other than under cultivation, are considered naturalised and are included and marked with an asterisk(\*).

Families are arranged in the system of A.Cronquist, *An Integrated System of Classification of Flowering Plants* (Columbia University Press, New York, 1981). Within families, the genera and species are arranged to show natural relationships as interpreted by the contributor. Although relationships cannot be shown adequately in a linear sequence, such an arrangement in a *Flora* usually assists comparison of related taxa. Intraspecific taxa are keyed out under relevant species. Up to five collections are cited for each species and infraspecific taxon.

Maps showing distribution in Australia are arranged in the same sequence as the descriptions and are grouped 15 on a page. Each group of maps occurs on the first right-hand page after the text reference to its last map. Thus, for any taxon, the reader will always find the map on a later page. The term 'Malesia' is often used in the notes on

## INTRODUCTION

geographical distribution for species which occur widely in the region covered by *Flora Malesiana*, i.e. Malaysia, Singapore, Indonesia, Philippines, New Guinea and adjacent islands.

New taxa and lectotypifications are included<sup>3</sup> in an appendix where they are formally published in accordance with the *International Code of Botanical Nomenclature* (Bohn, Scheltema & Holkema, Utrecht, 1978).

Abbreviations, contractions and references to the format for author and bibliographic citations are listed after the Appendix.

## Acknowledgments

There are fifteen contributors (including photographers) to Volume 25. Their co-operation is gratefully acknowledged. The directors and staff of Australian and overseas institutions have assisted preparation of the Volume with loans of specimens to writers and illustrators as well as with additional information and reviews of manuscripts.

The figures of *Dodonaea*, drawn by Ann Prescott, Adelaide, were originally published in *Brunonia* and are here reproduced by permission of the CSIRO Publications and Editorial Service. The figures of *Diplopeltis*, first published in *Grana Palynologica*, are reproduced by permission of the Swedish Museum of Natural History.

The assistance of the staff of the Bureau of Flora and Fauna in producing Volume 25 is acknowledged with pleasure. Special thanks go to David Berman, Arthur Chapman, Chris Curtis, Ai Ha Thi Diep, Gloria Downing, Helen Hewson, Roger Hnatiuk, Barbara McCullough, Vicky Ochiltrie, Wendy Riley, Geetha Sriprakash and Cindy Wolter.

The continued co-operation of the Australian Government Publishing Service, Canberra, and Griffin Press, Adelaide, is gratefully acknowledged.

# MELIANTHACEAE

*H.J.Hewson*

Trees or shrubs. Leaves alternate, pinnate, stipulate. Inflorescence racemose. Flowers usually bisexual, zygomorphic, resupinate at anthesis. Sepals 5, free or fused, sometimes 4 by fusion of two. Petals 4 or 5, free, clawed, unequal. Nectariferous disc complete or incomplete, outside stamens. Stamens 4 or 5, alternate with petals, free or connate at base, often declinate; anthers 2-locular. Ovary superior, of 4 or 5 carpels, fused, 4- or 5-locular; style 1; stigma lobed or toothed; ovules 1-4 per locule; placentation basal or axile. Fruit a capsule with loculicidal dehiscence. Seeds usually solitary, sometimes arillate, with endosperm.

A family of 2 genera native to Africa; 2 species of *Melianthus* naturalised in Australia.

## MELIANTHUS

*Melianthus* L., *Sp. Pl.* 2: 639 (1753); *Gen. Pl.* 5th edn, 287 (1754); from the Greek *meli* (honey) and *anthos* (flower), in reference to the nectariferous flowers.

Type: *M. major* L.

Shrubs, often fetid. Leaves imparipinnate; leaflets unequal, toothed, glabrous or hairy. Flowers in racemes (in Australia), bracteate, bisexual. Calyx abaxially saccate at base, the lobes unequal. Petals 5, or 4 with the anterior petal abortive. Disc prominent, unilateral. Stamens 4, didynamous, free, slightly exerted. Ovary 4-locular, lobed; ovules 2-4 per locule, in 2 rows. Capsule membranous, leathery or woody. Seeds black, shiny, exarillate.

A genus of 8 species in South Africa, 2 of which have become naturalised in Australia.

Stipules fused into one; capsule not winged

**1. *M. major***

Stipules free; capsule winged

**2. *M. comosus***

### **1. \**Melianthus major* L., *Sp. Pl.* 2: 639 (1753)**

T: near Cape of Good Hope, South Africa, *collector unknown*; *n.v.*

Illustration: B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* fig. 118d-f (1983).

Shrub to 3 m tall, glaucous, glabrous. Leaves to 35 cm long; leaflets lanceolate, serrate, sometimes double-serrate, to 12 cm long; stipules fused into 1 above petiole, broadly lanceolate. Inflorescence a dense terminal pedunculate raceme, up to 40 cm long, sometimes longer. Flowers red-brown. Sepals unequal, the longest 2-2.5 cm long, the shortest (abaxial) one saccate or spurred. Petals 4, sometimes 5, unequal, shorter and narrower than sepals, shortly exerted each side of abaxial sepal, the apices ±rolled. Ovary 4-lobed; style c. equal to stamens. Capsule 2-4 cm long, lobed at summit, membranous. Seeds 2 per locule, ovoid, 5 mm long. *Cape Honey Flower*. Fig. 1A-B.

Occurs in S.A., Qld and N.S.W. as localised but established garden escape. Not considered naturalised in Vic. Map 1.

S.A.: Fishery Ck, Cape Jervis, *C.R.Alcock* (BRI); Finnis R., Giles Ck Branch, Feb. 1945, *E.C.Black* (AD); Fulham, Jan. 1908, *J.M.Black* (AD). Qld: Gumbank, *D.Martin* (BRI). N.S.W.: Costens Point, Royal National Park, Oct. 1973, *A.Rodd* (NSW).

**2. \*Melianthus comosus** Vahl, *Symb. Bot.* 3: 86 (1794)

T: from South Africa, *collector unknown*; *n.v.*

Illustrations: J.M.Black, *Fl. S. Australia* 2nd edn, fig. 700 (1952); B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* fig. 118a-c (1983).

Shrub usually less than 1 m tall, downy with stellate hairs. Leaves to 12 cm long; leaflets oblong to lanceolate, serrate, to 5 cm long, sometimes glabrescent above; stipules narrowly lanceolate, free. Inflorescence a dense axillary raceme, subsessile, to 10 cm long. Sepals very unequal, greenish, the longest 1–2 cm long, the shortest (abaxial) saccate at base. Petals 4, unequal, 2 sometimes bifid, shortly exceeding abaxial sepal, red. Ovary 4-lobed; style c. equal to stamens. Capsule 2.5–3 cm long, winged, membranous. Seeds 1 or 2 per locule, ovoid, c. 4 mm long. *Tufted Honey Flower*. Fig. 1C–D.

Naturalised in S.A. and Vic. Map 2.

S.A.: Waterfall Gully, Nov. 1908, *J.M.Black* (AD); Fishery Beach, Sept. 1970, *J.A.Carpenter* (AD); Lands End, Cape Jervis, June 1973, *M.Carver* (CANB); Sellick Scrub, Aug. 1949, *J.B.Cleland* (AD); Fishermans Beach near Normanville, *R.Hartley* 25 (AD).

**AKANIACEAE**

*H.J.Hewson*

Trees, bisexual. Leaves alternate, imparipinnate, stipulate; leaflets opposite or subopposite; abaxial surface white-dotted in areolae with papillae concealing stomata. Inflorescence axillary or supra-axillary, paniculate, bracteate. Flowers regular. Calyx-lobes 5, imbricate. Petals 5, free or adnate to calyx, convolute. Disc absent. Stamens 8–10 in 2 whorls. Ovary superior, 3-locular; ovules 2 per locule, pendulous; placentation axile; style simple. Fruit a loculicidal capsule. Seeds exarillate, endospermic.

A monotypic family, endemic in eastern Australia.

G.Bentham, *Fl. Austral.* 1: 471 (1863) under Sapindaceae; O.Stapf, LII. –Akaniaceae: A new family of Sapindales, *Bull. Misc. Inform.* 1912: 378–380 (1912); C.R.Metcalf & L.Chalk, Akaniaceae in *Anatomy of the Dicotyledons* 1: 436–439 (1950).

**AKANIA**

*Akania* J.D.Hook. in G.Bentham & J.D.Hooker, *Gen. Pl.* 1: 409 (1862); from the Greek *akan* (needle-pointed), referring to the pungent serrations on the leaves.

Type: *A. hillii* J.D.Hook. = *A. lucens* (F.Muell.) Airy Shaw

**Akania lucens** (F.Muell.) Airy Shaw, *Bull. Misc. Inform.* 1940: 199 (1940)

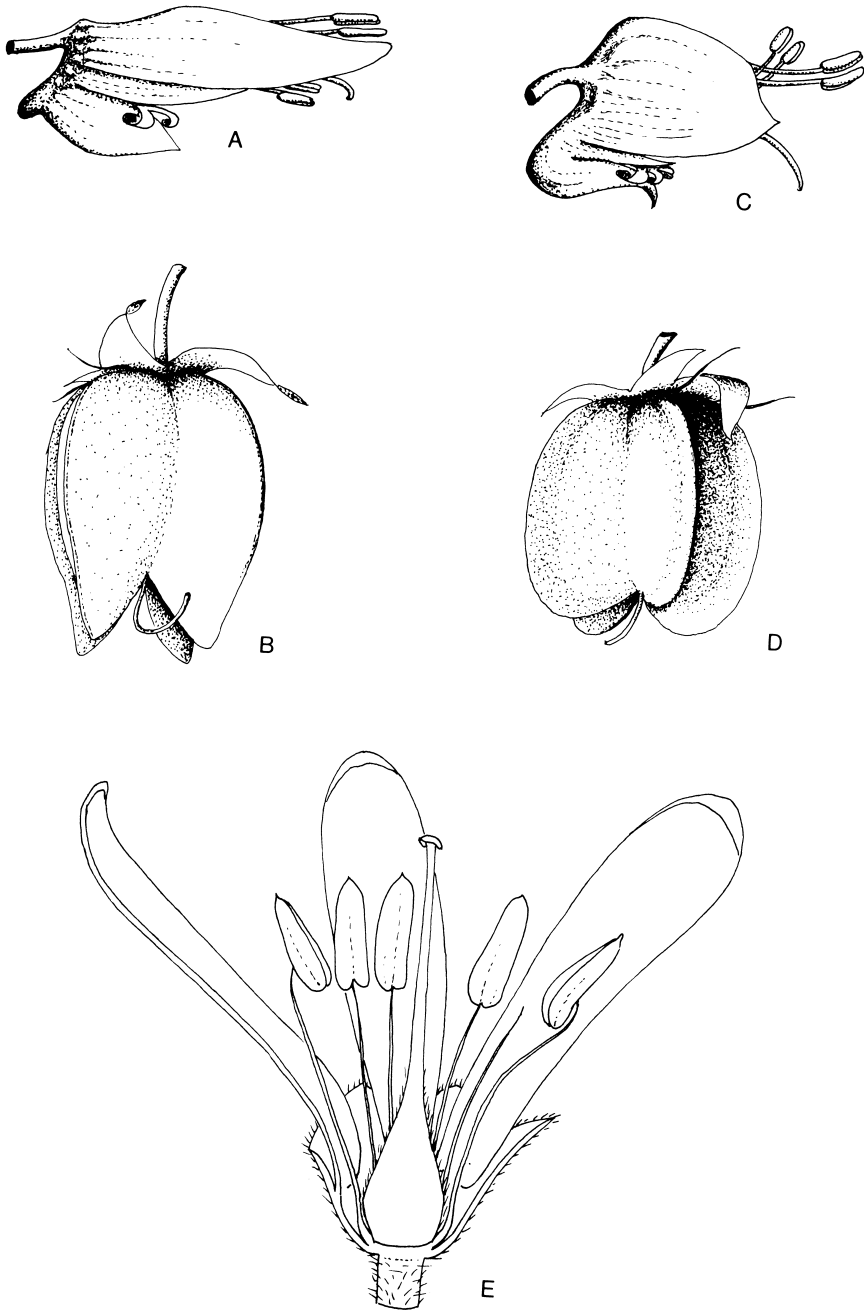
*Cupania lucens* F.Muell., *Fragm.* 3: 44 (1862). T: Moreton Bay, Qld, *L.Leichhardt*; Pine River, Qld, *W.Hill*; Clarence River, N.S.W., *H.Beckler*; Richmond River, N.S.W., *C.Moore*; all *n.v.*

*Akania hillii* J.D.Hook. in G.Bentham & J.D.Hooker, *Gen. Pl.* 1: 409 (1862). T: Moreton Bay, Qld, *collector unknown*; *n.v.*

Illustrations: O.Stapf, *Bot. Mag.* 138: t. 8469 (1912); J.H.Maiden, *Forest Fl. New South Wales* 8: t. 294 (1925); H.Harms, *Pflanzenfam.* 2nd edn, 19(b1): fig. 36 (1940); N.C.W.Beadle, *Stud. Fl. N.E. New South Wales* 4: fig. 258 (1980).

Tree to 13 m tall; cut bark and wood with odour of turnips. Leaves to 75 cm long; leaflets 9–31, lanceolate or oblanceolate, pungently serrate, 10–30 cm long, coriaceous, glabrous; petiolules swollen, to 1.5 cm long; venation distinct, raised; stipules subulate.





**Figure 1.** A–D, *Melianthus*. A–B, *M. major*. A, flower from side  $\times 2$  (K.Czornij 47, AD); B, fruit  $\times 1.3$  (Mt Gambier, S.A., J.Black, AD). C–D, *M. comosus*. C, flower from side  $\times 2$  (Sellik Scrub, S.A., J.Cleland, AD); D, fruit  $\times 1.3$  (R.Hartley 25, CANB). E, *Akania lucens*, flower with 1 side removed,  $\times 6$  (R.Hoogland 8611, CANB).

Panicles to 50 cm long, rusty-hairy; bracts c. 1 mm long, caducous; flowers scented; pedicels 0.5–2 cm long. Calyx 3–4 mm long. Petals 5, oblong, 8–12 mm long, white or pink. Staminal filaments filiform, 4 mm long; anthers sub-basifixed, latrorse. Style c. 6 mm long; stigma capitate; ovary pilose. Capsule ovoid to pyriform, coriaceous or woody, to 2.5 cm long, red. Seeds 1 or 2, 10–12 mm long, yellow. *Turnipwood*, *Horse-radish Tree*. Fig. 1E.

Common in coastal and near-coastal rainforest in north-eastern N.S.W. and south-eastern Qld. Map 3.

Qld: Warrie National Park, *W.J.F.McDonald 2077* & *L.W.Jessup* (BRI); Tamborine Mtn, Oct. 1909, *J.H.Simmonds* (BRI). N.S.W.: Ballina, Feb. 1893, *W.Baeuerlen* (NSW); near Coffs Harbour, *R.D.Hoogland 8611* (CANB, NSW); Waihou trig, NW of Coffs Harbour, *H.Streimann 8141* (BRI, CBG, MEL, NSW).

*Akania* has been variously placed in Staphyleaceae, Sapindaceae and Akaniaceae. There is considerable variation in the insertion and degree of fusion of the petals and stamens, and there are discrepancies between published descriptions of the flowers. The genus should be revised.

## SAPINDACEAE

S.T.Reynolds

*Dodonaea* & *Diplopeltis* by *J.G.West*

Trees, shrubs or climbers, rarely herbaceous, dioecious, monoecious, or polygamo-dioecious, rarely polygamous; some with saponin in bark, leaves and pericarp. Leaves alternate, simple, trifoliolate, biternate or pinnate; petiole and petiolule usually pulvinate, exstipulate. Inflorescence axillary, terminal or ramiflorous, usually thyrsoïd, raceme-like, panicle-like or cymose or flowers sometimes solitary or fasciculate. Flowers small, regular or irregular, usually pedicellate; bracteate. Sepals 4–10, usually united, imbricate or valvate. Petals absent or 4–6, free, usually clawed, with 1 or 2 hairy scales inside towards base; scales crested or not, sometimes absent. Disc usually present. Stamens 5–74, usually 8, inserted within disc, free, reduced in females, exerted in males; anthers 2–locular, longitudinally dehiscent. Ovary superior, 1–8–locular, rudimentary in males; ovules 1 or 2 per locule; style 1, entire or with 2– or 3–lobed stigma, rarely absent. Fruit drupaceous, or capsular or separating into cocci, when capsular the dehiscence loculicidal or septicidal, rarely septicidal, sometimes irregular. Seeds usually with aril, non-endospermic.

A family of 150 genera with c. 2 000 species, chiefly tropical and subtropical, best represented in Asia and America; 30 genera with c. 190 species in Australia.

Many Sapindaceae are of economic value. Several contain saponin in bark, twigs, leaves and pericarp; some yield valuable timbers and others edible fruits. The best known of the fruits (noted for their delicious aril) are Lychee (*Litchi chinensis* Sonn.), Longan (*Dimocarpus longan* Lour. subsp. *longan*), Rambutan (*Nephelium lappaceum* L.) and Akee (*Blighia sapida* C. König); these are cultivated in tropical and subtropical Australia. The thick aril of the Native Tamarind (*Diploglottis cunninghamii* (Hook.) J.D.Hook.) and other species of *Diploglottis* is used for making jams and acid drinks. Many species have showy fruits or striking reddish young leaves and red anthers. A number are cultivated as ornamental or shade trees e.g. *Alectryon tomentosus* (F.Muell.) Radlk., *Cupaniopsis anacardioides* (A.Rich.) Radlk., *Diploglottis campbellii* Cheel, species of *Harpullia*, e.g. *H. pendula* Planchon ex F.Muell., *Jagera pseudorhus* (A.Rich.) Radlk., *Koelreuteria elegans* (Seeman) A.C.Smith and *K. paniculata* Lxm. (Golden Rain Tree), *Sapindus*

## SAPINDACEAE

*saponaria* L. and *Sapindus mukorosii* Gaertner (Soapberry) and *Filicium* sp. The last three genera are introductions to Australia.

The best known timber of the family in Australia is that of Tulip wood (*Harpullia pendula*). The bark of *Jagera pseudorhus* contains a large amount of saponin and is used as a foaming agent and as a fish poison.

Many Sapindaceae in Australia occur in gallery rainforest or sometimes in dry scrub, along creek and rivers and also along the coast. The genus *Dodonaea* is widespread especially in inland regions.

G.Bentham, Sapindaceae, *Fl. Austral.* 1: 451–488 (1863); L.A.T.Radlkofer, Sapindaceae, *Pflanzenr.* 98 (1933); W.D.Francis, *Austral. Rainforest Trees* 4th edn, 246–266 (1981).

### KEY TO GENERA

- 1 Herbaceous vines with tendrils; leaves biternate **1. CARDIOSPERMUM**
- 1: Trees or shrubs; tendrils absent; leaves simple, trifoliolate or pinnate
- 2 Leaves simple, sometimes deeply lobed
- 3 Petals present
- 4 Petals showy, without scales; flowers irregular; fruit separating into 3 cocci or a capsule, not winged; leaves to 4 cm long, lobed or dentate, rarely entire; low shrubs, usually glandular-hairy **27. DIPLOPELTIS**
- 4: Petals small, usually with scales; flowers regular; fruit separating into winged samaras; leaves 4–17 cm long, entire; tall shrubs or trees with simple hairs **4. ATALAYA**
- 3: Petals absent
- 5 Sepals united; ovule 1 per locule; fruit of 1 or 2 rounded indehiscent lobes, not winged; aril red, cupular **6. HETERODENDRUM**
- 5: Sepals free; ovules 2 per locule; fruit a capsule with 2–4 wings or angles; aril absent or white and funnel-shaped
- 6 Sepals 5–10; stamens 8–74; leaves usually densely hairy, prominently reticulate **28. DISTICHOSTEMON**
- 6: Sepals 3–7; stamens 6–14; leaves usually glabrous, not prominently reticulate **29. DODONAEA**
- 2: Leaves trifoliolate or pinnate or pinnatifid
- 7 Leaves pinnatifid or deeply divided or lobed **27. DIPLOPELTIS**
- 7: Leaves trifoliolate or pinnate
- 8 Indumentum of stellate or tufted hairs, usually mixed with simple hairs
- 9 Indumentum of fine sessile stellate hairs and coarse stipitate ones; leaves trifoliolate or pinnate; fruit 3-lobed, septifragally dehiscent **30. COSSINIA**
- 9: Indumentum of fine sessile stellate hairs; leaves pinnate; fruit 1- or 2-lobed, loculicidally dehiscent or indehiscent
- 10 Fruit indehiscent, mostly 1-lobed; seed 1 per locule; leaflets usually with naked glands on lower surface **12. DIMOCARPUS**
- 10: Fruit 2-lobed, loculicidally dehiscent, 2-valved; seeds 1 or 2 per locule; leaflets without naked glands **11. HARPULLIA**
- 8: Indumentum if present of simple and/or glandular hairs
- 11 Leaves trifoliolate; sepals and petals 4, in 2 pairs; erect or scrambling shrubs **2. ALLOPHYLUS**
- 11: Leaves pinnate; sepals and petals 4 or 5, not in 2 pairs, or petals absent; erect shrubs and trees

- 12** Leaves bipinnate
- 12:** Leaves simply pinnate
- 13** Leaves usually imparipinnate; leaflets 1–29 pairs, to 40 mm long, and to 8 mm wide; fruit usually membranous, capsular, septicial or septifragal; sepals free; petals absent; ovules 2 per locule
- 13:** Leaves usually paripinnate; leaflets 1–19 pairs, usually more than 40 mm long and 8 mm wide; fruit various, either capsular or indehiscent or breaking up irregularly or separating into winged samaras; sepals free or united; petals present or absent; ovules 1 or 2 per locule
- 14** Fruit either indehiscent or cells breaking up irregularly or separating into winged samaras; calyx cupular 4–6-toothed or –partite or truncate, or sepals free
- 15** Fruit separating into samaras with long wings; sepals free, suborbicular; petals usually with scales
- 15:** Fruit either indehiscent or breaking up irregularly; sepals free or united; petals if present usually with scales
- 16** Ovules 2 per locule; petals absent; calyx cupular, toothed; leaves and branchlets with resinous scales
- 16:** Ovules 1 per locule; petals usually present; sepals free or united; leaves and branchlets without resinous scales
- 17** Petals with well-developed crested scales; disc one-sided; sepals free, suborbicular, concave; fruit 1–4-lobed or not lobed; seeds exarillate; buds globose
- 17:** Petals with small, crestless scales; disc complete; calyx cupular, truncate, lobes toothed or partite; fruit 1–4-lobed or not lobed; seeds arillate or not; buds ovoid
- 18** Fruit not lobed, 2.5–3 cm long; seeds chestnut-like, exarillate; calyx 5–partite; petals present
- 18:** Fruit with 1–4 knob-like or globose lobes, rarely not lobed, less than 1.5 cm long; seeds ellipsoidal with cupular aril; calyx 4–6-toothed or -partite, or truncate; petals present or absent
- 14:** Fruit loculicidally dehiscent; calyx cupular and dentate or sepals free and 2–seriate
- 19** Calyx lobes nearly free or sepals free, usually 2–seriate, orbicular, elliptic or obovate, concave
- 20** Petals absent; stamens 5; fruit to 7 mm long, not lobed; endocarp hard, bony; leaflets thin, finely reticulate
- 20:** Petals present; stamens usually 8; fruit 1–5 cm long, rarely smaller, with or without lobes; endocarp not hard; leaflets coriaceous, not finely reticulate
- 21** Scales present on petals
- 22** Scales usually crested; disc complete or incomplete
- 23** Petals 4 or 5, the 5<sup>th</sup> often reduced; fruit to 7 cm long and 8 cm wide, usually with 1–3 subglobose lobes; aril thick, fleshy, bilobed; leaflets green on lower surface
- 23:** Petals 5, none reduced; fruit to 1.5 cm long and 2.5 cm wide, with 3 wing-like lobes; aril thin, tailed; leaflets usually glaucous below
- 22:** Scales not crested; disc complete
- 3. TRISTIOPSIS**
- 29. DODONAEA**
- 4. ATALAYA**
- 5. GANOPHYLLUM**
- 8. LEPISANTHES**
- 9. CASTANOSPORA**
- 7. ALECTRYON**
- 13. DICTYONEURA**
- 10. DIPLOGLOTTIS**
- 14. GUIOA**

## SAPINDACEAE

*Key to Genera*

- 24 Sepals not petaloid, usually silky outside; valves of fruit villous inside; aril nearly enclosing seed; leaflets entire, crenate or serrate, drying brownish **16. CUPANIOPSIS**
- 24: Sepals petaloid on margins, glabrous outside; valves of fruit glabrous inside; aril small; leaflets entire, drying yellow-green **17. RHYSOTOECHIA**
- 21: Scales absent from petals
- 25 Sepals petaloid, delicate; petals without basal thickenings; valves of capsule usually drying slightly woody; aril usually covering seed; upper surface of leaflets with appressed glands **15. LEPIDEREMA**
- 25: Sepals petaloid only on margins; petals with thickened margins; valves of fruit drying rind-like, wrinkled; aril small; leaflets usually shining above **17. RHYSOTOECHIA**
- 19: Calyx shortly cupular, the lobes toothed or partite, usually ovate
- 26 Petals present; scales crested
- 27 Fruit usually with fleshy wings; valves glabrous inside; aril thin, covering seed **20. SARCOPTERYX**
- 27: Fruit usually without wings; valves villous inside; aril small and basal, or mantle-like over seed
- 28 Fruit rusty setose; leaflets serrate to entire, pellucid-dotted **18. JAGERA**
- 28: Fruit glabrous outside, or if hairy then not setose; leaflets usually entire, not pellucid-dotted
- 29 Valves usually drying thick and woody, densely villous inside; aril small, disc-like, at base of seed; cymules not in clusters; leaflets usually with domatia **21. TOECHIMA**
- 29: Valves drying thin and wrinkled, sparsely villous inside; aril small, mantle-like, adhering to basal part of seed; cymules usually in clusters; leaflets without domatia **22. SYNIMA**
- 26: Petals present or absent; scales not crested
- 30 Petals present; aril very small, sometimes absent
- 31 Pericarp thick, drying hard and woody; fruit 3-locular; aril dorsal; inflorescence a raceme or panicle; leaflets usually with domatia **19. ELATTOSTACHYS**
- 31: Pericarp usually very fleshy, drying thin; fruit 2- or 3-locular; aril at base of seed or absent; inflorescence raceme-like; leaflets without domatia **23. SARCOTOECHIA**
- 30: Petals present or absent; aril usually covering seed
- 32 Petals minute with one large scale; fruit obovoid, 2-lobed, 2-valved **24. LEPIDOPETALUM**
- 32: Petals small with 2 small scales or absent; fruit either with 1-3 lobes, the lobes 2-valved, or fruit not lobed, irregularly dehiscent or loculicidally 3-valved

33 Fruit sessile, rarely stipitate, divaricately 2- or 3-lobed, 1-lobed or not lobed, 2-valved or irregularly dehiscent; aril not spurred; petals usually present

25. ARYTERA

33: Fruit long-stipitate, not lobed, loculicidally 3-valved; aril with basal spur; petals present or absent

26. MISCHOCARPUS

## 1. CARDIOSPERMUM

*Cardiospermum* L., *Sp. Pl.* 1: 366 (1753), *Gen. Pl.* 5th edn, 171 (1754); from the Greek *kardia* (heart) and *sperma* (a seed), referring to the heart-shaped aril.

Type: *C. halicacabum* L.

Herbaceous climbers, monoecious; stems, leaf axes and peduncles usually ribbed. Leaves biternate; leaflets lobed, pinnatifid, dentate or serrate, chartaceous. Inflorescence axillary; peduncle long, with 1 or 2 pairs of circinnate tendrils; branches usually with densely bracteate racemes or cymules towards apex; bracts small, subulate. Flowers unisexual. Sepals usually 2-paired; outer pair smaller, ovate, flat; inner ones elliptic, concave. Petals 2-paired, obovate; scales when present, oblong, cucullate; crests broad. Disc unilateral, 4-lobed; posterior lobes usually obsolete. Stamens 6–8, unilateral, opposite disc; filaments filiform. Ovary 3-locular; ovule 1 per locule; style short; stigma 3-lobed. Fruit loculicidally dehiscent, stalked, inflated; valves membranous. Seed globose, smooth, black; aril minute.

A genus of 12 species mainly from tropical America; 2 species naturalised in Australia.

G.Bentham, *Fl. Austral.* 1: 453 (1863); L.A.T.Radlkofer in A.Engler, *Pflanzenr.* 98b: 370 (1932); S.T.Reynolds, *Austrobaileya* 2: 30–31 (1984).

Distinctive by its climbing twining habit, tendrils and bladderly fruits; seeds with a small heart-shaped aril.

Plants usually densely pale-rusty hairy; flowers 8–12 mm long; fruit 4–8 cm long; inflorescence corymb-like

1. *C. grandiflorum*

Plants glabrous or sparsely pale hairy; flowers 4 mm long; fruit 1–3 cm long; inflorescences umbel-like, with 3 or 4 short branches towards apex

2. *C. halicacabum*

### 1. \**Cardiospermum grandiflorum* Sw., *Nov. Gen. Sp. Pl.* 64 (1788)

T: Jamaica, collector unknown; n.v.

*C. hirsutum* Willd., *Sp.Pl.* 4th edn, 2: 467 (1799). T: New Guinea, collector unknown; n.v.

Illustration: S.T.Reynolds *Austrobaileya* 2: 33 fig. 1E–G (1984).

Scrambling vine; stems, leaf axes and peduncles usually rusty-hairy. Leaf rachis 1.5–3.5 cm long; pinnae 3.5–10.5 cm long, 2.5–12.5 cm wide; secondary petioles 0.6–1.5 cm long; leaflets oblong-ovate or elliptic-ovate, acute or acuminate, irregularly serrate, 2.5–8 cm long, puberulent above, pubescent below; terminal petiolule 4–6 mm long, lateral ones subsessile; petiole 1–6.5 cm long. Panicle corymb-like; peduncle 5.5–14.5 cm long, tendrils 1-paired; pedicels 5 mm long. Sepals 2–8.5 mm long and wide. Petals 9–11 mm long, 4.5–5 mm wide, all with scales and crests, white. Disc 2-lobed, erect, horn-like. Fruit ellipsoidal or ovoid, apiculate, 6-ribbed, 5–8 cm long, puberulent. Seed 7 mm long and wide; aril saucer-shaped. *Heart-seed Vine*. Fig. 2A–F.

Occurs in tropical America, Africa, West Indies; naturalised in central and southern Qld and in north and central coastal areas of N.S.W.; usually along riverbanks, climbing over trees. Map 4.



**Figure 2.** A–F, *Cardiospermum grandiflorum*. A, flowering habit  $\times 0.7$ ; B, petal  $\times 2.7$ ; C, sepal  $\times 2.7$ ; D, scales and stamens  $\times 2.7$ ; E, fruit  $\times 0.7$ ; F, seed  $\times 2.7$  (A–F, L.Jessup 567, BRI). G–K, *Allophylus cobbe*. G, flowering habit  $\times 0.7$ ; H, petal  $\times 16$ ; I, inner view of sepal  $\times 8$ ; J, outer view of sepal  $\times 8$ ; K, fruits  $\times 0.7$  (G–K, A.Dockrill 792, BRI).

Qld: Burnett River, Gayndah, *L.R.Durrington 111* (BRI); Riverview, E of Ipswich, *L.Pedley 4273* (BRI); Wivenhoe Bridge, Brisbane River, S of Esk, *P.R.Sharpe 477* (BRI). N.S.W.: Wahroonga, *H.Salasoo 674*(NSW); Bunburry Curran Ck, Glenfield, *E.J.McBarron 12522* (NSW).

*C. grandiflorum* differs from *C. halicacabum* in being densely hirsute and in having larger flowers.

## 2. \*Cardiospermum halicacabum L., *Sp. Pl.* 1: 366 (1753)

T: East Indies, *collector unknown; n.v.*

Slender trailing vine; glabrous, or stems, leaf axes and peduncles puberulous. Leaf rachis 1–2.5 cm long; pinnae 2.5–6.5 cm long, 2–7 cm wide; secondary petioles 0.5–1 cm long; leaflets elongate-ovate, acuminate or acute, irregularly dentate or pinnatifid, 1.5–3.5 cm long, 0.7–1.8 cm wide, puberulent or glabrous; petiolules 2–7 mm long; petiole 1.5–5.5 cm long. Inflorescence umbel-like with 3 or 4 raceme-like branches; peduncle 2.5–14 cm long; tendrils 1 or 2 pairs; pedicels 2–3 mm long. Sepals 1–4 mm long, 1–2 mm wide. Petals 3 mm long, 1.5 mm wide; posterior pair with puberulent scales and crests, white. Disc small, swollen. Fruit subglobose, pyriform or obovoid, 1–3 cm long, pubescent or puberulent. Seed 3–5 mm diam.; aril 2-lobed.

Common usually as a weed in warm countries; naturalised in W.A., N.T., Qld and N.S.W. Two varieties are recognised.

Fruit subglobose or pyriform, 2.5–3 cm long; aril cordate; leaves 6.5–14 cm long **2a. var. halicacabum**

Fruit depressed obovoid, to 1 cm long, 2 cm diam.; aril broadly 2-lobed; leaves 6–8.5 cm long **2b. var. microcarpum**

### 2a. \*Cardiospermum halicacabum L. var. halicacabum

Leaves 6.5–14 cm long. Fruit subglobose or pyriform, 2.5–3 cm long. Aril cordate.

Usually climbing over grass and other vegetation along margins of creeks, rivers and lagoons in W.A., N.T., Qld and N.S.W. Map 5.

W.A.: Fitzroy R. near Fitzroy Crossing, *M.Lazarides 6527* (NSW). N.T.: Wavehill Police Station, *R.A.Perry 2243* (BRI, NSW). Qld: Mackenzie River, *E.R.Anderson 2068* (BRI); Bundoan, S of Nonda, *S.L.Everist 3019* (BRI). N.S.W.: Hornsby, April 1914, *W.F.Blakely* (NSW).

### 2b. \*Cardiospermum halicacabum var. microcarpum (Kunth) Blume, *Rumphia* 3: 185 (1847)

*C. microcarpum* Kunth in Humb. & Bonpl., *Nov. Gen. Sp.* 5: 104 (1821). T: Province of Orinoco, South America, *collector unknown; n.v.*

Leaves 6–8.5 cm long. Fruit depressed obovoid, to 1 cm long, 2 cm diam. Aril broadly 2-lobed.

Naturalised near Gayndah in south-eastern Qld. Map 6.

Qld: Barambah Ck, NE of Gayndah, *B.A.Lebler & L.R.Durrington 30* (BRI, NSW).

## 2. ALLOPHYLUS

*Allophylus* L., *Sp. Pl.* 1: 348 (1753), *Gen. Pl.* 5th edn, 164 (1754); from the Greek *allo* (other, different) and *phylon* (tribe), perhaps because the type came from a distant country.

Type: *A. zeylanicus* L.

*Schmidelia* L., *Syst. Nat.* 12th edn, 274 (1767), *Mant. Pl.* 10, 67 (1767). T: *S. racemosa* L.



Monoecious erect or scrambling shrubs. Branchlets with simple hairs and lenticels. Leaves trifoliolate, occasionally 1- or 5-foliolate; leaflets petiolulate to sessile, serrate, to subentire, semicoriaceous, dotted. Inflorescence axillary, spike-like with scattered fascicles of flowers, rarely branched; bracts small. Flowers small, irregular, unisexual. Sepals 4, paired, broadly imbricate, outer pair smaller; elliptic or suborbicular, concave, membranous, gland-dotted. Petals 4, unilateral, spathulate, long-clawed; scales 2-lobed, pilose, crestless. Disc unilateral, 4-lobed or with 2-4 glands. Stamens 8, opposite disc; filaments filiform. Ovary deeply 2- or 3-lobed, segments 1-locular, 1-ovuled; style filiform; stigma 2-lobed. Fruit usually 1-lobed, drupaceous or nearly dry, indehiscent. Seed obovoid, exarillate.

A genus of one extremely variable species. Occurs in tropical and subtropical Africa, Asia, New Guinea and Australia.

K.Domin, *Biblioth. Bot.* 89: 344 (1927); L.A.T.Radlkofer in A.Engler, *Pflanzenr.* 98b: 455 (1932); P.W.Leenhouts, *Blumea* 15: 301-358 (1967); S.T.Reynolds, *Austrobaileya* 2: 31-32 (1984).

Distinguishable from other Australian Sapindaceae by its trifoliolate serrulate to entire leaves, spike-like inflorescence and small drupe-like fruits.

### **Allophylus cobbe** (L.) Blume, *Rumphius* 3: 131 (1847)

*Rhus cobbe* L., *Sp.Pl.* 1: 267 (1753). T: Ceylon, collector unknown; n.v.

*Allophylus ternatus* (Forst.) Radlk., *Pflanzenfam.* 3(5): 313 (1895).

*Ornitrophe serrata* Roxb., *Pl. Coromandel* 1: 44, t. 61 (1796); *Schmidelia serrata* (Roxb.) DC., *Prodr.* 1: 610 (1824). T: India, collector unknown; n.v.

*Allophylus crenatus* Radlk., *Sitzungsber. Math.-Phys. Kl. Königl. Bayer Akad. Wiss. München* 38: 234 (1908). T: north coast of Australia, R.Brown; syn; n.v.; Port Essington, N.T., J.Armstrong; syn; n.v.

Illustration: S.T.Reynolds, *Austrobaileya* 2: 33 fig. 1A-D (1984).

Small scrambling shrub. Branchlets, leaf axes and peduncles pubescent to glabrescent. Leaflets ovate, obovate or elliptic, 4-13.5 cm long, 2-7.5 cm wide, puberulent or glabrous; base truncate, rounded or cuneate; petiolules 1-10 mm long; petiole 2.5-7.5 cm long, terete. Inflorescence 1.5-13.5 cm long; cymules subsessile; pedicels 1-2 mm long. Sepals as long as petals, puberulent or glabrous. Petals 1.5-2 mm long to 0.5 mm wide, glabrous except scale. Filaments 1-2 mm long, glabrescent. Ovary villous. Fruit ellipsoidal, 5-6 mm long, 4-5 mm diam., glabrescent, bright red. Fig. 2G-K.

Occurs in N.T. from Daly R. to South Alligator R. and in N Qld from Cape York Peninsula to Cardwell, including offshore islands; grows on sandstone hills and dunes, in semideciduous vine forest, strand forest and at edge of mangroves. Map 7.

N.T.: Buffalo Creek, Darwin, N.B.Byrnes 2063 (BRI, NSW). Qld: Port Douglas, L.J.Brass 1913 (BRI); Daintree near McDowells crossing, A.W.Dockrill 792 (BRI); Saibai, G.L.Stocker 1408 (BRI); c. 4 km N of Cardwell, A. & M.Thorsborne 7 (BRI); 30 km S of Cooktown, L.A.Craven 3213 (BRI).

### 3. TRISTIOPSIS

*Tristiopsis* Radlk. in Durand, *Ind. Gen. Phan.* 76 (1887); from the Greek *opsis* (resembling), resembling *Tristira*, another genus of Sapindaceae.

Type: not designated.

Monoecious trees. Branchlets lenticellate, with short simple hairs towards apex. Leaves bipinnate; leaflets distichous, entire, petiolulate. Inflorescence axillary, panicle-like. Flowers regular, unisexual, pedicellate. Calyx 5-partite, lobes ovate or obovate, concave, unequal, imbricate. Petals obovate or subrhomboidal, clawed; scales 2, broad, not crested. Disc annular. Stamens 8-10, hairy. Ovary 3- or 4-locular; ovule 1 per locule; style short, persistent; stigma 3- or 4-lobed, decurrent. Fruit ellipsoidal, obovoid or subglobose,

slightly 3- or 4-angled or smooth, cuspidate, fleshy, indehiscent, when dry with fibrous exocarp and woody endocarp. Seed exarillate.

A genus of 13 or 14 species in the Philippines, Malaysia, Marianne Is, Solomon Is and Christmas Is (Pacific Ocean), New Guinea and Australia; 1 species in Australia.

The genus is easily distinguished by the bipinnate leaves.

L.A.T.Radlkofer in C.Lauterbach, *Beitr. Fl. Papuasien* 7: 269–270 (1921)

**Tristiropsis canarioides** Boerl. ex Val. in J.G.Boerlage, *Icon. Bogoriensis* 2: 285, 186, 187 (1906)

T: New Guinea, Teysman; *n. v.*

[*T. subangulata* auct. non Schumann: anon, *Ann. Rep. Bot. Branch Queensland Herb.* 1977–78: 20 (1978)]

Tree to 25 m high. Branchlets with short brown appressed pubescence at apex. Leaves with 1 or 2 pairs of pinnae; primary rachis to 9 cm long, secondary 12–14 cm long; leaflets 6–8, alternate, obliquely oblong-ovate, elliptic or ±ovate, subacute or emarginate, 7.5–18 cm long, 3–7 cm wide, glabrous, coriaceous; petiolules 6–10 mm long; petiole 2.5–9 cm long, swollen at base, lenticellate. Flowers not seen. Fruit shortly stipitate, ellipsoidal, 2.5–3.5 cm long, slightly 3-angled, minutely velvety outside, cream; calyx persistent.

Rare in semideciduous forest at tip of Cape York Peninsula, Qld. Map 8.

Qld: between Lockerbie and Somerset, *B.P.M.Hyland* 3983 (BRI) & 12379(BRI); Lockerbie Scrub, Bamaga, *L.J.Webb & J.G.Tracey* 13245 (BRI).

#### 4. ATALAYA

*Atalaya* Blume, *Rumphia* 3: 186 (1847); from 'Atalaya' an Indian name.

Type: *A. salicifolia* (A.DC.) Blume; *Sapindus salicifolia* A.DC.

*Pseudatalaya* Baillon., *Hist. Pl.* 5: 419 (1874); *Atalaya* sect. *Pseudatalaya* (Baillon) Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 3: 326 (1878). T: *P. multiflora* (Benth.) Baillon.

Shrubs or trees, usually dioecious. Leaves paripinnate, rarely imparipinnate or simple; petiole and rachis usually winged; leaflets usually subalternate or opposite, mostly long and narrow, entire, coriaceous, usually with fine lateral nerves, petiolulate. Panicles terminal or in upper axils; cymules shortly stalked. Flowers small, regular, pedicellate. Sepals 5, imbricate, unequal, suborbicular or elliptic-obovate, concave. Petals 4 or 5, elliptic-obovate, shortly clawed; scales usually bilobed, hairy, with or without crests, or scales absent. Disc annular or unilateral. Stamens 8. Ovary trigono-obovoid, 3-locular; ovule 1 per locule; style persistent. Fruit divaricately 2- or 3-lobed, apiculate, separating into indehiscent, 1-seeded, dorsally-winged samaras. Seed exarillate.

A genus of 11 species in Africa, Indonesia, New Guinea and Australia; 9 species in Australia, 8 of them endemic.

G.Bentham, *Fl. Austral.* 1: 462–464 (1863); H.E.Baillon., *Hist. Pl.* 5: 406 & 419 (1874); L.A.T.Radlkofer in A.Engler, *Pflanzenr.* 98b: 607–610 (1932); S.T.Reynolds, *Austrobaileya* 1: 398–406 (1981).

Distinguished by the fruits having elongate dorsal wings and most species having long linear leaves.

- |    |  |                           |
|----|--|---------------------------|
| 1  | Petals densely sericeous all over outside; adult leaves simple or pinnate                                    | <b>1. A. sericopetala</b> |
| 1: | Petals glabrous or glabrescent towards apex; adult leaves pinnate, rarely simple                             |                           |
| 2  | Leaflets 0.2–2 cm wide, 4–40 times as long as wide; adult leaves with or without wings on rachis and petiole |                           |

- 3 Leaves pari- or imparipinnate, or simple, closely reticulate; wings leaf-like, present on rachis, as wide as leaflets; branchlets and peduncles velvety-tomentose **2. A. variifolia**
- 3: Leaves usually paripinnate; leaflets openly reticulate; wings if present narrower than leaflets and distinct from them; branchlets and peduncles puberulent or glabrous
- 4 Leaflets 4–6 pairs, rarely to 11 pairs, 1.5–7 cm long, 0.2–0.5 cm wide, rarely wider; fruit hairy **5. A. angustifolia**
- 4: Leaflets 1–3 pairs, rarely to 6 pairs, 4.5–16 cm long, 0.3–2 cm wide; fruit glabrous or hairy
- 5 Leaflets glaucous below, hairy or glabrous, thickly coriaceous; wings if present very narrow; fruit hairy **4. A. hemiglauca**
- 5: Leaflets green below, glabrous, thinly coriaceous; wings narrow or broad, sometimes absent; fruit glabrous **3. A. salicifolia**
- 2: Leaflets 1.5–7.5 cm wide, about 2 or 3 times as long as wide; adult leaves without wings on rachis and petiole
- 6 Leaflets 1 pair, rarely 2–4 pairs, pubescent or puberulent; petioles, petiolules and peduncles  $\pm$ crispate tomentose **6. A. calcicola**
- 6: Leaflets 1–4 pairs, glabrous; petioles, petiolules and peduncles shortly pubescent to glabrous
- 7 Petals 4, crested; disc incomplete; leaflets usually 1 or 2 pairs, densely reticulate **7. A. multiflora**
- 7: Petals 5, crestless; disc complete; leaflets usually 2–4 pairs, openly reticulate
- 8 Petiolule 10–35 mm long; leaflets shining, drying rigid, coarsely nerved and reticulate; flowers 8–10 mm diam.; sepals membranous; peduncles angular **8. A. rigida**
- 8: Petiolule 3–10 mm long; leaflets dull, drying thin, finely reticulate; flowers 4.5–6.5 mm diam.; sepals coriaceous; peduncles not angular **9. A. australiana**

**1. *Atalaya sericopetala* S.Reyn., *Austrobaileya* 1: 399 (1981)**

T: Morehead River, 102.4 km N of Laura, Qld, 6 Sept. 1971, A.K.Irvine 53; holo: BRI; iso: QRS.

Illustration: S.T.Reynolds, *op.cit.* fig. 27E.

Shrub or tree to 3 m. Branchlets, leaves, peduncles and fruit finely pubescent to glabrescent. Leaves simple, elliptic, 4.5–17 cm long, 2–8 cm wide; or paripinnate with 2–4 pairs of leaflets; rachis 2.5–7 cm long; leaflets elliptic or oblong-ovate, obtuse at both ends, oblique at base, 5–9.5 cm long, 2.5–5 cm wide; petiolule 5–10 mm long, petiole 0.5–3.5 cm long. Panicles to 27 cm long; pedicels 2–5 mm long. Sepals 2.5–3 mm long, 2 mm wide, densely silky outside. Petals 5, as long as sepals, densely silky outside; scales without crests. Disc complete. Samaras 2.5–3.5 cm long, pubescent, wing  $\pm$ erect, recurved at apex.

Occurs in N Qld between Coen and Mareeba, usually in monsoon forest. Map 9.

Qld: Coen, 7 Jan. 1906, R.W.Garraway (BRI); S of Bathurst Bay B.P.M.Hyland 4656 (BRI); Groganville, W of Mossman, B.P.M.Hyland 7928 (BRI); State Forest Reserve 607, NE of Mareeba, B.P.M.Hyland 12362 (BRI, QRS).

Distinctive in having the petals densely silky all over the outer surface and in having both simple and pinnate leaves. Varies greatly in the leaves and may intergrade with *A. australiana*.

**2. *Atalaya variifolia* (F.Muell.) F.Muell. ex Benth., *Fl. Austral.* 1: 463 (1863)**

*Thouinia variifolia* F.Muell., *Fragm.* 1: 45 (1858). T: tropical Australia, *collector unknown; n.v.*

Illustration: S.T.Reynolds, *Austrobaileya* 1: fig. 27 H (1981).

Tree to 8 m. Young parts, branchlets, peduncles and fruit pale yellow tomentose. Leaves paripinnate or imparipinnate, rarely simple; petiole and rachis usually with broad leaf-like wings; rachis 3.5–14 cm long; leaflets 2–7 pairs, usually narrowly elliptic-oblong, obtuse, 7–23 cm long, 1–2 cm wide, closely reticulate, glabrous or puberulous, acute at base, attenuate; petiolule to 2 mm long, usually absent; petiole 3.5–10.5 cm long. Panicles terminal, 10–24 cm long; pedicels 5–7 mm long. Sepals 2–3.5 mm long, 1.5–2 mm wide, membranous, densely silky outside. Petals 5, obovate, 6 mm long, 4 mm wide, pubescent outside; scales without crests. Disc complete. Samaras to 5.5 cm long, tomentose; wings erect, depressed-obovate, crenulate.

Occurs in the Kimberley, W.A., the Darwin and Gulf areas, N.T., and from Cape York to Atherton Tableland, Qld, in various habitats. Map 10.

W.A.: Swan Point, Nov. 1906, *W.V.Fitzgerald* (NSW). N.T.: East Alligator River, *N.B.Byrnes & P.Martensz* 2820 (BRI, NSW); Oenpelli, *R.L.Specht* 1265 (BRI, NSW). Qld: Edward River, *J.R.Clarkson* 3550 & 3572 (BRI); N of Palmerville, *L.Pedley* 1856 (BRI).

Differs from other species in having a broadly winged rachis and petiole, and in having leaf-like wings.

**3. *Atalaya salicifolia* (A.DC.) Blume, *Rumphia* 3: 186 (1847)**

*Sapindus salicifolius* A.DC., *Prodr.* 1: 608 (1824). T: Timor, *collector unknown; n.v.*

*Thouinia australis* A.Rich. in Urv., *Voy. Astrolabe* 2: 31, t. 12 (1834); *Atalaya australis* (A.Rich.) F.Muell., *Fragm.* 1: 46 (1858). T: Melville Island, N.T., *Fraser; n.v.*

*A. salicifolia* var. *intermedia* C.Gardner, *For. Dept. Bull.* No. 32: 61 (1921). T: Carson River, W.A., Sept. 1921, *C.A.Gardner* 1556; iso: PERTH, NSW.

*Atalaya virens* C.White, *Proc. Roy. Soc. Queensland* 55: 62 (1944). T: Eidsvold, Qld, *T.L.Bancroft*; holo: BRI  
Illustration: S.T.Reynolds, *Austrobaileya* 1: fig. 27A (1981).

Tree to 10 m. Young parts, branchlets and peduncles puberulent, soon glabrous. Leaves paripinnate; petiole and rachis with broad or narrow wings or wings absent; rachis 1–3 cm long; leaflets 1–3 pairs, narrowly elliptic-oblong or obovate-oblong, obtuse or subacute, 4.5–13.5 cm long, 0.7–2 cm wide, the juveniles larger, green on both surfaces, acute at base, usually glabrous, thinly coriaceous; petiolules 1–5 mm long; petiole 1.5–6 cm long. Panicles 8–26 cm long; pedicels 4–7 mm long. Sepals 2–3 mm long and wide, glabrous. Petals 5, obovate, 5–7 mm long, 2.5–3.5 mm wide, puberulent outside; scales without crests. Disc complete. Samaras 2.5–3.5 cm long, glabrous, wings falcate.

Occurs in northern W.A., in Arnhem Land, N.T., and from Torres Strait, Qld, to northern N.S.W. Also known from Timor, Sumbawa and Sumba, Indonesia. Usually grows in dry rainforest on basalt. Map 11.

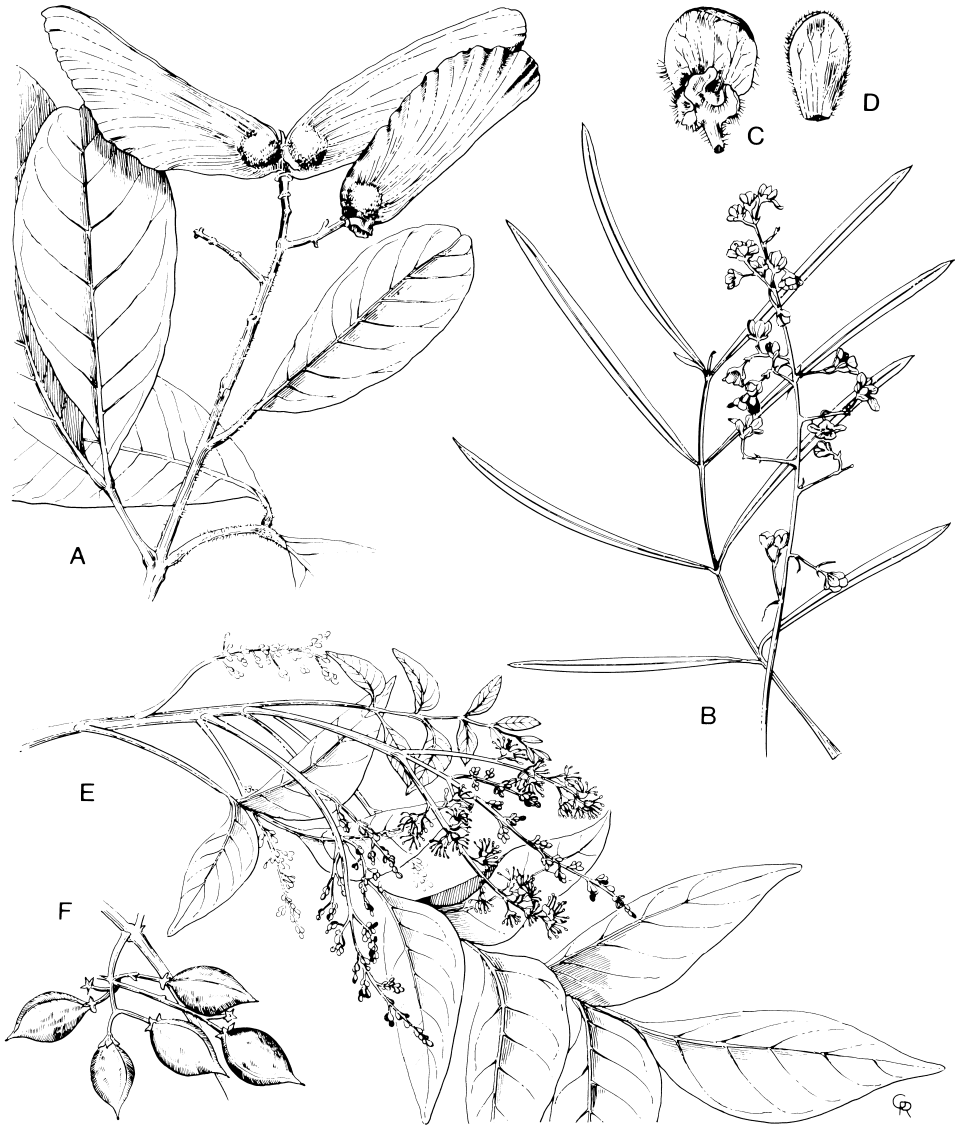
W.A.: eastern Walcott Inlet, *A.V.Milewski* 103 (BRI, PERTH). N.T.: SE of Mt Howship, Arnhem Land, C.R.Dunlop 6653 (BRI, DNA). Qld: 3.2 km SE of Coen, *L.S.Smith* 11990 (BRI); Blackbutt Range, Dec. 1968, *G.W.Trappnell & K.A.W.Williams* (BRI). N.S.W.: 48 km N of Warialda, *E.McKie* 2313 (NSW).

Differs from *A. hemiglauca* in having glabrous leaves, flowers and fruits, and green leaflets.

**4. *Atalaya hemiglauca* (F.Muell.) F.Muell. ex Benth., *Fl. Austral.* 1: 463 (1863)**

*Thouinia hemiglauca* F.Muell., *Fragm.* 1: 98 (1859). T: Mt Murchison, Qld, *J.Dallachy & Goodwin; n.v.*  
Illustration: S.T.Reynolds, *Austrobaileya* 1: fig. 27B (1981).

Small ±glaucous tree to 6 m; glabrous or young parts, branchlets, leaves and peduncles puberulent. Leaves paripinnate (simple in some juvenile ones); petiole and rachis with or



**Figure 3.** A–D, *Atalaya*. A, *A. calcicola*, fruiting habit  $\times 0.7$  (B.Simon & J.Clarkson 3596, BRI). B–D, *A. angustifolia*. B, leaf and inflorescence  $\times 0.7$ ; C, petal  $\times 4$ ; D, sepal  $\times 4$  (B–D, A.Irvine, BRI 233573). E–F, *Ganophyllum falcatum*. E, flowering habit  $\times 0.7$  (K.Williams 77235, BRI); F, fruits  $\times 0.7$  (B.Hyland 9259, BRI).

without narrow wings; rachis 1.2–4.5 cm long; leaflets 1–3 pairs, rarely to 6, elongate, narrowly elliptic to subobovate or linear and long, usually subfalcate, obtuse or subacute, 6–16 cm long, 0.3–1.5 cm wide, dull bluish-green, drying glaucous below, thickly coriaceous; petiolules 1–5 mm long; petiole 0.8–4.5 cm long. Panicles 6–23 cm long; pedicels 2.5 mm long. Sepals 2.5–5 mm long, 2–3 mm wide, pubescent to glabrous. Petals 5, obovate, usually silky outside, scales without crests. Disc complete. Samaras 2–4 cm long, tomentose to appressed-puberulent; wings erect, crispate. *Whitewood*. Fig. 5.

Occurs in all States except Vic. and Tas.; in dry open mixed forest, at edge of Brigalow scrub and in deserts, in various soils. Map 12.

W.A.: 11.2 km S of Derby, *M.Lazarides 6585* (BRI, NSW). N.T.: 18.7 km N of Daly Waters P.O., *G.Chippendale 3748* (BRI, NSW). S.A.: Killalpaninna, 1919, *H.Basedow* (BRI, NSW). Qld: Blackall, *S.L.Everist 1563* (BRI). N.S.W.: Warrumbungle–Toorawenah Rd, Dec. 1973, *H.Streimann* (BRI).

Differs from *A. salicifolia* in having hairy leaves, flowers and fruits, and in the leaflets being glaucous below.

Very variable in density of indumentum, width of leaflets, length of petiolules and glaucousness. A fairly distinct form with very narrow glabrous leaflets and glabrous flowers occurs in north-western Qld. Regarded as a good fodder tree.

### 5. *Atalaya angustifolia* S.Reyn., *Austrobaileya* 1: 402 (1981)

T: 107.2 km S of Laura, Qld, 17 Sept. 1971, *A.K.Irvine 79*; holo: BRI, iso: QRS.

Illustration: S.T.Reynolds, *op. cit.* fig. 27C.

Tree to 4 m. Branchlets glabrous, lenticellate. Leaves paripinnate; petiole and rachis narrowly winged; rachis 2–11 cm long; leaflets 4–6 pairs, rarely to 11 pairs, usually sessile, narrowly obovate or narrowly elliptic-oblong, falcate, obtuse or subacute, apiculate, 1.5–7 cm long, 0.2–0.5 cm wide, rarely to 1 cm wide, glabrous, finely reticulate; petiolules if present to 1 mm long; petiole 1–3.5 cm long. Panicles terminal, 12–25 cm long; peduncles slender; pedicels 3 mm long. Sepals 2.5–5 mm long, 2 mm wide, usually submembranous, densely silky outside except glabrous margins. Petals 5, obovate, 4.5–7 mm long, 2–3 mm wide, hairy outside; scales without crests. Disc complete. Samara 2.5–4.5 cm long, densely velvety; wings erect, oblong-cuneate, oblique, truncate. Fig. 3B–D.

Occurs in N Qld between Coen and Maytown, common from Cooktown to Laura; grows in eucalypt woodland, in sandy or rocky soils. Map 13.

Qld: Maytown, *M.Godwin C 1474* (BRI); Annan River, *L.S.Smith 10759* (BRI); 99 km W of Cooktown, *R.Story 7968* (BRI); Battle Camp near Normanby River, *V.Scarth-Johnson 1142* (BRI).

Similar to *A. hemiglauca* but has more leaflets that are smaller and narrower.

### 6. *Atalaya calcicola* S.Reyn., *Austrobaileya* 1: 404 (1981)

T: Chillagoe–Almaden Rd, 5 km from Chillagoe, Qld, 10 Mar. 1980, *B.K.Simon & J.R.Clarkson 3596*; holo: BRI.

Illustration: S.T.Reynolds, *op. cit.* fig. 27F.

Tree to 10 m; young parts, branchlets, leaf axes and peduncles crispate-tomentose. Leaves bifoliate, rarely leaflets 2–4 pairs; rachis 2–6.5 cm long; leaflets obovate-elliptic, obtuse, emarginate, unequal and obtuse or acute at base, 6–14 cm long, 3–6 cm wide, appressed-pubescent or puberulent, ±subglaucous below; petiolule 2–4 mm long; petiole 1–2.5 cm long. Panicles to 10 cm long and wide; pedicels 5 mm long. Sepals 3–4 mm long to 3 mm wide, hoary outside. Petals 5, obovate, 6 mm long, 2.5 mm wide; scales absent or rudimentary. Disc complete. Samaras 3–4 cm long, hoary, wings cuneate/oblong, margins crispate. Fig. 3A.

Occurs in N Qld from Lakeland Downs to Chillagoe and near Townsville; in deciduous vine thickets, on limestone outcrops. Map 14.

Qld: Chillagoe, Aug. 1941, *H.Flecker* (BRI, QRS); Chillagoe, *L.J.Webb & J.G.Tracey 8028* (BRI); Almaden-Chillagoe Rd, 8 km from Chillagoe, *V.K.Moriarty 1448* (BRI); 6.4 km N of Mungana, *L.J.Webb & J.G.Tracey 10197* (BRI).

Distinctive in having only 1 pair of leaflets that are very unequal at the base and are usually hairy.

### 7. *Atalaya multiflora* Benth., *Fl. Austral.* 1: 463 (1863)

*Pseudatalaya multiflora* (Benth.) Baillon, *Hist. Pl.* 5: 419 (1874). T: Brisbane River, Qld, Dec. 1856, *F.Mueller*; lecto: MEL, *vide* S.Reynolds, *Austrobaileya* 1: 404 (1981); same locality, 1858, *W.Hill & F.Mueller*; syn: K.

Illustration: S.T.Reynolds, *Austrobaileya* 1: fig. 27D (1981).

Small tree, glabrous except inflorescence; branchlets lenticellate. Leaves paripinnate; rachis 1–2.5 cm long; leaflets usually 1 or 2 pairs, oblong or obovate-elliptic, truncate or retuse, 4–9.5 cm long, 1.5–4.5 cm wide; cuneate or acute, or obtuse at base; lateral nerves oblique, raised and prominent especially below; petiolules 2–6 mm long; petiole 1–4.5 cm long. Panicles many-flowered, to 17 cm long; pedicels 5–6 mm long. Sepals 3–3.5 mm long, 2–5 mm wide, thin, silky outside. Petals 4, obovate, 6 mm long, 3 mm wide, glabrous or puberulous on claw; scales densely hairy, crested. Disc unilateral. Samaras to 3.5 cm long, glabrous; wings divaricate.

Occurs from Proserpine, Qld, to northern N.S.W. Map 15.

Qld: Imbil, Dec. 1943, *M.S.Clemens* (BRI); 47.5 km NE of Dalby on Kingaroy Rd, *G.P.Guymer 10776* (BRI); Kelsey Creek, Proserpine, *H.Thorogood* (BRI). N.S.W.: Emerys scrub, 3 km S of Nashua, *A.G.Floyd 1634* (BRI, NSW)

Differs from all the other species in having crested scales, 4 petals, an incomplete disc, and prominently and densely nerved leaflets. Considered endangered by J.Leigh *et al.*, *Extinct and Endangered Pl. Australia* 322 (1984).

### 8. *Atalaya rigida* S.Reyn., *Austrobaileya* 1: 405 (1981)

T: Strathdickie North, near Proserpine, Qld, Oct. 1937, *K.A.Macpherson 123*; holo: BRI, iso: QRS.

Illustration. S.T.Reynolds, *op cit.* fig. 27 I.

Small tree. Branchlets and leaf axes minutely hairy. Leaves paripinnate; rachis 3.5–14 cm long; leaflets 2–4 pairs, broadly ovate or elliptic, obtuse, 10–14.5 cm long, 5.5–7.5 cm wide, truncate or obtuse at base, glabrous, drying hard and rigid, shiny above, densely and prominently reticulate; petiolule 1–3.5 cm long; petiole 2–5.5 cm long. Panicles densely flowered, 25–38 cm long; peduncle angular; pedicels 4–6 mm long. Sepals 3–4 mm long, 2 mm wide, thin, hoary outside. Petals 5, obovate, 7–8 mm long, 3–4 mm wide, hairy outside; scales without crests. Disc complete. Samaras 3.5–4 cm long, pubescent, usually puberulent towards wings; wings oblong-spathulate, obtuse.

Occurs in Qld from N of Proserpine to Mackay. Map 16.

Qld: Mackay, Dec. 1938, *P.MacArthur* (BRI); Cannonvale area, *D.Wynne 25* (BRI); W side of Mt Dryander, Oct. 1984, *K.A.McPherson* (BRI).

The species is closely related to *A. australiana* differing in the hard and rigid leaflets, longer petiolules and larger flowers.

### 9. *Atalaya australiana* Leenh., *Blumea* 13: 126 (1965)

*Sapindus ? australis* Benth., *Fl. Austral.* 1: 464 (1863); *Atalaya australis* (Benth.) Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. München* 3: 298, 327 (1878) *nom. illeg.*, non *A. australis* (A.Rich.) F.Muell. T: Cape York, Qld, 27 Oct. 1849, *J.MacGillivray*; holo: K.

[*Atalaya multiflora* Benth., *Fl. Austral.* 1: 463 (1863) p.p., not as to lectotype]

Illustration: S.T.Reynolds, *Austrobaileya* 1: fig. 27G (1981).

Tree to 20 m; branchlets and leaf axes pubescent to glabrescent; branchlets lenticellate. Leaves paripinnate; rachis 1–8 cm long; leaflets 1–3 pairs, usually elliptic-oblong or obovate-elliptic, obtuse or acute, 6–14 cm long, 2–7 cm wide, narrow and acute or broad and unequal at base, usually glabrous, thinly coriaceous, finely prominently reticulate; petiolule 3–10 mm long; petiole 2–5.5 cm long, lenticellate. Panicles 10–24 cm long; pedicels 3–5 mm long. Sepals 2–4 mm long, 1–2 mm wide, coriaceous, silky outside. Petals 5, obovate, 4–5 mm long, 1–2 mm wide, densely appressed-hairy outside; sales without crests. Disc complete. Samaras 2.5–4 cm long, pubescent or wings puberulent; wings recurved, obtuse.

Occurs in N Qld from Torres Strait to Princess Charlotte Bay, in beach scrub, strand forest or monsoon forest. Map 17.

Qld: Banks (Moa) Is., Torres Strait, *Cameron 2474* (QRS); Wenlock R., Weipa, *M.Godwin 1637* (BRI); Red Is. Point, 25 km SW of Cape York, *D.Jones 2478* (BRI) & *L.S.Smith 12550* (BRI).

A variable species, very close to *A. rigida*, differing only in its thin leaves, shorter petiolules and smaller flowers.

## 5. GANOPHYLLUM

*Ganophyllum* Blume, *Mus. Bot.* 1: 230 (1850); from the Greek *ganos* (brightness), and *phyllum* (leaf).

Type: *G. falcatum* Blume

Trees. Branchlets, leaves and peduncles with fine, peltate, resinous scales, glabrous. Leaves paripinnate; leaflets alternate, entire, shortly petiolulate. Inflorescence axillary, usually panicle-like, branches raceme-like or with 3–5-flowered cymules; bracteate. Flowers unisexual, the males and females on different inflorescences. Calyx cupular, 5–7-toothed; lobes narrowly ovate, subvalvate. Petals absent. Disc regular, puberulent. Stamens 5–7, glabrous; filaments filiform. Ovary sessile, ovoid, 2-locular, each with 2 ovules; style short; stigma 2-lobed. Fruit drupaceous, 1-locular, 1- or 2-seeded; seed exarillate, testa thinly crustaceous; embryo pale green.

A monotypic genus, occurring in tropical West Africa, Andaman Islands, Philippines, Malaysia, Indonesia, New Guinea and Australia.

F.Mueller, *Fragm.* 7: 24 (1869); F.M.Bailey, *Queensland Fl.* 1: 230 (1899); S.T.Reynolds, *Austrobaileya* 2: 32–34 (1984).

Distinguishable from other genera by its resinous scaly branchlets and leaves and by its small ovoid drupaceous fruits.

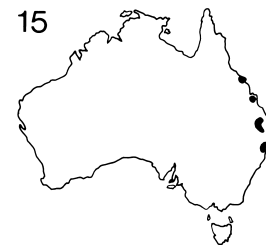
### ***Ganophyllum falcatum*** Blume, *Mus. Bot.* 1: 230 (1850)

T: coastal New Guinea, *collector unknown*; *n.v.*

Illustration: S.T.Reynolds, *op. cit.* 33 fig. 1 H–J.

Tree to 32 m. Young parts resinous; branchlets scurfy, resinous towards apex, lenticellate. Leaf rachis 12–19 cm long; leaflets 10–20, obliquely ovate or ovate-oblong, subfalcate, attenuate or shortly acuminate or caudate, truncate, rounded or subacute and oblique at base, 3–9.5 cm long, 1.5–5 cm wide, shiny above, pellucid-punctate; midrib excentric; lateral nerves looping away from margins; petiolules 3–4 mm long; petiole 4.5–6.5 cm long. Panicles 10–28 cm long; bracts small; pedicels 1.5–4 mm long. Calyx 1.5–2.5 mm long, 2–3 mm wide, coriaceous, gland-dotted, glabrous. Filaments 3–5 mm long. Fruit red, ovoid, acute, 1–1.5 cm long, 0.6–0.8 cm diam. Fig. 3E–F.





1. *Melianthus major*

4. *Cardiospermum grandiflorum*

7. *Allophylus cobbe*

10. *Atalaya variifolia*

13. *Atalaya angustifolia*

2. *Melianthus comosus*

5. *Cardiospermum halicacabum*  
var. *halicacabum*

8. *Tristiropsis canarioides*

11. *Atalaya salicifolia*

14. *Atalaya calcicola*

3. *Akania lucens*

6. *Cardiospermum halicacabum*  
var. *microcarpum*

9. *Atalaya sericopetala*

12. *Atalaya hemiglauca*

15. *Atalaya multiflora*

Occurs in far northern W.A., N.T. and north Qld, including offshore islands; grows in monsoon forest and at the edge of rainforest and mangroves. Map 18.

W.A.: Mitchell Plateau, N Kimberley, *K.F.Kenneally 7100* (BRI). N.T.: East Point, Darwin, *N.B.Byrnes 286* (BRI, NSW); Channel Point, Dec. 1983, *C.Dunlop & J.Russel-Smith* (BRI, DNA, CANB, L, MEL, NSW). Qld: Little Mulgrave, *B.P.M.Hyland 9259* (BRI, NSW); Brisk Bay, S of Bowen, *K.A.W.Williams 77235* (BRI).

## 6. HETERODENDRUM

*Heterodendrum* Desf., *Mém. Mus. Hist. Nat.* 4: 8, t. 3 (1818); from the Greek *hetero* (diverse or different) and *dendron* (a tree).

T: *H. oleifolium* Desf.

Shrubs or small trees. Leaves simple, alternate or fasciculate, entire, dentate, serrate or lobed. Inflorescences axillary, open, raceme-like or panicle-like or in small clusters, rarely flowers solitary; cymules subsessile or on long stalks, open; bracts minute. Flowers usually bisexual, regular, subsessile or on filiform pedicels. Calyx broad, shortly cupular, 5-lobed or finely 5-10-toothed or truncate. Petals absent. Disc small, complete. Stamens 6-12, rarely more, glabrous; anthers as long as filaments. Ovary 2-4-locular, with 1-ovule per locule. Fruit 2-lobed, occasionally 1-lobed, the lobes subglobose or ellipsoidal; pericarp drying ±crustaceous or almost woody, splitting irregularly. Seed globose, black, shiny; aril cupular, granular, red.

A genus of 4 species endemic in Australia.

G.Bentham, *Fl. Austral.* 1: 469 (1863); K.Domin, *Biblioth. Bot.* 89: 348 (1927); L.A.T. Radlkofer in A.Engler, *Pflanzenr.* 98e: 1006 (1933); S.T.Reynolds, *Austrobaileya* 1: 481-485 (1982).

Has the fruits (with knob-like lobes) and aril of *Alectryon* but leaves are simple and flowers apetalous.

- |    |  |                            |
|----|--|----------------------------|
| 1  | Leaves linear, usually 10-30 times as long as wide   | <b>1. H. oleifolium</b>    |
| 1: | Leaves obovate, cuneate or subelliptic, 2-7 times as long as wide  |                            |
| 2  | Leaves entire; inflorescence raceme-like or panicle-like, to 9 cm long   |                            |
| 3  | Branchlets appressed hairy; leaves glabrous or silky; fruit stipitate, 0.8-1.2 cm diam.  | <b>1. H. oleifolium</b>    |
| 3: | Branchlets with short spreading hairs; leaves glabrous; fruit sessile, 1.6-2.8 cm diam.  | <b>2. H. tropicum</b>      |
| 2: | Leaves sharply dentate, serrate or laciniately lobed, rarely entire; flowers in small raceme-like inflorescence to 2.5 cm long or in small clusters, rarely solitary |                            |
| 4  | Branchlets and fruits puberulous or glabrous; leaves 1.5-5.5 cm long, 0.4-1.5 cm wide  | <b>3. H. diversifolium</b> |
| 4: | Branchlets and fruits densely pubescent; leaves 3.5-9 cm long, 1.5-4.5 cm wide   | <b>4. H. pubescens</b>     |

### 1. *Heterodendrum oleifolium* Desf., *Mém. Mus. Hist. Nat.* 4: 8, t. 3 (1818)

*Nepheium oleifolium* (Desf.) F.Muell., *Fragm.* 10: 82 (1876)

T: probably Shark Bay area, [W.A.], *Baudin expedition*; ?iso: fragment & photo (NSW).

Small tree to 7 m; young parts densely silky or puberulent; branchlets, leaves and inflorescence pubescent or glabrescent with white appressed hairs. Leaves linear or narrowly elliptic or obovate, acute, acuminate, obtuse or truncate, entire, acute at base, 3-16.5 cm long, 0.3-2.3 cm wide; petiole 5-10 mm long. Inflorescence raceme-like or panicle-like to 9 cm long; pedicels 1.5-10 mm long. Calyx finely 5-10-toothed or

truncate, 2.5–5 mm wide, silky or glabrous. Stamens 8–12; filaments 1.5–4 mm long. Fruit obcordate, 2-lobed, rarely 1-lobed, 8 mm long, 8–12 mm diam.; pericarp thin, crustaceous. *Western Rosewood, Boonaree.*

A widespread species in semi-arid areas of all States except Tas. Very variable, with 3 fairly distinct varieties, the extreme forms intergrading.

*H. oleifolium* is distinguished by its usually long and narrow entire leaves and fairly large inflorescence.

- |  |                            |
|--|----------------------------|
| <p>1 Leaves 16–23 mm wide, usually 4 or 5 times as long as wide, narrowly obovate, truncate; inflorescence raceme-like with 2- or 3-flowered subsessile cymules</p>  | <b>1a. var. oleifolium</b> |
| <p>1: Leaves 3–10 mm wide, usually 5–30 times as long as wide, linear and long or narrowly elliptic, acute or acuminate; inflorescence raceme-like or panicle-like; cymules 2–5-flowered, on peduncles to 15 mm long</p> |                            |
| <p>2 Calyx 2.5–5 mm wide, tomentose; pedicels 6–15 mm long; leaves 5–7 times as long as wide, usually silky; inflorescence openly branched and flowered</p>  | <b>1b. var. macrocalyx</b> |
| <p>2: Calyx less than 3.5 mm wide, puberulous or glabrous; pedicels 1–5 mm long; leaves 10–30 times as long as wide, usually glabrescent; inflorescence densely flowered</p>   | <b>1c. var. microcalyx</b> |

### 1a. *Heterodendrum oleifolium* Desf. var. *oleifolium*

*H. oleifolium* var. *euryphyllum* Domin, *Biblioth. Bot.* 89: 348 (1927). T: Hamersley Range, near Nickol Bay, W.A., *F. Gregory's Exped.*; *n.v.*

Illustration: S.T.Reynolds, *Austrobaileya* 1: fig. 37 I6 (1982).

Leaves, branchlets and peduncles usually thick and rigid. Inflorescence ± spike-like, with subsessile cymules; pedicels less than 4 mm long. Calyx and peduncles white-pubescent.

Occurs in north-western Australia from Shark Bay to Nickol Bay. Usually grows on loam flats with limestone outcrops. Map 19.

W.A.: c. 170 km N of Carnarvon, May 1962, *T.E.H.Aplin* (PERTH); c. 360 km N of Geraldton near Wooramel River, *T.E.H.Aplin 1513* (PERTH); Dorre Is., Aug. 1977, *A.S.Weston* (PERTH).

Recognisable by its stiff narrowly obovate leaves and rigid raceme-like inflorescence.

### 1b. *Heterodendrum oleifolium* var. *macrocalyx* (Radlk.) Domin, *Biblioth. Bot.* 89: 348 (1927)

*H. macrocalyx* Radlk., *Act. Congr. Bot. Amsterdam* 119 (1877); = *Sapind. Holl.-Ind.* 49 (1879). T: Murray River, *collector unknown*; syn: *n.v.*; between Youldah (Ooldea) and Charlotte Waters, *collector unknown*; syn: *n.v.*

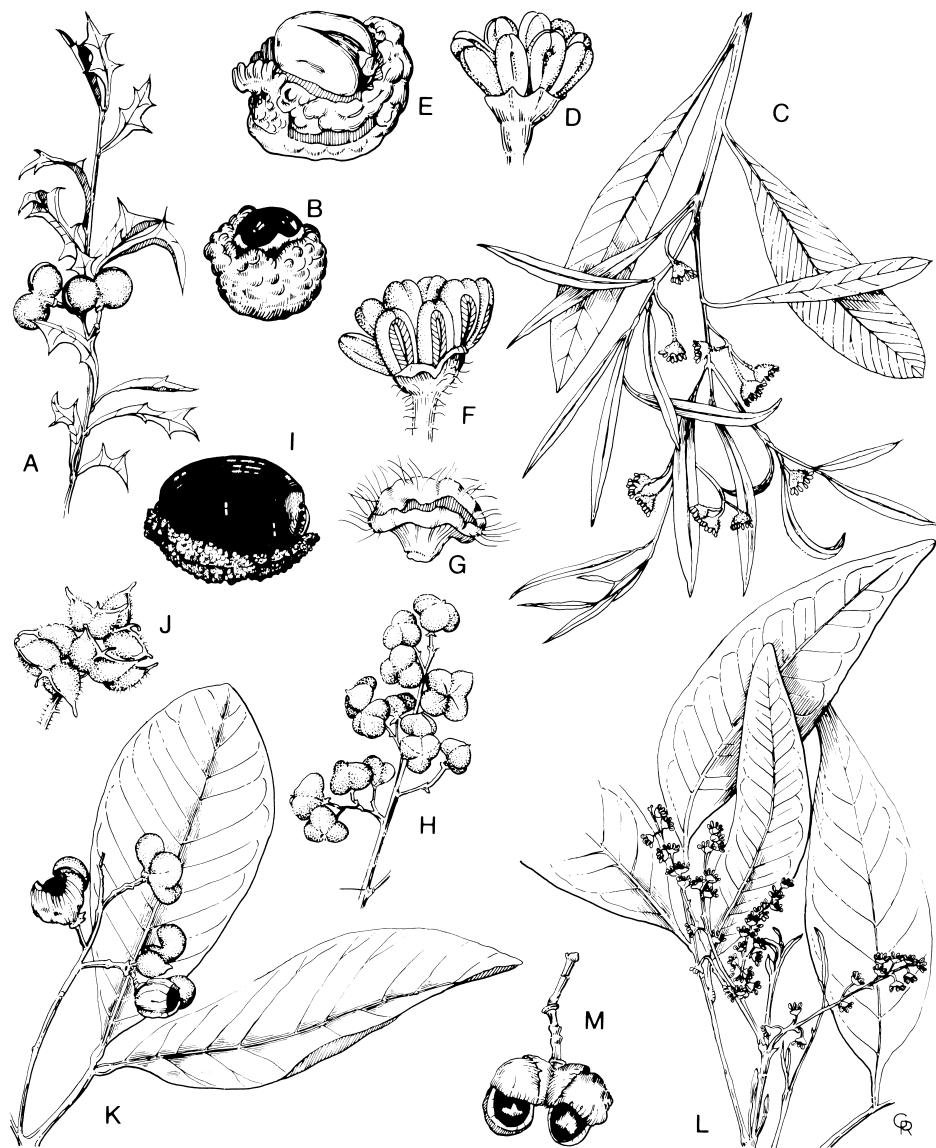
Illustration: S.T.Reynolds, *Austrobaileya* 1: fig. 37 I5 (1982).

Leaves silky especially when young. Inflorescence drooping, 3–12-flowered; cymules 3-flowered; peduncles of cymules and pedicels 6–15 mm long. Fig. 4C–D.

Occurs in W.A. south-west of the Great Victoria Desert, in S.A., south-western Qld, western N.S.W. and north-western Vic.; usually on dry hills. Map 20.

W.A.: Kalgoorlie, *C.T.White 5161* (BRI). S.A.: Ooldea, *C.T.White 5164* (BRI). Qld: 57 km E of Thargomindah near Dynevor Lakes, *L.S.Smith 6059* (BRI). N.S.W.: Menindie to Ivanhoe, *H.Salasoo 5410* (NSW). Vic.: Mildura, Oct. 1928, *H.B.Williamson* (BRI).

The white silky indumentum on the leaves and calyces is distinctive. The calyx is wider than other varieties and the inflorescence is few-flowered.



**Figure 4.** A–E, *Heterodendrum*. A–B, *H. diversifolium*. A, fruiting habit  $\times 0.7$ ; B, seed  $\times 2$  (A–B, S.Blake 7621, BRI). C–D, *H. oleifolium* var. *macrocalyx*. C, flowering habit  $\times 0.7$ ; D, male flower  $\times 4$  (C–D, L.Smith 6059, BRI). E, *H. oleifolium* var. *microcalyx*, seed  $\times 2$  (K.Williams, BRI 81369). F–M, *Alectryon*. F–H, *A. connatus*. F, male flower  $\times 6$ ; G, petal  $\times 12$  (F–G, L.Jessup 77, BRI); H, fruits  $\times 0.7$  (P.Sharpe & R.Dowling 2232, BRI). I–J, *A. repandodentatus*. I, seed  $\times 4$ ; J, fruits  $\times 0.7$  (I–J, C.White 49, BRI). K, *A. coriaceus*, fruiting habit  $\times 0.7$  (P.Sharpe 2315, BRI). L, *A. unilobatus*, flowering habit  $\times 0.7$  (L.Hegartz C3, BRI). M, *A. subcinereus*, fruit  $\times 0.7$  (L.Bird & K.Williams, BRI 343457).

**1c. *Heterodendrum oleifolium* var. *microcalyx* (Radlk.) Domin, *Biblioth. Bot.* 89: 348 (1927)**

*H. microcalyx* Radlk., *Act. Congr. Bot. Amsterdam* 119 (1877); = *Sapind. Holl.-Ind.* 49 (1879). T: Flinders River, Qld, collector unknown; n.v.

*H. floribundum* E.Pritzl, *Repert. Spec. Nov. Regni. Veg.* 15: 358 (1918). T: Hermannsburg at Fincke River, N.T., 1906–1908, *Strehlow* 43; n.v. (See below)

Illustration: S.T.Reynolds, *Austrobaileya* 1: fig. 37 I1–4 (1982).

Leaves usually linear, glabrous or sparsely hairy. Inflorescence of up to 32 crowded flowers; cymules 2–5-flowered; peduncles of cymules and pedicels 1–5 mm long. Fig. 4E.

Occurs from central N.T. through Qld to central N.S.W. Grows in open woodland, in sandy or gravelly soil. Map 21.

N.T.: 40 km N of Lake Nash Station, *R.Perry* 919 (BRI). Qld: c. 16 km E of Duinga near Dawson River, *N.H.Speck* 1812 (BRI); 10 km NW of Toobeah, Feb. 1969, *K.A.W.Williams* (BRI). N.S.W.: 8 km from Aberdeen on Rouchel Brook road, *R.Story* 7088 (CANB, NSW).

Distinguished by its usually long and narrow leaves which are sparsely hairy or glabrous, and by its narrow calyces; inflorescence usually densely flowered. *H. floribundum* probably belongs here but the type must be checked to confirm this.

**2. *Heterodendrum tropicum* S.Reyn., *Austrobaileya* 1: 484 (1982)**

T: Mungana, Qld, June 1946, *H.Flecker N.Q.N.C. No. 10423*; holo: BRI.

Illustration: S.T.Reynolds, *op. cit.* fig. 37J.

Tree to 7 m. Branchlets hoary with short spreading hairs or glabrous, lenticellate. Leaves narrowly obovate-oblong or subelliptic truncate, obtuse, entire, acute at base, 3.5–12 cm long, 0.6–3 cm wide, glabrous; petiole 4–6 mm long. Flowers not seen. Fruit transversely ellipsoidal, 2-lobed rarely 1-lobed, 1.3 cm long, 1.6–2.8 cm diam.; lobes globose, glabrous; pericarp drying hard and ±woody.

Occurs in Qld on limestone outcrops around Chillagoe. Map 22.

Qld: Chillagoe, Jan. 1918, *N.Michael* (BRI); 6.4 km N of Mungana, *L.J.Webb & J.G.Tracey* 10202 (BRI).

*H. tropicum* differs from *H. oleifolium* in having larger fruits, and from *H. diversifolium* in having entire leaves.

**3. *Heterodendrum diversifolium* F.Muell., *Fragm.* 1: 46 (1858)**

*Nepheium diversifolium* (F.Muell.) F.Muell., *Fragm.* 10: 82 (1876). T: Brigalow scrub, tropical and subtropical eastern Australia, collector unknown; n.v.

Illustration: S.T.Reynolds, *Austrobaileya* 1: fig. 37H (1982).

Shrub to 4 m. Branchlets puberulent towards apex. Leaves often fasciculate, subelliptic, obovate or cuneate, obtuse, mucronate, tridentate or truncate, coarsely sharply serrate, dentate or laciniate, subentire or entire, cuneate at base, 1.5–5.5 cm long, 0.4–1.5 cm wide, glabrous; petiole to 4 mm long. Flowers 3.5 mm diam., solitary or in small clusters or racemes; pedicels 3 mm long. Calyx 3.5 mm wide, broadly 5-lobed, lobes ovate, glabrous. Stamens 6–8, filaments 2–5 mm long. Fruit sessile, transversely ellipsoidal or depressed obovoid, 0.6–1.2 cm long, 0.6–1.4 cm diam., 1- or 2-lobed; pericarp drying thick and ±woody, glabrous or puberulous. *Scrub Boonaree, Holly Bush.* Fig. 4A–B.

Occurs in central and south-eastern Qld and north-eastern N.S.W.; usually in Brigalow scrub in dark clay. Map 23.

Qld: Palardo, W of Miles, *S.T.Blake* 7621 (BRI); Wood End, Rockhampton, Mar. 1920, *W.D.Francis* (BRI). N.S.W.: 10.5 km SE North Star road to Rocky Dam, *G.P.Guymer* 1432 (BRI, NSW).

*H. diversifolium* is distinguished by its serrate or pinnately lobed leaflets and small inflorescences.

**4. Heterodendrum pubescens** S.Reyn., *Austrobaileya* 1: 485 (1982)

T: Eidsvold, Qld, Sept. 1915, *T.L.Bancroft*; holo: BRI.

Illustration: S.T.Reynolds, *op. cit.* fig. 37K.

Tree to 6 m. Branchlets, petioles and fruits densely pubescent. Leaves obovate, broadly cuneate, truncate, obtuse or retuse, coarsely serrate, serrulate, subentire, rarely entire, cuneate at base, 3.5–9 cm long, 1.5–4.5 cm wide, puberulent or glabrous; petioles 3–10 mm long. Flowers 3.5 mm diam., solitary or in small racemes to 2.5 cm long; pedicels 5–10 mm long, puberulent. Calyx lobes ovate, 1.5 mm long and wide, puberulent. Stamens 8; filaments 1.5 mm long. Fruit 1-lobed, rarely 2-lobed, lobes globose, 1.2–1.4 cm long and wide; pericarp drying thick and hard, ±woody, rusty velvety outside.

Occurs in south-eastern Qld on rocky outcrops. Map 24.

Qld: Brian Pastures near Gayndah, *S.T.Blake 18913* (BRI); Mt Russel, c. 26 km SW of Oakey, *D.Hockings 17* (BRI).

*H. pubescens* is very close to *H. diversifolium* differing only in the hairy branchlets and fruits and the broad leaves.

**7. ALECTRYON**

*Alectryon* Gaertner, *Fruct.* 1: 216, t. 46 (1788); from the Greek *alectryon* (a cock), possibly because of a comb-like crest on the fruit of some species.

Type: *A. excelsum* Gaertner

Trees, monoecious. Branchlets usually hairy towards apex, lenticellate. Leaves paripinnate; leaflets opposite or alternate, entire serrate, serrulate or denticulate, coriaceous. Inflorescence axillary, raceme-like or paniculate; cymules stalked; bracts ovate, small. Flowers small, regular. Calyx saucer-shaped, shallowly 4–6-lobed, or truncate; lobes ovate, ±valvate. Petals 4 or 5, or absent, broadly ovate, shortly clawed; scales broad, inflexed, hairy, crestless. Disc complete. Stamens 5–10; filaments filiform, shorter than anthers. Ovary 2–4-locular, 1 ovule per locule; style filiform. Fruit usually 1–4-lobed, the lobes mostly knob-like or globose, turgid, 1-locular, 1-seeded; pericarp mostly thin, drying ±crustaceous, splitting irregularly. Seed globose, shiny; aril cupular, smooth or granular, red.

A genus of c. 30 species, in Hawaii, Philippines, Melanesia, Indonesia, New Caledonia, New Guinea, New Zealand and Australia; 9 species in Australia, 8 of them endemic.

L.A.T.Radlkofer in A.Engler, *Pflanzenr.* 98e: 983–1002 (1933); S.T.Reynolds, *Austrobaileya* 1: 472–481 (1982).

The genus is recognisable by the knob-like fruits of most members, the cupular aril and the accrescent leaflets of most species.

- |    |  |                          |
|----|--|--------------------------|
| 1  | Petals present; aril smooth  |                          |
| 2  | Branchlets crispate hairy; fruit 3- or 4-sulcate with inflated lobes; pericarp chartaceous         | <b>1. A. connatus</b>    |
| 2: | Branchlets without crispate hairs; fruit with 1–4 knob-like or globose lobes; pericarp crustaceous |                          |
| 3  | Leaflets 2–4, opposite, glaucous below; fruit pubescent, usually 3- or 4-lobed                     | <b>2. A. coriaceus</b>   |
| 3: | Leaflets 4–8, alternate, not glaucous below; fruit glabrous, usually 2-lobed                       | <b>3. A. subcinereus</b> |
| 1: | Petals usually absent; aril granular   |                          |
| 4  | Leaflets entire  |                          |

- 5 Leaflets 4–8, alternate; fruit 1-lobed, 1-locular **4. A. unilobatus**
- 5: Leaflets 2–4, opposite; fruit 2- or 3-lobed, lobes 1-locular; or not lobed, 2- or 3-locular
- 6 Fruit compressed, glabrous, lobed; branchlets glabrescent with straight hairs **5. A. forsythii**
- 6: Fruit turgid, velvety, not lobed; branchlets tomentose to puberulous crispate hairs **6. A. kimberleyanus**
- 4: Leaflets serrate, dentate, serrulate or denticulate
- 7 Fruit velvety, indistinctly lobed or not lobed; pericarp drying thick, ±woody
- 8 Leaflets 1 or 2 pairs, dentate; fruit not lobed; indumentum of crispate hairs **6. A. kimberleyanus**
- 8: Leaflets 2–4 pairs, serrulate or denticulate; fruit lobed; indumentum of straight hairs . *A. subdentatus*
- 7: Fruit rusty villous, usually with 2 or 3 knob-like lobes; pericarp drying thin, ±crustaceous
- 9 Fruit with apical appendage; leaflets broadly oblong; obovate to elliptic, less than half as long as wide remotely denticulate **9. A. tatus**
- 9: Fruit without apical appendage; leaflets narrowly ovate-oblong or elliptic, twice as long as wide, obtuse, acute or acuminate, serrulate or serrate **8. A. tomentosus**

**1. *Alectryon connatus*** (F.Muell.) Radlk., *Act. Congr. Bot. Amsterdam* 118 (1877), = *Sapind. Holl.-Ind.* 48 (1879) as *connatum*

*Spanoghea connata* F.Muell., *Trans. & Proc. Philos. Inst. Victoria* 3: 26 (1859); *Nephelium connatum* (F.Muell.) Benth., *Fl. Austral.* 1: 465 (1863). T: Moreton Bay, Qld, *W.Hill & F.Mueller; n.v.*

Illustration: S.T.Reynolds, *Austrobaileya* 1: fig. 37C (1982).

Tree to 12 m. Branchlets, young parts and leaf axes pale rusty crispate tomentose to glabrescent. Leaf rachis 5–6.5 cm long; leaflets 4–8, rarely 2, elliptic-oblong or narrowly obovate, obtuse, retuse or subacute, entire, rarely serrulate, oblique and acute at base, 4.5–14.5 cm long, 1.5–6 cm wide, puberulent or glabrous; petiolule 1–3 mm long; petiole 2–5 cm long. Panicles 4.5–18 cm long; peduncle tomentose. Flowers 2–4 mm diam.; pedicels 3–7 mm long. Calyx 1.5 mm long; lobes broadly ovate, pubescent. Petals slightly longer than calyx. Fruit broadly ovoid or subglobose, 8–12 mm long, 8–20 mm diam., 3–5-sulcate, inflated, orange-red; pericarp thin, pubescent outside. Aril smooth. Fig. 4F–H.

Occurs in Qld from Cape York Peninsula to Logan river, and in New Guinea. Common in light rainforest and on ridges behind dunes. Map 25.

Qld: Camerons Ck, Mt Crosby, N of Ipswich, Feb. 1980, *L.H.Bird* (BRI); 8 km SE of Eungella Dam, *N.B.Byrnes & J.R.Clarkson* 3622 (BRI); Upper Brookfield Brisbane, *L.W.Jessup* 77 (BRI, NSW).

Differs from other species of the genus in having indistinctly lobed thin-walled fruits and crispate-hairy branchlets.

**2. *Alectryon coriaceus*** (Benth.) Radlk., *Act. Congr. Bot. Amsterdam* 118 (1877), = *Sapind. Holl.-Ind.* 48 (1879) as *coriaceum*

*Nephelium coriaceum* Benth., *Fl. Austral.* 1: 466 (1863). T: Brisbane River, *C.Fraser; n.v.*

*Nephelium semicinereum* F.Muell., *Fragm.* 4: 158 (1864); *A. semicinereus* (F.Muell.) Radlk., *Act. Congr. Bot. Amsterdam* 118 (1877), = *Sapind. Holl.-Ind.* 48 (1879). T: Rockingham Bay, Qld, *J.Dallachy; iso: BRI, NSW.*

Tree to 7 m. Branchlets, leaves and peduncles appressed pubescent or glabrous. Leaf rachis 2–8 cm long; leaflets 1 or 2 pairs, rarely 3, elliptic, subobovate, elliptic-oblong, rounded, obtuse, subacute or retuse, entire, oblique and obtuse at base, 5.5–18.5 cm long,

2.5–8.5 cm wide, glabrous above, pubescent or puberulent below; lower surface glaucous, papillose; petiolule 5–10 mm long; petiole 1.5–4 cm long. Panicles 5–23.5 cm long; pedicels 1–3 mm long. Calyx 2.5–3.5 mm long, subtruncate or shallowly broadly lobed, pubescent outside. Petals minute, shorter than calyx. Fruit shortly stipitate, usually turbinate, 6–12 mm long and wide, pubescent, usually 3-lobed; lobes globose; pericarp drying thinly crustaceous. Aril smooth, lobed at apex. Fig. 4K.

Occurs from N Qld to Port Stephens, N.S.W. Map 26.

Qld: Coolum Beach, *P.R.Sharpe 2129* (BRI); State Forest Reserve 91 near Chillagoe, Jan. 1957, *E.Volck* (BRI). N.S.W.: Harrington Inlet, *N.B.Byrnes 3491* (BRI); Cudgen, *C.T.White 9672* (BRI).

Distinguishable by its 1- or 2-paired leaflets which are glaucous on the lower surface.

**3. *Alectryon subcinereus*** (A.Gray) Radlk., *Act. Congr. Bot. Amsterdam* 117 (1877), = *Sapind. Holl.-Ind.* 47 (1879) as *subcinereum*

*Cupania subcinerea* A.Gray, *U.S. Explor. Exped.* 15, *Bot.* 1: 258 (1854). T: Hunter River & Puen Buen, N.S.W.; *n.v.*

*Spanoghea nephelioides* F.Muell., *Trans. & Proc. Philos. Inst. Victoria* 3: 25 (1859); *Nephelium leiocarpum* F.Muell. ex Benth., *Fl. Austral.* 1: 467 (1863) based on *S. nephelioides* F.Muell. T: Moreton Bay, Qld, *W.Hill & F.Mueller*; *n.v.*

*A. laeve* Radlk., *Act. Congr. Bot. Amsterdam* 117, 119 (1877), = *Sapind. Holl.-Ind.* 47, 49 (1879). T: Clarence River, N.S.W., *C.Moore*; syn: K.

Tree to 10 m. Branchlets and inflorescence puberulent. Leaf rachis 2–9 cm long, usually flattened and margined; leaflets 2–8, alternate, elliptic-oblong to elliptic-ovate, acute, shortly acuminate or obtuse, entire or coarsely serrulate, acute at base, 8–16.5 cm long, 2–5.5 cm wide, glabrous or puberulous on lower surfaces; petiolules 1–3 mm; petiole 1.5–3.5 cm long. Panicles 10–15 cm long; pedicels 2.5–4 mm long. Calyx 1.5 mm long; lobes ovate, pubescent. Petals minute. Fruit sessile, green, usually bilobed, 8–10 mm long, 8–16 mm diam.; lobes globose, turgid, glabrous; pericarp drying thinly crustaceous. Aril smooth. Fig. 4M.

Occurs from Gladstone, Qld, to Tilba, N.S.W.; also recorded from east Gippsland, Vic.; usually in dry rainforest, along creeks, gullies and on steep slopes. Map 27.

Qld: Kin Kin, Mar. 1916, *W.D.Francis & C.T.White* (BRI, NSW); Mt Glorious Brisbane, *L.W.Jessup & S.T.Reynolds 120* (BRI, NSW); Mt Lindsay, *C.T.White 8566* (BRI). N.S.W.: c. 35 km NE of Singleton, *R.Storey 7167* (BRI); Bulli Pass, Oct. 1927, *C.T.White* (BRI).

Recognisable by its flattened rachis and glabrous bilobed fruits.

**4. *Alectryon unilobatus*** S.Reyn., *Austrobaileya* 1: 475 (1982)

T: Pascoe River, Qld, 1977, *L.J.Webb & J.G.Tracey 13123*; holo: BRI.

Illustration: S.T.Reynolds, *op. cit.* fig. 37G.

Tree 3–10 m. Branchlets and inflorescence usually puberulent. Leaf rachis 1.5–9 cm long; leaflets 4–8, alternate or opposite, elliptic-ovate or elliptic-oblong, shortly acuminate or obtuse, entire, oblique and acute or obtuse at base, shortly attenuate, 4–13 cm long, 2.5–6 cm wide, glabrous or lower surface puberulent, nerves and reticulation prominent; petiolule 3–7 mm long; petiole 2–6 cm long. Panicle 3.5–11 cm long; pedicels to 3 mm long. Calyx 0.5–1 mm long, shallowly broadly lobed, glabrescent. Petals absent. Fruit sessile, usually 1-lobed; lobes obliquely obovoid, 8–14 mm long, 8–14 mm diam., turgid, glabrous; pericarp ±thin, drying crustaceous. Aril granular, deep red. Fig. 4L.

Occurs from N Qld to near Brisbane. Map 28.

Qld: Wolvi State Forest, near Gympie, Jan. 1976, *E.G.Cook* (BRI); near Mt Nebo, Boombana National Park, *L.Hegarty C3* (BRI); Magnetic Is., *C.Sandercoe 887* (BRI); mouth of Pennefather Ck near Mapoon, Cape York, *A.Morton 1238* (BRI); Mt Eerwah, 4 km W of Eumundi, *P.R.Sharpe 3670* (BRI).

Distinctive in having 1-lobed, glabrous fruits.





**Figure 5.** *Atalaya hemiglauca*.  
Photograph — R.W.Purdie.



**Figure 6.** *Alectryon subdentatus*.  
Photograph — K.A.W.Williams.



**Figure 7.** *Harpullia pendula*.  
Photograph — M.Fagg.



**Figure 8.** *Diploglottis diphylostegia*.  
Photograph — B.Gray.

**5. Alectryon forsythii** (Maiden & E.Betche) Radlk., *Pflanzenfam. Nachtr.* 3 to 3(5): 205 (1907)

*Nepheium forsythii* Maiden & E.Betche, *Proc. Linn. Soc. New South Wales* ser. 2, 26: 81 (1901). T: Tia Canyon, N.S.W., Nov. 1897, *J.H.Maiden*; syn: *n.v.*; same locality, Dec. 1898, *J.Kretschmann*; syn: *n.v.*: Tia & Aspley Canyon, Oct. 1900, *W.Forsyth*; syn: *n.v.*

Illustration: S.T.Reynolds, *Austrobaileya* 1: fig. 37A (1982).

Tree to 8 m. Branchlets and peduncles finely puberulent or glabrescent. Leaf rachis 1–1.5 cm long; leaflets 1 or 2 pairs, elliptic to elliptic-ovate, broadly obtuse or subacute, apiculate, entire, obtuse at base, decurrent, 4.5–6.5 cm long, 2.5–4 cm wide, glabrous or lower surface puberulous, greyish white; densely prominently reticulate; petiolule subterete, 3–8 mm long; petiole 1.7–2.5 cm long. Panicle to 7 cm long. Flowers 5.5 mm diam.; pedicels 2–3 mm long. Calyx 2.5 mm long, shallowly 5-lobed, glabrescent. Petals absent. Fruit subsessile, compressed, transversely ellipsoidal, usually 2- or 3-lobed, 6–10 mm long, 7–17 mm diam., glabrous; pericarp thin, crustaceous. Aril granular.

Occurs in north-eastern N.S.W., from Guy Fawkes River to Nundle; grows along eastern escarpments of the northern tablelands in rocky gorges. Map 29.

N.S.W.: Walcha, Dec. 1898, *E.Betche* (BRI, NSW); Tia Falls, Oct. 1890, *W.Forsyth & E.Cheel* (BRI, NSW); Church Point, Wollombi Gorge, *A.G.Floyd 1201* (BRI).

**6. Alectryon kimberleyanus** S.Reyn., *Austrobaileya* 1: 477 (1982)

T: Lone Dingo, Mitchell Plateau, W.A., 14°35'S, 125°45'E, Feb. 1979, *J.S.Beard 8484*; holotype: PERTH.

Illustration: S.T.Reynolds, *op. cit.* fig. 37F.

Shrub or small tree to 5 m. Young parts and branchlets pale crispate tomentose to puberulous. Leaf rachis 0.5–1.5 cm long; leaflets 1 or 2 pairs, obovate or obovate-elliptic, broadly obtuse or retuse, entire or coarsely dentate (juvenile leaves), obtuse, truncate, unequal at base, 2–5.5 cm long, 1.5–2.5 cm wide, glabrous, or lower surface puberulous; petiolule to 2 mm long; petiole 0.5–2.2 cm long. Flowers not seen. Fruit broadly depressed obovoid to ovoid, 1–1.2 cm 1.8–2.3 cm diam., turgid, not lobed, 2- or 3 locular; pericarp thick, hard, drying ±woody, velvety outside. Aril granular.

Occurs on the Mitchell Plateau, N Kimberly, W.A., in semi-deciduous rainforest. Map 30.

W.A.: towards Port Warrender, *K.F.Kenneally 6675* (PERTH); Surveyors vine thicket, Mitchell Plateau, *K.F.Kenneally 5103* (PERTH); near Crusher Pool, Mitchell Plateau, *J.G.Tracey 13962* (BRI).

This species has similar leaves to *A. subdentatus* but differs in its crispate indumentum and in the absence of any lobing or grooves on the fruit.

**7. Alectryon subdentatus** (F.Muell. ex Benth.) Radlk., *Act. Congr. Bot. Amsterdam* 117 (1877), *Sapind. Holl.-Ind.* 47 (1879) as *subdentatum*

*Nepheium subdentatum* F.Muell. ex Benth., *Fl. Austral.* 1: 465 (1863). T: Tenterfield, N.S.W., *C.Stuart*; syn: *n.v.*; Tarampa Hill, N.S.W., *L.Leichhardt*; syn: *n.v.*

Shrub or small tree to 7 m. Branchlets and peduncles densely or thinly villous. Leaf rachis 1.5–4 cm long; leaflets 2–4 pairs, occasionally 1, elliptic or elliptic-obovate, broadly obtuse or subacute, serrulate, denticulate, or subentire, oblique, acute, obtuse or truncate at base, 0.7–9.5 cm long, 0.5–3.5 cm wide, puberulent to glabrescent, lower surface subglaucous; petiolule 1–2 mm long; petiole 0.2–2 cm long. Panicles to 6 cm long, few-branched. Male flowers not seen. Females 1.5–3.5 mm diam.; pedicels 1–2 mm long. Calyx 0.7–2.2 mm long, broadly shortly 5-lobed, pubescent. Petals absent. Fruit sessile, obscurely 2-lobed, transversely ellipsoidal or 1-lobed, subglobose, 0.8–1.2 cm long, 1.4–2 cm diam., turgid; pericarp drying hard and ±woody, velvety outside. Aril granular. Fig. 6.

Occurs from south-eastern Qld to Gloucester, N.S.W.; in dry rainforest, usually on foothills and steep, rocky slopes. Two fairly close forms have been recognised.

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16. *Atalaya rigida*19. *Heterodendrum oleifolium*  
var. *oleifolium*22. *Heterodendrum tropicum*25. *Alectryon connatus*28. *Alectryon unilobatus*17. *Atalaya australiana*20. *Heterodendrum oleifolium*  
var. *macrocalyx*23. *Heterodendrum*  
*diversifolium*26. *Alectryon coriaceus*29. *Alectryon forsythii*18. *Ganophyllum falcatum*21. *Heterodendrum oleifolium*  
var. *microcalyx*24. *Heterodendrum pubescens*27. *Alectryon subcinereus*30. *Alectryon kimberleyanus*

The species is close to *A. tomentosus* in having leaflets in accrescent pairs with serrulate or entire margins; it differs in its velvety 2-lobed or indistinctly lobed fruits and thick pericarp.

Lowermost pair of leaflets well-developed, 5–20 mm above base of petiole;  
petiole more than 5 mm long

**7a. F. subdentatus**

Lowermost pair of leaflets reduced and stipule-like, attached near base of  
petiole; petiole less than 5 mm long

**7b. F. pseudostipularis**

**7a. Alectryon subdentatus** (F.Muell. ex Benth.) Radlk., f. **subdentatus**

Lowermost pair of leaflets well-developed, 5–20 mm above base of petiole; petiole more than 5 mm long.

Occurs from SE Qld to Gloucester, N.S.W. Map 31.

Qld: Warwick, Mar. 1979, *D.M.Wilson* (BRI). N.S.W.: Curriecabark, 56 km W of Gloucester, Feb. 1937, *J.Vickery* (BRI, NSW).

**7b. Alectryon subdentatus** f. **pseudostipularis** Radlk., *Repert. Spec. Nov. Regni. Veg.* 20: 28 (1924)

T: Toowoomba, Qld, *Warburg 19158; n.v.*

Illustration: S.T.Reynolds, *Austrobaileya* 1:fig. 37B (1982).

Lowermost pair of leaflets reduced stipule-like, attached near base of petiole; petiole mm long.

Occurs in south-eastern Qld. Map 32.

Qld: Crows Nest, Feb. 1944, *M.S.Clemens* (BRI, NSW); Bunya Mts, *V.Hando 138* (BRI); Flagstone Ck, SW of Stringybark Mtn, *B.R.Jahnke 70* (BRI); Yarraman, Apr. 1957, *L.S.Smith* (BRI).

Forma *pseudostipularis* differs from the typical form by the reduced lowermost pair of leaflets being d near the base of the petiole and not higher up as in f. *subdentatus*.

**8. Alectryon tomentosus** (F.Muell.) Radlk., *Act. Congr. Bot. Amsterdam* 117 (1877), = *Sapind. Holl.-Ind.* 47 (1879) as *tomentosum*

*Nephegium tomentosum* F.Muell., *Trans. & Proc. Philos. Inst. Victoria* 2: 64 (1858). T: Brisbane River, Qld *W.Hill & F.Mueller; n.v.*

[*Nephegium subdentatum* auct. non F.Muell.: F.M.Bailey *Queensland Fl.* 1: 303 (1899)]

Illustration: S.T.Reynolds, *Austrobaileya* 1: fig. 37D (1982).

Tree to 10 m. Young parts branchlets, leaves, peduncles and fruits densely to sparsely yellow-rusty villous. Leaf rachis 3–7.5 cm long; leaflets 2–4 pairs, narrowly ovate-oblong or broadly ovate, obtuse, acute or acuminate, irregularly serrate or serrulate, oblique and obtuse or truncate at base, 4–14.5 cm long, 2–6.5 cm wide, puberulent or glabrous above, pubescent or puberulent below; petiolules to 2 mm long; petiole 2–4.5 cm long. Panicles to 14.5 cm long; pedicels to 1.5 mm long. Calyx 1.5 mm long, broadly 5-lobed, villous. Petals absent. Fruit sessile, with 1–3 knob-like lobes, 8–12 mm long, 8–22 mm diam.; lobes turgid; pericarp drying crustaceous. Aril granular.

Occurs from Cape York Peninsula, Qld, to Hunter River, N.S.W., usually in coastal scrub. Map 33.

Qld: Petrie, Brisbane, *S.T.Blake 2337* (BRI); Channel Rd, below Walsh Bluff, *B.Gray 560* (BRI, QRS); Black Mtn, S of Cookwotn, *L.S.Smith 10713* (BRI); Long Is., *C.T.White 12201* (BRI). N.S.W.: Lochinvar, *R.M.Cabbage 2216* (NSW).

Distinguished by its rusty hairy accrescent leaflets and thin-walled fruits. Often cultivated as a shade and ornamental tree. Collections from Cape York differ in shape, texture and indumentum of leaves and may represent a distinct taxon; further collections are needed.

**9. Alectryon repandodentatus** Radlk., *Bot. Jahrb. Syst.* 56: 274 (1920)

T: near Port Moresby, New Guinea, Apr. 1910, *A. Loher*; *n.v.*

Illustration: S.T.Reynolds, *Austrobaileya* 1: fig. 37E (1982).

Tree to 10 m. Young parts, branchlets, leaves, peduncles and fruits densely or sparsely rusty villous. Leaf rachis 3.5–12 cm long; leaflets usually 1–3 pairs, broadly oblong or obovate to elliptic, broadly obtuse, truncate or retuse, margins and usually apex remotely denticulate, truncate and unequal at base, 6.7–12 cm long, 4.5–8.5 cm wide, puberulent above, pubescent below, usually bullate between nerves; petiolules 4–6 mm long; petiole 2.5–5.5 cm long. Flowers (males only seen) to 2 mm diam., pedicels to 1 mm long. Calyx 2 mm long, obtusely 4-lobed, pubescent. Petals absent. Fruit sessile, usually 2-lobed, 7 mm long, 14–16 mm diam., broadly obovoid with compressed crescent-shaped appendage at top; lobes turgid; pericarp drying thin, crustaceous. Aril granular. Fig. 4 I–J.

Occurs in New Guinea and on Murray Is., Torres Strait, Qld, in coastal scrub. Map 34.

Qld: Murray Is., *M. Laurie* 29 (BRI).

*A. repandodentatus* has broader leaflets than *A. tomentosus* and the fruits have a crescent-shaped apical appendage.

**Excluded species**

*Alectryon bleeseri* Schwarz, *Fedde Repert.* 24: 89 (1927).

T: Port Darwin, N.T., *Bleeser* 332; *n.v.*

From the description this appears to be *Cupaniopsis anacardioides* (A.Rich.) Radlk.

*Alectryon canescens* DC., *Prodr.* 1: 617 (1824).

This is *Terminalia canescens* (DC.) Radlk.

**8. LEPISANTHES**

*Lepisanthes* Blume, *Bijdr.* 1: 237 (1825); from the Greek *lepis* (a scale), and *anthos* (flower), referring to well developed scale of petals.

Type: *L. montana* Blume

*Erioglossum* Blume, *Bijdr.* 1: 229 (1825). T: *E. edule* Blume

Shrubs or trees, usually monoecious. Leaves paripinnate in Australia; leaflets opposite or alternate, entire. Inflorescence terminal or axillary, panicle-like; bracteate. Flowers zygomorphic. Sepals 5, imbricate, the outer pair smaller. Petals 4, rarely absent, shortly clawed; scales well developed, crested. Disc one-sided, glabrous. Stamens 8; filaments hairy. Ovary 1–4 lobed; segments 1-locular with, 1 ovule per locule; style slender, curved, persistent. Fruit sessile or subsessile, 1–4-lobed or not lobed; lobes oblong, ellipsoidal or ±globose, succulent or dry, indehiscent. Seed ellipsoidal, glabrous or hairy, exarillate.

A genus of 24 species occurring in West Africa, China, Philippines, SE Asia, New Guinea and Australia; one non-endemic species in Australia.

L.A.T.Radlkofer, *Pflanzenz.* 98c: 726 (1932); P.W.Leenhouts, *Blumea* 17: 33–91 (1969); S.T.Reynolds, *Austrobaileya* 2: 35–36 (1984).

**Lepisanthes rubiginosa** (Roxb.) Leenh., *Blumea* 17: 82 (1969)

*Sapindus rubiginosa* Roxb., *Pl. Coromandel* 1: 44, t. 62 (1795); *Erioglossum rubiginosum* (Roxb.) Bl., *Rumphia* 3 (1847). T: *Pl. Coromandel* 1: 44, t. 62 (1795).

*Sapindus edulis* Blume, *Catalogus* 64 (1823) *nom. illeg. non* Aiton; *Erioglossum edule* (Blume) Blume,

*Bijdr.* 1: 229 (1825). T: cult. Bogor Botanic Gardens, Java, *Reinwardt* 823; *L.n.v.*, *fide* P.W.Leenhouts, *op. cit.* 82.

Tree to 10 m. Leaf rachis 10–36 cm long; leaflets 4–10, elliptic-oblong or ovate-oblong, obtuse, subretuse or subacute, oblique and obtuse at base, 3–24 cm long, 3–6 cm wide, pubescent or puberulent; lateral nerves 8–16 pairs; petiolules 2–5 mm long; petiole 5–14 cm long. Panicles 10–35 cm long; cymules 3–8-flowered; bracts subulate; pedicels 1–5 mm long. Sepals 5, usually suborbicular, 3–4 mm long, concave, silky outside except petaloid margin. Petals 5–6 mm long, subobovate, abruptly clawed, glabrous, white; scale 2-lobed, usually hooded, villous, crested; crests erect, linear. Stamens usually at opening of interrupted 3-lobed disc; filaments 3–5 mm long. Fruit 3-lobed, red or purple; lobes ellipsoidal, 8–15 mm long, puberulent or glabrous.

Occurs in SE Asia, New Guinea and Australia. Map 35.

W.A.: Mt Trafalgar, Prince Regent River Reserve, *A.S.George* 12642 (PERTH); Python Cliffs, *K.F.Kenneally* 2144 (PERTH).

Fruit not seen in Australian collections, description taken from non-Australian material.

## 9. CASTANOSPORA

*Castanospora* F.Muell., *Fragm.* 9: 92 (1875); from the Latin *castanea* (a chestnut), and the Greek *spora* (a seed), referring to chestnut-shaped seeds.

Type: *C. alphandi* (F.Muell.) F.Muell.; *Ratonia alphandi* F.Muell.

Trees. Branchlets shortly densely hairy, lenticellate. Leaves paripinnate; leaflets alternate or subopposite, entire. Inflorescence axillary, panicle-like, usually polygamo-monoecious; bracts small, ovate. Flowers small, regular. Calyx shortly cupular, 5-partite, lobes ovate, subvalvate, coriaceous. Petals 5, shortly clawed, with 2 acute, inflexed, hairy, crestless scales. Disc cupular. Stamens 8, filaments subulate, densely villous. Ovary 2-locular, locule 1-seeded; style short, stigma 2-lobed. Fruit large, drupaceous, 2-locular, septa thin or none; pericarp fleshy, rugose, ±crustaceous, indehiscent. Seed solitary in each locule, large, chestnut-like, brown, exarillate.

One species endemic in eastern Australia.

F.M.Bailey, *Queensland Fl.* 1: 287 (1899); W.D.Francis, *Austral. Rainforest Trees* 248 (1970); S.T.Reynolds, *Austrobaileya* 2: 34–35 (1984).

### ***Castanospora alphandi* (F.Muell.) F.Muell., *Fragm.* 9: 92 (1875)**

*Ratonia alphandi* F.Muell., *Fragm.* 4: 158 (1864). T: Seaview Range, near Rockingham Bay, Qld, *J.Dallachy*; *n.v.*

*Nepelium callarrie* Bailey, *Queensland Agric. J.* 5: 396 (1899). T: Upper Barron River, Qld, June 1899, *J.F.Bailey*; *holo*: BRI.

Illustration: S.T.Reynolds, *Austrobaileya* 2: 33 fig. 1K–N (1984).

Tree to 35 m. Young parts and inflorescence densely pubescent, branchlets and leaf axes puberulent. Leaf rachis 15–23 cm long; leaflets usually 8–12, narrowly elliptic-oblong or ovate-oblong, acute or acuminate, almost acute at base, 9–17.5 cm long, 3–6 cm wide, glabrous above, pubescent or puberulent below; lower surface subglaucous, papillose, prominently reticulate; domatia usually present; petiolule 0.8–1.2 cm long; petiole 8–19 cm long. Panicles 13–27 cm long; cymules stalked; pedicels 1.5–3 mm long. Calyx 2 mm long, hairy outside. Petals as long as calyx, rhomboidal, puberulent. Fruit transversely ellipsoidal or broadly ovoid, 2.5–3 cm long 3–6 cm diam., obscurely 2–4-sulcate, finely tomentose, reddish brown or peach. Seed 1.7–2.4 cm long, 2.2–2.7 cm diam. Fig. 9K–L.

Occurs from Daintree, Qld, to Bellinger River, N.S.W., usually along creeks and in remnant rainforest. Map 36.

Qld: Daintree, *S.T.Blake 14998* (BRI); Pinbarren Creek, Pomona–Kin Kin Road, Nov. 1975, *D.Loch* (BRI); Tallebudgera, *C.T.White 6593* (BRI). N.S.W.: Rosebank, *G.C.Stocker 1471* (BRI, QRS).

Easily distinguished by its large fruits with 2 large chestnut-like seeds. The trees are usually tall, the leaflets finely and densely nerved and subglaucous on the lower surface.

### Excluded species

*Castanospora longistipitata* Bailey, *Queensland Fl.* 1: 288 (1889).

T: Barron R., near Cairns, *E.Cowley 8D*; holo: BRI.

This is *Chisocheton longistipitatus* (Bailey) L.S.Smith, *Proc. Roy. Soc. Queensland* 70: 29 (1959) in the Meliaceae.

## 10. DIPLOGLOTTIS

*Diploglottis* J.D.Hook. in Benth. & J.D.Hook., *Gen. Pl.* 1: 390, 395 (1862); from the Greek *diplos* (double), and *glotta* (tongue), referring to 2 tongue-like crested scales of the petals.

Type: *D. cunninghamii* (Hook.) J.D. Hook. ex Benth.; *Cupania cunninghamii* Hook.

Tree. Branchlets usually hairy, lenticellate. Leaves paripinnate; leaflets usually large, opposite or alternate, thinly coriaceous, entire. Panicles axillary; cymules usually sessile; bracteate. Flowers polygamous, regular or slightly irregular, small. Calyx either shortly cupular with 5 lobes, or of nearly free lobes and imbricate. Petals 4 or 5, the 5th usually reduced, broadly ovate, clawed, glabrous; scales bilobed, hairy, usually crested. Disc usually incomplete, glabrous. Stamens 6–10; filaments usually hairy. Ovary 3–locular, with 1 ovule per locule; style stout. Fruit usually large, subglobose to transversely ellipsoidal, 1–3-lobed, loculicidally dehiscent; valves usually hairy. Seeds subglobose, slightly compressed; aril thick, fleshy, bilobed, usually red, acidic, nearly enveloping seed.

A genus of 10 species in East Malesia, New Caledonia, Australia, probably also in New Guinea; 8 species occur in Australia, all endemic.

G.Bentham, *Fl. Austral.* 1: 453–454 (1863); L.A.T.Radlkofer, *Pflanzenr.* 98f: 1224 (1933); P.W.Leenhouts, *Blumea* 24: 173–179 (1978); S.T.Reynolds, *Austrobaileya* 1: 390–398 (1981).

The large 2- or 3-lobed fruits with bilobed fleshy aril covering the large seed are distinctive. Leaves of most species are large and rusty hairy.

- 1 Calyx lobes nearly free, suborbicular or obovate, concave, unequal; petals 5, equal
- 2 Fruit glabrous; young parts, peduncles and leaf axes villous with deep red hairs; leaflets 5–10 pairs 1. *D. pedleyi*
- 2: Fruit hairy; indumentum, if present, of pale hairs; leaflets 2–4 pairs
- 3 Fruit usually 2-lobed, valves thick; disc complete; petiolule 10–35 mm long; inflorescence to 2.5 cm long 2. *D. harpullioides*
- 3: Fruit usually obscurely 3-sulcate, valves thin; disc incomplete, lateral; petiolule to 5 mm long; inflorescence 12–16 cm long 3. *D. campbellii*
- 1: Calyx shortly cupular with 5-ovate, subequal lobes, not concave; 5th petal usually reduced
- 4 Young inflorescences with conspicuous large bracts, usually pale hairy and scurfy; bracts 5–35 mm long, 2–7 mm wide; branchlets and leaf axes usually pale hairy

- 5 Lateral nerves of leaflets 24–34 pairs, 3–7 mm apart; primary peduncles not globose at base; valves drying thin; bracts 5–8 mm long **4. D. smithii**
- 5: Lateral nerves of leaflets 11–23 pairs, 6–15 mm apart; primary peduncles globose at base; valves drying thick, ±woody; bracts 8–35 mm long **5. D. bracteata**
- 4: Young inflorescences without large bracts, usually rusty hairy; bracts 3–7 mm long, 1–3 mm wide; branchlets and leaf axes rusty-brown villous and tomentose
- 6 Petiolules 7–35 mm long; flowers 7–8 mm diam., in narrow panicles; slender tree 2–4 m high **6. D. macrantha**
- 6: Petiolules 2–15 mm long; flowers 4–6 mm diam., in large panicles as long as wide; tree 10–30 m high
- 7 Leaflets usually 3–5 pairs, oblong, usually broadly obtuse at both ends or base truncate, unequal; leaf rachis 10–35 cm long; branchlets and peduncles stout **7. D. cunninghamii**
- 7: Leaflets usually 3–9 pairs, elliptic-oblong or subovate, abruptly shortly acuminate, rarely obtuse or rounded, the base acute or obtuse; leaf rachis 3–7 cm long; branchlets and peduncles usually slender **8. D. diphylostegia**

### 1. *Diploglottis pedleyi* S.Reyn., *Austrobaileya* 1: 392 (1981)

T: The Boulders, Babinda Creek, c. 6 km W of Babinda, Qld, 31 Aug. 1954, *L.S.Smith* 5336; holo: BRI.

Illustration: S.T. Reynolds, *op. cit.* fig. 26E.

Small tree to 9 m. Branchlets, leaf axes and peduncles usually villous, deep red; young leaves red furry. Leaf rachis 16–36 cm long; leaflets 5–10 pairs, narrowly elliptic-oblong, shortly acuminate, obtuse at base, truncate, oblique, 10–28 cm long, 3–5 cm wide, glabrous or puberulous; petiolules 0.8–2 cm long; petiole 10–19 cm long. Inflorescence 6–10 cm long; branches spike-like; bracts to 3 mm long; flowers sessile. Calyx lobes suborbicular, 3–4 mm long, glabrous, ciliolate. Petals 5, as long as calyx. Disc complete. Fruit transversely ellipsoidal or subglobose, 1- or 2-lobed, 3.5–5.5 cm long, 4–8 cm diam., pale green, 2-valved; valves slightly fleshy, drying thin, crustaceous, glabrous. Aril orange or red. Fig. 9 I.

Occurs in northern Qld from Harvey Ck to Innisfail; common on foothills of Mt Bellenden Ker. Map 37.

Qld: W of Innisfail, Sept. 1972, *S.J.Dansie* (QRS); W of Innisfail, Oct. 1976, *B.P.M.Hyland* 9157 (QRS); Mt Bellenden Ker, *R.L.Jago* 578 (BRI); The Boulders, Babinda, *N.L.J.Krause* 3 (BRI); McNamee Ck., near Palmerston National Park, *L.J.Webb & J.G.Tracey* 8322 (BRI).

*Diploglottis pedleyi* is easily distinguished by the deep red villous branchlets, leaf axes and peduncles, and the glabrous fruit.

### 2. *Diploglottis harpullioides* S.Reyn., *Austrobaileya* 1: 391 (1981)

T: Harvey Creek, Qld, 12 Oct. 1973, *L.J.Webb & J.G.Tracey* s.n.; holo: BRI.

Illustration: S.T. Reynolds, *op. cit.* fig. 26F.

Tree to 8 m. Branchlets and leaf axes minutely appressed puberulous to glabrous. Leaf rachis 3–27 cm long; leaflets 2–4 pairs, elliptic-oblong, subovate or subobovate, abruptly acuminate, base acute or abruptly attenuate, obtuse, oblique, 8–23 cm long, 3–8 cm wide; petiolules 1–3.5 cm long; petiole 5–14 cm long. Inflorescence to 2.5 cm long; peduncle pubescent; bracts minute. Flowers 5 mm diam.; pedicels 5–7 mm long. Calyx lobes suborbicular, 4–5 mm long and wide, silky outside. Petals 4 or 5, as long as calyx, membranous. Disc regular. Fruit transversely ellipsoidal, usually with 2 globose lobes, 3–4.5 cm long, 3.5–6.5 cm diam., 2-valved; valves thick, fleshy, pubescent outside, silky inside. Aril red. Fig. 9A.





**Figure 9.** A–J, *Diploglottis*. A, *D. harpullioides*, flowering habit  $\times 0.7$  (R.Jago 558, BRI). B–D, *D. campbellii* B, disc and stamens  $\times 8$ ; C, petal  $\times 8$ ; D, sepal  $\times 4$  (B–D, E.Cheel, BRI 164615). E–H, *D. macrantha*. E, inflorescence  $\times 0.7$ ; F, leaflets  $\times 0.7$ ; G, petal  $\times 4$ ; H, sepal  $\times 2.7$  (E–H, B.Hyland 10048, BRI). I, *D. pedleyi*, fruit  $\times 0.7$  (R.Jago 578, BRI). J, *D. smithii*, seed with aril  $\times 0.7$  (D.Kubala C76, BRI). K–L, *Castanospora alphandi*. K, fruit  $\times 0.7$ ; L, seed  $\times 0.7$  (K–L, J.Clarkson 2730, BRI).

Occurs in northern Qld from Cedar Bay to Babinda; common between Fishery Falls and Babinda Ck; grows in lowland rainforest. Map 38.

Qld: Cedar Bay, near Bloomfield River, 1973, *H.Dick* (BRI); Weinerts Creek, Babinda, *B.Jago* 272 (QRS), & 558 (BRI, QRS); Harvey Creek, Russel River, *W.S.Sayer* 257 (MEL 71660 & 71664).

Differs from other species in having glabrous leaves and very short inflorescences.

### 3. *Diploglottis campbellii* Cheel, *Proc. Linn. Soc. New South Wales* 48: 685 (1923)

T: Tintenbar N.S.W., Feb. 1892, *W.Baerlen*; syn: *n.v.*; Tweed River, Feb. 1918, N.S.W. *R.A.Campbell*; syn: NSW; same locality, Mar. 1918, *R.A.Campbell*; syn: NSW.

Illustration: S.T. Reynolds, *op. cit.* fig. 26A.

Tree to 20 m. Branchlets and leaf axes puberulous or glabrous. Leaf rachis 2–10 cm long; leaflets usually 2–4 pairs, elliptic-oblong or subovate, acute or shortly acuminate, subacute or obtuse and unequal at base, 7–19 cm long, 2.5–7 cm wide, glabrous, midribs puberulent; petiolules 2–5 mm long; petiole 3.5–8 cm long. Panicles 12–16 cm long; peduncles tomentose. Flowers 5 mm diam.; pedicels 3 mm long. Calyx lobes obovate or suborbicular, 2–4 mm long, tomentose. Petals 4 or 5, as long as calyx. Disc lateral, oblong, erect, enclosing stamens on one side. Fruit depressed-ovoid or subglobose, 3–sulcate or 1-lobed, 2–7 cm long, up to 7 cm diam., brown; valves slightly fleshy, drying thin, crustaceous, hairy inside. Seeds granular; aril red. Fig. 9B–D.

Occurs from south-eastern Qld to Richmond River, N.S.W. Map 39.

Qld: Tallebudgera Ck, Dec. 1917, *C.T.White & J.E.Young* (BRI, NSW). N.S.W.: Mt Warning, *L.W.Jessup* 196 (BRI); Mt Warning, Feb. 1975, *J.Willows* (BRI).

Distinctive in having very irregular flowers with the unilateral disc forming an erect lobe enclosing the stamens on one side. Considered endangered by J.Leigh *et al.*, *Extinct and Endangered Pl. Australia* 322–323 (1984).

### 4. *Diploglottis smithii* S.Reyn., *Austrobaileya* 1: 393 (1981)

T: Paronella Park, Mena Ck, near Innisfail, Qld, Aug. 1948, *L.S.Smith s.n.*, holotype: BRI.

Illustration: S.T. Reynolds, *op. cit.* fig. 26C.

Tree to 15 m. Branchlets and leaf axes pale appressed-hairy. Leaf rachis 10–28 cm long; leaflets 4–6 pairs, elliptic-oblong or subobovate, obtuse or abruptly acuminate, obtuse or acute at base, 9–20 cm long, 3–8 cm wide, glabrous or lower surface puberulous; lateral nerves 24–34 close pairs; petiolules 0.5–14 cm long; petiole 6–12 cm long. Panicle 13–32 cm long; peduncle tomentose; bracts narrowly ovate-oblong, 5–8 mm long, hoary tomentose; flowers 5 mm diam.; pedicels 3 mm long. Calyx lobes ovate, 2–3 mm long, 2 mm wide, tomentose outside. Petals 5, one reduced, usually exceeding calyx. Disc incomplete. Fruit transversely ellipsoidal or broadly ovoid, 1.5–4.5 cm long, 2–5.5 cm diam., 2- or 3-sulcate, usually 3-valved, pale yellow; valves pubescent outside, sparsely silky inside. Aril red. Fig. 9J.

Occurs in N Qld from Cooktown to Innisfail in rainforest; common in Russell River, Harvey Ck area. Map 40.

Qld: W of Innisfail, *B.Gray* 838 (BRI); McNamee Ck Rd, *A.W.Graham* 2188 (BRI); Babinda, Nov. 1982, *D.Kubala* (BRI); Daintree, *G.Rosenstrom* 9 (BRI); Harvey Ck, *W.S.Sayer* 243 (MEL 104167 & 104168).

Differs from other species in the closely arranged lateral nerves of the leaves. Aril used in making acidic drinks.

**5. *Diploglottis bracteata*** Leenh., *Blumea* 24: 176 (1978)

T: Gadgarra and Ghurka Pocket, 17°17'S, 145°39'E, Qld, 5 Sept. 1957, *L.S.Smith 10157*; holo: L, iso: BRI.

Illustration: S.T. Reynolds, *op. cit.* fig. 26B.

Small tree to 10 m. Branchlets, leaf axes and peduncles pubescent. Leaf rachis 6–24 cm long; leaflets 4–7 pairs, elliptic-oblong, obtuse or shortly acuminate, attenuate at base, 5.5–23 cm long, 2–6.5 cm wide, glabrous above, puberulous below; petiolules 0.8–2 cm long; petiole 4–9 cm long. Panicle 15–31 cm long; peduncle globose at base; bracts oblong-ovate 8–35 mm long, 4–7 mm wide, hoary outside; flowers 5–6 mm diam.; pedicels 4–11 mm long. Calyx lobes ovate, 2–3 mm long, crispate hairy. Petals 5, slightly exceeding calyx. Disc regular. Fruit subglobose, 2.5–4 cm long, 2.5–4.5 cm diam.; 3-valved, valves minutely velvety outside, densely silky inside.

Occurs on the Atherton Tableland, Qld. Map 41.

Qld: Malanda, *B.Gray 677* (BRI, QRS); Gadgarra, *E.Volck 3464* (BRI); Butchers Ck Rd, E of Malanda, *E.Volck 4399* (BRI).

The large bracts of the inflorescence of this species are distinctive.

**6. *Diploglottis macrantha*** L.S.Smith ex S.Reyn., *Austrobaileya* 1: 395 (1981)

T: Iron Range, Qld, 27 July 1949, *H.Flecker 13158*; holo: BRI.

Illustration: S.T. Reynolds, *op. cit.* fig. 26D.

Tree to 4 m. Leaf axes and peduncles rusty tomentose. Leaf rachis 21–34 cm long; leaflets 3–5 pairs, oblong-ovate or oblong-elliptic, obtuse or rounded but shortly acuminate, broadly obtuse or truncate at base, 9–22 cm long, 4–9 cm wide, hairy especially on midrib and nerves; petiolules 7–35 mm long; petiole 15–18 cm long. Panicles 6–13 cm long; bracts 4–7 mm long, rusty velvety; flowers 7–8 mm diam.; pedicels 6–8 mm long. Calyx lobes ovate 3–5 mm long, tomentose outside. Petals 5, one reduced, usually as long as calyx. Disc complete or nearly so. Fruit broadly obovoid or obcordate, 1.5–2 cm long, 2–4 cm diam., 2- or 3-sulcate; valves golden-rusty velvety outside, sparsely silky inside. Aril orange-red. Fig. 9E–H.

Occurs on Cape York Peninsula, Qld, in dry monsoon forests. Map 42.

Qld: Tozer Gap, Tozer Range, *L.J.Brass 19520* (BRI); Kennedy Rd, W of Claudie R., *C.H.Gittins 1041* (BRI, NSW); Rocky R., near Coen, *B.P.M.Hyland 6798* (BRI); Bamaga, *L.S.Smith 12411* (BRI).

Similar to *D. cunninghamii*, differing chiefly in the larger flowers and the small habit.

**7. *Diploglottis cunninghamii*** (Hook.) J.D.Hook. ex Benth., *Fl. Austral.* 1: 454 (1863)

*Cupania cunninghamii* Hook., *Bot. Mag.* 75: t. 4470 (1849). T: cultivated at Kew; *n.v.*

[*Diploglottis australis auct. non* (G.Don) Radlk.: L.A.T.Radlkofer, *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 8: 278 (1878) *p.p.* and other authors at least in part]

Tree to 35 m. Branchlets, leaf axes and peduncles rusty tomentose. Leaf rachis 10–35 cm long; leaflets 3–5 pairs, rarely 8, oblong to elliptic-oblong, obtuse, rarely acute; unequal and truncate at base, rarely obtuse, 8–33 cm long, sometimes to 50 cm, 3.5–12 cm wide, glabrous above except hairy midrib, usually hairy below; petiolules 2–15 mm long; petiole 7–12 cm long. Panicle 12–50 cm long; peduncle stout; flowers 4–6 mm diam.; pedicels 6 mm long. Calyx lobes ovate, 2–3 mm long, villous outside. Petals 4, rarely a reduced 5th, as long as calyx. Disc incomplete. Fruit subglobose or transversely ellipsoidal, 1–1.5 cm long, 2.5–3 cm diam., 2- or 3-sulcate, yellow-orange; valves rusty velvety outside, sparsely silky inside. Aril orange-red, acidic. *Native Tamarind*.

Occurs from southern Qld to Illawarra district, N.S.W., in rainforest. Map 43.

Qld: Mt Glorious, Jan. 1945, *M.S.Clemens* (BRI); Maleny, *M.Olsen & H.Dillewaard 143* (BRI); Bunya Mtns, Oct. 1919, *C.T.White* (BRI). N.S.W.: Hunter River, *R.Brown* (MEL 623526, NSW); Hastings River, *H.Beckler* (MEL 623529 & 623530).

Distinctive in having large rusty hairy leaves with large oblong leaflets and stout fluted branchlets. Aril used for jam and acid drinks.

The name *Diploglottis australis* (G.Don) Radlk., based on *Stadmannia australis* G.Don, has been applied to this species by some workers. As no type material of this name is apparently available its application depends on the interpretation of Don's description. He described a tree 60 feet tall with '2 or 3 pairs of large ... opposite leaflets with an odd one'. The description could possibly apply to the leaves of seedlings of *D. cunninghamii* but scarcely to mature plants. Seedlings even a metre tall, usually have more leaflets. It is unlikely also that Hooker would describe Don's plant again after only 18 years without some reference to Don. The application of Don's name therefore remains doubtful.

**8. *Diploglottis diphylostegia* (F.Muell.) Bailey, *Proc. Roy. Soc. Queensland* 1: 148 (1884)**

*Cupania diphylostegia* F.Muell., *Fragm.* 5: 145 (1866); *Diploglottis cunninghamii* var. *diphylostegia* J.F.Bailey, *Queensland Agric. J.* 5: 396 (Oct. 1899); *Diploglottis cunninghamii* var. *muelleri* Bailey, *Queensland Fl.* 1: 287 (1899), based on *Cupania diphylostegia* F.Muell.; *D. australis* var. *muelleri* (Bailey) Radlk., *Pflanzenr.* 98: 1226 (1933). T: Meunga Ck, Rockingham Bay, Qld, 30 Sept. 1865, J.Dallachy; lecto: MEL 104164, fide S.T.Reynolds, *Fl. Australia* 25: 199 (1985).

Tree to 30 m. Branchlets, leaf axes and peduncles densely pale rusty villous. Leaf rachis 3–7 cm long; leaflets 2–9 pairs, elliptic-oblong to subobovate, shortly acuminate, obtuse or rounded, oblique and obtuse or acute at base, 4.5–19 cm long, 2–8 cm wide, glabrous, or hairy on nerves above, hairy below; petiolules 2–6 mm long; petiole 3–5 cm long. Panicles 14–19 cm long; bracts ovate-oblong, 3–5 mm long, tomentose outside; flowers 4–5 mm diam.; pedicels 2–6 mm long. Calyx lobes ovate, 2–3 mm long. Petals 5, 5th one reduced, usually slightly exceeding calyx. Disc usually incomplete. Fruit transversely ellipsoidal or subglobose, 1–3–sulcate, 0.8–1.7 cm long, 1.5–2.8 cm diam., yellow to orange; valves pale rusty tomentose outside, silky inside. Aril orange-yellow. Fig. 8.

Occurs in Qld from Cape York Peninsula to near Mackay, at edge of rainforest and riverine forest. Map 44.

Qld: Wongabel, S of Atherton, Oct. 1975, H.Brassel (BRI); Wongabel, B.Gray 1471–1472 (BRI); Claudie R., B.P.M.Hyland 7001 (BRI); Strathdieckie near Proserpine, K.A.McPherson 90 (BRI); Jarra Ck, Tully area, K.J.White 432 (BRI); Cathu State Forest, P.Young 429 (BRI).

Very close to *D. cunninghamii* but the leaflets are elliptic, smaller, acuminate or acute and the branchlets are usually slender.

### Doubtful name

*Diploglottis Australis* (G.Don) Radlk., *Sitzungsber. Math.- Phys. Cl. Königl. Bayer Akad. Wiss. München* 8: 278 (1878) – *p.p.* as to basionym but not the synonym *Cupania cunninghamii*.

*Stadmannia australis* G.Don, *Gen. Hist.* 1: 669 (1831). T: cultivated at Kew; *n.v.*

See note under *Diploglottis cunninghamii* (Hook.) J.D.Hook. ex Benth.

## 11. HARPULLIA

*Harpullia* Roxb., *Hort. Bengal.* 86 (1814) *nom. nud.*; *Fl. Ind.* 2: 441 (1824), from *Harpulli*, the native name in India of *H. cupanioides* Roxb.

Type: *H. cupanioides* Roxb.

Shrubs or trees, usually dioecious. Indumentum of stellate and simple hairs. Leaves paripinnate; rachis and petiole sometimes winged; leaflets usually alternate, mostly entire, petiolulate or sessile. Inflorescence axillary, rarely terminal or ramiflorous, panicle-like;

bracts subulate. Flowers regular. Sepals usually 5, free, imbricate. Petals usually 5, oblong-obovate, sessile or clawed then with 2 inflexed auricles, thick or membranous. Disc small, complete. Stamens 5–8; filaments glabrous. Ovary 2-locular; ovules 1 or 2 per locule; style reflexed or spiral at apex. Fruit usually stipitate, mostly 2-lobed, apiculate, inflated, loculicidally 2-valved. Seeds 1 or 2 per locule, subglobose or ellipsoidal, black, shiny; aril entire, nearly covering seed, rarely minute or absent.

A genus of 26 species occurring in China, SE Asia, Malesia, Pacific Islands, New Guinea and Australia; 8 species in eastern Australia, 6 of them endemic.

G.Bentham, *Fl. Austral.* 1: 470–471 (1863); L.A.T.Radlkofer, *Pflanzenr.* 98: 1433–1462 (1934); S.T.Reynolds, *Austrobaileya* 1: 412–419 (1981); P.W.Leenhouts & M.Vente, *Blumea* 28: 1–51 (1982).

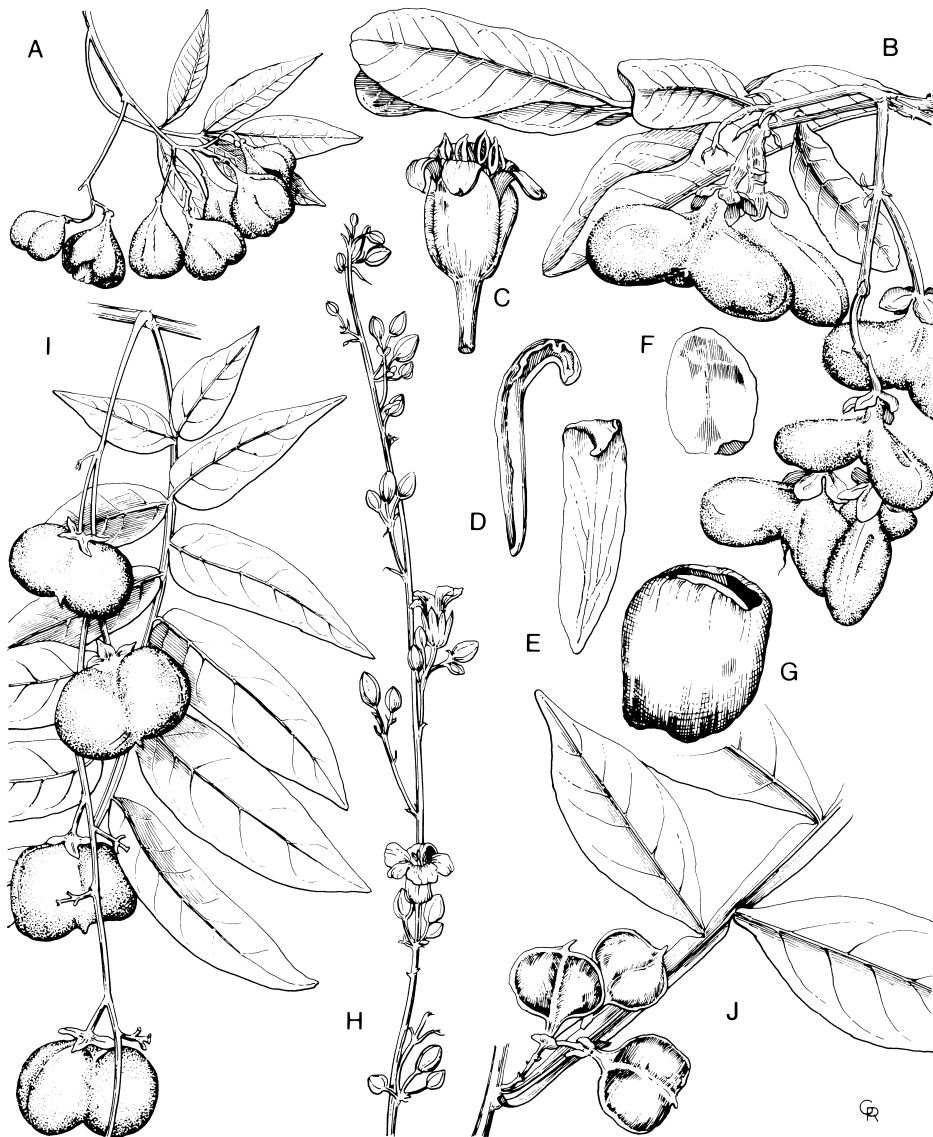
The large 2-lobed showy fruits and stellate indumentum distinguish this genus.

- 1 Aril cupular, nearly enclosing seed; petals thick, sessile, not auriculate; style short, recurved; rachis and petiole with or without wings
  - 2 Rachis winged
    - 3 Petiole winged only towards apex **3. H. rhyticarpa**
    - 3: Petiole winged to base or near base
      - 4 Margins of leaflets and wings usually dentate; wings narrowing towards base; petals 12 mm long; stamens 8 **1. H. alata**
      - 4: Margins of leaflets and wings entire; wings broad to base, auriculate; petals 15–20 mm long; stamens 5 or 6 **2. H. frutescens**
  - 2: Rachis not winged
    - 5 Seeds usually 2 per locule; fruit velvety; valves drying rind-like, wrinkled; petals 12–14 mm long; stamens 5 or 6; leaflets thickly coriaceous, shiny **3. H. rhyticarpa**
    - 5: Seeds 1 per locule; fruit pubescent or puberulent; valves usually drying thin, reticulate or granular; petals 7.5–13 mm long; stamens 5; leaflets thinly coriaceous
      - 6 Inflorescence ramiflorous; petals 9.5–13 mm long; valves drying chartaceous, prominently reticulate; leaf rachis 23–27 cm long **4. H. ramiflora**
      - 6: Inflorescence axillary or terminal; petals 7.5–12 mm long; valves drying ±woody, obscurely reticulate or granular; leaf rachis 5–17.5 cm long
        - 7 Valves granular, glabrous inside; leaflets usually acuminate or acute; inflorescence axillary; peduncles puberulent; petals 7.5 mm long **5. H. leichhardtii**
        - 7: Valves reticulate, woolly inside; leaflets usually rounded, obtuse, retuse; inflorescence terminal or axillary; peduncles brown velvety; petals 8–12 mm long **6. H. hillii**
  - 1: Aril minute or absent; petals membranous, clawed, auriculate; style long, slender, straight; rachis and petiole not winged
    - 8 Fruit with very divaricate subglobose, bladdery lobes; stipe to 3 mm long, puberulent; pedicels 5–10 mm long; petals 7–8 mm long; stamens 8; midrib hairy below **8. H. pendula**
    - 8: Fruit broadly obcordate, lobes suberect or divaricate, ellipsoidal; stipe 4–6 mm long, tomentose; pedicels 10–50 mm long; petals 12–14 mm long; stamens 5; midrib hairy both sides **7. H. arborea**

### 1. *Harpullia alata* F.Muell., *Fragm.* 2: 103 (1860)

T: Clarence River, N.S.W., *H.Beckler*; *n.v.*

Tree to 7 m, glabrous except young parts and inflorescence. Leaf rachis and petiole with broad, dentate wings; rachis 11–18 cm long; leaflets 6–12, elliptic or elliptic-obovate,



**Figure 10.** **A**, *Cossinia australiana*, fruiting habit  $\times 0.7$  (L.Smith 4140, BRI). **B–J**, *Harpullia*. **B–G**, *H. hillii*. **B**, fruiting habit  $\times 0.7$  (K.Williams 83041, BRI); **C**, flower  $\times 1$ ; **D**, side view of petal  $\times 2$ ; **E**, front view of petal  $\times 2$ ; **F**, sepal  $\times 2$  (**C–F**, L.Jessup 150, BRI). **G**, seed with aril  $\times 2$  (K.Williams 83041, BRI). **H–I**, *H. rhyticarpa*. **H**, inflorescence  $\times 0.7$  (K.Williams 80134, BRI); **I**, fruiting habit  $\times 0.7$  (S.Blake 9595, BRI). **J**, *H. frutescens*, fruiting habit  $\times 0.7$  (L.Smith 3740, BRI).

acuminate or acute, remotely dentate, 6–18 cm long, 2.5–7 cm wide, glabrous, densely reticulate; sessile or petiolule to 3 mm long; petiole 6–10.5 cm long. Inflorescence axillary, 5–14 cm long; peduncle puberulent; pedicels 5–13 mm long. Sepals ovate, 7 mm long, puberulent. Petals 12 mm long. Disc hairy. Stamens 8. Ovary pubescent; style flat, reflexed. Fruit broadly obovoid, 2–2.5 cm long, 3–4 cm diam., 2–sulcate, slightly compressed, puberulent, yellow; sepals persistent. Seeds 2 per locule, nearly enclosed in yellow to red aril.

Occurs from Nerang River, south-eastern Qld, to Stroud, N.S.W., in rainforest. Map 45.

Qld: Lamington National Park, *W.J.F.McDonald & J.R.Clarkson 600* (BRI); Roberts Plateau, *D.A.Goy & L.S.Smith 145* (BRI); Springbrook, *W.J.F.McDonald & W.G.Whiteman 2825* (BRI). N.S.W.: Whian Whian State Forest near Lismore, *V.K.Moriarty 1688* (BRI).

The only Australian species with dentate margins on the leaflets and the wings of the leaf rachis.

## 2. *Harpullia frutescens* Bailey in Meston, *Rep. Bellenden-Ker Exped.* 36 (1889)

T: Mulgrave River, Qld, 1889, *F.M.Bailey*; lecto: BRI 72386, *fide* S.T.Reynolds, *Fl. Australia* 25: 200 (1985)

*H. holoptera* Radlk., *Repert. Spec. Nov. Regni Veg.* 20: 40 (1924). T: Mulgrave, Qld, May 1907, *L.Diels 8306*; *n.v.*

Shrub to 1 m. Young parts puberulent. Rachis and petiole with broad entire wings; rachis 4.5–18.5 cm long; leaflets 6–8, elliptic or elliptic-oblong, acuminate or caudate, entire, 7.5–17 cm long, 2.5–5 cm wide, glabrous or puberulous below, finely reticulate; sessile or petiolule to 1 mm long; petiole 3.5–8.5 cm long. Inflorescence axillary, to 12 cm long; peduncles puberulent; pedicels to 5 mm long. Sepals obovate-oblong, 7–8 mm long, pubescent. Petals 15–20 mm long, glabrous. Disc puberulent. Stamens 5 or 6. Ovary tomentose; style short, thick recurved. Fruit oblong-obovoid, 1.2–1.6 cm long, finely hairy outside, slightly compressed, crimson; valves glabrous inside, sepals persistent. Seeds 2 per locule; aril cupular, yellow. Fig. 10J.

Occurs in Qld from Weary Bay S of Cooktown to Cowley Beach, in rainforest. Map 46.

Qld: Johnstone R., *T.L.Bancroft 39* (BRI); Cowley Beach, *B.M.Hinton 128* (BRI); Jarra Ck, near Danbulla, *L.S.Smith 3740* (BRI); State Forest Reserve 185, S of Danbulla, *G.Unwin 9* (QRS).

Close to *H. alata* but the leaf margins are entire and the wings extend to the base of the petiole

## 3. *Harpullia rhyticarpa* C.White & Francis, *Queensland Dept. Agric. Bot. Bull.* 22: 10 (1920)

T: Bernards Spur, Bellenden-Ker Range, Qld, 1889, *F.M.Bailey*; holo: BRI.

*H. angustialata* C.White & Francis, *op. cit.* 12 (1920). T: Yarrabah, Qld, June 1918, *Rev. N.Michael*; holo: BRI.

Tree to 6 m, glabrous except inflorescence. Rachis and top of petiole usually with narrow, entire wings; rachis 11–19 cm long; leaflets 8–10, elliptic or ovate-oblong, abruptly acuminate, caudate or acute, entire, 3.5–17 cm long, 1.5–5.5 cm wide, coriaceous, shiny; petiolule 2–4 mm long; petiole 4.5–10 cm long. Inflorescence axillary, pendulous, to 72 cm long; peduncle tomentose; pedicels to 7 mm long, tomentose. Sepals ovate, 8–10 mm long, tomentose. Petals 12–14 mm long, glabrous. Disc hairy. Stamens 5 or 6. Ovary villous; style short. Fruit broadly obovoid-oblong, 1.5–2.5 cm long, slightly compressed, velvety, orange-yellow; valves puberulous inside; sepals persistent. Seeds usually 2 per locule; aril cupular, yellow. Fig. 10H–I.

Occurs in northern Qld from Cooktown to Tully, usually in montane rainforest on granite; common on Atherton Tableland. Map 47.

Qld: Mt Lewis, WNW of Julatten, *J.R.Clarkson 2501a* (BRI); Boonjie near Malanda, *B.Gray 1477* (BRI, QRS); near Noah Ck, *B.P.M.Hyland 5977* (BRI); Mossman, *L.S.Smith 394* (BRI); Saddle Mt near Kuranda, Apr. 1967, *V.Winkel* (BRI).

Differs from *H. alata* and *H. frutescens* in having only the rachis and top of petiole winged or the wings absent, the leaflets discolorous and the inflorescence usually long and pendulous.

**4. Harpullia ramiflora** Radlk., *Act. Congr. Bot. Amsterdam* 124 (1877), = *Sapind. Holl.-Ind.* 54 (1879)

T: Aru Is., Indonesia, *Beccari herb.* 2822; *n.v.*

Tree to 9 m; glabrous except inflorescence. Rachis 23–27 cm long, wingless; leaflets 8–12, oblong-ovate or elliptic, acute or acuminate, entire, 11–27 cm long, 4–8 cm wide, coriaceous; petiolule 3–8 mm long; petiole 3.5–10 cm long. Inflorescences ramiflorous, clustered, 6–20 cm long; peduncle pubescent. Pedicels 5–8 mm long. Sepals ±elliptic, 6–7.5 mm long, pubescent. Petals reflexed at apex, 9.5–13 mm long, 3–4 mm wide, glabrous. Disc pubescent. Stamens 5. Ovary tomentose. Fruit suborbicular to transversely ellipsoidal, 1.2–1.8 cm long, red; lobes inflated, reticulate, puberulent; valves glabrous inside, sepals persistent. Seeds 1 per locule, aril yellow-orange.

Occurs in the Philippines, Moluccas, New Guinea, and in Australia on the Iron Range, north Qld; in gallery and riverine rainforest. Map 48.

Qld: Iron Range, *L.J.Brass 19121* (BRI); Claudie R., Apr. 1944, *H.Flecker* (BRI); Claudie R., *B.P.M.Hyland 6208 & 9739* (BRI, QRS).

Differs from other species in having small clustered ramiflorous inflorescences.

**5. Harpullia leichhardtii** F.Muell. ex Benth., *Fl. Austral.* 1: 470 (1863)

T: Port Essington, N.T., *F.W.L.Leichhardt*; *n.v.*

[*H. thanatophora* auct. non Blume: S.T.Reynolds, *Austrobaileya* 1: 418 (1981)]

[*H. cupanioides* auct. non Roxb.: P.W.Leenhouts & M.Vente, *Blumea* 28: 29 (1982) *p.p.*]

Tree to 8 m. Shoots and peduncles pubescent, otherwise glabrous. Leaf rachis 5–17.5 cm long; leaflets 4–8, obliquely ovate or ovate-oblong or elliptic, usually subfalcate, attenuate, acuminate to obtuse, entire, 5.5–18 cm long, 2.5–8 cm wide, ± chartaceous, finely reticulate; petiolule 3–6 mm long; petiole 4–7 cm long. Inflorescence axillary, to 11 cm long; pedicels 6–10 mm long. Sepals elliptic, 6–7 mm long, tomentose. Petals 7.5 mm long. Disc hairy. Stamens 5. Ovary velvety; style short. Fruit transversely ellipsoidal or depressed broadly obovoid, 1.5–2.2 cm long, lobes subglobose, divaricate, inflated, slightly granular, glabrescent; valves glabrous inside, sepals persistent. Seed 1 per locule, nearly covered by aril.

Occurs in far northern N.T. Map 49.

N.T.: ?North Australia *R.Brown* (BRI 71168); Nhulunbuy Lagoon, Yirrkala Mission, *N.Scarlet 132–74* (BRI); near Jacks Landing, *M.Rankin 2577* (DNA).

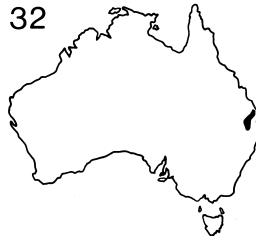
Closely resembles *H. pendula* in the leaves but the fruits have persistent sepals and the seeds have a well developed aril.

**6. Harpullia hillii** F.Muell., *Trans. Philos. Inst. Victoria* 3: 26 (1859)

T: Durando, *W.Hill*; *n.v.*

Tree to 20 m; glabrous except puberulous young parts and dark-brown velvety inflorescences. Leaf rachis 5.5–12 cm long; leaflets 2–10, elliptic-oblong to obovate, obtuse or retuse, entire, 5.5–16 cm long, 2.5–5.5 cm wide, coriaceous; petiolule 3–6 mm long; petiole 3.5–8 cm long. Panicles axillary or terminal, densely flowered, 14–30 cm long; bracts subulate, to 6 mm long; pedicels to 4 mm long. Sepals obovate-elliptic, 6–8 mm long, velvety. Petals reflexed at apex, 8–12 mm long, glabrous. Disc minute,





31. *Alectryon subdentatus*  
f. *subdentatus*  
34. *Alectryon repandodentatus*  
37. *Diploglottis pedleyi*  
40. *Diploglottis smithii*  
43. *Diploglottis cunninghamii*

32. *Alectryon subdentatus*  
f. *pseudostipularis*  
35. *Lepisanthes rubiginosa*  
38. *Diploglottis harpullioides*  
41. *Diploglottis bracteata*  
44. *Diploglottis diphyllostegia*

33. *Alectryon tomentosus*  
36. *Castanospora alphandi*  
39. *Diploglottis campbellii*  
42. *Diploglottis macrantha*  
45. *Harpullia alata*

pubescent. Stamens 5. Ovary velvety; style short. Fruit transversely ellipsoidal or depressed obovoid, 1.3–1.5 cm long, yellow; lobes subglobose, divaricate, inflated, pubescent or puberulent; valves woolly inside; sepals persistent. Seed 1 per locule, nearly enclosed in red aril. Fig. 10B–G.

Occurs from Burdekin River, Qld, to near Wauchope, N.S.W.; usually in dry rainforest on hillsides, mostly on basalt. Map 50.

Qld: S of Canungra, *L.W.Jessup 150* (BRI, CANB, DNA, K. L. NSW); same locality, Nov. 1970, *K.A.W.Williams* (BRI); Clare-Burdekin Levee, *L.S.Smith 4408 & 4409* (BRI); Henning Is., *C.T.White 12202* (BRI). N.S.W.: Broken Bay State Forest, c. 9 km SW of Wauchope, *R.Coveny 10905* (BRI,NSW).

Distinguished by the obtuse leaflets and dark brown hairy peduncles.

**7. Harpullia arborea** (Blanco) Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 16: 404 (1886)

*Ptelea arborea* Blanco, *Fl. Filip.* 63 (1837). T: Luzon, Bulacan Province, Philippines, Sept. 1913, *E.D.Merrill sp. Blancoanae 339*; n.v.

*H. divaricata* Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 20: 279 (1890). T: Bloomfield River, Qld, 1884, *E.Bauer*; iso: MEL; n.v.

Tree to 30 m. Shoots brown-tomentose; branchlets, leaf axes and peduncles villous or glabrescent. Leaf rachis 4–22 cm long; leaflets 6–10, elliptic-oblong or obovate, acute to obtuse, entire, 10–19 cm long, 4–7.5 cm wide, glabrous except midrib and nerves below hairy, thinly coriaceous; petiolules 4–6 mm long, tomentose; petiole 4–9 cm long. Inflorescence axillary or ramiflorous, 4–22 cm long, open, or of 2- or 3-flowered cymules. Pedicels 10–50 mm long, drooping. Sepals obovate, 6–7 mm long, membranous, tomentose. Petals clawed, 12–14 mm long, glabrous except claw. Disc hairy. Stamens 5. Ovary pubescent; style 10–15 mm long, twisted. Fruit broadly obcordate, 1.5–2.3 cm long, orange-yellow to red; lobes ellipsoidal or subglobose, reticulate, puberulent; valves drying ±woody, glabrescent or glabrous inside; sepals not persistent. Seed 1 per locule, shiny, black; aril minute or absent.

Occurs in India, Sri Lanka, Thailand, Vietnam, the Philippines, Malaysia, Indonesia, Solomon Islands, Fiji, Moluccas, New Hebrides, Samoa, Tonga, New Guinea and Australia (northern Qld). Usually grows in rainforest. Map 51.

Qld: Mowbray River, *L.J.Brass 2018* (BRI); near Noah Head, Cape Tribulation, *B.P.M.Hyland 5968* (BRI).

*H. arborea* has the petals and aril of *H. pendula* but differs in the thicker walls of the fruit, and in having fewer stamens. The fruits are also stipitate. Bark used as fish poison, a substitute for soap and a pain killer.

**8. Harpullia pendula** Planchon ex F.Muell., *Trans. Philos. Inst. Victoria* 3: 26 (1859)

T: Brisbane River, Qld, Sept. 1828, *A.Cunningham 125*; iso: MEL; n.v.

Tree to 15 m. Shoots and peduncles puberulent; branchlets and leaf axes glabrescent. Leaf rachis 1.5–6 cm long; leaflets 4–6, elliptic-oblong to obovate, obtuse to acute, entire, 5.5–10.5 cm long, 2–4 cm wide, glabrous above, puberulent or glabrescent below, thinly coriaceous; petiolules 3–6 mm long; petiole 2–5.5 cm long. Panicles axillary, to 28 cm long; pedicels 5–10 mm long, pubescent. Sepals oblong or suborbicular, 4–5 mm long, tomentose to puberulent. Petals clawed, 7–8 mm long, pubescent inside. Disc glabrous. Stamens usually 8. Ovary tomentose; style 5–10 mm long, twisted. Fruit sessile, transversely ellipsoidal, 1.3–2.5 cm long, yellow-orange to red; lobes subglobose, bladderly, glabrescent, reticulate; valves chartaceous, glabrous inside, sepals not persistent. Seed 1 per locule; aril minute or absent. *Tulipwood*. Fig. 7.

Occurs from Cooktown, Qld, to Bellinger River, N.S.W.; usually in dry rainforest on basalt. Map 52.

Qld: Burleigh Heads, *N.B.Byrnes 3519* (BRI); Mt Greville, *S.L.Everist 7257* (BRI); Mulgrave River, *J. O'Farrell 50* (BRI); Upper Brookfield, Brisbane, *L.W.Jessup 78* (BRI, NSW); S of Canungra, Nov. 1970, *K.A.W.Williams* (BRI). N.S.W.: Iluka, *J.B.Williams J34* (NSW).

Recognisable by the fruit with bladdery lobes, the rudimentary aril and the auricled petals. Timber used for cabinet making. Also cultivated as an ornamental tree.

## 12. DIMOCARPUS

*Dimocarpus* Lour., *Fl. Cochinch.* 233 (1790); possibly from the Greek *dimorphus* (two forms) and *carpus* (fruit).

Type: *D. lichi* Lour.

Shrubs or trees, usually monoecious. Indumentum of stellate or tufted and simple hairs. Leaves paripinnate, rarely unifoliate; leaflets alternate or subopposite, entire or serrate-dentate, usually papillose below and with naked glands along midrib, rarely along margins. Inflorescence axillary or terminal, panicle-like; cymules sessile or stalked. Calyx cupular, deeply 5-lobed; lobes imbricate. Petals 5 or 0, oblong-obovate, shortly clawed, hairy or with glabrous apex, papillate; scales absent. Disc complete, hairy. Stamens 6–8; filaments hairy. Ovary sessile, 2- or 3-lobed; ovule 1 per locule; stigma 2-lobed. Fruit 1- or 2-lobed; lobes indehiscent. Seed dark brown, shiny, enveloped by fleshy translucent white aril.

Six species distributed in SE Asia, Philippines, New Guinea and Australia; two endemic species in Australia. One species, *D. longan* Lour. subsp. *longan*, is cultivated for its edible fruit in Asia, New Guinea and north Qld.

P.W.Leenhouts, *Blumea* 19: 113–131 (1971), & 21: 377–380 (1973); S.T.Reynolds, *Austrobaileya* 1: 494–496 (1982).

Glands present along midrib and near margins; peduncles and ovary finely hairy; maturing ovaries not warty

**1. *D. australianus***

Glands rarely present along midrib, absent near margins; peduncles and ovary coarsely hairy; maturing ovaries warty, each wart with large tuft of hairs

**2. *D. leichhardtii***

### 1. *Dimocarpus australianus* Leenh., *Blumea* 21: 377 (1974)

T: c. 9.6 km S of Helenvale on Shipton Flat Rd, Qld, 28 Aug. 1970, C.H.Gittins 2162; iso: BRI(♀), NSW.

Illustration: S.T. Reynolds, *Austrobaileya* 1: fig. 39G (1982).

Small tree. Branchlets, leaf axes and peduncles finely rusty hairy, usually lenticellate. Leaf rachis 1.5–6 cm long; leaflets 4–6, subobovate or oblong-elliptic, obtuse to shortly acuminate, entire, 3–12.5 cm long, 1.5–4 cm wide, glabrous or puberulous below; lower surface pale with glands along midrib and near margins; petiolules 4–8 mm long; petiole 2.5–6 cm long. Panicles 14–27 cm long, with scattered subsessile cymules; pedicels 2–3 mm long. Calyx as long as petals, finely pubescent. Petals 2.5–3 mm long, pubescent towards middle, papillose at apex. Filaments 2.5–3 mm long. Ovary deeply 2-lobed. Fruit 1-lobed, rarely 2-lobed, then lobes divaricate, ±ellipsoidal, pale brown, 1.5 cm long, 1.3 cm diam. Aril watery.

Occurs in Cape York Peninsula, Qld, in rainforest. Map 53.

Qld: Alligator Ck, Pascoe River, *B.P.M.Hyland 2725* (QRS); Claudie River near Iron Range, *B.P.M.Hyland 3454* (QRS); Rocky River, McIlwraith Range, *B.P.M.Hyland 3227* (BRI, QRS); T.R. 165, near Shiptons Flat, *B.P.M.Hyland 12880* (QRS).

The naked glands on the lower surface of the leaflets distinguish this from *D. leichhardtii*.

**2. Dimocarpus leichhardtii** (Benth.) S.Reyn., *Austrobaileya* 1: 495 (1982)

*Euphoria leichhardtii* Benth., *Fl. Austral.* 1: 468 (1863). *Nepheleum leichhardtii* (Benth.) F.Muell., *App. Rep. Intercol. Exhib.* 25 (1867); F.Muell., *Fragm.* 9: 99 (1875); *Arytera leichhardtii* (Benth.) Radlk., *Act. Congr. Bot. Amsterdam* 114 (1877), = *Sapind. Holl.-Ind.* 44 (1879). T: eastern Australia, *L.Leichhardt*; holo: MEL.

[*Arytera leichhardtii* var. *hebeptala* auct. non (Benth.) Radlk.: L.A.T.Radlkofer, *Act. Congr. Bot. Amsterdam* 114 (1877), = *Sapind. Holl.-Ind.* 44 (1879)]

Tree. Branchlets, leaf axes and inflorescence pubescent to puberulent; lenticels crowded on branchlets. Leaf rachis 3.2 cm long; leaflets 7, elliptic to obovate, obtuse, entire, 5.5–6.5 cm long, 2.8 cm wide, glabrous above, puberulous below; glands rarely present along midrib, absent near margins; petiolules 3–5 mm long; petiole 2 cm long. Panicle 8–10 cm long, to 6 cm wide; cymules subsessile, scattered; pedicels to 1.5 mm long, pubescent. Calyx as long as petals, pubescent. Petals 3 mm long, puberulent inside except glabrous apex, glabrous outside. Filaments 3.5–4.5 mm long. Ovary 2-lobed; lobes globose, densely coarsely stellate hairy, warty when mature. Fruit not seen.

Known only from the type. Map 54.

Closely related to the cultivated *D. longan* subsp. *longan*, differing especially in the absence of leaf glands and narrower panicles.

**13. DICTYONEURA**

*Dictyoneura* Blume, *Rumphia* 3: 163 (1847); from the Greek *dictyon* (net) and *neuro* (strongly nerved), referring to the dense reticulation of nerves on the leaflets.

Type: not designated.

Small trees, monoecious. Branchlets glabrous except at apex; indumentum of simple hairs. Leaves paripinnate; leaflets entire, crenate or serrulate, thinly coriaceous or ±membranous, densely reticulate-nerved, usually lepidote, petiolulate or subsessile. Inflorescence axillary, spike-like, rarely branched; cymules clustered, few-flowered. Flowers regular, pedicellate. Calyx 4- or 5-partite, 2-seriate. Petals absent. Disc regular, hairy. Stamens 5; filaments filiform, hairy. Ovary 2- or 3-sulcate, slightly compressed, 2- or 3-locular; ovule 1 per locule, 1 or 2 abortive; style short. Fruit obovoid or subglobose, usually small, 1-seeded, loculicidally dehiscent; endocarp bony. Seed ellipsoidal with cupular, bilobed ventral aril at base.

A genus of 9 species occurring in Malaysia, Philippines, New Guinea and Australia; one non-endemic species in Australia, in N Qld.

L.A.T.Radlkofer in C.Lauterbach, *Beitr. Fl. Papuasien* 7: 292–294 (1921); L.A.T. Radlkofer, *Pflanzenr.* 98: 1219–1224 (1933).

The delicately and elegantly veined thin leaflets and the peppercorn-like fruit are distinctive.

**Dictyoneura microcarpa** Radlk., *Bot. Jahrb. Syst.* 56: 293 (1920)

T: New Guinea, collector unknown; *n.v.*

Tree to 3 m. Branchlets and leaf axes puberulous to glabrous. Leaf rachis 4.5–9 cm long, narrowly winged towards apex; leaflets 3–6 pairs, opposite or subopposite, narrowly elliptic or ovate-oblong, acute or ±acuminate, entire or remotely serrulate towards apex, 2.7–10.5 cm long, 1–3.5 cm wide, glabrous except hairy midrib, ±membranous, densely and finely reticulate; lateral nerves usually with hairy tufts in axils; petiolule 1–3 mm long; petiole 1–1.5 cm long. Pedicels 1.5 mm long. Calyx lobes orbicular to elliptic, 1.5–2.5 mm long, membranous. Fruit orange-yellow, 7 mm long, rugose, glabrous; valves glabrous inside.

Occurs on Cape York Peninsula, Qld, and in New Guinea; usually along creeks and rivers, in rainforest. Map 55.

Qld: Claudie River, *B.P.M.Hyland* 2930 (BRI). Bamaga, *L.J.Webb* & *J.G.Tracey* 8023 (BRI); Bamaga, *L.S.Smith* 12375 (BRI).

Flowers and fruit described from New Guinea material; not yet seen in Australian collections.

## 14. GUIOA

*Guioa* Cav., *Icon.* 4: 49, t. 373 (1797); named after J.Guio, an 18th century Spanish botanist.

Type: *G. lentiscifolia* Cav.

Trees, monoecious. Leaves paripinnate; leaflets usually opposite, entire or crenulate-serrulate, pale and glaucous below, pellucid-punctate. Inflorescence panicle-like, axillary or ramiflorous, solitary or clustered; cymules stalked. Flowers small, regular or slightly irregular; pedicels slender. Calyx 5-sect, lobes 2-seriate, orbicular or elliptic, unequal. Petals 5, subobovate or subrhomboidal, usually clawed; scales 2-lobed, hairy, usually slender and crested. Disc unilateral or complete, glabrous. Stamens 6–8; filaments usually pilose. Ovary 3-locular; ovule 1 per locule; style filiform; stigma 3-lobed. Fruit broadly obcordate, deeply 3-lobed, apiculate, loculicidally dehiscent; valves thick, glabrous. Seed ellipsoidal; aril thin, tailed, nearly enclosing seed.

A genus of c. 78 species in SE Asia, Pacific Islands, New Guinea and Australia; 5 species in eastern Australia, 3 endemic.

K.Domin, *Biblioth. Bot.* 89: 349 (1927); L.A.T.Radlkofer, *Pflanzenr.* 98: 1157 (1933); S.T.Reynolds, *Austrobaileya* 2: 36–40 (1984).

Leaflets in this genus usually dry glaucous or subglaucous on the lower surfaces. The fruit with compressed wing-like lobes is distinctive.

- |    |   |                                  |
|----|---|----------------------------------|
| 1  | Leaflets 6–9 pairs, crenate-serrulate   | <b>1. <i>G. crenifoliola</i></b> |
| 1: | Leaflets 2–4 pairs, entire  |                                  |
| 2  | Indumentum on branchlets, leaves and peduncles of ferruginous long hairs  | <b>2. <i>G. lasioneura</i></b>   |
| 2: | Indumentum if present of short pale brown hairs   |                                  |
| 3  | Domatia solitary, towards base of leaflet; inflorescences slender, usually clustered, ramiflorous or axillary; leaflets 2–4 pairs, not glaucous below | <b>3. <i>G. acutifolia</i></b>   |
| 3: | Domatia absent; inflorescences usually solitary in each axil; leaflets 1 or 2 pairs, usually glaucous below   |                                  |
| 4  | Leaflets broad, obtuse or rounded at apex, acute at base; margins flat; flowers 4 mm diam.; fruit 6–10 mm long, 10–13 mm diam.                        | <b>4. <i>G. semiglauca</i></b>   |
| 4  | Leaflets acuminate or acute at both ends; margins recurved; flowers 6 mm diam.; fruit 12–16 mm long, 22–25 mm diam.                                   | <b>5. <i>G. montana</i></b>      |

**1. *Guioa crenifoliola*** Merr. & Perry, *J. Arnold Abor.* 21: 514 (1940)

T: Bernhard Camp, Idenburg River, New Guinea, Mar. 1939, *L.J.Brass* 13082; iso: BRI.

Illustration: S.T.Reynolds, *Austrobaileya* 2: fig. 2K–L (1984).

Tree to 18 m. Branchlets and leaves glabrous. Leaf rachis 5.5–17 cm long, semiterete, dilated; leaflets 6–9 pairs, elliptic-oblong or subovate-oblong, subfalcate, abruptly shortly acuminate, crenulate-serrulate, 2.8–6.3 cm long, 1–2 cm wide; lateral nerves usually with solitary domatia towards base; petiolules 1–3 mm long; petiole 3.5–4 cm long.

Inflorescence 6–13 cm long. Flowers 7 mm diam.; pedicel 3 mm long. Calyx lobes 2–4 mm long and as wide. Petals 4 mm long, 2.5 mm wide. Disc unilateral. Fruit not seen.

Occurs on Cape York Peninsula, Qld, and in New Guinea, growing in rainforest. Map 56.

Qld: Windsor Tableland, NE of Mt Carbine, *B.P.M.Hyland 2311* (BRI); China Camp, NW of Thornton Peak, *L.J.Webb & J.G.Tracey 13314* (BRI).

*G. crenifoliola* is easily distinguished by the crenate serrulate margins and by the greater number of leaflets than other species. The description of the flowers is taken from New Guinea material.

**2. *Guioa lasioneura* Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 9: 608 (1879)**

T: Rockingham Bay, Qld, *J.Dallachy; n.v.*

Illustration: S.T.Reynolds, *Austrobaileya* 2: fig. 2M–N (1984).

Tree to 15 m. Young parts, branchlets, leaves and peduncles densely or sparsely ferruginous hirsute. Leaf rachis 1–3.5 cm long; leaflets 1 or 2 pairs, elliptic to elliptic-ovate, acute or acuminate, entire, 3.5–12.5 cm long, 1.5–4 cm wide, lower surface whitish; petiolules 2–5 mm long, petiole 1–4 cm long. Inflorescences clustered, axillary or ramiflorous, to 10.5 cm long; peduncle very slender; pedicels 2 mm long. Calyx lobes 1.5–2.5 mm long. Petals shorter. Disc unilateral. Capsule pink-purple, 0.8–1.4 cm long, 1–2.2 cm diam.

Occurs in N Qld on mountain ranges between Cooktown and Proserpine. Map 57.

Qld: Freshwater Ck, c. 10 km S of Cairns, *C.H.Gittins 2203* (BRI, NSW); Gadgarra & Ghurka Pocket, *L.S.Smith 10142* (BRI, NSW); McDowall Range, between Daintree and Bloomfield Rivers, *L.J.Webb & J.G.Tracey 10852* (BRI).

Easily distinguished by its ferruginous hirsute indumentum and very fragile flowers.

**3. *Guioa acutifolia* Radlk., *Act. Congr. Bot. Amsterdam* 81 (1877), = *Sapind. Holl.-Ind.* 11 (1879)**

*Nephelium semiglaucum* var. *acutifolium* (Radlk.) J.F.Bailey & C.White, *Queensland Bot. Bull.* 18: 6 (1916). T: Port Dennison, Qld, *E.Fitzalan*; syn: *n.v.*; Rockingham Bay, Qld, *J.Dallachy, n.v.*; Mossman River, Qld, *W.Hill; n.v.*

Illustration: S.T.Reynolds, *Austrobaileya* 2: 40 fig. 2A (1984).

Tree to 20 m. Branchlets and leaves glabrous. Leaf rachis 2.5–9 cm long; leaflets 4–6, rarely 8, opposite or alternate, narrowly elliptic-oblong or ovate-elliptic, ±falcate, acute or acuminate, entire, 5.5–17.5 cm long, 1.8–6.5 cm wide; lateral nerves usually with solitary domatium towards base; petiolules 3–10 mm long; petiole 1.2–3 cm long. Inflorescences raceme- or panicle-like, clustered, ramiflorous or axillary, to 14 cm long; peduncles slender, puberulent; pedicels 2–2.5 mm long. Calyx lobes 1.5–2.5 mm long. Petals minute, half as long as calyx; scales crested or not. Disc complete or incomplete. Capsule 1–1.2 cm long, 1–2.2 cm diam., pale yellow or reddish. Fig. 11D–F.

Occurs in coastal Qld from Cape York Peninsula to near Gympie, including offshore islands; also in New Guinea. Usually grows along creeks and the beach. Map 58.

Qld: McKell Road on way to crater, Atherton Tableland, *A.K.Irvine 1504* (BRI); Bamaga, *W.T.Jones 21525* (BRI); Fraser Is., Oct. 1919, *W.R.Petrie* (BRI); 15 km NW Cardwell, *A. & M.Thorsborne & W.Travers 462* (BRI).

Very variable in size, shape and arrangement of leaflets. The solitary prominent domatium towards the base of the leaflet is distinctive.



**Figure 11.** A–F, *Guioa*. A–C, *G. montana*. A, flowering habit  $\times 0.7$ ; B, male flower  $\times 4$ ; C, petal  $\times 8$  (A–C, B.Hyland 7021, BRI). D–F, *G. acutifolia*. D, flowering habit  $\times 0.7$  (J.Tracey 14432, BRI); E, fruit  $\times 2$ ; F, seed with aril  $\times 2$  (E–F, J.Clarkson 2852, BRI). G–L, *Lepiderema*. G–K, *L. pulchella*. G, flowering habit  $\times 0.7$ ; H, male flower  $\times 4$ ; I, petal  $\times 8$ ; J, sepal  $\times 8$  (G–J, L.Bird, BRI 260164). K, fruits  $\times 0.7$  (D.Jones 6, BRI); L, *L. sericolignis*, fruits  $\times 0.7$  (L.Smith 11587, BRI).

**4. *Guioa semiglauca*** (F.Muell.) Radlk., *Act. Congr. Bot. Amsterdam* 107 (1877), = *Sapind. Holl.-Ind.* 38 (1879)

*Arytera semiglauca* F.Muell., *Trans. & Proc. Philos. Inst. Victoria* 3: 25 (1859); *Cupania semiglauca* (F.Muell.) F.Muell. ex Benth., *Fl. Austral.* 1: 457 (1863); *Nephelium semiglaucum* (F.Muell.) F.Muell., *Fragm.* 4: 158 (1864). T: Moreton Bay, Qld, *W.Hill & F.Mueller*; n.v.

Illustration: S.T.Reynolds, *Austrobaileya* 2: 40 fig. 2D–G (1984).

Tree to 25 m; young parts, branchlets, leaf axes and peduncles finely appressed-pubescent. Leaf rachis 1–5.5 cm long; leaflets 1 or 2 pairs, occasionally 3, obovate-elliptic or elliptic, obtuse, apiculate, entire, 4.5–8.5 cm long, 1.5–3 cm wide, glaucous and puberulous below; petiolules 2–4 mm long; petiole 1–3 cm long. Panicles slender, axillary, to 15 cm long and wide, densely flowered; pedicels 2 mm long. Calyx lobes 1.5–2.5 mm long and wide. Petals as long as calyx, crested. Disc complete or incomplete. Capsule reddish pink, 6–10 mm long, 10–13 mm diam. Aril yellow, long-tailed.

Occurs from Mackay, Qld, to Milton, N.S.W.; on ranges and along creeks, at edge of rainforest. Map 59.

Qld: Dalrymple Heights near Eungella, July–Nov. 1947, *M.S.Clemens* (BRI); Stoney Ck, near Bundaberg, *D.Goy & L.S.Smith* 634 (BRI); Beechmont, *R.Schodde* 5589 (BRI, NSW). N.S.W.: Tweed River, opposite Stotts Is., *K.A.Williams* 75010 (BRI).

*G. semiglauca* differs from *G. acutifolia* in having 1 or 2 pairs of obtuse leaflets lacking a domatium.

**5. *Guioa montana*** C.T.White, *Contr. Arnold Arbor.* 4: 61 (1933)

T: Mt Bartle Frere, Qld, 24 Oct. 1929, *S.F.Kajewski* 1286; holo: BRI.

Illustration: S.T.Reynolds, *Austrobaileya* 2: 40 fig. 2H–J (1984).

Tree to 20 m. Branchlets, leaf axes and peduncles appressed pubescent or puberulent. Leaf rachis 1.5–2.5 cm long; leaflets 1 or 2 pairs, occasionally 3, usually elliptic, acute or acuminate, apiculate, entire, slightly recurved, 4–10 cm long, 1.5–4 cm wide, coriaceous, coarsely prominently reticulate; lower surface pale, puberulent; petiolules 2–10 mm long; petiole 1–2.5 cm long. Panicles axillary, 3–12 cm long, to 7 cm wide, laxly flowered; pedicels 4 mm long. Calyx lobes 2.5–3.5 mm long, 1.5–2.5 mm wide. Petals as long as calyx; scales linear, crested. Disc complete. Capsule 1.2–1.6 cm long, 2–2.5 cm diam. Fig. 11A–C.

Occurs in N Qld between Mossman and Ravenshoe, in montane rainforest. Map 60.

Qld: near Mt Lewis, *B.P.M.Hyland* 7021 (BRI); near Atherton, *B.P.M.Hyland* 1628 (QRS); Mt Bellenden Ker, 1.4 km SE of Centre Peak, *L.S.Smith* 14705A (BRI); Koolmoon Ck, near Ravenshoe, *K.J.White* 888 (BRI).

*G. montana* is very close to *G. semiglauca* differing only in the acuminate or acute leaf apex and the larger flowers and fruits.

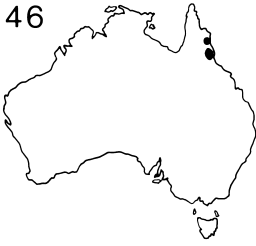
### Imperfectly known species

*Guioa chrysantha* Radlk., *Repert. Spec. Nov. Regni Veg.* 20: 28 (1924)

T: Richmond River, N.S.W., *C.Moore*; n.v.



46



47



48



49



50



51



52



53



54



55



56



57



58



59



60



46. *Harpullia frutescens*  
 49. *Harpullia leichhardtii*  
 52. *Harpullia pendula*  
 55. *Dictyoneura microcarpa*  
 58. *Guioa acutifolia*

47. *Harpullia rhyticarpa*  
 50. *Harpullia hillii*  
 53. *Dimocarpus australianus*  
 56. *Guioa crenifoliola*  
 59. *Guioa semiglaucua*

48. *Harpullia ramiflora*  
 51. *Harpullia arborea*  
 54. *Dimocarpus leichhardtii*  
 57. *Guioa lasioneura*  
 60. *Guioa montana*

## 15. LEPIDEREMA

*Lepiderema* Radlk., *Act. Congr. Bot. Amsterdam* 250, 535 (1877), = *Sapind. Holl.-Ind.* 180, 165 (1879); from the Greek *lepidos* (a scale) and *eremos* (deprived of), referring to the petals lacking scales.

Type: *L. papuana* Radlk.

Shrubs or trees, usually monoecious. Branchlets lenticellate. Leaves paripinnate; leaflets opposite or alternate, usually pellucid-dotted, upper surface usually with appressed lepidote glands; petiolulate. Inflorescence axillary or ramiflorous, solitary or clustered, raceme-like or panicle-like; cymules stalked. Flowers small, regular. Calyx deeply 5-lobed, the lobes 2-seriate, or sepals free, imbricate, elliptic or obovate, concave, petaloid, the outer pair smaller, gland-dotted, ciliolate. Petals 5, obovate or elliptic, membranous; scales absent. Disc regular, glabrous. Stamens 6–8; filaments usually hairy. Ovary 3-locular; ovule 1 per locule; style slender, persistent. Fruit globose or obovoid, drying blackish, 3-locular, loculicidally dehiscent; valves drying ±woody, glabrous. Seed ellipsoidal, slightly compressed; aril thinly fleshy, oily, oblique, ventrally attached to seed and usually covering it.

A genus of 8 species in Australia and New Guinea; 6 species in Australia, all endemic.

K.Domin, *Biblioth. Bot.* 89: 351 (1927); L.A.T.Radlkofer, *Pflanzenr.* 98: 1216–1218 (1933); S.T.Reynolds, *Austrobaileya* 1: 488–493 (1982).

Characterised by the petaloid sepals, small fruits usually drying black, valves usually woody and by most species having appressed lepidote glands on the leaflets.

- |    |   |                                  |
|----|---|----------------------------------|
| 1  | Branchlets with dense rusty hirsute apex; leaflets 16–19 pairs, crenulate-serrulate                         | <b>1. <i>L. hirsuta</i></b>      |
| 1: | Branchlets usually glabrous; leaflets 2–10 pairs, entire  |                                  |
| 2  | Leaflets 9–10 pairs; panicles densely flowered, 13–40 cm long   | <b>2. <i>L. largiflorens</i></b> |
| 2: | Leaflets 2–6 pairs; panicles usually open, mostly less than 13 cm long                                      |                                  |
| 3  | Inflorescence raceme-like, less than 4.5 cm long; leaflets 2 or 3 pairs, 5–16.5 cm long, 2–6.5 cm wide      | <b>3. <i>L. sericolignis</i></b> |
| 3: | Inflorescence panicle-like, more than 4.5 cm long; leaflets usually 3–6 pairs, 3.5–8.5 cm long, 1–4 cm wide |                                  |
| 4  | Petiolules less than 3 mm long; flowers orange-yellow   | <b>4. <i>L. pulchella</i></b>    |
| 4: | Petiolules 3–12 mm long; flowers usually pink   |                                  |
| 5  | Fruit viscid, obovoid; calyx lobes persistent; midrib central   | <b>6. <i>L. ixiocarpa</i></b>    |
| 5: | Fruit not viscid, subglobose; calyx lobes caducous; midrib excentric  | <b>5. <i>L. punctulata</i></b>   |

**1. *Lepiderema hirsuta*** S.Reyn., *Austrobaileya* 1: 489 (1982)

T: Oliver Creek, tributary of Noah Creek, Qld, 21 Aug. 1972, *L.J.Webb & J.G.Tracey 10891*; holo: BRI.

Illustration: S.T.Reynolds, *op. cit.* fig. 39A.

Tree to 10 m. Young parts, branchlets and leaf axes ferruginous-hirsute. Leaf rachis 19–57 cm long; leaflets 16–19 pairs, narrowly oblong-ovate or elliptic, caudate, bluntly acuminate, entire to remotely crenulate-serrulate, oblique and obtuse or truncate at base, 6.5–19.5 cm long, 0.8–4 cm wide, glabrous except midribs, pellucid-dotted; petiolules 2–3 mm long; petiole 4.5–16 cm long. Panicles ramiflorous, clustered, to 7 cm long, few-flowered; pedicels 3 mm long. Calyx lobes 3–4.5 mm long, 1.5–2.5 mm wide. Petals 2.5 mm long, 1.5 mm wide, pink. Filaments to 2 mm long. Fruit obcordate, 1.8–2 cm long, 1.5–1.8 cm diam., reddish-pink; calyx lobes persistent.

Occurs in Cape Tribulation area, N Qld, in rainforest. Map 61.

Qld: Arsenic Ck (Oliver Ck), *G.C.Stocker 1586* (BRI); McDowall Range, *L.J.Webb & J.G.Tracey 13127* (BRI).

Distinguished by the densely hirsute branchlets and crenulate-serrulate leaflets.

## 2. *Lepiderema largiflorens* S.Reyn., *Austrobaileya* 1: 489 (1982)

T: Bartle Frere, Qld, May 1952, *K.J.White 198*; holo: BRI.

Illustration: S.T.Reynolds, *op. cit.* fig. 39F.

Tree to 7 m. Young parts and inflorescence puberulent, otherwise glabrous. Leaf rachis 28–32.5 cm long; leaflets 9 or 10 pairs, narrowly elliptic or ovate-oblong, tapering, acuminate, entire, broadly obtuse and unequal at base, 8–18 cm long, 2–5 cm wide, glabrous except midrib, pellucid-dotted; petiolules 4–8 mm long; petiole 6.5–9 cm long. Panicles ramiflorous, 13–40 cm long, densely flowered; pedicels 3–4 mm long. Calyx lobes 2.5–4 mm long, 2–4 mm wide, membranous. Petals 2.5–3 mm long, 2 mm wide, cream. Filaments to 2 mm long. Fruit obovoid, apiculate, 1.3–1.5 cm long, 1.2 cm diam.; calyx lobes usually persistent.

Occurs on Atherton Tableland, Qld, in rainforest. Map 62.

Qld: State Forest Reserve 755, near Bartle Frere, *D.Fitzsimon 115* (BRI); Topaz, near Malanda, *L.S.Smith 3309* (BRI).

Characterised by the large inflorescence and glabrous leaves with up to 10 pairs of leaflets.

## 3. *Lepiderema sericolignis* (Bailey) Radlk., *Repert. Spec. Nov. Regni Veg.* 20: 29 (1924)

*Cupania sericolignis* Bailey, *Queensland Dept. Agric. Bot. Bull.* 5: 11 (1892). T: Barron River Kamerunga, near Cairns, Qld, May 1892, *E.Cowley 69a*; lecto: BRI, *vide* L.Radlkofer, *Pflanzenr.* 98: 1217 (1933), by exclusion of collection from Mulgrave R. which is *Guioa acutifolia*.

Illustration: S.T.Reynolds, *Austrobaileya* 1: fig. 39B (1982).

Tree to 4 m. Branchlets, leaves and peduncles glabrous. Leaf rachis 4–14 cm long; leaflets 2 or 3 pairs, rarely 4, elliptic-oblong or ovate-oblong, obtuse or shortly acuminate, entire, oblique and acute or obtuse at base, 5–16.5 cm long, 2–6.5 cm wide; petiolules 3–7 mm long, mainly pulvinus; petiole 2–7 cm long. Inflorescence ramiflorous, raceme-like, 2–4.5 cm long, few-flowered; pedicels 2 mm long. Calyx lobes hyaline, 1.5–2.5 mm long, 1–2 mm wide. Petals as long as calyx, white. Filaments 1–1.5 mm long. Fruit globose to ellipsoidal, 1–1.5 cm long and wide; valves apricot outside, red inside; calyx lobes persistent. *Silkwood*. Fig. 11L.

Occurs in N Qld, in riverine rainforest between Mossman and Mt Fox. Map 63.

Qld: Mt Fox, 2–4 Dec. 1949, *M.S.Clemens* (BRI); Daintree at Ferry Crossing, *B.P.M.Hyland 7045* (BRI); Mossman Gorge, *J.Wrigley & I.Telford NQ 1164* (BRI).

*L. sericolignis* differs from other species in its broad, 2- or 3-paired leaflets and usually small inflorescence.

## 4. *Lepiderema pulchella* Radlk., in Engl. & Prantl, *Nat. Pflanzenfam. Nachtr.* 3 to 3(5): 206 (1907)

T: cultivated at Royal Botanic Gardens, Sydney, N.S.W., Dec. 1896, from unknown locality, sent by *J.H.Maiden*; *n.v.*

Illustration: S.T.Reynolds, *Austrobaileya* 1: fig. 39C (1982).

Tree to 15 m. Branchlets, leaves and peduncles glabrous. Leaf rachis 2–6.5 cm long; leaflets 2–4 pairs, sometimes 1, narrowly oblong-ovate to elliptic, ±falcate, tapering, bluntly acuminate, entire, oblique and attenuate at base, 4–8 cm long, 1–2.3 cm wide; petiolules to 3 mm long; petiole 1.5–2.5 cm long. Panicles axillary, 5.5–12 cm long, openly flowered; pedicels 2–3.5 mm long. Calyx lobes 1.5–3.5 mm long. Petals

yellow-orange. Fruit subglobose, shortly attenuate at base, or ellipsoidal, 0.8–1.4 cm long, 0.8–1 cm diam., brown. Aril yellow. Fig. 11G–K.

Occurs from south-eastern Qld to Tweed River, N.S.W.; grows on creek and river banks and at edge of rainforest. Map 64.

Qld: Currumbin Ck, Sept. 1980 & Dec. 1981, *L.H.Bird* (BRI); Warrie National Park, Springbrook, June 1978, *W.J.F.McDonald* & *L.W.Jessup* (BRI). N.S.W.: Hopkins Ck, near Murwillumbah, Sept. 1965, *C.E.Lemaire* (BRI, NSW); Terranora, Dec. 1961, *A.S.Tricks* (BRI).

Close to *L. punctulata* differing in its narrow, shortly stalked leaflets and orange-yellow flowers.

**5. *Lepiderema punctulata* (F.Muell.) Radlk., Repert. Spec. Nov. Regni Veg. 20: 30 (1924)**

*Cupania punctulata* F.Muell., *Fragm.* 3: 12 (1862); *Cupaniopsis punctulata* (F.Muell.) Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 9: 521, 530, 585 (1879). *Ratonia punctulata* (F.Muell.) Bailey, *Queensland Fl.* 1: 297 (1899). T: Cumberland Islands, Qld, *E.Fitzalan*; n.v.

Illustration: S.T.Reynolds, *Austrobaileya* 1: fig. 39E (1982).

Tree to 10 m. Young parts slightly viscid; branchlets, leaves and peduncles glabrous. Leaf rachis 4.5–8.5 cm long; leaflets 3–5 pairs, obliquely ovate-oblong to elliptic, acuminate or acute, entire, abruptly obtuse at base, and decurrent into petiolule, 3.5–8 cm long, 1.5–3.5 cm wide, pellucid-dotted; midrib excentric; petiolule 3–12 mm long; petiole 2.5–4.5 cm long. Panicles ramiflorous or axillary, 5.5–9.5 cm long, openly flowered; peduncles resin-dotted; pedicels 1–1.5 mm long, resin-dotted. Calyx lobes 1.5–2.5 mm long, 1–2 mm wide. Petals 2–2.5 mm long, 1.5–2 mm wide, gland-dotted. Filaments 3.5–4 mm long. Fruit obovoid to globose, 1–1.2 cm long and wide.

Occurs in coastal Qld from Proserpine to Bustard Head; usually in mixed forests, on granite. Map 65.

Qld: Gregory River near Mt Dryander, *N.Michael 1099* (BRI); Eurumbula near Bustard Head, Jan. 1906, *J.Keys* (BRI).

*L. punctulata* differs from most species in having pellucid-dotted leaflets and pink flowers.

**6. *Lepiderema ixiocarpa* S.Reyn., *Austrobaileya* 1: 492 (1982)**

T: State Forest Reserve 251, Ismailia near Ravenshoe, Qld, 17 June 1954, *E.Volck 761*; holo: BRI.

Illustration: *S.T.Reynolds, op. cit.* fig. 39D.

Tree to 7 m. Young parts, peduncles and fruits viscid; branchlets, leaves and flowers puberulent or glabrescent. Leaf rachis 5.5–23.5 cm long; leaflets 4–6 pairs, ovate to oblong, attenuate to caudate, entire, oblique at base and shortly attenuate 3.5–8.5 cm long, 1.5–3.7 cm wide, pellucid-punctuate; petiolule 6–11 mm long; petiole 2.2–6.5 cm long. Panicles axillary or ramiflorous, 6.5–29 cm long; peduncles resin-dotted; pedicels 2–2.5 mm long. Calyx lobes 1.5–3.5 mm long, 1.5–2.5 mm wide, pink-red. Petals 2.5 mm long, 1.5 mm wide. Filaments 2–3 mm long. Fruit broadly obovoid, 1–1.6 cm long, 1.3.6 cm diam.; calyx lobes persistent.

Occurs in N Qld from Mareeba to Cardwell Range; grows in rainforeston basalt. Map 66.

Qld: State Forest Reserve 185, near Mareeba, *B.P.M.Hyland 5016* (BRI, NSW); Kirrama, W of Cardwell, Oct. 1969, *R.Mazlin* (BRI); Mt Haigh, near Tully Falls, *T.S.Risley 112* (QRS).

Differs from *L.punctulata* chiefly in the obovoid, very viscid fruit.

## 16. CUPANIOPSIS

*Cupaniopsis* Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 9: 498, 584 (1879); from *Cupania* named after Italian monk Francesco Cupani (1657–1710) author of *Sicilian Plants*; and from the Greek *-opsis* (resemblance) referring to close relationship to *Cupania*.

T: *C. anacardioides* (A.Rich.) Radlk.

Monoecious or dioecious trees. Branchlets lenticellate, indumentum of simple hairs. Leaves paripinnate; leaflets opposite or alternate, entire to serrate. Inflorescences axillary, raceme-like or panicle-like. Flowers regular, small. Calyx 5-lobed, lobes 2-seriate, imbricate, outer lobes smaller, suborbicular or elliptic, concave. Petals 5, sessile; scales 2, oblong, hairy, crestless. Disc annular, crenate. Stamens 6–10; filaments filiform, pilose in lower half; anthers glabrous. Ovary usually 3-locular; ovule 1 per locule; style short, persistent. Fruit obovoid to subglobose, usually cuspidate, 3-lobed, 3-locular, loculicidally dehiscent; valves slightly fleshy, villous inside. Seed ellipsoidal; aril thin, cupular with erose margin, usually nearly enclosing seed.

A genus of c. 66 species in New Guinea, New Caledonia, Fiji and Australia; 11 species in Australia, all endemic.

K.Domin, *Biblioth. Bot.* 89: 349 (1927); L.A.T.Radlkofer, *Pflanzenr.* 98: 1177–1208 (1933); S.T.Reynolds, *Austrobaileya* 2: 44–52 (1984).

*Cupaniopsis* distinguished by the insides of the subglobose or obovoid capsules being villous, the cupular aril nearly enclosing the seed and the sepals being usually silky outside.

- |    |   |                            |
|----|---|----------------------------|
| 1  | Leaflets cuneate, truncate, lobed or toothed at apex; uppermost pair the largest  |                            |
| 2  | Leaflets serrate, 3–5 pairs; inflorescence spike-like   | 1. <i>C. shirleyana</i>    |
| 2: | Leaflets entire, 1 or 2 pairs; inflorescence raceme-like  | 2. <i>C. wadsworthii</i>   |
| 1: | Leaflets obovate, elliptic or oblong-ovate, obtuse, truncate, retuse or acuminate; uppermost pair usually same size as others |                            |
| 3  | Domatia present   |                            |
| 4  | Leaflets crenate-serrulate or subentire, acuminate or acute   | 3. <i>C. foveolata</i>     |
| 4: | Leaflets entire, obtuse or retuse   |                            |
| 5  | Domatia inconspicuous, usually along whole midrib; branchlets usually densely lenticellate                                    | 4. <i>C. dallachyi</i>     |
| 5: | Domatia prominent, 1–5 per leaflet; branchlets sparsely lenticellate  | 7. <i>C. fleckeri</i>      |
| 3: | Domatia absent  |                            |
| 6  | Leaflets entire, usually glabrous; flowers and fruits pedicellate   |                            |
| 7  | Lateral nerves 6–20 mm apart; leaflets and panicles usually more than 7 cm long   | 5. <i>C. anacardioides</i> |
| 7: | Lateral nerves 2–5 mm apart; leaflets and panicles less than 7 cm long  | 6. <i>C. parvifolia</i>    |
| 6: | Leaflets serrate, serrulate or almost entire; usually hairy at least on nerves; flowers and fruits sessile or subsessile      |                            |
| 8  | Leaflets glabrous or lower surface puberulous especially on midrib and nerves   |                            |
| 9  | Leaflets usually 3–5 pairs, tapering, acuminate, or cuspidate, serrate; inflorescence 1–6.5 cm long, rarely branched          | 8. <i>C. serrata</i>       |
| 9: | Leaflets usually 6–12 pairs, apex serrulate to almost entire; inflorescence to 55 cm, branches usually nearly as long         |                            |

- 10** Petiole 8–16 cm long; leaflets usually 8–12 pairs; panicles to 21 cm long, the branches short and spreading or long and pendulous; small unbranched trees **9. C. newmanii**
- 10:** Petiole 3.5–9 cm long; leaflets usually 6–10 pairs; panicles to 55 cm long, the branches usually long, pendulous; tree with spreading crown **10. C. flagelliformis**
- 8:** Leaflets hairy especially below on midrib and nerves
- 11** Leaflets 3 or 4 pairs, serrulate, sinuate or subentire; branches of panicle patent, to 5.5 cm long **11. C. tomentella**
- 11:** Leaflets 6–10 pairs, serrate or serrulate; branches of panicle  $\square$  pendulous to 60 cm long **10. C. flagelliformis**

**1. Cupaniopsis shirleyana** (Bailey) Radlk., *Repert. Spec. Nov. Regni Veg.* 20: 32 (1924)

*Cupania shirleyana* Bailey, *Syn. Queensland Fl. Suppl.* 2: 15 (1888). T: Sankeys Scrub, off Logan Rd, Brisbane, Qld, *F.M. Bailey*; holotype: BRI.

Illustration: S.T. Reynolds, *Austrobaileya* 2: 52 fig. 4P (1984).

Tree to 10 m. Young parts, branchlets, leaf axes and peduncles pubescent. Leaf rachis 4.5–8 cm long; leaflets 3–7 pairs, broadly or narrowly cuneate, truncate, mucronate, irregularly serrate or serrulate, cuneate at base, 0.8–5.5 cm long, 0.8–3 cm wide, glabrous above, pubescent or puberulent below, midribs hairy; lowermost pair stipule-like; petiolule to 1 mm long; petiole 2–5 mm long. Inflorescence spike-like, 5–18 cm long. Calyx lobes 4–5 mm long, pubescent outside. Petals obovate, 2 mm long, hairy outside. Disc glabrous. Fruit subglobose, 1.5–1.7 cm long and wide, velvety, orange; valves thin, puberulous inside. Aril orange-red.

Occurs in south-eastern Qld, in dry rainforest. Map 67.

Qld: Cedars Bridge Crossing, Burnett River, 5 km S of South Kolan, *L.K. Bates 335* (BRI); Pine Mtn Reserve, near Carina, Brisbane, Dec. 1982, *L.H. Bird* (BRI); Rosedale, *L.G. Dovey 535* (BRI); Bundaberg, Sept. 1981, *M.G. Lithgow* (BRI).

The small, serrate, cuneate leaflets with the lowermost pair stipule-like, and the spike-like inflorescence distinguish this species.

**2. Cupaniopsis wadsworthii** (F. Muell.) Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 9: 530, 534, 585 (1879)

*Harpullia wadsworthii* F. Muell. *Fragm.* 4: 1, t. 26 (1863); *Cupania wadsworthii* (F. Muell.) F. Muell., *Census Austral. Pl.* 24 (1882). T: Rockhampton, Qld, *Thozet & J. Dallachy*; n.v.

Illustration: S.T. Reynolds, *Austrobaileya* 1: 52 fig. 40 (1984).

Slender shrub to 3 m. Branchlets, leaf axes and peduncles sparsely or densely pale appressed villous; branchlets and petioles with minute lenticels. Leaf rachis 10–20 mm long; leaflets 1 or 2 pairs, broadly cuneate, truncate or broadly 2- or 3-lobed, entire except juveniles, 1.3–3.5 cm long and wide, cuneate and oblique at base, glabrous; petiolules 1–2 mm long; petiole 2–25 mm long. Inflorescence raceme-like, 5–12.5 cm long, openly flowered; pedicels 1.5–4 mm long. Calyx lobes 4 mm long, puberulous outside. Petals ovate, 2–3 mm long; scales longer, densely hairy. Disc glabrous. Fruit obovoid, to 1.5 cm long, 2 cm diam., pubescent or puberulent; valves thin, puberulent inside.

Occurs in Qld from Shute Harbour to Bulburin; usually grows on hill slopes in rocky soil. Map 68.

Qld: Cape Hillsborough, *B.P.M. Hyland 8230* (BRI); 2 km N of Yeppoon on Byfield road, *P.R. Sharpe 2382* (BRI); State Forest 54, Burnett Range, NW of Mt Perry, Nov. 1978, *J.P. Stanton* (BRI); Conway State Forest, between Airlie and Shute Harbour, *L.J. Webb & J.G. Tracey 7568* (BRI).



**Figure 12.** A–J, *Cupaniopsis*. A–B, *C. flagelliformis* var. *flagelliformis* A, flowering habit  $\times 0.7$  (B. Hyland 2107, BRI); B, fruits  $\times 0.7$  (L. Jessup 510, BRI). C–H, *C. newmanii*. C, male flower  $\times 2$ ; D, outer calyx lobe  $\times 4$ ; E, inner calyx lobe  $\times 4$  (C–E, L. Jessup 26, BRI). F, fruits  $\times 0.7$ ; G, seed with aril  $\times 0.7$  (F–G, L. Jessup & S. Reynolds 158, BRI); H, petal  $\times 2$  (L. Jessup 26, BRI). I, *C. tomentella*, fruit  $\times 0.7$  (L. Bird, BRI 283963). J, *C. fleckeri*, flowering habit  $\times 0.7$  (D. Smyth, BRI 256857). K–Q, *Rhysotoechia*. K–M, *R. mortoniana*. K, flowering habit  $\times 0.7$ ; L, petal  $\times 4$ ; M, calyx lobe  $\times 4$  (K–M, L. Webb & J. Tracey 13210, BRI). N–O, *R. bifoliolata*. N, fruit  $\times 0.7$ ; O, dehisced fruit showing seed with aril  $\times 0.7$  (N–O, C. Harman B64, BRI). P–Q, *R. robertsonii*. P, petal  $\times 8$ ; Q, fruits  $\times 0.7$  (P–Q, A. Dockrill 1082, BRI).

*C. wadsworthii* is distinguished by its 1- or 2-paired, entire, cuneate leaflets and subracemose inflorescences.

**3. Cupaniopsis foveolata** (F.Muell.) Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 9: 514, 530, 585 (1879)

*Cupania foveolata* F.Muell., *Fragm.* 9: 95 (1875). T: Nulla-Nulla, McLeay River, Bellinger River, N.S.W., Carson; syn: *n.v.*; Rockingham Bay, Qld, *J.Dallachy*; syn: NSW; Moeresby Range, Qld, *W.Hill*; syn: *n.v.*

*Cupaniopsis baileyana* Radlk., *Repert. Spec. Nov. Regni Veg.* 20: 32 (1924). T: Mt Mistake, Qld, *F.M.Bailey*; holo: BRI.

Illustration: S.T.Reynolds, *Austrobaileya* 2: 52 fig. 4E (1984).

Tree to 25 m. Young parts, branchlets, leaf axes and peduncles minutely puberulous to glabrous; branchlets and petioles lenticellate. Leaf rachis 6.5–14 cm long; leaflets 8–16, rarely to 20, narrowly oblong-elliptic or oblong-ovate, acuminate to obtuse, remotely crenate-serrulate or subentire, obtuse or acute and slightly decurrent at base, 4.5–9 cm long, 1.5–2 cm wide, glabrous; domatia present; petiolules 4–10 mm long; petiole 3.5–5.5 cm long. Panicles 6.5–10 cm long; pedicels 2–4 mm long. Calyx lobes 2.5–4 mm long, puberulous or glabrous. Petals ovate, 2 mm long; scales shorter. Disc tomentose. Fruit shortly stipitate, subglobose, apiculate, 1–1.3 cm long and wide, glabrescent; valves thin, villous inside. Aril orange. *White Tamarind*.

Occurs from McIlwraith Range, N Qld, to Bulga Plateau, N.S.W.; usually in rainforest at high altitude. Map 69.

Qld: Mt Fox, Sept.–Dec. 1949, *M.S.Clemens* (BRI); Springbrook, *W.J.F.McDonald & W.G.Whiteman* 2819 (BRI); Kuranda, *L.J.Webb & J.G.Tracey* 5721 (BRI). N.S.W.: Dorrigo, 24 Dec. 1951, *J.King* (NSW).

Differs from other species in its crenate-serrate leaflets and in the prominent domatia along the midrib.

**4. Cupaniopsis dallachyi** S.Reyn., *Fl. Australia* 25: 199 (1985)

T: Jaggan, near Malanda, (17°23'S 145°36'E), Qld, 30 Sept. 1980, *G.C.Stocker* 1773; holo: BRI, iso: QRS.

Tree. Branchlets, leaf axes and peduncles finely rusty puberulent to glabrescent, lenticellate. Leaf rachis 5.5–17.5 cm long; leaflets 4–14, elliptic-oblong to obovate, obtuse, subretuse, entire, oblique and obtuse or ±acute at base, 6–13 cm long, 3–5.5 cm wide, glabrous, drying thick, domatia small, usually present along whole midrib; petiolules 5–12 mm long, petiole 2–5.5 cm long. Flowers not seen. Infructescence 12–25 cm long. Fruit shortly stipitate, obovoid to ellipsoidal, brown, drying slightly carinate at sutures, 2–3 cm long, 2–2.5 diam., glabrous; valves thick, red-brown crispate-tomentose inside. Seed covered in brown aril.

Occurs in N Qld from near Daintree to S of Ravenshoe, in rainforest. Map 70.

Qld: State Forest Reserve 251, S of Ravenshoe, *B.Gray* 1037 (BRI); State Forest Reserve 78, near Daintree, *B.P.M.Hyland* 3485 (BRI).

*C. dallachyi* is close to *C. anacardioides* differing chiefly by the presence of small domatia along midrib.

**5. Cupaniopsis anacardioides** (A.Rich.) Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 9: 512, 530, 585 (1879)

*Cupania anacardioides* A.Rich., *Sert. Astrolab.* 33, t. 13 (1834). T: Moreton Bay, Qld, *C. Fraser*; *n.v.*

Illustration: S.T.Reynolds, *Austrobaileya* 2: 52 fig. 4F–G (1984).

Tree to 15 m. Branchlets and leaf axes shortly appressed pubescent to glabrous, lenticellate. Leaf rachis 2.5–13.5 cm long; leaflets 4–8, occasionally to 12, obovate or elliptic, obtuse to retuse, entire, obtuse to acute at base, 4.5–19 cm long, 1.5–7.5 cm wide, glabrous or lower surface puberulous, coriaceous; lateral nerves 6–20 mm apart;



reticulation prominent; petiolules 2–7 mm long; petiole 3–7.5 cm long. Panicles 8–35 cm long, peduncles pubescent; cymules stalked; pedicels 3–7 mm long. Calyx lobes 2.5–4 mm long, puberulent or glabrous. Petals ovate, 1.5–3 mm long; scales short. Fruit shortly stipitate, subglobose, apiculate, slightly carinate at sutures, 1.5–3 cm long, 1.5–2.2 cm diam., puberulent, golden-yellow, red-tinged; valves thick, villous inside. Aril yellow to orange-red. *Tuckeroo*.

Occurs in northern W.A., N.T. and Qld and north-eastern N.S.W. S to Port Hacking; chiefly coastal, on rocky beaches, in hilly scrub and riverine forest. Map 71.

W.A.: Port Warrender, *L.J.Webb & J.G.Tracey 13132* (BRI). N.T.: South Alligator River, *M.Parker 668* (BRI, DNA). Qld: Moreton Is., *L.R.Durrington & G.N.Batianoff 1445* (BRI); Valley of Lagoons, *B.Gray 1421* (BRI, QRS). N.S.W.: Iluka, Clarence River, *L.Pedley 949* (BRI).

Distinguished by the glabrous 2–4 paired obovate or elliptic obtuse, entire leaflets and golden-yellow red-tinged fruits. Grown as a park and street tree.

**6. *Cupaniopsis parvifolia* (Bailey) L.Johnson, *Contr. New South Wales Natl Herb.* 3: 98 (1962)**

*Cupania anacardioides* var. *parvifolia* Bailey, *Queensland Fl.* 1: 290 (1899); *Cupaniopsis anacardioides* var. *parvifolia* (Bailey) Domin, *Biblioth. Bot.* 89: 350 (1927); *Cupaniopsis anacardioides* f. *parvifolia* (Bailey) Radlk., *Pflanzenr.* 98: 1187 (1933). T: Main Range and several other localities in southern Qld, *F.M.Bailey*; syn: *n.v.*; Mt Perry, *J.Keys*; syn: BRI.

Tree to 20 m. Branchlets and leaf axes pubescent or puberulent; branchlets densely lenticellate. Leaf rachis 2–4.5 cm long; leaflets 6–8, narrowly obovate to elliptic, obtuse or retuse, entire, acute to obtuse at base, 2.5–7 cm long, 0.7–2.5 cm wide, glabrous, thickly coriaceous, shiny; lateral nerves 2–5 mm apart; petiolule 2–5 mm long; petiole 1–2.5 cm long. Panicles 2.5–7.5 cm long, peduncles tomentose; pedicels 3–5 mm long. Calyx lobes 2–3.5 mm long, puberulous or glabrous. Petals ovate, 1.5–2 mm long; scales as long. Fruit shortly stipitate, subglobose, apiculate, 8–12 mm long and wide. Aril orange-yellow.

Occurs from south-eastern Qld to Gloucester, N.S.W., usually in dry rainforest. Map 72.

Qld: Gowrie junction, Sept. 1975, *B.Gilbert* (BRI); Kragra NE of Chinchilla, Aug. 1979, *M.G.Lithgow* (BRI); Brisbane, Rafting Grounds Reserve, *L.W.Jessup & S.T.Reynolds 245* (BRI). N.S.W.: Pikapene State Forest, S of Tabulam, *H.C.Hayes, J.Turner & D.J.McGillivray 2654* (BRI, NSW).

Close to *C. anacardioides* differing mainly in its smaller leaflets with close lateral nerves.

**7. *Cupaniopsis fleckeri* S.Reyn., *Austrobaileya* 2: 47 (1984)**

T: Mt White, Coen, Qld, July 1949, *H.Flecker*; holotype: BRI.

Illustration: S.T.Reynolds, *op. cit.* 52 fig. 4Q.

Tree to 9 m. Branchlets, leaf axes and peduncles finely puberulous or glabrous; branchlets lenticellate. Leaf rachis 2–6 cm long; leaflets 8–10, obovate to elliptic, obtuse or retuse, entire, acute at base, 2–6 cm long, 1.5–3 cm wide, glabrous, thinly coriaceous; lateral nerves 4–10 mm apart, usually with domatia in some of their axils; petiolule 1–2 mm long; petiole 1.5–4 cm long. Panicles 6.5–17 cm long, openly branched; peduncles flexuose; pedicels 3–6 mm long. Calyx lobes 3.5–4 mm long, usually glabrous. Petals ovate, 3 mm long, puberulent; scales shorter. Fruit not seen.

Occurs in N Qld near Princess Charlotte Bay, in dry rainforest, usually on sandstone. Map 73.

Qld: Altanmoni near Cape Bowen, *B.P.M.Hyland 6349* (BRI); Flinders Is., Aug. 1979 & Mar. 1981, *D.Smyth* (BRI).

*C. fleckeri* is very close to *C. parvifolia* differing chiefly by the presence of prominent domatia.

**8. Cupaniopsis serrata** (F.Muell.) Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 9: 523, 530, 585 (1879)

*Cupania serrata* F.Muell., *Fragm.* 3: 43 (1862). T: Pine River, Moreton Bay, Qld, *W.Hill*; holo: MEL.

Illustration: S.T.Reynolds, *Austrobaileya* 2: 52 fig. 4C–D (1984).

Tree to 12 m. Branches, leaf axes and peduncles with spreading and appressed hairs; branchlets and petioles lenticellate. Leaf rachis 4.5–14.5 cm long; leaflets 6–12, oblong to ovate, acuminate, cuspidate, serrate or serrulate, obtuse to acute at base, 6–12.5 cm long, 2.5 cm wide, glabrous or lower surface puberulous, ±rigid, strongly nerved and reticulate below; petiolule 1–5 mm long; petiole 4–7.5 cm long. Inflorescence raceme-like or 1- or 2-branched, 1–6.5 cm long; cymules and flowers ±sessile. Calyx lobes to 5 mm long, pubescent. Petals ovate, 2.5 mm long, white. Fruit sessile, subglobose, apiculate, 1.2–1.6 cm long, 2.5–2.8 cm diam., brown velvety; valves fairly thin, silky inside, drying slightly wrinkled. Seed nearly enclosed in orange aril. Fig. 12J.

Occurs from near Gympie in south-eastern Qld to near the Tweed R., N.S.W., on rocky hillsides and in rainforest. Map 74.

Qld: Eudlo Ck, Nov. 1881, *J.H.Simmonds* (BRI); Lagoon Pocket, *C.T.White 9231* (BRI); Imbil, *C.T.White 11405* (BRI); Blackall Range, Nov. 1916, *C.T.White* (BRI). N.S.W.: Tweed R., collector unknown (NSW166304).

*C. serrata* differs from other species with serrate or serrulate leaf margins in its coarse and usually sharp serrations, small inflorescences and velvety fruits.

**9. Cupaniopsis newmanii** S.Reyn., *Austrobaileya* 2: 49 (1984)

T: Lower Beechmont Rd, 5 km from Numinbah Valley Rd intersection, Dec. 1978, *L.W.Jessup & S.T.Reynolds 158*; holo: BRI.

Illustration: S.T.Reynolds, *op. cit.* 52 fig. 4H–N.

Tree to 6 m, ±unbranched. Branchlet fluted, pale brown velvety, lenticellate; leaf axes puberulous or glabrous. Leaf rachis 14–37 cm long; leaflets 16–24, narrowly ovate to elliptic, acuminate to obtuse, irregularly serrulate, obtuse and oblique at base, 6–18 cm long, 2.5–6 cm wide, glabrous or lower surface puberulous, coriaceous; petiolule 0.8–3.0 cm long; petiole 8–16 cm long. Panicles 10–21 cm long; peduncles pubescent; pedicels 1–3 mm long. Calyx lobes 5–7 mm long, silky outside. Petals ovate, 2.5 mm long, pink-mauve; scales short. Ovary ferruginous tomentose. Fruit sessile, obovoid-obcordate, grooved at sutures, rusty with pink flush, velvety, 1.8–2.4 cm long, 1.6–2.7 cm diam.; valves thin, hairy inside, drying deeply wrinkled. Aril cupular, yellow. Fig. 12C–H.

Occurs on ranges along the border between Qld and N.S.W., on margins of rainforest. Map 75.

Qld: Springbrook, Sept. 1931, *W.Rudder* (BRI); 3 km S of Advancetown on road to Springbrook, *P.R.Sharpe & R.M.Dowling 2000* (BRI); Tamborine Mtn, *P.R.Sharpe & S.T.Reynolds 1995* (BRI). N.S.W.: Mooball State Forest, SSE of Murwillumbah, Nov. 1960, *A.G.Floyd & H.C.Hayes* (Forests Comm. N.S.W., Coffs Harbour).

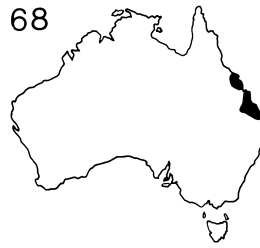
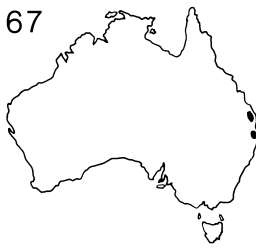
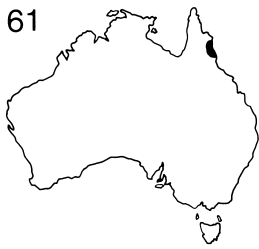
Closely related to *C. flagelliformis* differing chiefly in its slender unbranched habit, longer stalked leaflets and velvety fruits.

**10. Cupaniopsis flagelliformis** (Bailey) Radlk., *Repert. Spec. Nov. Regni Veg.* 20: 31 (1924)

*Cupania flagelliformis* Bailey, *Queensland Dept. Agric. Bot. Bull.* 8: 73 (1893). T: Barron River, Qld, *E.Cowley*; holo: BRI.

*Cupaniopsis curvidentata* (Bailey) Radlk., *Repert. Spec. Nov. Regni Veg.* 20: 31 (1924); *Cupania curvidentata* Bailey, *Queensland Agric. J.* 5: 483 (1899). T: Stony Ck, near Cairns, Qld, *L.J.Nugent*; holo: BRI

Illustration: S.T.Reynolds, *Austrobaileya* 4: 52 fig. 4R–T (1984).



61. *Lepiderema hitsuta*  
64. *Lepiderema pulchella*  
67. *Cupaniopsis shirleyana*  
70. *Cupaniopsis dallachyi*  
73. *Cupaniopsis fleckeri*

62. *Lepiderema largiflorens*  
65. *Lepiderema punctulata*  
68. *Cupaniopsis wadsworthii*  
71. *Cupaniopsis anacardioides*  
74. *Cupaniopsis serrata*

63. *Lepiderema sericolignis*  
66. *Lepiderema ixiocarpa*  
69. *Cupaniopsis foveolata*  
72. *Cupaniopsis parvifolia*  
75. *Cupaniopsis newmanii*

Tree to 25 m, with spreading crown. Young parts densely hairy, the branchlets and leaf axes rusty pubescent, lenticellate. Leaf rachis 6–18 cm long; leaflets 12–20, narrowly elliptic or oblong, subobovate or subovate, acute to obtuse, serrate or serrulate, obtuse to acute at base, 3.5–9 cm long, 1–16 cm wide, glabrous or puberulous above, pubescent or puberulent below; petiolule 2–12 mm long; petiole 3.5–9 cm long. Panicles 9–55 cm long, usually pendulous, peduncles tomentose; cymules and flowers sessile. Calyx lobes 4–5 mm long, silky outside. Petals ovate, to 2.5 mm long, pink; scales long. Fruit sessile, obovoid, ellipsoidal or depressed-globose, 3–6–sulcate, 1.5–2.2 cm long, 1.5–2.5 cm diam., villous, pinkish-brown or orange-yellow; valves densely silky inside, drying deeply wrinkled. Aril cupular, yellow-orange.

Occurs in N Qld and on ranges along border between Qld and N.S.W., in rainforest. The species is distinguished by the long pendulous branches of the inflorescence, rosy pink flowers and yellow or pinkish brown villous fruits. There are 2 varieties.

Fruit subglobose, valves thin, pink-brown; secondary peduncles to 60 cm long; leaflets 6–10 pairs

**10a. var. flagelliformis**

Fruit ellipsoidal to obovoid; valves thick, yellow; secondary peduncles to 17 cm long; leaflets 6 or 7 pairs

**10b. var. australis**

**10a. Cupaniopsis flagelliformis** (Bailey) Radlk. var. **flagelliformis**

Leaflets 6–10 pairs; petiolules 2–12 mm long. Fruit ±globose, pink-brown; valves thin. Fig. 12A–B.

Occurs in N Qld from Cape York Peninsula to Tully River. Map 76.

Qld: Ravenshoe Rd, *B.P.M.Hyland 2107* (BRI, NSW); Warramami Hill near N.Johnstone River, *S.F.Kajewski 1238* (BRI); Glen Allyn, Atherton Tableland, *L.J.Webb & J.G.Tracey 13216* (BRI).

**10b. Cupaniopsis flagelliformis** var. **australis** S.Reyn., *Austrobaileya* 2: 51 (1984)

T: Wiangaree State Forest, N.S.W., Jan. 1981, *L.H.Bird*; holotype: BRI; same locality Dec. 1982, *L.H.Bird*; paratype: BRI.

Leaflets 6 or 7 pairs; petiolules 1–4 mm long. Fruit ellipsoidal to obovoid, yellow; valves thick.

Occurs in south-eastern Qld and northern N.S.W. Map 77.

Qld: Robert Plateau, Jan. 1919, *C.T.White* (BRI, NSW). N.S.W.: Wilson Ck near Lismore, Oct. 1976, *A.G.Floyd* (Forests Comm. N.S.W.)

**11. Cupaniopsis tomentella** (F.Muell. ex Benth.) S.Reyn., *Austrobaileya* 2: 51 (1984)

*Cupania tomentella* F.Muell. ex Benth., *Fl. Austral.* 1: 458 (1863); *Cupaniopsis serrata* var. *tomentella* (F.Muell. ex Benth.) Domin, *Biblioth. Bot.* 89: 349 (1927); *Cupaniopsis serrata* f. *tomentella* (F.Muell. ex Benth.) Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 9: 585 (1879). T: scrubs near Ipswich, Moreton Bay, Qld, *W.Hill*; holotype: MEL.

Illustration: S.T.Reynolds, *op. cit.* 52 fig. 4A–B.

Tree to 10 m. Young parts, branchlets, leaf axes and peduncles ±crispate, tomentose; branchlets lenticellate. Leaf rachis 6–13 cm long; leaflets usually 6–8, elliptic, oblong or subobovate, obtuse to retuse, entire to remotely serrulate especially towards apex, obtuse and oblique at base, 4–9 cm long, 2–4 cm wide, glabrous or puberulent above, pubescent or puberulent below, densely reticulate; petiolules 7–10 mm long; petiole 3.5–7 cm long. Panicles 2–9 cm long; pedicels 1 mm long. Calyx lobes 5–6 mm long, pubescent. Petals obovate, 2.5 mm long, white; scales as long. Fruit sessile, depressed ellipsoidal drying obtriangular, 2–2.5 cm long, 3–4 cm diam., pubescent, orange-yellow with red flush; valves thick, rugose, drying deeply wrinkled outside. Seed ±covered by thin, yellow aril. Fig. 12 I.

Occurs in south-eastern Qld, usually in dry scrub. Map 78.

Qld: Mt French, near Boonah, Jan. 1982, *L.H.Bird* (BRI); between Mt Edwards & Kalbar, *J.A.Elsol* 408 (BRI); Bundaberg, *N.Michael* 1816 (BRI); Roadvale, *N.Michael* 2035 (BRI).

## 17. RHYSOTOECHIA

*Rhysotoechia* Radlk., *Act. Congr. Bot. Amsterdam* 61 (1877), = *Sapind. Holl.-Ind.* 131 (1879); from the Greek *rhyosos* (shrivelled) and *toichos* (wall), referring to wrinkled fruit walls.

Type: *R. mortoniana* (F.Muell.) Radlk.

Monococious trees. Leaves paripinnate; leaflets subopposite or opposite, entire, coriaceous, usually shiny, drying yellow-green. Inflorescence axillary or subterminal, panicle-like; cymules stalked. Flowers regular. Calyx 5-partite; lobes 2-seriate, imbricate, the outer pair smaller, suborbicular or elliptic, concave, margins petaloid, ciliate. Petals 5, obovate, with bilobed scales or with thickened basal margins; crests absent. Disc complete. Stamens 7 or 8; filaments hairy towards base. Ovary 2- or 3-locular; ovule 1 per locule; style persistent. Fruit subglobose, obovoid or obcordate, apiculate, 2- or 3-lobed, turgid, loculicidally dehiscent; valves slightly fleshy, glabrous, mostly glandular inside, drying wrinkled and reflexed. Seed ellipsoidal, shiny, black, with small fleshy, yellow, basal aril.

A genus of c. 14 species in Philippines, Borneo, New Guinea and Australia; 4 species in Australia, all endemic.

K.Domin, *Biblioth. Bot.* 89: 351 (1927); L.A.T.Radlkofer, *Pflanzenr.* 98: 1209–1216 (1933); S.T.Reynolds, *Austrobaileya* 2: 41–44 (1984).

Characterised by the inflated, usually obovoid fruits, small aril at base of seed and petaloid margins of the sepals. The leaves usually dry yellow-green and have sunken glands on lower surfaces of leaflets in most species.

- |    |  |                                 |
|----|--|---------------------------------|
| 1  | Petals with scales; leaflets 1–3 pairs   |                                 |
| 2  | Leaves usually bifoliolate, broadly obtuse or subacute; petiolule 2–7 mm long; fruit sessile                           | <b>1. <i>R. bifoliolata</i></b> |
| 2: | Leaflets 2 or 3 pairs, usually acute or acuminate; petiolule 8–18 mm long; fruit stipitate                             | <b>2. <i>R. mortoniana</i></b>  |
| 1: | Petals scaleless, usually with slightly thickened basal margins; leaflets 2–6 pairs                                    |                                 |
| 3  | Branchlets glabrous; leaflets vernicose, finely densely nerved; petiolule 7–10 mm long; fruit 2-locular                | <b>3. <i>R. flavescens</i></b>  |
| 3: | Branchlets villous at apex; leaflets not vernicose, openly and coarsely nerved; petiolule 2–6 mm long; fruit 3-locular | <b>4. <i>R. robertsonii</i></b> |

**1. *Rhysotoechia bifoliolata*** Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 9: 522, 541, 656 (1879)

T: Rockhampton, Qld, *O'Shanesy*; *n.v.*

*Cupania dunnii* Maiden & E.Betche, *Proc. Linn. Soc. New South Wales* ser. 2, 33: 305 (1908); *Cupaniopsis dunnii* (Maiden & E.Betche) Maiden & E.Betche, *Census New South Wales* Pl. 128 (1916). T: Acacia Creek via Killarney, N.S.W., Oct. 1905, *W.Dunn*; syn: NSW; same locality, 28 Oct. 1907; syn: BRI, NSW.

Illustration: S.T.Reynolds, *Austrobaileya* 2: 43 fig. 3A–F (1984).

Tree to 20 m. Young parts and peduncles puberulous, otherwise glabrous. Leaves bifoliolate, rarely leaflets 2 pairs; leaflets elliptic to obovate, obtuse to acute, acute at base, 5.5–7 cm long, 2.5–4 cm wide; lateral nerves 6–10 pairs, looping away from margins; petiolules 2–7 mm long; petiole 1.5–4 cm long. Panicles to 9.5 cm long, openly branched; pedicels 5 mm long. Calyx lobes 2–3 mm long, 1.5 mm wide, glabrous. Petals

2–3.5 mm long, with 2 thick, curly scales, glabrescent inside. Disc pubescent. Filaments 3–4 mm long. Fruit sessile, subglobose or obovate, 1.5–2.6 cm long, 1–3.2 cm diam., obtusely 3-lobed, carinate at base, orange-yellow. Fig. 12N–O.

Occurs from Many Peaks Range near Miriam Vale, Qld, to Hunter River, N.S.W.; usually on ranges at rainforest margin. Map 79.

Qld: near Maryborough, Sept. 1948, *M.S.Clemens* (BRI); O'Reillys Guest House, Lamington Plateau, Dec. 1978, *C.Harman* (BRI); Sarabah Range, 24 km S of Canungra, *R.Schodde 3365* (BRI); Top of Woowoonga Range, 15 km NE of Biggenden, *P.Young & J.Randall 230* (BRI). N.S.W: Mungo Brush, Myall Lakes, Jan. 1935, *L.Fraser* (NSW).

The bifoliolate leaves with small leaflets are distinctive in this species.

**2. *Rhysotoechia mortoniana*** (F.Muell.) Radlk., *Act. Congr. Bot. Amsterdam* 132 (1877), = *Sapind. Holl.-Ind.* 62 (1879)

*Cupania mortoniana* F.Muell., *Fragm.* 5: 177 (1866). T: Rockingham Bay, Qld, *J.Dallachy*; ?iso: NSW166307.

Illustration: S.T.Reynolds, *Austrobaileya* 2: 43 fig. 3G–H.

Tree to 7 m, glabrous except flowers. Leaf rachis 2.5–14 cm long; leaflets 2 or 3 pairs, rarely 1, broadly elliptic or ovate-elliptic, acute, shortly acuminate or obtuse, oblique at base, 6–12.5 cm long, 2.5–6 cm wide, shining above; lateral nerves 5–9 pairs, looping away from margins; petiolules long-pulvinate, 0.8–1.8 cm long; petiole 3–7.5 cm long. Panicles to 26 cm long, openly branched; pedicels 6–9 mm long. Calyx lobes 3–6 mm long, puberulent. Petals 4–5 mm long, with 2 glandular hairy scales, puberulent towards base. Disc glabrous. Filaments 4 mm long. Fruit stipitate, broadly obovate or obovoid, keeled towards base, 1.2–1.4 cm long, 2–3.2 cm diam.; 2- or 3-lobed, yellow with red flush; valves thinly coriaceous. Fig. 12K–M.

Occurs in N Qld in Atherton Tableland district, usually on steep slopes. Map 80.

Qld: Danbulla via Kairi, Sept. 1948, *J.Byrne* (BRI); between Kuranda and Barron Falls, *L.S.Smith 4273* (BRI); Koolmoon Ck, near Ravenshoe, *L.S.Smith 10467* (BRI).

*R. mortoniana* is similar to *R. flavescens* in its shiny leaves but differs in its fewer lateral nerves and open reticulation. The petals also have scales.

**3. *Rhysotoechia flavescens*** Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 9: 522, 541, 658 (1879)

T: Rockingham Bay, Qld, *J.Dallachy*; n.v.

Illustration: S.T.Reynolds, *Austrobaileya* 2: 43 fig. 3I–K (1984).

Tree to 14 m, glabrous except flowers. Leaf rachis 17–22.5 cm long; leaflets 2–8, occasionally to 12, oblong-ovate to elliptic-oblong,  $\pm$ falcate, acute to subcaudate, acute and oblique at base, 13–16 cm long, 4.5–5.5 cm wide, rarely to 25 cm long and 9.5 cm wide, shining above, finely nerved and reticulate; lateral nerves 12–20 pairs; petiolules long-pulvinate, 7–10 mm long; petioles 3.5–8 cm long. Panicles 20–34 cm long, densely flowered; pedicels 2–5 mm long. Calyx lobes 1.5–4 mm long. Petals 2.5 mm long, long-clawed, with thickened basal margins, pubescent inside. Disc glabrous. Filaments 4–5 mm long, villous. Fruit shortly stipitate, broadly obovoid, 1.8–2 cm long, 2–2.5 cm diam., 2-locular; valves thickly coriaceous, reticulate.

Occurs in N Qld from Mossman to Tully; in montane rainforest. Map 81.

Qld: near Black Mtn, E of Mt Molloy, *B.P.M.Hyland 8649* (BRI, NSW); Danbulla, *B.P.M.Hyland 2178* (QRS); near Mossman, *V.K.Moriarty 2472* (QRS); Tully, *K.J.White 53/295* (BRI).

*R. flavescens* is distinctive in having densely nerved, very shiny leaflets, large inflorescences and 2-locular fruit.

**4. *Rhysotoechia robertsonii*** (F.Muell.) Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 9: 522, 542, 657 (1879)

*Cupania robertsonii* F.Muell., *Fragm.* 5: 146 (1866). T: Rockingham Bay, Qld, *J.Dallachy*; ?iso: NSW.

*R. contermina* Domin, *Biblioth. Bot.* 89: 351 (1927). T: Harvey Creek, Qld, Dec. 1909, *K.Domin*; n.v.

Illustration: S.T.Reynolds, *Austrobaileya* 2: 43 fig. 3L–N (1984).

Tree to 16 m. Young parts densely rusty villous; branchlets puberulent, minutely lenticellate. Leaf rachis 9–12.5 cm long, dilated; leaflets usually 6–10, elliptic-oblong or subobovate, acuminate or acute, oblique and acute at base, 7–17 cm long, 2.5–5.5 cm wide, glabrous above, puberulous below; lateral nerves 12–16 pairs; petiolules long-pulvinate, 2–6 mm long; petiole 2.5–4 cm long. Panicles 14–25 cm long, densely flowered; pedicels 2–4 mm long. Calyx lobes 2–3 mm long. Petals 2 mm long, with thickened basal margins, puberulent inside. Filaments 1–2 mm long. Fruit shortly stipitate, obovoid or subglobose, 1.6–2.8 cm long, 2.2–3.2 cm diam., 3–locular, orange-yellow with red flush; valves reticulate, glandular inside. Figs 12P–Q, 15.

Occurs in N Qld from near Mossman to Cardwell, usually along creeks in fringing rainforest. Map 82.

Qld: Russell River, *A.W.Dockrill 1082* (BRI); Harvey Ck, Nov. 1947, *H.Flecker* (BRI); Bushy Ck, SW of Julattan, *V.K.Moriarty 2175* (BRI); Ravenshoe, Nov. 1961, *E.Volck* (BRI).

The villous hairy tips of the branchlets and shortly stalked leaflets easily distinguish this species.

## 18. JAGERA

*Jagera* Blume, *Rumphia* 3: 155 (1847); named after Dr Herbert de Jager, collector of plants in Indonesia in mid 19th century for botanist G.E.Rumphius.

Type: *J. speciosa* Blume, *nom. illeg.*; = *J. javanica* (Blume) Blume ex Kalman

Monoecious or dioecious trees with saponin in bark, leaves and pericarp. Leaves paripinnate; leaflets opposite to alternate, usually serrate, semicoriaceous, usually pellucid-punctate. Inflorescence axillary or ramiflorous, usually panicle-like; cymules stalked. Flowers small, regular. Calyx deeply 5–lobed, lobes ovate. Petals 5, ovate, obovate or suborbicular, clawed; scales 2, broad, crested. Disc complete, glabrous. Stamens 7–10; filaments hairy. Ovary sessile, 3– or 4–locular; ovule 1 per locule; style short. Fruit usually obovoid, 3– or 4–locular, loculicidally dehiscent; valves woody, verrucose, rusty-setose outside, villous inside. Seed obovoid, with small basal cupular aril.

A genus of 4 species in Moluccas, New Guinea and Australia; 3 species in Australia, 1 endemic.

*K.Domin*, *Biblioth. Bot.* 89: 352 (1927); *L.A.T.Radlkofer*, *Pflanzenr.* 98: 1238–1243 (1933); *S.T.Reynolds*, *Austrobaileya* 1: 406–412 (1981).

The rusty setose hairy fruits and serrate or serrulate margins of leaflets of most species are distinctive.

- |    |   |                                |
|----|---|--------------------------------|
| 1  | Leaflets 3 or 4 pairs, rarely 6, discolourous, whitish below, entire  | <b>1. <i>J. discolor</i></b>   |
| 1: | Leaflets 4–13 pairs, not whitish below, serrate, serrulate or entire  |                                |
| 2  | Leaf rachis 25–39 cm long; leaflets usually 10–13 pairs, 6–17.5 cm long, 2–5 cm wide; inflorescence 22–36 cm long, much-branched, densely flowered                    | <b>2. <i>J. javanica</i></b>   |
| 2: | Leaf rachis 8.5–18 cm long; leaflets usually 4–9 pairs, 1.5–11.5 cm long, 0.5–3 cm wide; inflorescence 4.5–25 cm long, openly branched or unbranched, openly flowered | <b>3. <i>J. pseudorhus</i></b> |



**Figure 13.** A–F, *Jagera*. A–D, *J. javanica*. A, tip of branchlet with inflorescences  $\times 0.3$ ; B, flower  $\times 4$ ; C, petal  $\times 8$ ; D, calyx lobe  $\times 8$  (A–D, B.Hyland 3179, BRI). E, *J. pseudorhus*, fruit  $\times 1$  (J.Simmonds, BRI 111840). F, *J. pseudorhus* forma *pilosiuscula*, fruiting habit  $\times 0.7$  (W.Jones, BRI 123377). G–M, *Elattostachys*. G–H, *E. nervosa*. G, fruiting habit  $\times 0.7$ ; H, inflorescence  $\times 0.7$  (G–H, L.Jessup & W.McDonald 83, BRI). I–M, *E. xylocarpa*. I, fruiting habit  $\times 0.7$  (L.Jessup 361, BRI); J, flower  $\times 2.7$ ; K, petal  $\times 5.3$ ; L, calyx lobe  $\times 5.3$  (J–L, L.Jessup 47, BRI); M, dehisced fruit  $\times 1$  (L.Jessup 361, BRI).



**1. Jagera discolor** L.S.Smith ex S.Reyn., *Austrobaileya* 1: 407 (1981)

T: Clump Mt, Qld, 7 Nov. 1951, *L.S.Smith 4977*; holotype: BRI, isotype: NSW.

Illustration: S.T.Reynolds, *op. cit.* fig. 28A.

Tree to 25 m. Young parts and peduncles densely rusty-hairy; branchlets and leaf axes shortly hairy or glabrous, usually lenticellate. Leaf rachis 4.5–20.5 cm long; leaflets 6–8, rarely to 12, elliptic or elliptic-ovate, shortly acuminate or acute, entire, oblique and obtuse or acute at base, 7.5–15 cm long, 3–5 cm wide, upper surface glabrous, the lower pubescent, papillose, drying whitish; petiolule 8–16 mm long; petiole 7.5–10.5 cm long. Panicles axillary or ramiflorous, 9–14 cm long; pedicels 2–4 mm long. Calyx tomentose. Petals long clawed, 2.5 mm long; scales with small crests. Filaments 1–3 mm long. Fruit trigonous-globose, carinate at sutures, 1.2–1.8 cm long and wide, reddish.

Occurs in N Qld between Mt Lewis and Mt Fox, in montane rainforest. Also in New Guinea. Map 83.

Qld: Cairns, *W.R.Birch 59* (BRI); Mt Fox, Oct. 1949, *M.S.Clemens* (BRI); near Mena Ck, S of Innisfail, *T.S.Risley 28* (BRI); Mt Lewis, *K.Sanderson 436* (QRS).

*J. discolor* differs from other species in Australia in its large, entire leaflets with whitish lower surfaces.

**2. Jagera javanica** (Blume) Blume ex Kalkman, *Blumea* 7: 470 (1953)

*Garuga javanica* Blume, *Bijdr.* 2: 1165 (1825). T: ?Moluccas, collector unknown; n.v.

*Sapindus serratus* Roxb., *Hort. Bengal* 88 (1814) *nom. nud.*; *Fl. Ind.* 2: 284 (1832). *Jagera serrata* (Roxb.), *Radlk., Act. Congr. Bot. Amsterdam* 80, 106 (1877), = *Sapind. Holl.-Ind.* 10, 36 (1879). T: from Moluccas; n.v.

*Jagera speciosa* Blume, *Rumphia* 3: 155 (1847) *nom. illeg.* T: not designated.

Tree 13–20 m. Young parts densely rusty-villous; branchlets, leaf axes and peduncles dark brown-tomentose; branchlets stout, fluted. Leaf rachis 25–39 cm long; leaflets usually 20–26, oblong-ovate or subelliptic, ±falcate, acute to acuminate, serrate or serrulate, oblique and obtuse at base, 6–17.5 cm long, 2–5 cm wide, glabrous above, puberulous below; midrib ±excentric, hairy; petiolule 1–5 mm long; petiole 3–11 cm long. Panicles clustered below tips of branchlets, 22–38 cm long, much branched; bracts velvety; pedicels 2–4 mm long, pubescent. Calyx pubescent. Petals shortly clawed, 2 mm long; crests clavate. Filaments 1–3 mm long. Fruit obovoid, 1.2 cm long, 1 cm diam. Fig. 13A–F.

Occurs in Australia, in rainforest of N Qld between Cape Tribulation and Port Douglas. Also in New Guinea and Moluccas. Map 84.

Qld: Mossman, *B.Gray 1456* (BRI, QRS); Olive Ck, near Daintree, *B.P.M.Hyland 3179* (BRI, QRS).

Close to *J. pseudorhus*, differing chiefly in the greater number of leaflets, which are usually larger, and the larger, densely flowered, inflorescences.

**3. Jagera pseudorhus** (A.Rich.) Radlk., *Act. Congr. Bot. Amsterdam* 107 (1877), = *Sapind. Holl.-Ind.* 37 (1879)

*Cupania pseudorhus* A.Rich., *Sert. Astrolab.* 34, fig. 14 (1834). T: Hastings River, Port Macquarie, N.S.W., *C.Fraser*; n.v.

*Cupania setigera* Cunn. ex Heynh., *Nomencl.* 1: 239 (1840). T: Moreton Bay, Qld, *A.Cunningham*; n.v.

Tree 4–18 m. Young parts usually densely rusty villous; branchlets, leaves and peduncles pubescent or glabrous. Leaf rachis 8.5–18 cm long; leaflets 4–9 pairs, obliquely elliptic or oblong-ovate, usually falcate, acute or acuminate, serrate, serrulate or entire, base oblique, obtuse or acute, 1.5–11 cm long, 0.5–3 cm wide, pellucid-punctate, midrib excentric; petiolule 1–3 mm long; petiole 1.5–12 cm long, subterete, trisulcate at base. Panicles clustered below young leaves, 4.5–25 cm long and nearly as wide. Calyx pubescent to glabrous. Petals shortly clawed, 3 mm long, 2 mm wide, crest slender, thin, or fleshy,

clavate. Filaments 2–6 mm long. Fruit obovoid or ellipsoidal, 1.4–2 cm long, 1.2–1.8 cm diam. *Foam Bark Tree*, *Fern Tree*.

Occurs in eastern Australia and New Guinea. Bark used as fish poison by aborigines and as a cleaning foaming agent by natives of New Guinea.

*J. pseudorhus* differs from *J. javanica* in its smaller, and fewer leaflets and the smaller, few branched inflorescences. There are 2 varieties.

Leaf margins usually serrate, serrulate or subentire; lateral nerves not impressed above

**3a. var. pseudorhus**

Leaf margins entire or almost so; lateral nerves usually impressed above

**3b. var. integerrima**

### **3a. Jagera pseudorhus** (A.Rich.) Radlk. var. **pseudorhus**

Leaf margins usually serrate, serrulate or almost entire; lateral nerves not impressed above.

Very variable in density of indumentum, size of leaflets and inflorescence.

Two forms are distinguished, the extreme forms usually intergrading.

Branchlets, leaves, peduncles and calyx densely rusty hairy; leaflets usually 7–9 pairs; inflorescence nearly as long as wide

**3a1. f. pseudorhus**

Branchlets, leaves, peduncles and calyx puberulous or glabrous; leaflets usually less than 7 pairs; inflorescence narrow, longer than wide

**3a2. f. pilosiuscula**

### **3a1. Jagera pseudorhus** (A.Rich.) Radlk. var. **pseudorhus** f. **pseudorhus**

Illustration: S.T.Reynolds, *Austrobaileya* 2: fig. 28B (1981).

Branchlets, leaves, peduncles and calyx densely rusty hairy. Leaflets usually 7–9 pairs. Inflorescence 4–26 cm long, 4–16 cm wide; peduncle densely hairy.

Occurs from Yeppoon, Qld, to Manning River, N.S.W.; in fringing and remnant rainforest. Map 85.

Qld: Farnborough Beach, N of Yeppoon, *G.N.Batianoff & T.J.McDonald 341* (BRI); N Pine River, Petrie Brisbane, *S.T.Blake 2358* (BRI); Tallebudgera Ck, *W.J.F.McDonald 1813* (BRI). N.S.W.: 1.6 km S of Coaldale, *S.Clerk, J.Pickard & R.Coveny 1844* (BRI, NSW).

### **3a2. Jagera pseudorhus** var. **pseudorhus** f. **pilosiuscula** Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 9: 621 (1879)

T: Rockingham Bay, Qld, *Wawra 628, 703*; syn: *n.v.*

*J. pseudorhus* f. subglabrescens Domin, *Biblioth. Bot.* 89: 352 (1927). T: Emu Park, Rockhampton, Qld, Mar. 1910, *Domin; n.v.*

Illustration: S.T.Reynolds, *Austrobaileya* 2: fig. 28D (1981).

Plant glabrous or puberulous. Leaflets usually less than 7 pairs. Inflorescence 9–18 cm long, 2–6.5 cm wide; peduncle sparsely hairy. Fig. 13F.

Occurs from Cape York Peninsula to Double Island Point and Fraser Is., Qld, usually in dry rainforest and beach scrub. Also in New Guinea. Map 86.

Qld: Cape Hillsborough, *B.P.M.Hyland 4274* (BRI); Pin Pin near Lloyd Bay, *B.P.M.Hyland 2923* (BRI); Middle Percy Is., Mar. 1906, *H.Tryon* (BRI); Somerset, *L.J.Webb & J.G.Tracey 6120* (BRI).

Southern specimens intergrade with f. *pseudorhus*.

**3b. Jagera pseudorhus** var. **integerrima** S.Reyn., *Austrobaileya* 1: 411 (1981)

T: Lake Barrine, Atherton Tableland, Qld, 9 Nov. 1929, *C.T.White 1354*; holo: BRI, iso: NSW.

Illustration: S.T.Reynolds, *op. cit.* fig. 28C.

Branchlets, leaf axes and peduncles densely rusty villous as in typical *J. pseudorhus*. Leaf margins entire or almost so; lateral nerves impressed above.

Occurs on Atherton Tableland, Qld, in rainforest. Map 87.

Qld: near Danbulla, *B.P.M.Hyland 1950* (QRS); W of Stannary Hills, *G.Unwin 237* (QRS); Tarzali, *M.Tucker 47* (BRI).

**19. ELATTOSTACHYS**

*Elattostachys* (Blume) Radlk., *Act. Congr. Bot. Amsterdam* 82, 107, 112 (1877), = *Sapind. Holl.-Ind.* 13, 37, 42 (1879); from the Greek *elotton* (little), and *stachys* (spike), referring to the inflorescence of some species.

Type: not designated.

Monoecious trees. Branchlets lenticellate, hairy towards apex with simple hairs. Leaves petiolate, paripinnate; leaflets opposite to alternate, entire, serrate or serrulate, domatia usually present along midrib. Inflorescence a raceme or raceme-like or panicle-like, axillary, spike-like when young; bracts minute. Flowers regular, pedicels slender. Calyx shortly cupular, 5-partite, hairy outside. Petals 5, clawed; scales 2, auriculiform, villous, crestless. Disc regular, cupular, glabrous. Stamens 6–8; filaments filiform. Ovary sessile, 3-locular, 1 ovule per locule; style simple. Fruit obovoid, subellipsoidal or subglobose, usually 3-sulcate, loculicidally dehiscent, 3-valved; valves thick, drying woody, granular, villous inside; pericarp ±fleshy. Seed obovoid, shiny, with small, dorsal aril at its base.

A genus of 13 species in Philippines, Indonesia, Pacific Islands, New Guinea and eastern Australia; 4 species in Australia, all endemic. The fruits with woody valves, pink at the sutures, and the simple raceme- or panicle-like inflorescence distinguish the genus. The leaves of most species dry blackish or dark brown.

L.A.T.Radlkofer, *Pflanzenr.* 98: 1258 (1933); K.Domin, *Biblioth. Bot.* 89: 353–354 (1927).

- |    |  |                         |
|----|--|-------------------------|
| 1  | Domatia present  |                         |
| 2  | Domatia prominent; leaflets mostly hairy, serrate or serrulate, rarely entire; petals 2.5–5 mm long                        | 1. <b>E. xylocarpa</b>  |
| 2: | Domatia inconspicuous; leaflets glabrous, entire, rarely sparsely serrulate; petals 6.5–7 mm long                          | 2. <b>E. megalantha</b> |
| 1: | Domatia absent   |                         |
| 3  | Fruit hairy, yellow-green; calyx crispate-hairy; leaflets 1 or 2 pairs, rarely 3   |                         |
| 4  | Leaflets 4–8.5 cm long, 1–5 cm wide, serrate, serrulate, rarely entire; petals 2.5–5 mm long; lateral nerves not decurrent | 1. <b>E. xylocarpa</b>  |
| 4: | Leaflets 10–16 cm long, 3.5–6.5 cm wide, usually entire; petals 6.5–7 mm long; lateral nerves decurrent on midrib          | 2. <b>E. megalantha</b> |
| 3: | Fruit glabrous outside, pink or red; calyx usually with straight hairs; leaflets 2–4 pairs                                 |                         |
| 5  | Fruit 1–2 cm long and wide; leaflets 2 or 3 pairs, 4–5 times as long as wide, strongly nerved, thick and glossy            | 3. <b>E. nervosa</b>    |
| 5: | Fruit less than 1 cm long and wide; leaflets 2–6 pairs, 3 times as long as wide, usually regularly finely nerved, thin     | 4. <b>E. microcarpa</b> |

**1. Elattostachys xylocarpa** (Cunn. ex F.Muell.) Radlk., *Act. Congr. Bot. Amsterdam* 112 (1877), = *Sapind. Holl.-Ind.* 42 (1879)

*Cupania xylocarpa* Cunn. ex F.Muell., *Trans. & Proc. Philos. Inst. Victoria* 3: 27 (1859). T: Brisbane River, Qld, A.Cunningham; lecto: K, *vide* S.T.Reynolds, *Fl. Australia* 25: 199 (1985) ; Clarence River, N.S.W., H.Beckler; syn: MEL 98816

*Cupania bidwillii* Benth., *Fl. Austral.* 1: 460 (1863); *Elattostachys bidwillii* (Benth.) Radlk., *Act. Congr. Bot. Amsterdam* 112 (1877), = *Sapind. Holl.-Ind.* 42 (1879). T: Wide Bay, Qld, J.C.Bidwill; holotype: K.

Tree to 10 m. Branchlets and leaf axes pubescent, becoming glabrous. Leaf rachis 1.5–5 cm long; leaflets 2–6, elliptic, obovate or oblong, obtuse to acute, remotely serrate, rarely entire, obtuse to acute at base, 4–8.5 cm long, 1–4.5 cm wide, puberulous or glabrous each side; domatia usually prominent, along midrib, hairy; petiolules 1–7 mm long; petiole 2–4 cm long. Inflorescence 1–10.5 cm long; peduncle pubescent; pedicels 2.5–4 mm long. Calyx lobes narrowly ovate 3–4 mm long, crispate-tomentose. Petals ovate or subhastate, 4–5 mm long, acute, shortly clawed. Filaments 3–4 mm long, glabrous. Fruit obovoid or ellipsoidal, 1.5–2 cm long, 1.5–2.2 cm diam., hairy outside, yellow-green with pink sutures. Aril white to purple. *White Tamarind*. Fig. 13 I–M.

Occurs from Rockhampton, Qld, to Orara River, N.S.W.; in softwood scrub or scrub remnants, usually on hillsides and ridges in sandy rocky soil. Map 88.

Qld: Worlds End Pocket, NW of Ipswich, Dec. 1979, L.H.Bird (BRI); 9 km E of Gayndah, P.I.Forster 1536 & 1537 (BRI); Upper Brookfield Brisbane, L.W.Jessup 47 (BRI); Mt Kiargarow, L.S.Smith 6258 (BRI). N.S.W.: Glenugie Park, J.Pickard & D.F.Blaxell 243 (NSW).

Distinguishable from other species of the genus in Australia by the hairy domatia in the axils of lateral nerves.

**2. Elattostachys megalantha** S.Reyn., *Fl. Australia* 25: 199 (1985)

T: State Forest Reserve 700, Gadgarra, Qld, 8 Jan. 1975, B.P.M.Hyland 3166; holotype: BRI; isotype: QRS.

Tree to 10 m. Branchlets and leaf axes puberulous to glabrous. Leaf rachis 0.6–1.8 cm long; leaflets 1 or 2 pairs, rarely 3, subopposite, ovate-oblong or elliptic-oblong, acute, entire or subentire, acute or obtuse and unequal at base, 10–16 cm long, 3.5–6.5 cm wide, glabrous, coriaceous; domatia 1 or 2, small, inconspicuous, or absent; petiolule 6–8 mm long; petiole 2.5–6.5 cm long. Inflorescence 4–10.5 cm long; peduncle pubescent; pedicels 5–8 mm long. Calyx lobes broadly ovate or elliptic, 4–4.5 mm long, crispate-tomentose. Petals subhastate, long clawed, 6.5–7 mm long. Filaments 1–3 mm long, glabrous. Fruit ellipsoidal-obovoid, 1.7–2.2 cm long, 1.5–2 cm diam., sparsely hairy outside, dull yellow-green. Aril broadly bifurcate.

Known only from Gadgarra; grows in rainforest. Map 89.

Qld: State Forest Reserve 700, Gadgarra, B.P.M.Hyland 3167 (BRI); same locality, A.K.Irvine 507 & 777 (BRI).

*E. megalantha* differs from *E. xylocarpa* in its larger flowers and leaflets, domatia, if present, not prominent and lateral nerves decurrent on midrib.

**3. Elattostachys nervosa** (F.Muell.) Radlk., *Act. Congr. Bot. Amsterdam* 112 (1877), = *Sapind. Holl.-Ind.* 42 (1879)

*Cupania nervosa* F.Muell., *Trans. & Proc. Philos. Inst. Victoria* 3: 27 (1859) (*as onervosa*); *Cupania xylocarpa* var. *nervosa* (F.Muell.) C.Moore, *Handb. Fl. New South Wales* 91 (1893). T: Richmond River, N.S.W., C.Moore; syn: *n.v.*; Moreton Bay, Qld, and Richmond River N.S.W., W.Hill & F.Mueller; syn: MEL 84184.

Tree to 12 m. Branchlets and leaf axes shortly appressed-pubescent, soon glabrous. Leaf rachis 3–8 cm long; leaflets 4–6, narrowly ovate or elliptic, acuminate or acute, usually falcate, entire or remotely serrulate, acute or obtuse and oblique at base, 9–18.5 cm long, 2–4.5 cm wide, glabrous, thickly coriaceous, glossy; midrib raised especially below, domatia absent; petiolule 3–5 mm long; petiole 4–5 cm long. Inflorescence 2.5–6.5 cm



**Figure 14.** *Sarcopteryx montana*.  
Photograph — L.W.Jessup.



**Figure 15.** *Rhysotoechia robertsonii*.  
Photograph — B.Gray.



**Figure 16.** *Lepidopetalum subdichotomum*.  
Photograph — B.Gray.



**Figure 17.** *Synima macrophylla*.  
Photograph — L.W.Jessup.

long; pedicels 2.5–4 mm long. Calyx lobes elliptic, 2–2.5 mm long, usually  $\pm$ appressed tomentose. Petals ovate, 2.5–3.5 mm long, narrowly clawed. Filaments 1–2.5 mm long, glabrous. Fruit obovoid or subglobose, 1–2 cm long and wide, slightly ridged, verrucose, glabrous outside, pink or red. Aril red-purple, broadly bifurcate. Fig. 13G–H.

Occurs from south-eastern Qld to Williams River, N.S.W.; in rainforest, usually in hilly country. Map 90.

Qld: State Forest 283 Colinton, *L.W.Jessup & W.J.F.McDonald 83* (BRI); near Imbil, *R.Larson 9* (BRI); Beechmont, *L.W.Jessup & S.T.Reynolds 160*; Mt Mellum, Glasshouse Mtns, *C.L.Wilson 694* (BRI). N.S.W.: Coneac district, *J.Vickery NSW 106408* (NSW)

*E. nervosa* differs from *E. xylocarpa* and *E. megalantha* by its glabrous fruits and leaflets which are long and usually subfalcate and strongly nerved.

#### 4. *Elattostachys microcarpa* S.Reyn., *Fl. Australia* 25: 199 (1985)

T: Cedar Bay, N of Bloomfield River, Qld, Jan. 1973, *L.J.Webb & J.G.Tracey 13275*; holo: BRI.

Tree 4–10 m. Branchlets and leaf axes puberulous or glabrous. Leaf rachis 3.5–7.5 cm long; leaflets 4–8, rarely to 12, narrowly elliptic or ovate, acute or acuminate, remotely serrulate or subentire, acute or obtuse at base, 6.5–14.5 cm long, 2.5–5.2 cm wide, glabrous or midrib puberulous, thinly coriaceous; midrib a slender ridge; domatia absent; petiolule 6–8 mm long; petiole 2.5–5.5 cm long. Inflorescence 5–7.5 cm long; peduncle shortly pubescent; pedicels 2–3 mm long. Calyx lobes ovate, 2.5 mm long, usually appressed-tomentose. Petals 2.5–3 mm long, broadly ovate, long-clawed. Filaments 2.5–3.5 mm long, pilose or glabrous. Fruit subglobose or  $\pm$ obovoid, 0.8–1.2 cm long and wide, smooth, glabrous outside, pink. Aril 2-lobed.

Occurs in N Qld from McIlwraith Range to near Cairns, in semideciduous forest on rocky hill sides. Map 91.

Qld: State Forest Reserve 607, near Mareeba, *A.W.Dockrill 1485* (BRI); Windsor Tableland, *B.P.M.Hyland 5552* (BRI); Mt Lewis, *R.L.Jago 282* (QRS); Whitfield Range, near Cairns, *R.L.Jago 5* (BRI); W of Lily Creek, 12 km E of Cooktown, *T.J.McDonald & G.N.Batianoff 1558* (BRI).

*E. microcarpa* is very close to *E. nervosa* differing chiefly in its smaller fruits and larger number of leaflets which are regularly and finely nerved.

## 20. SARCOPTERYX

*Sarcopteryx* Radlk., *Act. Congr. Bot. Amsterdam* 127 (1877), = *Sapind. Holl.-Ind.* 57 (1879); from the Greek *sarco* (fleshy), and *pteron* (wing), in reference to the fleshy wings of the fruit.

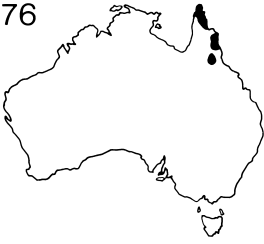
T: not designated.

Trees with saponin in bark, twigs and leaves. Branchlets hairy towards apex. Leaves paripinnate; leaflets opposite or alternate, entire; lower surface with clavate glands, and raised lateral nerves. Inflorescence axillary, polygamo-monoecious, panicle-like or raceme-like. Flowers regular, pedicellate. Calyx cupular, lobes 5, imbricate. Petals 5, shortly clawed, with 2 broad, villous, crested scales. Disc complete, glabrous. Stamens 7 or 8; filaments filiform, hairy. Ovary 3-locular, ovule 1 per locule; style filiform, persistent. Fruit obovoid or broadly ellipsoidal, angled, sometimes winged, cuspidate, 3-locular, loculicidally dehiscent; valves slightly fleshy, glabrous inside, glabrous or hairy outside. Seed usually ellipsoidal; aril thin, enclosing seed.

A genus of 11 species occurring in Moluccas, New Guinea and Australia; 5 species in Australia.

K.Domin, *Biblioth. Bot.* 89: 352 (1927); L.A.T.Radlkofer, *Pflanzenr.* 98: 1232–1238 (1933); S.T.Reynolds, *Austrobaileya* 2: 53–57 (1984).

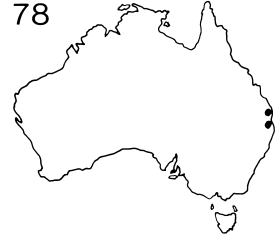
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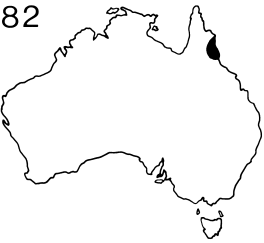
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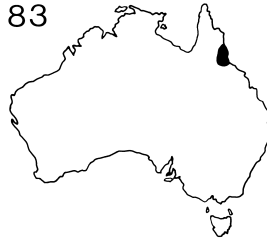
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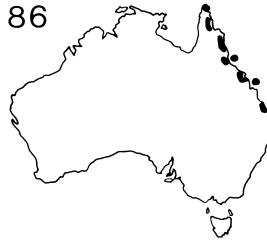
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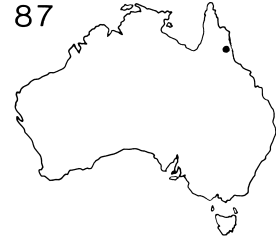
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76. *Cupaniopsis flagelliformis*  
var. *flagelliformis*

79. *Rhysoetochia bifoliolata*

82. *Rhysoetochia robertsonii*

85. *Jagera pseudorhus*  
f. *pseudorus*

88. *Elattostachys xylocarpa*

77. *Cupaniopsis flagelliformis*  
var. *australis*

80. *Rhysoetochia mortoniana*

83. *Jagera discolour*

86. *Jagera pseudorhus*  
f. *pilosiuscula*

89. *Elattostachys megalantha*

78. *Cupaniopsis tomentella*

81. *Rhysoetochia flavescens*

84. *Jagera javanica*

87. *Jagera pseudorhus*  
var. *integerrima*

90. *Elattostachys nervosa*

The genus is distinguished in particular by the fruits with fleshy valves that are glabrous inside, and the thin aril enclosing the seed; the leaflets usually have strongly arched lateral nerves and clavate glandlets on the lower surface.

- 1 Fruit obtusely 3-angled or keeled or compressed at sutures, not winged
- 2 Fruit obovoid, obtusely 3-angled; usually shortly stipitate; branchlets velvety to puberulent, the hairs pale or dark brown, straight; reticulation fine, open; leaflets 3 or 4 pairs, rarely 2 **1. S. stipata**
- 2: Fruit subglobose or ellipsoidal, keeled or compressed at sutures, sessile; branchlets ferruginous or hoary tomentose, the hairs ±crispate; reticulation raised, dense; leaflets 2 or 3 pairs, rarely 4 **2. S. reticulata**
- 1: Fruit usually acutely angular, winged
- 3 Fruit golden yellow with pink flush, tomentose to puberulent; leaflets subrigid; bracts long and slender; leaf rachis 1–3.5 cm long **3. S. montana**
- 3: Fruit pinkish or reddish, pubescent to glabrous; leaflets coriaceous; bracts ovate or subulate; leaf rachis 2.5–10 cm long
- 4 Leaflets 1 or 2 pairs, rarely 3, hairy especially below; panicles with closely arranged dense clusters of cymules; fruit with thin delicate wings **4. S. martyana**
- 4: Leaflets 3 or 4 pairs, rarely fewer, glabrous or nearly so; panicles with scattered open cymules; fruit with thick, ±fleshy wings **5. S. acuminata**

**1. *Sarcopteryx stipata*** (F.Muell.) Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 9: 522, 544, 659 (1879) as *stipitata*

*Cupania stipata* F.Muell., *Fragm.* 2: 75 (1860); *Ratonia stipata* (F.Muell.) Benth., *Fl. Austral.* 1: 461 (1863) as *stipitata*. T: Clarence River, N.S.W., *H.Beckler*; holotype: MEL 84174.

Illustration: S.T.Reynolds, *Austrobaileya* 2: 56 fig. 5E–F (1984).

Tree to 10 m. Branchlets, leaf axes and peduncles pubescent with dark brown or pale hairs. Leaf rachis 4.5–7 cm long; leaflets 6–8, rarely 4, narrowly elliptic-oblong to ovate-oblong, acuminate, oblique and obtuse or acute at base, shortly decurrent, 3.5–10 cm long, 1–4 cm wide, glabrous or lower surface puberulous, coriaceous, finely reticulate; petiolule 5–10 mm long; petiole 2–3.5 cm long. Inflorescence raceme-like or panicle-like, 3–14 cm long; cymules scattered; pedicels 2–6 mm long. Calyx lobes ovate, 1.5–2 mm long, puberulent outside. Petals ovate, as long as calyx. Fruit slightly 3-angled, obovoid, usually shortly stipitate, 1.5–2.5 cm long, 1–2 cm diam., pinkish-red; valves slightly fleshy. Aril yellow, bilobed, erose. Fig. 18E–F.

Occurs from south-eastern Qld to Bulga Plateau, N.S.W.; at edge of subtropical montane forest, usually in rocky soil. Map 92.

Qld: Mt Glorious, *N.B.Byrnes & L.W.Jessup 4061* (BRI); Upper Currumbin Ck, 2 km ESE of Boyds Butte, *W.J.F.McDonald & W.G.Whiteman 1567* (BRI). N.S.W.: Wiangaree State Forest, Tweed Range, *R.Schodde 5619* (BRI); Bulga Plateau, 19 Jan. 1934, *L.Fraser NSW 166314* (NSW).

*S. stipata* is recognisable by the wingless but obtusely 3-angled obovoid fruit, usually on a short stipe.

The spelling *stipitata*, first used by Bentham, *loc. cit.*, is not accepted here.

**2. *Sarcopteryx reticulata*** S.Reyn., *Austrobaileya* 2: 54 (1984)

T: Black Mtn Rd, Kuranda Qld, Dec. 1963, *L.J.Webb & J.G.Tracey 8222*; holotype: BRI.

Illustration: S.T.Reynolds, *op. cit.* 56 fig. 5I–J.

Tree to 25 m. Branchlets and leaf axes crispate-tomentose, ferruginous or hoary. Leaf rachis 2–4.5 cm long; leaflets 4–6, occasionally to 8, elliptic-oblong or subovate, acuminate or acute, oblique and decurrent at base, 6–12.5 cm long, 2–4.5 cm wide, glabrous above, puberulous below; midrib hairy, coriaceous, reticulation dense, prominent;





**Figure 18.** A–F, *Sarcopteryx*. A–C, *S. acuminata*. A, flowering habit  $\times 0.7$ ; B, male flower  $\times 2$ ; C, petal  $\times 8$  (A–C, B.Gray 704, BRI). D, *S. martyana*, fruiting habit  $\times 0.7$  (L.Webb & J.Tracey 13272, BRI). E–F, *S. stipata*. E, fruiting habit  $\times 0.7$ ; F, dehiscent fruit showing seed with aril  $\times 0.7$  (E–F, L.Jessup & N.Byrnes 4061, BRI). G–J, *Synima macrophylla*. G, infructescence and leaf  $\times 0.7$  (L.Jessup 523, BRI); H, petal  $\times 8$ ; I, calyx lobe  $\times 8$  (L.Webb & J.Tracey 8223, BRI); J, seed with aril  $\times 1.3$  (L.Jessup 523, BRI).

petiolule 4–7 mm long; petiole 2–4 cm long. Inflorescence panicle-like, 3.5–16 cm long, openly flowered; peduncle rusty tomentose; pedicels 2.5–5 mm long. Calyx lobes narrowly ovate, 2 mm long, pubescent or puberulent. Petals broadly ovate, as long as calyx. Fruit sessile, subglobose or broadly subobovoid, 1–2 cm long and wide, keeled or compressed at sutures, dull pink to red.

Occurs in N Qld from Cooktown to Atherton Tableland; usually along creeks, at margins of rainforest. Map 93.

Qld: 29 km NNW of Daintree, *D.E.Boyland & J.G.Gillieatt 502* (BRI); Upper Parrot Ck, Annan River, *L.J.Brass 20297* (BRI); State Forest Reserve 607, near Mareeba, *B.Gray 1022* (BRI, QRS); Range Rd, Atherton Tableland, *S.F.Kajewski 1325* (BRI).

*S. reticulata* is distinguished by the prominent dense reticulation of the leaflets and the sessile fruits which are carinate at the sutures.

### 3. *Sarcopteryx montana* S.Reyn., *Austrobaileya* 2: 55, 56 fig. 5K (1984)

T: 23.2 km up Mt Lewis Rd, turn off from Mt Molloy–Mossman Rd, 31 Jan. 1981, *L.W.Jessup & J.R.Clarkson 293*; holotype: BRI.

Illustration: S.T.Reynolds, *op. cit.* 56 fig. 5K.

Tree to 15 m. Branchlets and leaf axes crispate-tomentose to puberulous, rusty brown; branchlets lenticellate. Leaf rachis 1–3.5 cm long; leaflets 2 or 3 pairs, elliptic to obovate, acute or acuminate, ±oblique at base, 3.5–9 cm long, 1.5–4 cm wide, glabrous or puberulous; midrib pubescent; petiolule 3–10 mm long; petiole 1–3.5 cm long. Panicles 6–11 cm long; peduncle tomentose; bracts very narrowly ovate, erect, to 7 mm long; pedicels to 2 mm long. Calyx lobes ovate, 2 mm long, densely villous. Petals obovate, slightly longer than calyx. Fruit sessile, broadly obovoid or ellipsoidal, triquetrous, winged, 1.5–2.5 cm long and in diam., yellow with pink flush, tomentose to puberulous. Fig. 14.

Occurs in N Qld on ranges near Cape Tribulation; on rocky ridges in rainforest. Map 94.

Qld: near Mt Carbine, *B.Gray 283* (BRI); Thornton Peak, *B.P.M.Hyland 7086* (BRI); Mt Spurgeon, *C.T.White 1624* (BRI).

*S. montana* differs from other species in the hairy, golden-yellow, winged fruits and ±rigid leaflets.

### 4. *Sarcopteryx martyana* (F.Muell.) Radlk., *Act. Congr. Bot. Amsterdam* 128 (1877), = *Sapind. Holl.-Ind.* 58 (1879)

*Cupania martyana* F.Muell., *Fragm.* 5: 6 (1865); *Ratonia martyana* (F.Muell.) Bailey, *Queensland Fl.* 1: 298 (1899). T: Rockingham Bay, Qld, *J.Dallachy*; lectotype: MEL 84173, *vide* S.T.Reynolds, *Fl. Australia* 25: 200 (1985).

Illustration: S.T.Reynolds, *Austrobaileya* 2: 56 fig. 5G–H (1984).

Tree to 20 m. Branchlets, leaf axes and peduncles ferruginous-villous; branchlets lenticellate. Leaf rachis 2.5–8.5 cm long; leaflets 2–4, rarely 6, ovate-oblong to elliptic, acuminate, broad and oblique at base, 3.5–18.5 cm long, 1–6.5 cm wide, glabrous or puberulous above, pubescent or puberulent below, ±coriaceous; petiolules 5–12 mm long; petiole 1–5.5 cm long. Panicles 4.5–18 cm long, densely flowered; bracts narrowly ovate, to 2 mm long; pedicels 2–4 mm long. Calyx lobes ovate, 2 mm long, rusty-villous. Petals obovate, as long as calyx. Fruit sessile, broadly depressed-obovoid, triquetrous, narrowly winged at angles, 1–1.5 mm long, 1.5–2 cm diam., pink or red. Seed with yellow ventral aril. Fig. 18D.

Occurs in Qld from Cairns to Eungella Range, on rainforest margins. Map 95.

Qld: Tinaroo Range, near Danbulla, *J.Byrne 1 & 2* (BRI); Mt Fox, Sept.–Dec. 1949, *M.S.Clemens* (BRI); Eungella Range, via Mackay, Oct. 1922, *W.D.Francis* (BRI); Pine Ck, Forestry Rd–Malbon Thompson Range, *L.J.Webb & J.G.Tracey 13273* (BRI).

*S. martyana* is distinguished by the delicate wings of the capsules, dense cymules and large hairy leaves.

### 5. *Sarcopteryx acuminata* S.Reyn., *Austrobaileya* 2: 57 (1984)

T: State Forest Reserve 755, near Topaz, Qld, Dec. 1977, *B.Gray* 822; holo: BRI, iso: QRS.

Illustration: S.T.Reynolds, *op. cit.* 56 fig. 5A–D.

Tree to 15 m. Branchlets, leaf axes, peduncles and flowers tomentose to glabrescent with rusty or hoary crispate hairs. Leaf rachis 4–10 cm long; leaflets 6–8, rarely fewer, elliptic or ovate-oblong, acuminate or subcaudate, oblique and rounded or ±acute at base, 3.5–11 cm long, 1.5–4.5 cm wide, glabrous or puberulous especially on midrib; petiolule 5–14 mm long; petiole 2.5–6.5 cm long. Panicles to 23 cm long, openly flowered; bracts subulate, to 3 mm long; pedicels 3–5 mm long. Calyx lobes narrowly ovate, acuminate, 2–2.5 mm long, pubescent or puberulent. Petals as long. Fruit sessile, ovoid or transversely ellipsoidal, triquetrous, winged, 1.5–2 cm long and wide, puberulous or glabrous, deep pink; wings 3–4 mm wide, coriaceous. Fig. 18A–C.

Occurs in N Qld in high altitude rainforest. Map 96.

Qld: State Forest Reserve 755, near Bartle Frere, *B.Gray* 704 (BRI, QRS); Gadgarra, *B.P.M.Hyland* 9758 (BRI, QRS).

*S. acuminata* is characterised by the large, pink, winged fruits, large panicles and acuminate leaflets.

## 21. TOECHIMA

*Toechima* Radlk., *Act. Congr. Bot. Amsterdam* 130 (1877), = *Sapind. Holl.-Ind.* 60 (1879); from the Greek *toichos* (wall) and *ima* (lowermost), probably referring to the thick wall of the fruit.

Type: not designated.

Monoecious trees. Branchlets lenticellate, hairy towards apex with simple hairs. Leaves paripinnate; leaflets alternate or subopposite, entire or crenate-serrate; domatia or hairy tufts usually present in axil of nerves. Inflorescence axillary, raceme-like or panicle-like; cymules stalked, 3–5-flowered. Flowers regular. Calyx cupular, 5-partite; lobes ovate, slightly imbricate. Petals 5, obovate or ovate, shortly clawed, truncate or toothed, scales large, recurved, bilobed, clavate, densely hairy, crested. Disc annular. Stamens 8; filaments filiform, hairy. Ovary 2- or 3-, rarely 4-locular; ovule 1 per locule; style filiform; stigma 2- or 3-lobed. Fruit ellipsoidal to obovoid, turgid, loculicidally dehiscent; valves fleshy, drying thick, densely villous inside. Seed ellipsoidal, with small, yellow, fleshy, bilobed aril at base; hilum large.

A genus of 8 species in Australia and Papua New Guinea; 6 in Australia.

L.A.T.Radlkofer, *Pflanzenr.* 98: 1249–1254 (1933).

*Toechima* is characterised by the thick fleshy valves of the fruit which is densely villous inside, and dries thick and somewhat woody, and the small aril attached to base of seed and the petals with crested scales.

1 Leaflet margins remotely crenate-serrate or wavy

3. **T. daemelianum**

1: Leaflet margins entire

2 Fruit with broad, thin, delicately veined wings from apex to base; peduncles glabrous

6. **T. pterocarpum**

2: Fruit not winged, usually keeled at sutures towards base; peduncles mostly hairy

- 3 Domatia prominent, few per leaflet; fruit 2-locular, clavate, slightly compressed 1. **T. tenax**
- 3: Domatia small, along whole midrib or absent; fruit 3-locular, ellipsoidal, obovoid or globose, turgid
- 4 Leaf rachis 3–8.5 cm long; leaflets 2–8 cm long, 1–3.5 cm wide; rachis and inflorescence usually densely villous; lateral nerves 6–10 pairs, not widely spaced, usually with domatia or hairy tufts in axils 2. **T. dasyrrhache**
- 4: Leaf rachis 6.5–17.5 cm long; leaflets 6.5–22 cm long, 2.8–8 cm wide; rachis and inflorescence shortly puberulous to glabrous; lateral nerves 5–9 pairs, widely spaced; domatia present or absent
- 5 Leaflets thinly coriaceous; domatia present; lateral nerves 5 or 6 pairs, 2.5–5 cm apart, reticulation prominent; fruit glabrous outside 4. **T. erythrocarpum**
- 5: Leaflets thickly coriaceous; domatia absent; lateral nerves 5–9 pairs, 1–2.5 cm apart; reticulation obscure above; fruit usually velvety outside 5. **T. monticola**

**1. *Toechima tenax*** (Cunn. ex Benth.) Radlk., *Act. Congr. Bot. Amsterdam* 130 (1877), = *Sapind. Holl.-Ind.* 60 (1879)

*Ratonia tenax* Cunn. ex Benth., *Fl. Austral.* 1: 461 (1863); *Cupania tenax* (Cunn. ex Benth.) F.Muell., *Fragm.* 9: 94 (1875); *Lepidopetalum tenax* (Cunn. ex Benth.) Ewart, *Proc. Roy. Soc. Victoria* 19: 41 (1907). T: Brisbane River, Qld, Oct. 1824, *A.Cunningham* 49; syn: BRI; same locality, 1829, *A.Cunningham* 22; syn: NSW; Brisbane R., Qld, *F.Mueller*; syn: *n.v.*; Brisbane R., Qld, *W.Hill*; syn: *n.v.*; Port Curtis, Qld, *C.Moore*; syn: *n.v.*

Tree to 18 m; glabrous or glabrescent except puberulous shoots and inflorescence. Leaf rachis 1–5.5 cm long; leaflets 2–6, elliptic to obovate, retuse to acute, entire, narrowly cuneate and decurrent at base, 3–7 cm long, 1–3 cm wide, glabrous, glossy; domatia prominent in some nerve axils; petiolule 2–6 mm long; petiole 1–2.5 cm long. Panicles slender, 5–9 cm long; peduncle puberulent; pedicels 4–5 mm long. Calyx 1.5 mm long, puberulent. Petals 1–2 mm long. Filaments woolly. Fruit clavate to obovoid, slightly compressed, narrowly keeled at sutures, 2–3.5 cm long, 2–2.5 cm diam., usually 2-locular, orange-yellow to red; valves 2–5 mm thick, rind-like, corrugate, resiniferous. Aril smooth, collar-like at base of seed. Fig. 19H–I.

Occurs from south-eastern Qld to Lismore, northern N.S.W.; usually in dry rainforest, common along creeks and river banks. Map 97.

Qld: Pullenvale, July 1978, *K.Bedford* (BRI); Rafting Grounds, near Moggil Ck, Brisbane, Sept. 1978, *T.D.Stanley* & *S.T.Reynolds* (BRI); *L.W.Jessup* & *S.T.Reynolds* 243 (BRI, NSW); near Imbil, *L.S.Smith* & *L.J.Webb* 3148 (BRI). N.S.W.: Stotts Is., Tweed R., *S.Clark*, *J.Pickard* & *R.Coveny* 1578 (BRI, NSW).

*T. tenax* is recognised by the few prominent domatia on the leaflets and the compressed, clavate, 2-locular fruit.

**2. *Toechima dasyrrhache*** Radlk. in J.H.Maiden & E.Betche, *Proc. Linn. Soc. New South Wales* ser. 2, 31, 733 (1907)

T: Tintenbar, N.S.W., Oct. 1891, *W.Baeuerlen* 571; holo: NSW, iso: BRI, NSW.

Tree to 15 m. Branchlets, leaf axes and peduncles usually rusty-villous. Leaf rachis 3–8.5 cm long; leaflets 4–10, narrowly elliptic to obovate, acute, entire, usually attenuate and decurrent at base, oblique, 2–8 cm long, 1–3.5 cm wide, glabrous or lower surface puberulous; usually with hairy domatia in some nerve axils; petiolule 3–7 mm long; petiole 2–4 cm long. Inflorescence 0.5–8 cm long, raceme-like; pedicels 2–5 mm long. Calyx 1.5 mm long, appressed-pubescent. Petals 2 mm long. Filaments villous. Fruit broadly ellipsoidal, 1–2.2 cm long and wide, yellow to apricot; valves fleshy rind-like, 2–4 mm thick, densely silky inside. Aril saucer-shaped, bilobed, fleshy, ±granular. Fig. 19E–G.

Occurs from Bulburrin near Boyne R., Qld, to Wilson R., N.S.W., usually in dry rainforest along creeks. Map 98.

Qld: Upper Nerang R., *N.B.Byrnes 3514* (BRI); Bulburrin State Forest 391, Scott Rd, NE of Boyne R., *W.J.F.McDonald 3438* (BRI). N.S.W.: Whian Whian State Forest, Nov. 1953, *W.T.Jones* (BRI); Numinbah Valley, *W.J.F.McDonald & J.A.Elsol 1932* (BRI).

The densely villous leaf rachis and inflorescence differentiate this species.

**3. *Toechima daemelianum*** (F.Muell.) Radlk., *Act. Congr. Bot. Amsterdam* 130 (1877), = *Sapind. Holl.-Ind.* 60 (1879)

*Cupania daemelianum* F.Muell., *Fragm.* 9: 96 (1875); *Ratonia daemelianum* (F.Muell.) Bailey, *Syn. Queensland Fl.* 78 (1883). T: Cape York, Qld, *E.Daemel*; iso: BRI, NSW.

Tree to 13 m. Branchlets, leaf axes and peduncles pubescent or glabrescent. Leaf rachis 4.5–12.5 cm long; leaflets 4–10, elliptic to ovate, acuminate to acute, sparsely crenate-serrate, rarely entire, oblique and cuneate at base, 4.5–14.5 cm long, 2.5–4.5 cm wide, glabrous or lower surface puberulous; lateral nerves 8–10 pairs, sometimes with small domatia in axils; petiolule 5–9 mm long; petiole 2–5.5 cm long. Panicles 6–30 cm long, open; pedicels 4–7 mm long. Calyx 2 mm long, pubescent. Petals 3.5 mm long, hairy inside. Filaments hairy. Fruit broadly ellipsoidal, 1.8–2 cm long, 1.5–1.8 cm diam., yellow to orange, 3-locular; valves 4–8 mm thick. Aril smooth, ±fleshy.

Occurs in N Qld from Cape York Peninsula to Tully, in riverine rainforest. Map 99.

Qld: Claudie R., Iron Range, *A.W.Dockrill 537* (BRI); Rocky R., McIlwraith Range, *B.P.M.Hyland 2547* (BRI, NSW, QRS); Whitfield Range, near Cairns, *R.L.Jago 58* (BRI); Bamaga, *W.T.Jones 2462* (BRI).

The crenate-serrate leaf margins of this species are distinctive.

**4. *Toechima erythrocarpum*** (F.Muell.) Radlk., *Act. Congr. Bot. Amsterdam* 130 (1877), = *Sapind. Holl.-Ind.* 60 (1879)

*Cupania erythrocarpa* F.Muell., *Fragm.* 5: 7 (1865). T: Seaview Range, Rockingham Bay, Qld, *J.Dallachy*; ?iso: NSW 166318 & 166319.

*Ratonia nugentii* Bailey, *Queensland Dept. Agric. Bot. Bull.* 14: 9 (1896). T: Freshwater Ck, Cairns, Qld, Aug. 1896, *E.Cowley & L.J.Nugent*; holotype: BRI.

Tree to 20 m. Branchlets, leaf axes and peduncles puberulous to glabrescent. Leaf rachis 8.5–17.5 cm long; leaflets 2–10, elliptic-oblong to ±obovate, shortly acuminate or obtuse, entire, oblique and obtuse at base, 8.5–22 cm long, 3–8 cm wide, glabrous; lateral nerves 5 or 6 pairs, obliquely arched, usually with small domatia in some axils; reticulation prominent; petiolule 6–15 mm long; petiole 4–11 cm long. Panicles 11.5–27.5 cm long, open; pedicels 5–9 mm long. Calyx 2 mm long. Petals obovate, 3 mm long. Filaments woolly. Fruit obovoid-ellipsoidal, 2–3.5 cm long, 1.5–3.2 cm diam., 3-locular, apricot; valves fleshy, rind-like, 3–5 mm thick, densely tomentose inside. Aril smooth, yellow, fleshy. Fig. 19A–D.

Occurs in N Qld from Cape Tribulation to Tully, in gallery rainforest, usually on basalt. Also in Papua New Guinea. Map 100.

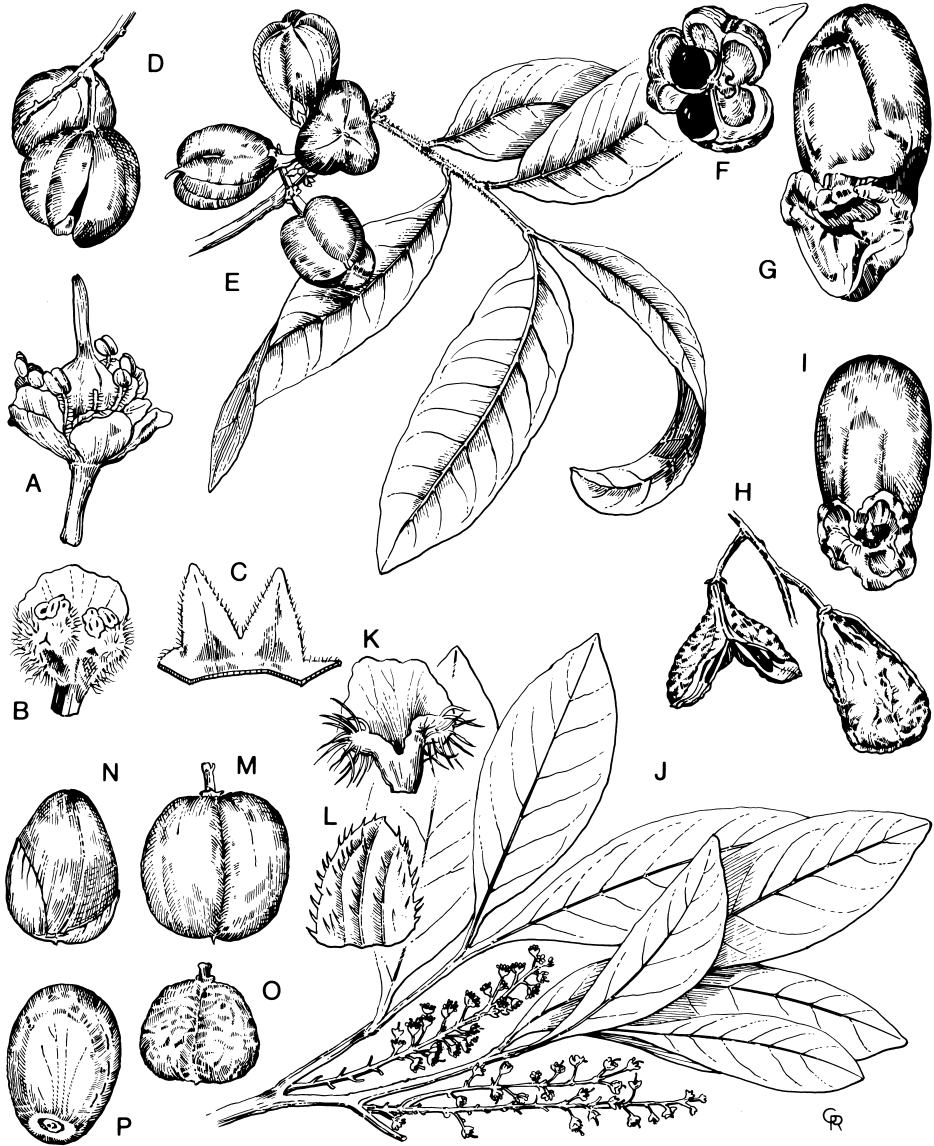
Qld: Noah Ck, Cape Tribulation, *B.Gray 1087* (QRS), State Forest Reserve 756, near Mena Ck, SW of Innisfail, *B.P.M.Hyland 5604* (BRI, QRS); eastern base of Mt Lewis, *V.K.Moriarty 2172* (BRI); State Forest Reserve 25, near Ravenshoe, *G.S.Stocker 900* (BRI, QRS).

*T. erythrocarpum* is easily recognisable by the fairly thin large leaflets with few, widely-spaced lateral nerves, and domatia in the axil of nerves.

**5. *Toechima monticola*** S.Reyn., *Fl. Australia* 25: 202 (1985)

T: Mt Lewis, 16°35'S, 145°15'E, Qld, 11 Jan. 1977, *B.Gray 218*; holotype: BRI, iso: QRS.

Tree to 25 m. Branchlets appressed-pubescent at apex; leaf axes glabrescent. Leaf rachis 6.5–11.5 cm long; leaflets 4–10, alternate, elliptic-oblong to obovate, obtuse or shortly



**Figure 19.** A–I, *Toechima*. A–D, *T. erythrocarpum*. A, female flower  $\times 4$ ; B, petal  $\times 8$ ; C, calyx lobes  $\times 8$  (A–C, V.Moriarty 1440, BRI); D, fruits  $\times 0.7$  (L.Jessup 518, BRI). E–G, *T. dasyrrhache*, E, fruiting habit  $\times 0.7$ ; F, dehiscent fruit  $\times 0.7$ ; G, seed with aril  $\times 4$  (E–G, W.McDonald 3438, BRI). H–I, *T. tenax*. H, fruits  $\times 0.7$ ; I, seed with aril  $\times 2.7$  (H–I, L.Jessup & S.Reynolds 243, BRI). J–P, *Sarcotoechia*. J–L, *S. cuneata*. J, flowering habit  $\times 0.7$ ; K, petal  $\times 16$ ; L, sepal  $\times 8$  (J–L, G.Stocker 1525, BRI). M–N, *S. protracta*. M, fruit  $\times 0.7$ ; N, seed with aril  $\times 1.3$  (M–N, B.Hyland 5619, BRI). O–P, *S. serrata*. O, fruit  $\times 0.7$ ; P, seed  $\times 1.3$  (O–P, B.Hyland 11409, BRI).

acuminate, entire, obtuse to attenuate at base, oblique, 6.5–16.5 cm long, 2.8–5.2 cm wide, glabrous or midrib puberulent below, thickly coriaceous, drying blue-grey above; lateral nerves 5–9 pairs, reticulation obscure above; domatia absent; petiolules 6–12 mm long; petiole 4.5–7.5 cm long. Panicles 4.5–18.5 cm long; peduncle minutely pubescent; pedicels 4 mm long. Calyx lobes 2.5 mm long. Petals shorter than calyx, broadly ovate. Filaments hairy towards base. Fruit subglobose, 1.8–2.2 cm long, 1.8–2.8 cm diam., orange to red; usually velvety outside; aril orange, disc-like.

Occurs in N Qld in montane rainforest over 1,000 m. Map 101.

Qld: Mt Fisher, *K.Sanderson 817 & 892* (BRI); State Forest Reserve 310, Gadgarra, *K.J.White 708* (BRI).

Similar to *T. erythrocarpum* with widely spaced lateral nerves but recognisable by the thicker leaflets that dry blue-grey above and absence of domatia.

### 6. *Toechima pterocarpum* S.Reyn., *Fl. Australia* 25: 202 (1985)

T: Bushy Ck, Julatten, Qld, 10 Jan. 1983, *G. & N.Sankowsky 231* (fruit); holotype: BRI; same locality, 16 Nov. 1983, *G. & N.Sankowsky 289* (flowers); para: BRI.

Tree to 4 m, glabrous except puberulous shoots. Leaf rachis 5–11 cm long; leaflets 4–6, subopposite or alternate, narrowly elliptic to ovate, obtuse to shortly acuminate, entire, oblique and acute or obtuse at base, 5.5–12.5 cm long, 2–3.5 cm wide, thinly coriaceous; petiolule 6–14 mm long; petiole 1.5–4 cm long. Inflorescence 17–24 cm long; peduncle glabrous. Calyx 1.5 mm long, lobes ovate, ciliolate. Petals obovate or ovate, 2.5–3 mm long, scales woolly. Filaments woolly. Fruit broadly obovoid, 3-lobed, broadly winged from apex to base, 1.5–2.5 cm long, 1.5–3 cm diam., red; pericarp thinly fleshy; wings thin, delicately veined. Aril bilobed, plate-like.

Known only from type locality. Map 102.

Qld: Jan. 1978, *T.S.Risley 285* (BRI, QRS).

The broad thin wings of the fruit easily distinguish this species.

## 22. SYNIMA

*Synima* Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss München* 9: 501 (1879); from the Greek *syn* (together or with) and Latin *ima* or *imum* (lowest part), probably referring to small layered aril adhering to lowermost part of seed.

Type: *S. cordieri* (F.Muell.) Radlk.; *Cupania cordieri* F.Muell.

Monoecious trees. Branchlets lenticellate, hairy with simple hairs. Leaves paripinnate; leaflets alternate or sub-opposite, coriaceous. Inflorescence axillary, spike-like or panicle-like; cymules clustered. Flowers regular. Calyx cupular, deeply 5-lobed; lobes ovate, slightly imbricate at base. Petals 5, ±rhomboidal, longer than calyx, with 2 large, usually crested, villous scales. Disc fleshy, annular, glabrous. Stamens usually 8; filaments filiform, villous. Ovary trigonous, 3-locular; ovule 1 per locule. Fruit obovoid or subglobose, keeled at sutures, loculicidally 3-valved; valves fleshy, drying thinly coriaceous, glabrous outside, villous inside. Seeds obovoid, slightly dorsally compressed, reddish brown; aril mantle-like or oblique, bilobed, adhering to base of seed.

A genus of 2 species occurring in New Guinea and Australia.

K.Domin, *Biblioth. Bot.* 89: 353 (1927); L.A.T.Radlkofer, *Pflanzenr.* 98: 1254–1255 (1933).

Inflorescence panicle-like; cymules pedunculate; branchlets less than 5 mm diam., finely pubescent at apex

1. *S. cordieri*

Inflorescence spike-like, rarely 1 or 2 branched; cymules subsessile; branchlets 6–10 mm diam., loosely crispate-tomentose at apex

2. *S. macrophylla*

**1. *Synima cordieri*** (F.Muell.) Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 9: 513, 546 (1879)

*Cupania cordieri* F.Muell., *Fragm.* 9: 93 (1875); *Ratonia cordieri* (F.Muell.) Bailey, *Queensland Fl.* 1: 299 (1899). T: Rockingham Bay, Qld, *J.Dallachy*; lecto: MEL 84176, *vide* S.T.Reynolds, *Fl. Australia* 25: 201 (1985).

Tree to 27 m, buttressed. Shoots and leaf axes pubescent; branchlets 3–5 mm diam., grey-brown-pubescent at apex. Leaf rachis angular, 5–9.5 cm long; leaflets 4–14, elliptic, ovate-oblong or subobovate, abruptly acuminate or obtuse, entire or remotely crenate-serrulate, oblique at base, 4.5–12.5 cm long, 2–4.5 cm wide, glabrous except puberulous midrib, coriaceous, densely reticulate; petiolule 3–8 mm long; petiole 4–6.5 cm long. Inflorescence 4–24 cm long and wide; peduncle crispate-tomentose; cymules pedunculate; pedicels 1.5 long. Calyx to 2 mm long, pubescent. Petals to 3 mm long; scales as long, villous. Filaments to 3 mm long. Fruit obovoid, triquetrous at base, slightly lobed at apex, 1–2.5 cm long and wide, red to brown, valves hairy inside. Seeds usually 2 per fruit; aril thin, bilobed, yellow, covering lower third or nearly whole of seed, dorsally split.

Occurs in N Qld from Cape Tribulation to Herberton; usually on ridges and low hills, in rainforest. Also in New Guinea. Map 103.

Qld: State Forest Reserve 675, near Danbulla, *B.Gray* 265 (BRI); State Forest Reserve 185, near Danbulla, *A.Irvine* 1806 (BRI, QRS); Keoughs scrub, Herberton, *T.Hartley & B.P.M.Hyland* 14102 (BRI); Oliver Ck, near Thornton Peak, *K.Sanderson* 1256 (QRS); State Forest Reserve 144, Windsor Tableland, *B.Gray* 2179 (BRI, QRS).

**2. *Synima macrophylla*** S.Reyn., *Fl. Australia* 25: 202 (1985)

T: Miriwinni, near Mt Bartle Frere, Qld, Dec. 1963, *L.J.Webb & J.GTracey* 8223; holotype: BRI.

Tree to 11 m. Branchlets 6–10 mm diam., rusty brown-tomentose towards apex with crispate hairs. Leaf rachis 11–23 cm long; leaflets 4–10, elliptic to ovate-oblong, shortly acuminate to obtuse, entire or crenulate-serrulate towards apex, oblique at base, 9–23 cm long, 5–11 cm wide, glabrous or lower surface puberulous; petiolule 0.5–1.5 cm long; petiole 4.5–18 cm long. Inflorescence spike-like, 6.5–28 cm long; peduncle tomentose; cymules subsessile; bracts to 8 mm long; pedicels 2–4 mm long. Calyx to 3.5 mm long, pubescent outside. Petals 2–2.5 mm long; scales ciliate. Filaments to 2.5 mm long. Fruit subglobose or broadly ellipsoidal, keeled at sutures, 1.5–2.2 cm long, red; valves fleshy, villous inside. Aril small, at base of seed, fleshy, orange-yellow. Figs 17, 18G–J.

Occurs in N Qld, from N of Daintree to S Johnstone River; grows on margins of rainforest. Map 104.

Qld: Upper Barron district, SE of Atherton, *T.Hartley & B.P.Hyland* 1410 (BRI); Topaz, SE of Malanda, *L.W.Jessup* 523 (BRI); State Forest Reserve 755, near Topaz, *G.C.Stocker* 1520 (QRS); near Lammonds Hill, Gourka Pocket Rd, SE of Malanda, *L.S.Smith* 12092 (BRI); Kaban, N of Ravenshoe, Aug.–Sept. 1954, *K.J.White* (BRI).

## 23. SARCOTOECHIA

*Sarcotoechia* Radlk., *Sitzungsber. Math.-Phys. Cl. KöAkad. Wiss. München* 9: 501, 659 (1879); from the Greek *o* (fleshy), and *toichos* (wall), referring to fleshy walls of fruit.

T: not designated

Monoecious trees. Indumentum of simple hairs. Leaves paripinnate; leaflets opposite or alternate, usually decreasing in size from apex to base. Inflorescence axillary or ramiflorous, usually slender, raceme-like or openly branched. Flowers regular. Calyx cupular, with 5 ovate lobes. Petals 5, usually ovate, clawed, the lower margins incurved or auricled; scales 2, hairy, crestless. Disc annular. Stamens 8; filaments filiform, hairy in lower half. Ovary 2- or 3-locular; ovule 1 per locule, 1 or 2 mostly abortive; style



slender. Fruit ellipsoidal, obovoid or subglobose, 1–3-locular, loculicidally dehiscent, 2- or 3-valved; pericarp usually fleshy but valves drying thin, usually hairy inside. Seed usually with thin, shiny, brittle testa; aril basal, shortly cupular or rudimentary, rarely absent.

A genus of 6 species in eastern Australia. Also in New Guinea.

Characterised by the very fleshy valves fruit, the seeds with small aril at their base and the absence of crests on scales on the petals.

- |    |   |                                  |
|----|---|----------------------------------|
| 1  | Leaflet margins serrate or serrulate; indumentum of crispate hairs; fruit 2-locular; pericarp not fleshy; aril minute or absent                             | <b>1. <i>S. serrata</i></b>      |
| 2  | Leaflets 3–6 pairs, regularly serrate, 2–5.5 cm long, 1.2–2.5 cm wide   |                                  |
| 2: | Leaflets 2 or 3 pairs, irregularly remotely serrate or serrulate, 5.5–12 cm long, 2.5–4.2 cm wide   | <b>2. <i>S. heterophylla</i></b> |
| 1: | Leaflet margins entire; indumentum of straight hairs; fruit 2- or 3-locular; pericarp fleshy; aril cupular  |                                  |
| 3  | Branchlets and leaves villous; leaves bifoliolate   | <b>3. <i>S. villosa</i></b>      |
| 3: | Branchlets and leaves with short appressed hairs or glabrous; leaflets 1–4 pairs  |                                  |
| 4  | Fruit 1.5–2.5 cm long, 1–3 cm diam., 3-locular; valves glabrous except villous sutures; leaflets 7–17 cm long, 2.5–6 cm wide; lateral nerves raised, curved | <b>4. <i>S. protracta</i></b>    |
| 4: | Fruit 0.6–1.3 cm long, 0.8–1.8 cm diam., 2-locular; valves hairy inside; leaflets 3.5–13 cm long, 1–4 cm wide; lateral nerves usually indistinct            |                                  |
| 5  | Leaflets 1 or 2 pairs, narrowly obovate-cuneate, coriaceous; petiolule short, tumid, to 4 mm long   | <b>5. <i>S. cuneata</i></b>      |
| 5: | Leaflets 2–4 pairs, narrowly elliptic-oblong, ±chartaceous; petiolule slender 4–12 mm long  | <b>6. <i>S. lanceolata</i></b>   |

### 1. *Sarcotoechia serrata* S.Reyn., *Fl. Australia* 25: 201 (1985)

T: Gadgarra, Qld, Sept. 1954, *K.J.White* 895 flower; holo: BRI; Gadgarra, Qld, 14 Dec. 1981, *B.P.M.Hyland* 11412 fruit; para: BRI, isopara:QRS.

Tree to 11 m. Branchlets, leaf axes and peduncles rusty brown crispate tomentose to glabrescent. Leaf rachis 4.3–8 cm long; leaflets 6–12, opposite to alternate, narrowly ovate-oblong or elliptic, acuminate to acute, serrate or serrulate, obtuse at base, 2–5.5 cm long, 1.2–2.5 cm wide glabrous above, puberulent below, thinly coriaceous, finely reticulate; petiole 1.5–3.2 cm long. Inflorescence ramiflorous or axillary, raceme-like, 5–10 mm long; pedicels 3–5 mm long. Calyx 2 mm long, lobes narrowly ovate. Petals ovate, acuminate. Disc lobed. Filaments 2.5–3.5 mm long. Fruit transversely ellipsoidal or obovoid, 1.2–2.3 cm long, 1.2–2.5 cm diam., 2-lobed, 2-locular, orange-yellow; valves 2, thin, silky inside. Seed large, oblong, orange-brown, dull; aril minute, yellow. Fig. 19 0–P.

Occurs in N Qld, from Gadgarra to Ravenshoe; common as an understorey tree in rainforest at Gadgarra. Map 105.

Qld: State Forest Reserve 310, Gadgarra, *B.P.M.Hyland* 2490 (BRI); Ravenshoe, *J.B.Mannell* (BRI 143968).

The 3–6 pairs of deeply serrate small leaflets, the crispate indumentum and the rudimentary aril distinguish the species.

**2. Sarcotoechia heterophylla** S.Reyn., *Fl. Australia* 25: 201 (1985)

T: Eungella, Qld, Nov. 1982, *K.A.W.Williams 82244*; holotype: BRI.

Tree to 12 m. Branchlets and peduncles pale brown crispate tomentose. Leaf rachis 2.5–6.5 cm long; leaflets 4–6, alternate, elliptic, obovate or ovate, acuminate to acute, remotely serrate, ±cuneate or obtuse at base, 5.5–12 cm long, 2.5–4.2 cm wide, glabrous or puberulous below towards base, thinly coriaceous, nerves raised especially below; domatia inconspicuous or absent; petiolule 1–4 mm long; petiole 2–3.5 cm long. Inflorescence axillary, raceme-like, 1.5–3.5 cm long; pedicels 3 mm long, pubescent. Calyx 1.5–2.5 mm long; lobes triangular. Petals ovate. Disc lobed. Filaments to 1.5 mm long. Fruit obovoid or transversely ellipsoidal, 1- or 2-lobed, 1.2 cm long, 1.3–1.6 cm diam., yellow; valves 2, thin, densely silky inside. Seed orange, oblong, dull; aril rudimentary or absent.

Occurs around Eungella, from W of Cathu to ranges; growing on ridges rainforest. Map 106.

Qld: Eungella, *N.B.Byrnes & J.R.Jackson 3704* (BRI); Finch Hatton Gorge, *B.P.M.Hyland 8241* (BRI); Massey Ck, near Eungella, *L.S.Smith 4830* (BRI).

*S. heterophylla* is close to *S. serrata*, differing chiefly in having 2 or 3 pairs of leaflets with irregularly serrate or serrulate margins.

**3. Sarcotoechia villosa** S.Reyn., *Fl. Australia* 25: 201 (1985)

T: Timber Reserve 66, Mt Lewis, 22 Nov. 1978, *V.K.Moriarty 2537*; holotype: BRI, isotype: QRS.

Tree to 10 m. Branchlets, leaves and peduncles villous. Leaves usually bifoliolate; leaflets narrowly elliptic, acute to obtuse, entire, narrowly cuneate or subtruncate at base, 3.5–12.5 cm long, 7–3.5 cm wide, puberulous or upper surface glabrous except midrib, thinly coriaceous, finely reticulate; petiolule 1–2 mm long; petiole 1.2–3.5 cm long. Inflorescence axillary, raceme-like, 2.5–3.5 cm long; pedicels 3 mm long. Calyx 1.8 mm long; lobes narrowly ovate, puberulous. Petals ±hastate, long clawed, sparsely hairy inside and on scale. Filaments 3–3.5 mm long. Fruit obovoid, narrowly winged at sutures, 1–1.2 cm long, 3-locular, 3-valved, orange-red; pericarp fleshy; valves glabrous except villous sutures inside. Seed small, shiny; aril cupular, bilobed.

Occurs in N Qld from S of Mossman to Kuranda area, in montane rainforest. Map 107.

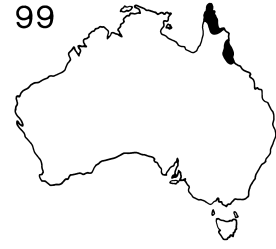
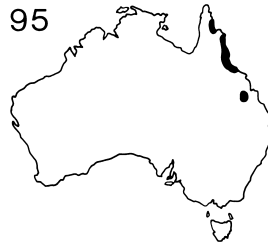
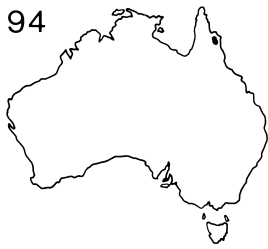
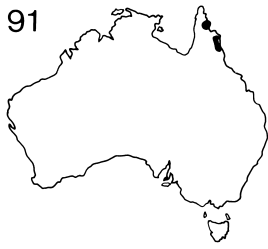
Qld: Black Mtn Rd, near Kuranda, *L.J.Webb & J.G.Tracey 7042* (BRI); Black Mtn area, Oct. 1961, *E.Volck* (BRI).

*S. villosa* differs from other species in its villous branchlets and leaves; the leaves are bifoliolate.

**4. Sarcotoechia protracta** Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 9: 525, 544, 660 (1879)

T: Rockingham Bay, Qld, Oct. 1870, *J.Dallachy*; lectotype: MEL 74665, *fide* S.T.Reynolds, *Fl. Australia* 25: 201 (1985).

Tree to 13 m. Branchlets minutely hairy, soon glabrous. Leaf rachis 4–8.5 cm long; leaflets 4–6, opposite or alternate, elliptic-oblong or ±ovate-oblong, acuminate to obtuse, entire, obtuse or attenuate at base, 7–16 cm long, 2.5–6 cm wide, glabrous; lateral nerves widely spaced, prominent; petiolule 3–11 mm long; petiole 3–8 cm long. Inflorescence axillary or ramiflorous, usually raceme-like, 2–7 cm long; peduncles minutely hairy; pedicels to 2.5 mm long, pubescent. Calyx lobes ovate, puberulent outside. Petals ovate, shortly clawed, 2 mm long, white. Filaments 2 mm long. Fruit subglobose, 1.5–2.5 cm long, 3-locular, 1-seeded, yellow to red; pericarp fleshy; valves glabrous except villous sutures. Seed ovoid, black, shiny; aril cupular, bilobed. Fig. 19M–N.



91. *Elattostachys microcarpa*  
94. *Sarcopteryx montana*  
97. *Toechima tenax*  
100. *Toechima erythrocarpum*  
103. *Synima cordieri*

92. *Sarcopteryx stipata*  
95. *Sarcopteryx martyana*  
98. *Toechima dasyrhache*  
101. *Toechima monticola*  
104. *Synima macrophylla*

93. *Sarcopteryx reticulata*  
96. *Sarcopteryx acuminata*  
99. *Toechima daemelianum*  
102. *Toechima pterocarpum*  
105. *Sarcotoechia serrata*

Occurs in N Qld from Walter Hill Range to Seaview Range; usually in rainforest in low hilly country. Map 108.

Qld: State Forest Reserve 756, near Mena Ck, S of Innisfail, *B.P.M.Hyland 5619* (BRI); Lacey's Ck, Clump Mtn, *L.S.Smith 4982* (BRI); Mission Beach, *E.Volck 945* (BRI); Cannabullen via Ravenshoe, *L.J.Webb & J.G.Tracey 7631* (BRI).

*S. protracta* has the largest leaflets and fruits in the genus; the lateral nerves are strongly curved and raised on the lower leaf surface.

**5. *Sarcotoechia cuneata* Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 9: 525, 544, 659 (1879)**

T: Rockingham Bay, 2 Nov. 1870, *J.Dallachy*; lecto: MEL 74661 *vide* S.T.Reynolds, *Fl. Australia* 25: 201 (1985)

Tree to 25 m. Branchlets and peduncles minutely pubescent. Leaf rachis 1.2–3.7 cm long; leaflets 2 or 4, usually opposite, narrowly elliptic to obovate-cuneate, obtuse, shortly acuminate, entire, decurrent, 3.5–11 cm long, 1–3.2 cm wide, glabrous, coriaceous, dull, opaque, finely nerved and reticulate; petiolule 1–4 mm long; petiole 0.5–3 cm long. Inflorescence axillary, 5–8.5 cm long, raceme-like or with 1 or 2 branches; cymules 2–flowered; pedicels 2–4 mm long. Calyx lobes ovate, puberulent. Petals broadly ovate, usually 2-toothed, clawed, 1.2–1.5 mm long, densely villous. Filaments 3 mm long. Fruit obovoid, 1- or 2-lobed, 1–1.2 cm long, usually 1-seeded, yellow or red; pericarp thinly fleshy; valves villous inside. Seed small, reddish brown, oblong, shiny; aril small, annular, fleshy. Fig. 19J–L.

Occurs in N Qld from Windsor Tableland to Mt Bellenden Ker, in montane rainforest. Map 109.

Qld: State Forest Reserve 607, near Mareeba, *B.Gray 2656* (BRI); State Forest Reserve 144, Mt Spurgeon, *B.P.M.Hyland 5678* (BRI); State Forest Reserve 185, Mt Haig near Danbulla, *J.Martin 4067* (BRI); Tinaroo Range via Danbulla, NE of Atherton, *L.S.Smith 4166A* (BRI).

Distinguished by the 1 or 2 pairs of leaflets with short petiolules and the leaflets cuneate and thick at the base.

**6. *Sarcotoechia lanceolata* (C.White) S.Reyn., *Fl. Australia* 25: 201 (1985)**

*Toechima lanceolatum* C.White, *Contr. Arnold Arbor.* 4: 62 (1933). T: Gadgarra Reserve, Atherton Tableland, Qld, 24 May 1929, *S.F.Kajewski 1038*; *holo*: BRI.

Tree to 30 m. Branchlets, leaf axes and peduncles minutely pubescent. Leaf rachis 1–6.5 cm long; leaflets 2–8, opposite to alternate, narrowly elliptic oblong, acuminate, entire, shortly attenuate at base, slightly oblique, 6.5–11 cm long, 2–3 cm wide, glabrous or glabrescent below towards base, chartaceous, finely nerved and reticulate; petiolule 4–12 mm long; petiole 1–4 cm long. Inflorescence axillary, panicle-like, 2.5–8 cm long; pedicels 2–3 mm long. Calyx 1.2 mm long; lobes ovate, puberulent. Petals shorter than calyx, broadly ovate, long-clawed, 2-toothed, sparsely hairy on claw and scale-like lower margin. Filaments 0.5–2 mm long. Fruit broadly obovoid or subcordate, usually 2-sulcate, 0.6–1.3 cm long, usually 1-seeded, 2-valved, yellow with reddish base; pericarp thinly fleshy; valves crispate-tomentose inside. Seed oblong, shiny; aril fleshy, annular, cream.

Occurs in N Qld in the Atherton Tableland area, in rainforest between 400 and 800 m. Map 110.

Qld: Gadgarra, *S.F.Kajewski 1084 & 1150* (BRI, NSW); State Forest Reserve 310, E of Malanda, *B.P.M.Hyland 2792* (BRI); near Mareeba, Aug. 1970, *D.Nicholson* (BRI); Koolmoon Ck, near Ravenshoe, *L.S.Smith 5280* (BRI).

**24. LEPIDOPETALUM**

*Lepidopetalum* Blume, *Rumphia* 3: 171 (1849); from the Greek *lepidos* (scaly or flaky) and *petalum* (a petal) referring to large scale of the petal.

T: *L. perrottetii* Blume

Monoecious trees. Branchlets lenticellate, usually hairy towards apex, with simple hairs. Leaves paripinnate; leaflets opposite or alternate, usually decreasing in size from apex, entire. Inflorescence axillary, panicle-like. Flowers regular. Calyx cupular, 5-partite; lobes ovate, valvate. Petals 5, minute; scale broad, free or united to margin forming a broad funnel or 2-valved and broadly ovate; crests absent. Disc complete. Stamens 8–10; filaments and anthers hairy. Ovary sessile, compressed, 2-locular; ovule 1 per locule, 1 usually abortive; style short. Fruit obovoid or obcordate, 2-sulcate, turgid but slightly compressed at sutures, 1-seeded, 2-valved; valves thick, drying crustaceous or woody. Seed subglobose; aril fleshy, basal or nearly covering seed.

A genus of 6 species, in Andaman and Nicobar Islands, Sumatra, Philippines, Tenimbar and Kei Island, Bismarck Archipelago, NewGuinea and Australia; 1 species in Australia.

Distinguished by the shell-like petals with a broad scale and by the oblong-obovoid, 2-valved, 1-seeded fruits.

L.A.T.Radlkofer, in C.Lauterbach, *Beitr. Fl. Papuasien* 7: 306–308 (1921).

**Lepidopetalum subdichotomum** Radlk., in Schumann & Hollrung, *Fl. Kaiser Wilhelms-Land* 67 (1889)

T: New Guinea 1887, *Hollrung* 387; *n.v.*

Tree to 13 m. Branchlets and leaf axes finely hairy, soon glabrous. Leaf rachis 4.5–11 cm long; leaflets 6–8, opposite or alternate, elliptic or subobovate, shortly acuminate or caudate at apex, acute or obtuse at base, 4.5–18 cm long, 2–6 cm wide, thinly coriaceous, glabrous; petiolule 2–8 mm long; petiole 2–5 cm long. Inflorescence usually near branch apices, dichotomously branched, 2.5–9.5 cm long; peduncle glabrescent; pedicels 3–6 mm long, glabrous. Calyx lobes 2–2.5 mm long, glabrous, veined. Petals ovate, shortly clawed, 0.5–1.2 mm long, veined, ciliolate; scale larger, broad, crispate-hairy. Filaments subulate, to 4 mm long, hairy from below middle. Fruit obcordate, shortly stipitate, 2–2.5 cm long, 1.5–2 cm diam., slightly ridged and compressed at sutures, orange to red; valves glabrous, crustaceous. Seed embedded at base in oblique, ventral, orange aril. Figs 16, 21K.

Occurs in Torres Strait and Cape York Peninsula, Qld, and in New Guinea, in rainforest. Map 111.

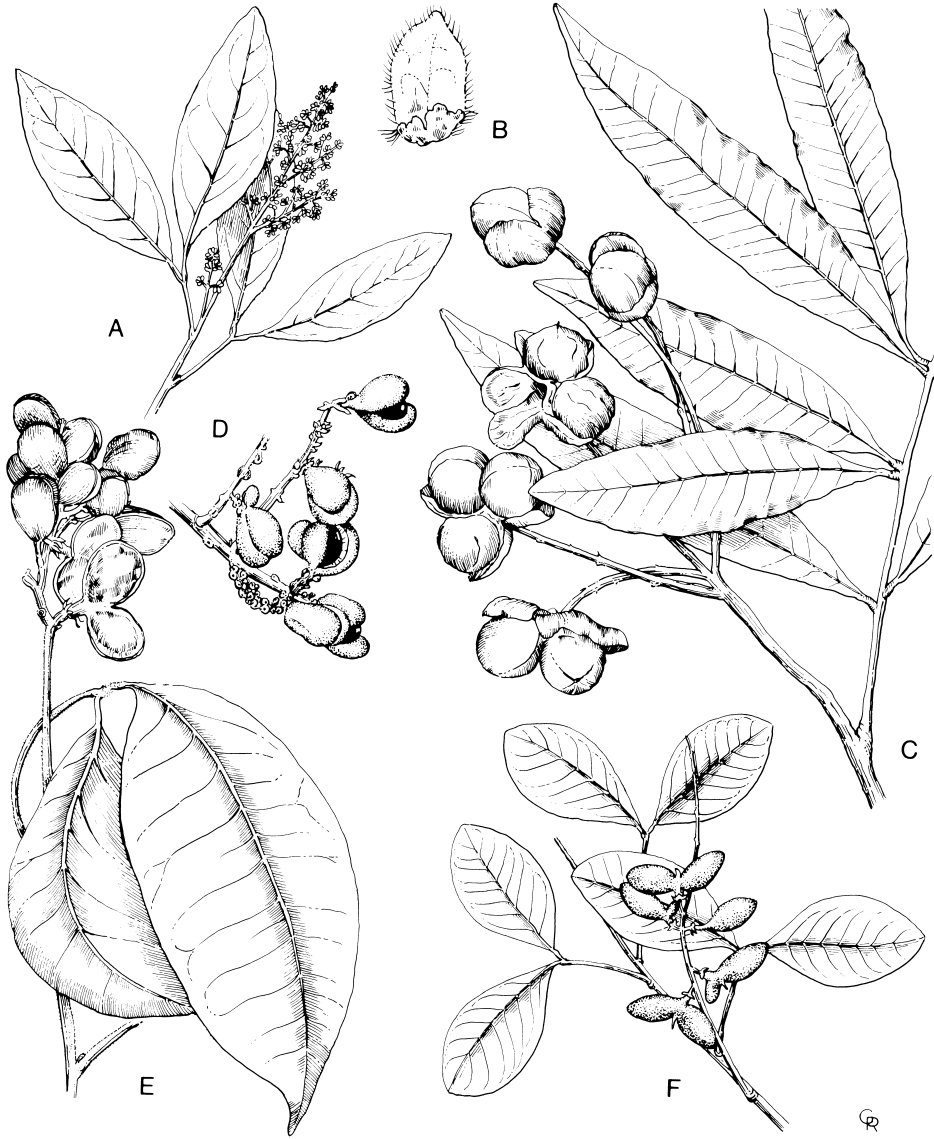
Qld: Claudie River, *B.P.M.Hyland* 9538 (QRS); Rocky River, Silver Plains, *A.K.Irvine* 65, 66 (QRS); Murray Is., Torres Strait, *M.Lawrie* 19, 130 (BRI).

**25. ARYTERA**

*Arytera* Blume, *Rumphia* 3: 169 (1847); from the Greek *Aryter* (cup or ladle) referring to cup-like fruit valves of most species.

T: not designated.

Trees, monoecious. Branchlets usually pale, lenticellate; indumentum of simple hairs. Leaves paripinnate; leaflets opposite to alternate, usually with prominent lateral nerves and parallel cross veins; domatia usually present along midrib. Inflorescence usually axillary, raceme-like or panicle-like; cymules stalked. Flowers regular. Calyx cupular, deeply 5-lobed; lobes ovate. Petals 5, usually clawed; scales crestless. Disc complete. Stamens 6–8, filaments filiform, hairy. Ovary 2- or 3-lobed or not lobed, 2- or 3-locular; ovule 1 per locule; style short; stigmas toothed or lobed. Fruit 1–3-lobed, 2-valved, or



**Figure 20.** A–F, *Arytera*. A–B, *A. distylis*. A, flowering habit  $\times 0.7$ ; B, petal  $\times 16$  (A–B, L.Jessup 266, BRI). C, *A. lautereriana*, dehisced fruits showing seed with aril  $\times 0.7$  (K.Reid 1, BRI). D, *A. foveolata*, fruits  $\times 0.7$  (L.Bird, BRI 283958). E, *A. dictyoneura*, fruiting habit  $\times 0.7$  (W.McDonald 3439, BRI). F, *A. microphylla* fruiting habit  $\times 0.7$  (L.Smith 4110, BRI).

not lobed, loculicidally or irregularly dehiscent; pericarp thin or thinly fleshy; valves drying thin, crustaceous. Seed obovoid; aril thinly fleshy, usually enclosing seed.

A genus of 25 species in Philippines, Indonesia, New Caledonia, New Guinea and Australia; 10 species in Australia.

Distinguishable by the lobed fruits (with 2 or 3 divaricate lobes), the aril enclosing the seed, and most species having strongly arched lateral nerves and fine cross veinlets.

L.A.T.Radlkofer, *Pflanzenr.* 98: 1268–1288 (1933); K.Domin, *Biblioth. Bot.* 89: 354–355 (1927); R.W.J.M. van der Ham, *Blumea* 23: 289–300 (1977).

- |    |  |                           |
|----|--|---------------------------|
| 1  | Leaflets 4–8 pairs with minute domatia along midrib; fruit drying black, irregularly lobed or not lobed, usually irregularly dehiscent                                     |                           |
| 2  | Leaflets usually 5–8 pairs, narrowly elliptic oblong or ovate-oblong; fruit on long stipe, irregularly dehiscent or by valves  | <b>1. A. lautereriana</b> |
| 2: | Leaflets usually 4–6 pairs, elliptic oblong; fruit on short stipe or sessile, irregularly dehiscent  | <b>2. A. macrobotrys</b>  |
| 1: | Leaflets 1–4 pairs, domatia prominent or absent; fruit divaricately 2- or 3-lobed or 1-lobed, loculicidally dehiscent by valves  |                           |
| 3  | Leaves bifoliolate; endocarp usually hairy   |                           |
| 4  | Domatia present, prominent, few per leaflet; endocarp villous  | <b>3. A. distylis</b>     |
| 4: | Domatia absent; endocarp villous or glabrous with only sutures hairy   |                           |
| 5  | Leaflets 2–5 cm long, 0.8–3 cm wide; valves densely villous inside   | <b>4. A. microphylla</b>  |
| 5: | Leaflets 6–19.5 cm long, 2.8–5.5 cm wide; valves glabrous inside except sparsely villous sutures   | <b>5. A. bifoliolata</b>  |
| 3: | Leaflets usually 2–4 pairs; endocarp glabrous or hairy only at sutures   |                           |
| 6  | Inflorescence ramiflorous, few-flowered, of small clusters or raceme-like; pedicels 4–12 mm long; leaflets usually bullate   | <b>6. A. pauciflora</b>   |
| 6: | Inflorescence axillary, panicle-like or raceme-like; pedicels 1–6 mm long; leaflets not bullate  |                           |
| 7  | Indumentum on tips of branchlets and inflorescence of crispate hairs   |                           |
| 8  | Leaflets 4–6, opposite to alternate, 6–12.5 cm long 2.3–3.5 cm wide, entire or serrulate; branchlets usually with dense rusty hairs  | <b>7. A. foveolata</b>    |
| 8: | Leaflets 2 pairs, opposite, 8–15 cm long, 3.5–7 cm wide, entire; branchlets with sparse, pale brown hairs  | <b>10. A. sp.</b>         |
| 7: | Indumentum of straight, usually short appressed hairs  |                           |
| 9  | Leaflets 2–4 pairs; lateral nerves strongly raised below with prominent cross veins; domatia prominent; branchlets with short, pale hairs; panicles to 18 cm long and wide | <b>8. A. divaricata</b>   |
| 9: | Leaflets 2 pairs, finely nerved and delicately reticulate; domatia obscure or absent; branchlets with dense, pale brown to rusty brown hairs; inflorescence to 9 cm long   | <b>9. A. dictyoneura</b>  |

**1. Arytera lautereriana** (Bailey) Radlk., *Repert. Spec. Nov. Regni Veg.* 20: 37 (1924)

*Nephelium lautererianum* Bailey, *Queensland Dept. Agric. Bot. Bull.* 4: 8 (1891). T: Eudlo scrub, Qld, Nov. 1891, J.H.Simmonds & F.M.Bailey; holotype: BRI 25328.

Tree to 30 m; glabrous except puberulous shoots and inflorescence. Leaf rachis 10–15 cm long; leaflets usually 10–16, alternate or subopposite, elliptic-oblong to ovate-oblong, bluntly acuminate, entire or serrulate, attenuate at base, 5.5–15 cm long, 1.5–3 cm wide; lateral nerves 14–26 pairs, with small domatia in axils; petiolule 0.8–1.8 cm long; petiole 3.5–6.5 cm long. Panicles axillary, 6–24 cm long; pedicels 2–3.5 mm long. Calyx 1.5 mm long, glabrous. Petals ovate, long-clawed, 2 mm long. Filaments 2.5–4 mm long, pilose. Fruit on long stipe, globose or broadly ellipsoidal, irregularly 2- or 3-lobed, 1–2 cm long

including stipe, 1–4 cm diam., irregularly dehiscent, or lobes 2-valved, the valves thin, glabrous. Seed large, enclosed in fleshy amber aril. *Corduroy Tamarind*. Fig. 20C.

Occurs from Atherton Tableland to south-eastern Qld, in montane rainforest. Map 112.

Qld: Dalrymple Heights, Nov. 1947, *M.S.Clemens* (BRI); Upper Boyne River, near Scott Rd crossing, *W.J.F.McDonald, W.J.Fisher & P.Ryan 3183* (BRI); Kin Kin, Wellworth Stn, Dec. 1980, *K.Reid* (BRI); Gadgarra, *R.Schodde 3255* (BRI); between Mt Edith and Danbulla, near Kairi, *L.S.Smith 3366* (BRI).

*A. lautereriana* is distinct in having 5–8 pairs of narrow leaflets, small domatia in the axils of lateral nerves and large, irregularly lobed, stipitate fruits.

Tamarind flavoured aril used for jams. Wood said to be suitable for flooring.

## 2. *Arytera macrobotrys* (Merr. & Perry) van der Ham, *Blumea* 23: 291 (1977)

*Mischocarpus macrobotrys* Merr. & Perry, *J. Arnold Arb.* 21: 254 (1940). T: Lake Daviumbu, Middle Fly River, New Guinea, Aug. 1936, *L.J.Brass 7618*; iso: BRI.

Tree to 10 m, monoecious or dioecious; glabrous except hairy shoots and inflorescence. Leaf rachis 21–26 cm long; leaflets 8–12, alternate, elliptic-oblong or ovate-oblong, obtuse to acute, entire, obtuse at base, 8.5–20.5 cm long, 3.5–6.5 cm wide; lateral nerves 8–14 pairs, strongly raised below, with minute domatia in axils; petiolules 0.5–1.5 cm long; petiole 6.5–13.5 cm long. Panicles axillary, 10–36 cm long; pedicels 1.5–2 mm long. Calyx 1.5 mm long, puberulent. Petals ovate, shortly clawed, 1.5 mm long. Filaments 2–3 mm long, pilose. Fruit sessile or on short stipe, globose or broadly obovoid, 2–3 cm long, irregularly 2-lobed or not lobed, irregularly dehiscent, drying black, shiny, glabrous. Seed large, enclosed in translucent acidic orange-yellow aril.

Occurs in Cape York Peninsula, Qld, and New Guinea, on rainforest margins. Map 113.

Qld: Claudie River, *A.W.Dockrill 467* (BRI), *B.P.M.Hyland 3574* (BRI), Chester River, *B.P.M.Hyland 3537* (QRS); McIlwraith Range, *L.J.Webb & J.G.Tracey 7968* (BRI).

Very close to *A. lautereriana* in leaf and fruit but the wider leaflets are in 4–6 pairs and the fruits are usually sessile.

## 3. *Arytera distylis* (F.Muell. ex Benth.) Radlk., *Act. Congr. Bot. Amsterdam* 114 (1877), = *Sapind. Holl.-Ind.* 44 (1879)

*Nepelium distylis* F.Muell., *Fragm.* 9: 99 (1825). T: Brisbane River, Moreton Bay, Qld, *W.Hill.*; ?syn: NSW 166328; Port Denison, Qld, *E.Fitzalan*; syn: *n.v.*; Bunija Ck Brush, Qld, *L.Leichhardt*, syn: *n.v.*

Tree to 20 m, glabrous except pubescent shoots and peduncles. Leaves bifoliolate; leaflets elliptic, subobovate or narrowly elliptic-oblong, acute to  $\pm$ retuse, entire,  $\pm$ acute at base, 3.2–7.5 cm long, 1.5–3.5 cm wide, glabrous, rarely puberulous below; lateral nerves raised below with prominent domatia in some axils; petiolules 3–5 mm long; petioles 5–10 mm long. Inflorescence axillary, usually unbranched, 2–8.5 cm long; pedicels 1.5–3.5 mm long. Calyx 1.5 mm long, pubescent. Petals subrhomboidal, 2 mm long. Disc lobed. Filaments 1.5 mm long, densely hairy. Ovary compressed; stigmas recurved, persistent. Fruit on short stipe, obcordate, 0.4–1.8 cm long, 1–2.5 cm diam., orange-yellow; lobes divaricate or  $\pm$ erect; valves thinly fleshy, glabrous outside, densely rusty-villous inside. Aril red. Fig. 20A–B.

Occurs from south-eastern Qld to Richmond River, N.S.W.; usually on ranges, in remnant rainforest or on border of rainforest. Map 114.

Qld: Brookfield, Brisbane, *L.W.Jessup 266* (BRI); Rosen Lookout, Beechmont, *L.W.Jessup & S.T.Reynolds 164* (BRI, NSW); Kin Kin, *C.T.White* (BRI 70858). N.S.W.: Manyon–Dunoon Rd, Dorrroughby, *L.S.Smith 5110* (BRI).

*A. distylis* is distinguishable by its bifoliolate leaflets, few prominent domatia and the valves of fruit which are densely hairy inside.



**4. *Arytera microphylla*** (Benth.) Radlk., *Act. Congr. Bot. Amsterdam* 114 (1877), = *Sapind. Holl.-Ind.* 44 (1879)

*Nepheium microphyllum* Benth., *Fl. Austral.* 1: 468 (1863). T: Wide Bay, Qld, *J.C.Bidwill*; n.v.

Tree to 3 m. Leaf axes and inflorescence minutely pubescent or puberulent. Leaves bifoliolate; leaflets broadly elliptic or obovate, rounded, truncate-dentate or retuse, entire, or serrulate towards apex, obtuse and shortly decurrent at base, 2–5 cm long, 0.8–3 cm wide; nerves prominent, fine; petiolules 1–2 mm long; petiole 4–18 mm long. Inflorescence axillary, raceme-like, 2.5–8 cm long; pedicels 1–2 mm long. Calyx deeply lobed; lobes narrowly ovate, to 1.5 mm long, puberulous. Petals not seen. Disc 5- or 6-lobed. Filaments 2–2.5 mm long, pilose. Fruit obcordate, abruptly stipitate, divaricately 2- or 3-lobed or 1-lobed, 6–8 mm long including stipe, 10–12 mm diam.; lobes ellipsoidal, grooved at sutures; valves glabrous outside, densely villous inside. Fig. 20F.

Occurs in south-eastern Qld from Bundaberg to Kingaroy, in rainforest. Map 115.

Qld: Maryborough, Sept. 1948, *M.S.Clemens* (BRI); Biggenden State Forest, *McLachlan* (BRI 71294); Edenvale Hill, near Kingaroy, *N.Michael* 3029 (BRI); Goonoon 32 km W of Bundaberg, *K.D.Sarnadsky* 7 (BRI); Bingera, *L.S.Smith* 4110 (BRI).

This species is close to *A. distylis* differing in the smaller, obovate leaflets without any domatia and in the very prominent lateral nerves.

**5. *Arytera bifoliolata*** S.Reyn., *Fl. Australia* 25: 198 (1985)

T: Lockerbie, Cape York Peninsula, Qld, 5 Dec. 1962, *B.P.M.Hyland* 2533; holo: BRI.

Tree to 10 m, glabrous except appressed pubescent shoots and inflorescence. Leaves bifoliolate; leaflets elliptic-oblong or ovate-oblong, acute or obtuse at both ends, entire, 6–19.5 cm long, 2.8–5.5 cm wide; finely nerved and reticulate, the lateral nerves 12–16 pairs, spreading; petiolules 3–8 mm long; petiole 1–2 cm long. Panicles axillary, 2–7 cm long and wide; peduncles pubescent; pedicels 2–3 mm long. Calyx 2 mm long, puberulous. Petals subrhomboidal, 2 mm long. Filaments 2–3.5 mm long, pilose. Ovary compressed; style short with persistent recurved stigmas. Fruit obcordate, abruptly stipitate, deeply 2-lobed with erect lobes or 1-lobed, 1–1.5 cm long, 0.5–1.5 cm diam.; valves glabrous except sparsely villous sutures inside.

Occurs in N.T. and N Qld, on Cape York Peninsula Qld; growing in lateritic soil and sandstone, in rainforest bordering mangroves. Map 116.

N.T.: Little Nourlangie Rock, *C.Dunlop* 5062 (DNA); Wessel Is., *P.Latz* 3506 (BRI). Qld: Weipa, Sept. 1980, *M.Godwin* (BRI); Timber Reserve 14, near Coen, *B.P.M.Hyland* 10854 (BRI); Annan River crossing, *L.S.Smith* 10638 (BRI); Pascoe River, *L.J.Webb* & *J.G.Tracey* 13247 (BRI).

**6. *Arytera pauciflora*** S.Reyn., *Fl. Australia* 25: 198 (1985)

T: Johnstone River, Mar. 1915, *Rev. N.Michael*, holo: BRI 170246; iso: BRI 170247.

Tree to 10 m. Shoots and inflorescence appressed puberulent. Leaf rachis 0.5–2.5 cm long; leaflets 2–4, opposite, elliptic or ovate-oblong, acuminate or acute, entire, obtuse to acute at base, 5.5–17.5 cm long, 2–5.5 cm wide, glabrous or puberulous below; lateral nerves 8–12 pairs, raised below, finely reticulate between; domatia usually present; petiolules 2–8 mm long; petiole 2–4.5 cm long. Inflorescence few-flowered, axillary, of small clusters or raceme-like, to 4 cm long, peduncles puberulent; pedicels 4–12 mm long. Calyx 1.5–2.5 mm long, puberulent. Petals oblong-ovate, shortly clawed, 1.5–3 mm long. Filaments 1 mm long, villous. Ovary compressed, 2-locular. Fruit subsessile, divaricately 2-lobed or 1-lobed, 0.8–1.5 cm long, 1–3.5 cm diam., rusty-scurfy outside; valves thick, glabrous except villous sutures inside. Aril red.

Occurs in N Qld from Cooktown to Tully; usually on ridges in scrubby rainforest. Map 117.

Qld: Upper Parrot Ck, Annan River, *L.J.Brass 20251* (BRI); N of road to Cardstone, *A.W.Graham 2488* (BRI); Mt Bellenden Ker, *L.S.Smith 14719* (BRI); Malanda, *G.C.Stocker 1484* (BRI); Cannabullen Falls, *L.J.Webb & J.G.Tracey 6294* (BRI); Tully, *E.Volck 1083* (BRI).

Differs from other species in Australia by its small, few-flowered inflorescence and very fine reticulation.

### 7. *Arytera foveolata* F.Muell., *Trans. & Proc. Philos. Inst. Victoria* 3: 24 (1859)

*Nephelium foveolatum* (F.Muell.) F.Muell. ex Benth, *Fl. Austral.* 1: 466 (1863). T: Moreton Bay, Qld, *W.Hill & F.Mueller*; n.v.

*Euphoria leichhardtii* var. *hebeptala* Benth., *Fl. Austral.* 1: 468 (1863); *Arytera leichhardtii* var. *hebeptala* (Benth.) Radlk., *Act. Congr. Bot. Amsterdam* 114 (1877), = *Sapind. Holl.-Ind.* 44 (1879). T: Nurrum Nurrum, Qld, *L.Leichhardt*; holo: MEL 74655; iso: MEL 74656, K.

Tree to 15 m. Branchlets, leaf axes and peduncles rusty crispate-tomentose to puberulous. Leaf rachis 1–5 cm long; leaflets 4–6, opposite to alternate, elliptic or ovate-oblong, acuminate to obtuse, entire or serrulate, acute or obtuse at base, 6–12.5 cm long, 2–3.5 cm wide, glabrous above, usually puberulous below; lateral nerves 7–12 pairs, divaricate, raised below, the cross veins prominent; domatia present along midrib; petiolules 5–8 mm long; petiole 1.5–4.5 cm long. Panicles axillary, 6–19 cm long; pedicels 1–1.5 mm long. Calyx 2–3 mm long, tomentose. Petals ±rhomboidal, to 3 mm long. Disc and stamens hairy. Filaments 2–3 mm long. Ovary 3-lobed; style slender. Fruit sessile, 1–4-lobed, 0.6–0.8 cm long, 1–1.5 cm diam.; lobes ellipsoidal, divaricate, grooved at sutures; valves thick, hairy outside, glabrous inside. Fig. 20D.

Occurs in south-eastern Qld from Bingera to Rosewood; in dry scrub or disturbed areas. Map 118.

Qld: Glastonbury, *P.A.Anning 367* (BRI); Tallegalla via Rosewood, Sept. 1978, *J.J.Else* (BRI); Lake Moogerah-Fassifern Rd, *J.A.Elsol & T.D.Stanley 501* (BRI); Bingera, *L.S.Smith 4123* (BRI); Blackall Range, Dec. 1916, *C.T.White* (BRI).

Very close to *A. divaricata* differing in its rusty crispate hairs, sessile fruits which are hairy outside, with the lobes grooved at the sutures and glabrous inside.

### 8. *Arytera divaricata* F.Muell., *Trans. & Proc. Philos. Inst. Victoria* 3: 25 (1859)

*Nephelium divaricatum* (F.Muell.) F.Muell. ex Benth., *Fl. Austral.* 1: 467 (1863). T: Moreton Bay, Qld, *W.Hill*; lecto: MEL 75411, *fide* S.T.Reynolds, *Fl. Australia* 25: 198 (1985).

*Nephelium beckleri* Benth., *Fl. Austral.* 1: 467 (1863). T: Clarence River, N.S.W., *H.Beckler*; holo: MEL 75413; iso: MEL 75414, 75415, NSW 166321.

*Cupania oshanesiana* F.Muell., *Fragm.* 9: 96 (1875); *Ratonia oshanesiana* (F.Muell.) Bailey, *Queensland Fl.* 1: 298 (1899); *Arytera oshanesiana* (F.Muell.) Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 9: 510, 520, 554 (1879). T: Gracemere, Qld, 20 Nov. 1967, *P. O'Shanesy*; holo: MEL 75429; iso: MEL 75430 (leaves only).

Tree to 30 m. Branchlets, leaf axes and inflorescence pale brown hairy. Leaf rachis 1.5–7 cm long; leaflets 4–6, opposite or subopposite, elliptic, obovate or elliptic-oblong, rounded to shortly acuminate, entire, cuneate to subacute at base, 5–11 cm long, 2–4.5 cm wide, glabrous or puberulous below; lateral nerves 8–14 pairs, straight, spreading or divergent, strongly raised below; cross veins fine, ±parallel; domatia present along midrib; petiolules 3–10 mm long; petiole 2–6 cm long. Panicles axillary, usually densely flowered, 7–18 cm long; pedicels 3–6 mm long. Calyx 1.5 mm long, pubescent or puberulent. Petals ovate, 1.5–2.5 mm long. Disc glabrous. Filaments 2–3.5 mm long, hairy. Fruit depressed-obovoid, shortly stipitate, 0.8–1.3 cm long, 0.6–2.5 cm diam., yellow or orange; lobes 1–3, divaricate, ellipsoidal or ovoid; valves thinly fleshy, glabrous except tomentose sutures inside. Aril red.

Occurs in New Guinea and eastern coastal Australia, from Coen, Qld, to Seal Rocks, N.S.W.; common in riverine forest and light rainforest. Map 119.

Qld: Imbil, Aug. 1917, *E.C.Epps* (BRI); Koumala S of Mackay, May 1927, *W.D.Francis* (BRI); Woodend, Rockhampton District, Mar. 1947, *W.D.Francis* (BRI); Tolga, *B.Gray 1354* (BRI); *B.P.M.Hyland 2847* (BRI). N.S.W.: Port Macquarie, Nov. 1896, *G.R.Brown NSW 166329* (NSW).

A very variable species especially in shape and size of leaflets; the lateral nerves also vary from straight and spreading to divergent. Differs from *A. foveolata* in its pale straight hairs and in the fruits which are glabrous outside, and usually stipitate with the lobes smooth at sutures and hairy inside the sutures.

### 9. *Arytera dictyoneura* S.Reyn., *Fl. Australia* 25: 198 (1985)

T: Bulburin State Forest, Scott Rd, NE of Boyne River crossing, Qld, Dec. 1981, *W.J.F.McDonald 3439*; holo: BRI.

Tree to 7 m. Branchlets, leaf axes and peduncles usually with dense, short and long pale to rusty brown hairs. Leaf rachis 1–4.5 cm long; leaflets usually 2 pairs, opposite, elliptic or subovate, obtuse to acute, entire, obtuse at base, 3.5–6 cm long, 1.7–3.5 cm wide, glabrous or midrib puberulous; finely prominently nerved and delicately reticulate; lateral nerves 8–14 pairs; domatia obscure or absent; petiolules 4–10 mm long; petiole 1.5–3 cm long. Inflorescence axillary, usually unbranched, 4–9 cm long; pedicels 1 mm long. Calyx lobes ovate, 1–2 mm long. Petals ovate, shortly clawed, 3.5 mm long. Fruit obcordate, shortly stipitate, 0.8–1.5 cm long, 1.5–2 cm diam., deeply lobed, yellow-orange; style persistent; valves thinly fleshy, glabrous except villous sutures inside. Aril thin, smooth.

Known only from Bulburin State Forest, on the Dawes Range; grows in rocky red soil. Map 120.

*A. dictyoneura* is close to *A. divaricata*, differing in having only 2 pairs of leaflets with a delicate network of veins. Fig. 20E.

### 10. *Arytera* sp.

Tree to 10 m. Shoots and inflorescence with dense, pale brown, crispate hairs; branchlets and leaf axes puberulous. Leaf rachis 2.5–3.5 cm long; leaflets 2 pairs, opposite, elliptic-oblong or subovate, acute to obtuse, entire, shortly attenuate at base, 8–15 cm long 3.5–7 cm wide, glabrous or puberulous below, drying pale above; lateral nerves 8–12 pairs, arched and ascending, finely cross-veined and reticulate; domatia usually present; petiolules 4–8 mm long; petiole 2.5–6 cm long. Inflorescence axillary. Flowers and fruits not seen.

Occurs at top of Cape York Peninsula, Qld; usually in monsoon forest, on ridges and hillsides. Map 121.

Qld: Bamaga, *W.T.Jones 2551* (BRI); *L.S.Smith 12579* (BRI); *L.J.Webb & J.G.Tracey 6960* (BRI); Murray Is., Torres Strait, *M.Lawrie 104* (BRI); Thursday Is., *L.J.Webb & J.G.Tracey 7884* (BRI).

## Doubtful and excluded names

*Arytera exostemonea* Domin, *Biblioth. Bot.* 89: 354 (1927)

T: Russel River, Qld, Jan. 1910, *K.Domin*; n.v.

From the description this appears conspecific with *A. divaricata* F.Muell. Radlkofer considered it related to this species (see R.W.J.M. van der Ham, *Blumea* 23: 292, 1977).

*Arytera leichhardtii* (Benth.) Radlk., *Act. Congr. Bot. Amsterdam* 114 (1877), = *Sapind Holl.-Ind.* 44 (1879).

This is *Dimocarpus leichhardtii* (Benth.) S.Reyn.

**26. MISCHOCARPUS**

*Mischocarpus* Blume, *Bijdr.* 1: 238 (1825), *nom. cons.*, from the Greek *mischos* (stalk), and *carpos* (fruit), referring to long stipe of the fruit.

Type: *M. sundaicus* Blume

Monococious trees. Indumentum of simple hairs. Leaves paripinnate; leaflets opposite to alternate, entire, coriaceous, usually prominently nerved, densely reticulate; domatia usually present along midrib. Inflorescence in upper axils or ramiflorous, panicle-like; cymules usually stalked. Flowers small, regular. Calyx cupular, 5-dentate or -partite; lobes ovate, slightly imbricate. Petals 0–5, usually clawed, with 2 usually hairy crestless scales. Disc annular, often lobed. Stamens 7–9. Ovary stipitate, 3-locular; ovule 1 per locule; style persistent; stigma 3-lobed. Fruit usually on long stipe, apiculate; pericarp slightly fleshy, loculicidally 3-valved, 1-seeded; valves drying crustaceous or subwoody, usually shrivelled and inrolled after dehiscence. Seed ellipsoidal or globose, shiny; aril nearly covering seed, with slender appendage, thinly fleshy, ±translucent.

A genus of 15 species in Phillipines, SE Asia, New Guinea and Australia; 9 species in eastern Australia.

Distinguished by the stipitate unlobed fruits and the spurred aril; the leaflets, in most species, have a fine dense reticulation and domatia.

L.A.T.Radlkofer, *Pflanzenr.* 98: 1288–1310 (1933); R.W.J.M. van der Ham, *Blumea* 23: 251–288 (1977).

- 1 Leaflets 22–50 cm long, 8–20 cm wide; rachis 13–60 cm long **3. *M. grandissimus***
- 1: Leaflets 4–18 cm long, 1–8 cm wide; rachis less than 12 mm long
- 2 Leaflets whitish below **4. *M. albescens***
- 2: Leaflets green below
- 3 Branchlets, leaves and peduncles ferruginous-villous, rarely glabrous
- 4 Domatia usually prominent; fruit glabrous outside; aril orange; petals present; leaflets usually 2 or 3 pairs **1. *M. exangulatus***
- 4: Domatia usually absent; fruit hairy outside; aril purple; petals absent; leaflets usually 1 pair **2. *M. lachnocarpus***
- 3: Branchlets, leaves and peduncles shortly pale brown appressed-hairy or glabrous
- 5 Petals present; calyx shortly lobed; filaments hairy; aril orange; fruit glabrous inside; midrib usually sunken in a groove above; reticulation obscure; petiolules 6–25 mm long **5. *M. pyriformis***
- 5: Petals absent; calyx deeply lobed; filaments glabrous; aril purple or blue; fruit villous or glabrous inside; midrib ridged or raised above; reticulation usually distinct; petiolules 4–10 mm long
- 6 Domatia prominent, 1 or 2, restricted to base of midrib; lateral nerves decurrent on midrib; valves drying hard and woody, villous inside; leaflets usually 1 pair **6. *M. anodontus***
- 6: Domatia inconspicuous or absent; lateral nerves not decurrent; valves ±crustaceous, glabrous or villous inside; leaflets 1–4 pairs
- 7 Domatia absent; leaflets 2–4 pairs; fruit (with stipe) 2–4 cm long, not topped with broad styler base, glabrous inside **7. *M. macrocarpus***
- 7: Domatia present or absent; leaflets 1–3 pairs; fruit (with stipe) 1–2.4 cm long, topped with broad styler base, villous inside
- 8 Fruit on stipe 3–6 mm long, densely villous inside including septa; leaflets 1 or 2 pairs, usually shiny above **8. *M. australis***
- 8: Fruit on stipe 10–22 mm long, sparsely villous inside, septa glabrous; leaflets 2 or 3 pairs, usually vernicose above **9. *M. stipitatus***

106



107



108



109



110



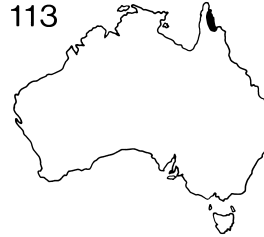
111



112



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117



118



119



120



**106.** *Sarcotoechia heterophylla*

**109.** *Sarcotoechia cuneata*

**112.** *Arytera lautereriana*

**115.** *Arytera microphylla*

**118.** *Arytera foveolata*

**107.** *Sarcotoechia villosa*

**110.** *Sarcotoechia lanceolata*

**113.** *Arytera macrobotrys*

**116.** *Arytera bifoliolata*

**119.** *Arytera divaricata*

**108.** *Sarcotoechia protracta*

**111.** *Lepidopetalum subdichotomum*

**114.** *Arytera distylis*

**117.** *Arytera pauciflora*

**120.** *Arytera dictyoneura*

**1. *Mischocarpus exangulatus*** (F.Muell.) Radlk., *Act. Congr. Bot. Amsterdam* 113 (1877), = *Sapind. Holl.-Ind.* 43 (1879)

*Ratonia exangulata* F.Muell., *Fragm.* 4: 156 (1864); *Cupania exangulata* (F.Muell.) F.Muell., *Fragm.* 9: 91 (1875). T: Rockingham Bay, Qld, *J.Dallachy*; lecto: MEL *n.v.*, *fide* R.W.J.M. van der Ham, *Blumea* 23: 266 (1977).

*Arytera subnitida* C.White, *Proc. Roy. Soc. Queensland* 47: 56 (1936). T: Daintree River, Qld, 19 Mar. 1933, *L.J.Brass* 2345; holotype: BRI.

[*Ratonia lessertiana* auct. non Benth. & J.D.Hook.: F.M.Bailey, *Queensland. Dept. Agric. Bot. Bull.* 9: 7 (1899)]

Tree to 15 m. Branchlets, leaf axes, peduncles and calyx ferruginous-tomentose to glabrous. Leaf rachis 1.5–6.5 cm long; leaflets 6–8, rarely 2, opposite or alternate, elliptic to ovate, acuminate to obtuse, decurrent at base, 5–18 cm long, 1.5–8 cm wide, glabrous or puberulous below; lateral nerves oblique; domatia along midrib or only near base; petiolules 7–18 mm long; petiole 3.5–6.5 cm long. Panicles axillary, pendulous, 6–28 cm long; pedicels 3–7 mm long. Calyx deeply lobed; lobes 2–3 mm long. Petals 5, elliptic, clawed, 3 mm long. Disc annular, glabrous. Filaments 1–3 mm long. Style short with prominent stigmatic lines. Fruit ellipsoidal or obovoid, curved, usually narrowing into broad stipe, orange-yellow or bright red, 1.8–3 cm long including stipe, 1–1.5 cm diam.; valves thin, glabrous; stipe dilated upwards, 6–12 mm long. Aril orange-yellow. Fig. 21J.

Occurs in N Qld from McIlwraith Range to Paluma Range; on foothills, rocky headlands, along river banks and in swamps, usually in light rainforest. Map 122.

Qld: W of Thornton Peak, *I.S.Olsen* 418 (BRI, NSW); Mt Lewis, *E.Phelps* 10 (BRI); Gap Ck, *V.Scarth-Johnson* 743 (BRI); 7 km ENE of Bilyana Bluff Landing, Murray R., *A. & M.Thorsborne* 361 (BRI); Hinchinbrook Is., *A. & M.Thorsborne* 525 (BRI).

A variable species, *M. exangulatus* is recognisable by its obovoid, usually curved fruits, orange aril, and prominent domatia of the leaflets.

**2. *Mischocarpus lachnocarpus*** (F.Muell.) Radlk., *Act. Congr. Bot. Amsterdam* 113 (1877), = *Sapind. Holl.-Ind.* 43 (1879)

*Ratonia lachnocarpa* F.Muell., *Fragm.* 4: 157 (1864); *Cupania lachnocarpa* (F.Muell.) F.Muell., *Fragm.* 5: 6 (1865). T: Dalrymple Cape, Rockingham Bay, Qld, 14 Apr. 1864, *J.Dallachy*; lecto: MEL *n.v.*, *fide* R.W.J.M. van der Ham, *Blumea* 23: 268 (1977).

Tree to 20 m. Shoots, branchlets, leaf axes and inflorescence densely rusty-hairy to ±glabrous. Leaf rachis 1–3 cm long; leaflets usually 2, opposite, ±elliptic, acute or acuminate, ±acute to rounded at base, 5–14.5 cm long, 2.5–7 cm wide, glabrous or midrib and nerves puberulent; lateral nerves looping at margins; reticulation dense, minute; domatia usually absent; petiolules 2–12 mm long; petiole 1.3–4 cm long. Panicles axillary, clustered, slender, 3.5–16 cm long; cymules subsessile; pedicels 1–2 mm long. Calyx deeply lobed; lobes 1–1.5 mm long, densely villous. Petals absent. Disc annular, puberulous. Fruit obovoid or globose, usually drying trigonous, 1.3–2 cm long including short stipe, 0.6–2 cm diam., rusty gold or red orange; valves thin, rusty villous outside, ±glabrous inside; stipe broad, 3–7 mm long. Aril mauve or purple-blue. Fig. 21A–B.

Occurs from Cape York Peninsula to Cardwell Range, N Qld, and on border ranges between Qld and N.S.W. as far S as Mullumbimby; usually on sandy ridges near beaches and edge of mangrove swamps. Also in New Guinea. Map 123.

Qld: N of Massey Ck on Silver Plains Stn, *J.R.Clarkson* 3622B (BRI), 3644 (BRI, NSW); Noah Ck, *B.P.M.Hyland* 6723 (BRI, NSW); Hinchinbrook Is., *P.Sharpe* 1712 (BRI); Springbrook Plateau, *W.J.F.McDonald* & *W.G.Whiteman* 2821 (BRI). N.S.W.: below summit of Mt Warning, July 1965, *H.C.Hayes* (BRI).

*M. lachnocarpus* is the only species with the fruits hairy outside. The aril is purple and the leaflets usually 1–paired and hairy.

**3. *Mischocarpus grandissimus*** (F.Muell.) Radlk., *Act. Congr. Bot. Amsterdam* 113 (1877), = *Sapind. Holl.-Ind.* 43 (1879)

*Ratonia grandissima* F.Muell., *Fragm.* 4: 156 (1864). T: Rockingham Bay, Qld, 5 Sept. 1864, *J.Dallachy*; lecto: MEL, iso: MEL, both *n.v.*, *fide* R.W.J.M. var *der Ham*, *Blumea* 23: 268 (1977).

Tree to 10 m, glabrous except pubescent shoots and inflorescence. Leaf rachis 13–60 cm long; leaflets 8–10, alternate, elliptic, oblong, subobovate or ovate-oblong, abruptly acuminate, acute or obtuse at base, 22–50 cm long, 8–20 cm wide; lateral nerves spreading; reticulation dense; petiolules 8–20 mm long; petiole 18–24 cm long. Panicles axillary or ±ramiflorous, 13–44 cm long; cymules sessile; pedicels 2–2.5 mm long. Calyx deeply lobed; lobes 1–2 mm long, puberulous. Petals 0–3, elliptic to ovate, 1–1.5 mm long. Filaments 2.5–3 mm long, pilose. Fruit obovoid or ellipsoidal, 2.5–4 cm long including stipe, 1.2–1.5 cm diam., yellow; valves thick, glabrous except rusty villous septa; stipe 1–2 cm long. Aril orange.

Occurs in N Qld from Mt Molloy to Johnstone R., usually in remnant rainforest. Map 124.

Qld: Gadgarra, Mar. 1932, *W.D.Francis* (BRI); State Forest Reserve 1073, NW of Kuranda, *B.P.M.Hyland* 2430 (QRS); Egan Ck Rd, *L.S.Smith* 10822 (BRI); Danbulla Forest Nursery–Tinaroo Dam Rd, *L.J.Webb* & *J.G.Tracey* 5742 (BRI); Timber Reserve 176, Mt Finnegan, *B.P.M.Hyland* 1202 & 12815 (QRS).

*M. grandissimus* has very large leaves and leaflets which easily distinguish it.

**4. *Mischocarpus albescens*** S.Reyn., *Fl. Australia* 25: 200 (1985)

T: China Camp, N of Daintree, Qld, 24 May 1970, *L.S.Smith*; holo: BRI.

Tree to 10 m. Branchlets and peduncles densely appressed pubescent to ±glabrous. Leaf rachis 3.5–11.5 cm long; leaflets 6–10, subopposite or alternate, narrowly elliptic to ovate-oblong, usually acuminate, acute at base, 4–15 cm long, 1–3 cm wide, glabrous above, whitish, puberulous and ±papillose below; venation fine; solitary domatia towards base; petiolules 3–5 mm long; petiole 2.5–7 cm long. Panicles axillary, 4.5–18 cm long; pedicels 2 mm long. Calyx lobed to above middle; lobes 1 mm long, puberulent. Petals 5, elliptic, 1.5–2 mm long. Disc 5-lobed, glabrous. Filaments 2 mm long, pilose. Fruit depressed-globose, 16–18 mm long including stipe, 8–9 mm diam.; valves glabrous; stipe 10–12 mm long.

Occurs in N Qld on ranges between Bloomfield and Daintree. Map 125.

Qld: McDowall Range, *L.J.Webb* & *J.G.Tracey* 11005 (BRI).

**5. *Mischocarpus pyriformis*** (F.Muell.) Radlk., *Act. Congr. Bot. Amsterdam* 113 (1877), = *Sapind. Holl.-Ind.* 43 (1879)

*Schmidelia pyriformis* F.Muell., *Fragm.* 1: 2 (1858); *Ratonia pyriformis* (F.Muell.) Benth., *Fl. Austral.* 1: 461 (1863); *Cupania pyriformis* (F.Muell.) F.Muell., *Fragm.* 2: 76 (1860), 4: 156 (1864). T: Moreton Bay, Qld, *Hill & Mueller*, lecto: MEL, *fide* R.W.J.M. van der Ham, *Blumea* 23: 275 (1977).

*Cupania laurifolia* Ettingsh., *Blatt-Skel. Dikot.* 145 (1861).

T: Hastings River, N.S.W., May 1819, *A.Cunningham* 24; iso: BRI, NSW.

Tree. Branchlets, leaf axes, peduncles and calyx puberulent. Leaf rachis 1–9.5 cm long; leaflets 2–8, subopposite or alternate, elliptic to ovate-oblong or subobovate, acuminate to retuse, acute or obtuse at base, 3.5–18 cm long, 1.5–8 cm wide, usually glabrous; midrib usually sunken above; lateral nerves slender, reticulation mesh-like; domatia few or absent; petiolules 0.6–2.5 cm long; petiole 1.5–8 cm long. Panicles axillary, 5–20 cm long, densely flowered; cymules stalked; pedicels 2–4 mm long. Calyx cupular, shortly lobed; lobes 1 mm long. Petals 5, usually subrhomboidal, long-clawed, to 2.5 mm long. Disc cupular, glabrous. Filaments 2.5–4 mm long, hairy. Fruit pyriform to ellipsoidal, 16–26 mm long including stipe, 6–10 mm diam.; valves glabrous; stipe 6–18 mm long. Aril orange.

*M. pyriformis* is recognisable by the long-stipitate obovoid fruits, orange aril, presence of petals and the leaflets having fine dense obscure reticulation. There are 3 subspecies, 2 of which occur in Australia.

Domatia absent; leaflets 4–8, elliptic-oblong or ovate-oblong, acuminate; margins flat; stipe as long as fruit

**5a. subsp. pyriformis**

Domatia present; leaflets usually 2–4, narrowly elliptic or subobovate, obtuse, retuse or acute; margins usually recurved; stipe twice as long as fruit

**5a. subsp. retusus**

**5a. *Mischocarpus pyriformis* (F.Muell.) Radlk. subsp. pyriformis**

Tree to 30 m. Leaf rachis 3.5–9.5 cm long; leaflets 4–8, elliptic, elliptic-oblong or ovate-oblong, acuminate to acute, 6.5–18 cm long, 2.5–8 cm wide; lateral nerves and dense reticulation fine; domatia absent; petiolules 1–2.5 cm long; petiole 2.5–8 cm long. Fruit pyriform or obovoid, 16–20 mm long including stipe, 6–8 mm diam., 3-ribbed, orange to red; stipe 6–10 mm long. Fig. 21C–G.

Occurs from Cape Flattery, N Qld, to Seal Rocks, N.S.W.; in dry rainforest, on creekbanks and in gullies. Map 126.

Qld: State Forest Reserve 310, near Gordonvale, *B.Gray 1496* (BRI); Upper Mudgeeraba Ck, *W.J.F.McDonald & J.A.Elsol 1646* (BRI); Eurimbulah Ck, NE of Miriam Vale, *P.R.Sharpe 2059* (BRI). N.S.W.: Iluka, ENE of Maclean, *R.Coveny 2180* (BRI, NSW).

**5b. *Mischocarpus pyriformis* subsp. retusus (Radlk.) van der Ham, *Blumea* 23: 277 (1977)**

*Mischocarpus retusus* Radlk., *Bot. Jahrb. Syst.* 56: 304 (1920). T: E. Sepik District, Hunsteinspitze, Kaiserin Augusta-Fluss Exped., New Guinea, Feb. 1913, *Ledermann 11231; n.v.*;

*Mischocarpus montanus* C.White, *Proc. Roy. Soc. Queensland* 47: 56 (1936). T: Thornton Peak, Qld, 14 Mar. 1932, *L.J.Brass 2293*; holo: BRI.

Tree to 20 m. Leaf rachis 1–4 cm long; leaflets 2–4, rarely 6, narrowly elliptic, to obovate-oblong, retuse to acute, 3.5–9 cm long, 1.5–5.5 cm wide, margins usually recurved; lateral nerves with prominent domatia in some of their axils; petiolules 6–16 mm long; petiole 1.5–5 cm long. Fruit broadly ellipsoidal, 22–26 mm long including stipe, 6–8 mm diam., yellow to red; stipe 12–18 mm long.

Occurs in N Qld, in montane rainforest from Thornton Peak to near Danbulla. Also in New Guinea. Map 127.

Qld: Thornton Peak, *L.J.Brass 2293* (BRI); Emerald Ck, N of Danbulla near Kairi, *L.S.Smith 341* (BRI); Mt Haig, *G.C.Stocker 1225* (BRI).

**6. *Mischocarpus anodontus* (F.Muell.) Radlk., *Act. Congr. Bot. Amsterdam* 113 (1877), = *Sapind. Holl.-Ind.* 43 (1879)**

*Schmidelia anodonta* F.Muell., *Fragm.* 1: 2 (1858); *Ratonia anodonta* (F.Muell.) Benth., *Fl. Austral.* 1: 461 (1863); *Cupania anodonta* (F.Muell.) F.Muell., *Fragm.* 2: 76 (1860). T: Brisbane River, Qld., *W.Hill*; lecto: MEL *n.v.*, *fide* R.W.J.M. var der Ham, *Blumea* 23: 265 (1977).

Tree to 8 m, glabrous except finely puberulous shoots and inflorescence. Leaf rachis 1.5–3.5 cm long; leaflets 1 or 2 pairs, elliptic or subovate, acute or obtuse, shortly attenuate at base, 4.5–11.5 cm long, 2–6.5 cm wide; lateral nerves decurrent, spreading, with 1 or 2 prominent domatia usually near base; petiolules 5–10 mm long; petiole 1–4 cm long. Panicles axillary, 5–11 cm long; pedicels 2–3 mm long. Calyx cupular, lobed to middle; lobes ovate, 1 mm long. Petals absent. Disc annular, glabrous. Filaments 1–3 mm long, glabrous. Fruit depressed-globose or obovoid narrowing into thick broad stipe, 3-ribbed, 2–3 cm long including stipe, 1–2 cm diam., orange-red; valves thick, drying woody, villous inside; stipe 8–15 mm long. Aril purple. Fig. 21H–I.

Occurs from Proserpine, Qld, to Richmond River, N.S.W.; on ridges and hillsides, in rainforest. Map 128.





**Figure 21.** A–J, *Mischoarpus*. A–B, *M. lachnocarpus*. A, leaf  $\times 0.3$ ; B, fruits  $\times 0.7$  (A–B, W.McDonald 2821, BRI). C–G, *M. pyriformis* subsp. *pyriformis*. C, flowering habit  $\times 0.7$ ; D, flower  $\times 4$ ; E, calyx lobe  $\times 8$ ; F, petal  $\times 8$  (C–F, B.Gray 1496, BRI); G, fruits  $\times 0.7$  (L.Bird 3, BRI). H–I, *M. anodontus*. H, fruiting habit  $\times 0.7$ ; I, fruit showing seed with aril  $\times 0.7$  (H–I, L.Bird & K.Williams, BRI 309989). J, *M. exangulatus*, fruiting habit  $\times 1$  (L.Webb & J.Tracey 13289, BRI). K, *Lepidopetalum subdichotomum*, fruiting habit  $\times 1$  (B.Hyland 9538, BRI).

Qld: Pine Mt, near Ipswich, July 1980, *L.H.Bird* (BRI); Strathdickie, near Proserpine, *N.Michael* 968 (BRI); Lamington, Mar. 1978, *E.M.Ross* (BRI); 6.5 km S of Canungra, Jan. 1971, *K.A.W.Williams* (BRI); 18 km S of Biggenden, *P.Young* 379 (BRI).

The presence of 1 or 2 prominent domatia towards base of leaflet and decurrent lateral nerves easily distinguish this species. The fruit is also densely hairy inside and the aril purple.

### 7. *Mischocarpus macrocarpus* S.Reyn., *Fl. Australia* 25: 200 (1985)

T: State Forest Reserve 650, near Millaa Millaa lookout, 17°29'S, 145°34'E, Qld, June 1982, *F.Crome* 886; holotype: BRI, isotype: QRS.

Tree to 20 m, glabrous except shoots and inflorescence puberulous. Leaf rachis 4.5–9.5 cm long; leaflets 4–8, alternate or opposite, narrowly elliptic or elliptic-oblong, acute, 13–21 cm long, 4.5–5.5 cm wide; midrib ± rounded above; reticulation prominent; lateral nerves 14–20 pairs; domatia absent; petiolules 3–10 mm long; petiole 4.5–9 cm long. Panicles axillary or ramiflorous, 7–18 cm long; cymules long-stalked; bracts conspicuous, to 4 mm long; pedicels 2.5–4 mm long. Calyx lobes almost free, c. 2 mm long. Petals absent. Filaments glabrous. Fruit broadly ellipsoidal, 2–4 cm long including stipe, 0.8–1.6 cm diam., yellow to orange-red; valves glabrous; stipe 1–2 cm long, trigonous. Aril blue.

Occurs in N Qld, from Atherton Tableland to Eungella Range. Map 129.

Qld: Millaa Millaa, *K.J.White* 439 (BRI); State Forest Reserve 185, near Mareeba, *B.Gray* 2770 (BRI); Atherton Tableland, *B.P.M.Hyland* 1868 (BRI); Beatrice River, *L.S.Smith* 10182 (BRI); Butchers Ck, *L.S.Smith* 5287 (BRI).

The large glabrous fruits, blue aril, and leaflets without domatia easily distinguish the species.

### 8. *Mischocarpus australis* S.Reyn., *Fl. Australia* 25: 200 (1985)

T: Lamington National Park, 28°13'S, 153°10'E, Qld, Apr. 1970, *L.J.Webb* & *J.G.Tracey* 13205; holotype: BRI

Tree to 7 m, glabrous except puberulous inflorescences. Leaf rachis 0.8–2.4 cm long; leaflets 2–4, opposite, elliptic-oblong to ovate-oblong, acuminate or acute, 7–14.5 cm long, 2–4.5 cm wide, dull green and shining above; lateral nerves 8–12 pairs; reticulation dense, prominent; domatia linear, inconspicuous, few or absent; petiolules 4–8 mm long; petiole 1.5–5 cm long, flattened above. Panicles 4.5–14 cm long; peduncles ± puberulent; cymules stalked; bracts to 4 mm long, persistent; pedicels 2–4 mm long. Calyx lobed to below middle; lobes 1.5 mm long. Petals absent. Filaments glabrous. Fruit ellipsoidal, 11–15 mm long including stipe, 6–8 mm diam.; valves densely villous inside; stipe broad, 3–6 mm long, ± trigonous. Aril purple.

Occurs from south-eastern Qld to Williams River, N.S.W., in rainforest. Map 130.

Qld: Kin Kin, Jan. 1974, *R.Henderson* (BRI); Deep Ck, near Gympie, Mar. 1918, *E.H.F.Swain* (BRI); The Head, Killarney–Head Rd, Sept. 1982, *L.H.Bird* (BRI). N.S.W.: Whian Whian, *N.B.Byrnes* 3003 (BRI); Minmi Ck, Minmi, *R.W.Earp* NSW 133909 (NSW).

*M. australis* is closely related to *M. stipitatus* but differs in having small shortly stipitate fruits which are densely villous inside, including the septa. It is also close to *M. anodontus*, differing in absence of prominent domatia, in the non-decurrent lateral nerves and in the smaller fruits.

### 9. *Mischocarpus stipitatus* S.Reyn., *Fl. Australia* 25: 200 (1985)

T: State Forest Reserve 185, 17°05'S, 145°36'E, Danbulla, near Mareeba, Qld, 27 Aug. 1982, *B.Gray* 2703; holotype: BRI, isotype: QRS.

Tree to 15 m. Branchlets, leaf axes and inflorescence puberulous or glabrous. Leaf rachis 3.5–4.5 cm long; leaflets 4–6, alternate, elliptic to ovate-oblong, obtuse to acuminate, 5.5–14.5 cm long, 2–6 cm wide, coriaceous, usually shiny or vernicose above, dark green, finely nerved and reticulate; lateral nerves 9–12 pairs; reticulation dense, mostly indistinct above; domatia linear, few, inconspicuous, usually absent; petiolules 5–10 mm long;

petiole 3.5–5.5 cm long, dorsiventrally flattened. Panicles divaricately branched, 7–16 cm long; cymules long-stalked; bracts 4.5 mm long; pedicels 2.5–4.5 mm long. Calyx cupular, lobed to middle; lobes 1 mm long. Petals absent. Filaments glabrous. Fruit subglobose or ellipsoidal, 18–24 mm long including stipe, 1–1.2 cm diam., red; valves sparsely appressed hairy inside; stipe narrow, 1–1.4 cm long. Aril purple, flaky.

Occurs in N Qld from Iron Range to Eungella Range, usually near water. Map 131.

Qld: Lake Eacham, June 1922, *R. Helms* (BRI); Hallorans Hill, Atherton, *A.K. Irvine 1760* (BRI); Lake Barrine, *S.F. Kajewski 1116* (BRI); *1128* (BRI, NSW); *1255* (BRI), Eungella South, *L.S. Smith 4794* (BRI).

Similar to *M. australis* but the stipe of the fruit is longer and the valves are sparsely hairy inside. Has also been confused with *M. pyriformis* which has petals, the valves glabrous inside and an orange aril.

### Excluded name

*Mischocarpus sundaicus* Blume, *Bijdr.* 1: 238 (1825).

Wrongly recorded for Australia by R. Kanehira & S. Hatusima, *Bot. Mag. Tokyo* 57: 79 (1943). Material of the three new species above was referred to this species by van de Ham, *Blumea* 23: 283, 284 (1977). These species differ from *M. sundaicus* in the much-branched panicle with cymules on longer pedicels, the hairy inner surface of the fruit, the persistent broad style base, the larger bracts and dorsiventrally flattened petioles.

## 27. DIPLOPELTIS

*J.G. West*

*Diplopeltis* Endl., *Enum. Pl.* 13 (1837); from the Greek *diplos* (double) and *pelte* (a shield), referring to the disc which is expanded into 2 large lobes somewhat like a shield.

Type: *D. huegelii* Endl.

Monococious shrubs or perennial herbs, usually suckering, usually with simple and glandular hairs. Leaves alternate, simple, entire, lobed or deeply divided; stipular lobes often present. Flowers in terminal panicles, pedicellate. Sepals 5, free, oblong to ovate or obovate, usually pubescent, persistent in fruit. Petals 4, rarely 5, clawed, pink or white, glabrous or sparsely or minutely pubescent outside. Disc attached beside ovary, expanded into 2 large lobes, the inner usually erect, margin usually lobed or toothed. Stamens 8, turned to one side of flower; in female flowers rudimentary. Ovary 3-lobed, pubescent or hirsute and with glandular hairs; gynoecium in male flowers rudimentary. Fruit a loculicidal capsule or schizocarp of 3 indehiscent obovoid cocci. Seeds 1 or 2 per locule, arillate.

A genus of 5 species endemic in Australia.

G. Bentham, *Fl. Austral.* 1: 455–456 (1863); A.S. George & G. Erdtman, *Grana Palynol.* 9: 93–101 (1970).

This account is based partly on George and Erdtman, *loc. cit.*

- |    |  |                                |
|----|--|--------------------------------|
| 1  | Petals equal; fruit a schizocarp of indehiscent cocci (sect. <i>Diplopeltis</i> )                                    |                                |
| 2  | Fruit 6–7 mm long, densely hirsute; pedicels 2–3 mm long   | <b>4. <i>D. eriocarpa</i></b>  |
| 2: | Fruit 4 mm or less long, with glandular hairs and some simple hairs, not densely hirsute; pedicels 3 mm or more long |                                |
| 3  | Leaves obovate-spathulate, crenate; petiole 2–12 mm long   | <b>1. <i>D. petiolaris</i></b> |
| 3: | Leaves oblong to obovate or narrowly cuneate, entire or variously lobed or pinnatifid, sessile or shortly petiolate  |                                |



**Figure 22.** *Diplopeltis huegelii* var. *huegelii*.  
Photograph — M.Fagg.



**Figure 23.** *Dodonaea petiolaris*.  
Photograph — R.W.Purdie.



**Figure 24.** *Dodonaea baueri*.  
Photograph — J.G.West.



**Figure 25.** *Dodonaea sinuolata*.  
Photograph — R.W.Purdie.

- 4 Glandular hairs restricted to inflorescence, the glands black or dark blue-purple; petals 5–7 mm long; cocci 3.5–4 mm long, with glandular hairs and sometimes pubescent **2. D. huegelii**
- 4: Glandular hairs throughout the plant, the glands cream-coloured; petals 3–4 mm long; cocci 2.5–3.5 mm long, pubescent and with glandular hairs **3. D. intermedia**
- 1: Petals unequal; fruit a loculicidal capsule (sect. *Diplopholis*) **5. D. stuartii**

## SECT. I. DIPLOPELTIS

### **Diplopeltis** Endl. sect. **Diplopeltis**

*Diplopeltis* sect. *Eudiplopeltis* Kuntze in T. von Post & O.Kuntze, *Lex. Gen. Phan.* 178 (1903).

Petals of equal size. Fruit a schizocarp of 3 indehiscent obovoid cocci.

A section of 4 species, all endemic in Australia.

#### **1. Diplopeltis petiolaris** F.Muell. ex Benth., *Fl. Austral.* 1: 456 (1863)

T: Murchison R., W.A., *A.Oldfield*; holo: MEL *n.v.*; iso: MEL, K *n.v.*; both *fide* A.S.George & G.Erdtman, *Grana Palynol.* 9: 100 (1970).

Shrub to 1.5 m, erect or spreading, suckering, with simple and glandular hairs, the glands peltate and cream-coloured. Leaves petiolate, obovate-spathulate, obtuse, crenate, with glandular hairs, and simple hairs mainly on margin and midrib; lamina 1–4 cm long, rarely to 7 cm, 0.5–2 cm wide, rarely to 4 cm; petiole 2–12 mm long. Pedicels 3–7 mm long. Sepals 1.5–2 mm long. Petals broadly spatulate to orbicular, 4–5 mm long including claw; claw 1–1.5 mm long. Stamens 4–5 mm long. Cocci 3–4 mm long, crustaceous, muricate, with glandular hairs and sparse simple hairs.

Occurs near the south-western coast of W.A. from N of Kalbarri to Dongara, S of Geraldton. Grows in sandy soils. Map 132.

W.A.: Spalding Park, N of Geraldton, *J.S.Beard 1700* (CANB, Kings Park, Perth); Hutt R., near Lynton, *W.E.Blackall s.n.* (PERTH); Balline Station, *C.A.Gardner 12237* (PERTH); 46 km S of Geraldton, A.S.George 9222 (PERTH); c. 5 km S of Lake Culcurdoo, N of Murchison R., *A.S.George 9608* (PERTH).

#### **2. Diplopeltis huegelii** Endl., *Enum. Pl.* 13 (1837)

T: Fremantle, Swan R., W.A., *C.Huegel*; holo: W *n.v.*, *fide* A.S.George & G.Erdtman, *Grana Palynol.* 9: 101 (1970).

*Diplopeltis preissii* Miq. in Lehm., *Pl. Preiss.* 1: 223 (1845). T: near seashore, near Perth, W.A., 18 June 1839, *L.Preiss 1281*; iso: MEL *n.v.*, *fide* A.S.George, pers. comm.

*Diplopeltis lehmanni* Miq. in Lehm., *Pl. Preiss.* 1: 224 (1845). T: Darling Range, W.A., 9 Aug. 1839, *L.Preiss 1282*, *n.v.*

Shrub to 1 m, erect or spreading, suckering, with long and short, mostly curved simple hairs, and with glandular hairs on inflorescence, the glands usually black or dark blue-purple. Leaves sessile or shortly petiolate, broadly linear, oblong to ovate, obovate or cuneate in outline, divided into linear, oblong or cuneate lobes, or entire or shortly lobed near apex, obtuse, 1–4.5 cm long, 0.3–1.5 cm wide, hirsute and usually pubescent, or pubescent on margin and midrib only, sometimes glabrous. Flowers pepper-scented. Pedicels 3–7 mm long. Sepals 1.5–2 mm long. Petals broadly spatulate to orbicular, 5–7 mm long including claw; claw 1 mm long. Stamens 4–5 mm long. Cocci 3.5–4 mm long, crustaceous, muricate, with glandular hairs and sometimes pubescent.

Occurs near the south-western coast of W.A. from S of Shark Bay to S of Perth. There are 2 varieties.

Leaves divided or lobed, usually pubescent

**2a. var. huegelii**

Leaves entire or shortly lobed near apex, pubescent on margin and midrib only or sometimes glabrous

**2b. var. subintegra**

**2a. Diplopeltis huegelii** Endl. var. **huegelii**

Leaves oblong to ovate, obovate or cuneate in outline, divided into linear, oblong or cuneate lobes, occasionally lobed again, sometimes pinnatifid, 1.5–4.5 cm long, 0.3–1.5 cm wide, hirsute and usually pubescent, mostly denser on lower surface. Figs 22,26.

Occurs in south-western W.A. along the coast and in the Darling Range from N of Three Springs to Yalgorup, S of Perth. Grows in calcareous soils near the coast and farther inland in granitic and lateritic soils. Map 133.

W.A.: Glen Forrest National Park, *T.E.H.Aplin 1013* (PERTH); Welshpool Hill, Darling Range, *A.S.George 9183* (PERTH); Mosman Park, near Fremantle, *A.S.George 9189* (PERTH); Cottesloe, 3 Oct. 1900, *A.Morrison* (CANB, E, PERTH); c. 5 km E of Jurien Bay, *R.V.Smith 66/175* (CANB, HO, MEL, PERTH).

The locality E of Southern Cross given with the collection *Davies 748* (PERTH) is considered doubtful.

**2b. Diplopeltis huegelii** var. **subintegra** A.S.George in A.S.George & G.Erdtman, *Grana Palynol.* 9: 102 (1970)

T: 2 miles (c. 3 km) W of Eradu, on Geraldton–Mullewa road, W.A., 1 Oct. 1966, *E.M.Scrymgeour 1446*; holo: PERTH; iso: CANB, also MEL, K, both *n.v.*, *fide* A.S.George & G.Erdtman, *loc. cit.*

Leaves broadly linear, oblong or cuneate, usually entire or rarely shortly lobed near the apex, 1–2.5 cm long, 0.2–0.5 cm wide, pubescent on margin and midrib only or sometimes glabrous.

Occurs near the coast of south-western W.A. from S of Shark Bay to the Dongara area S of Geraldton. Usually grows in sandplain associations. Map 134.

W.A.: W of Coburn Stn, *J.S.Beard 7395* (PERTH); Mary Springs Stn, *H.Demarz D3364* (PERTH); NE of Tamala Homestead, *A.S.George 9562* (PERTH); S of Lake Arrowsmith, *A.S.George 9783* (PERTH); 32 km N of Geraldton on Geraldton–Northampton road, *R.A.Saffrey 1533* (CANB, PERTH).

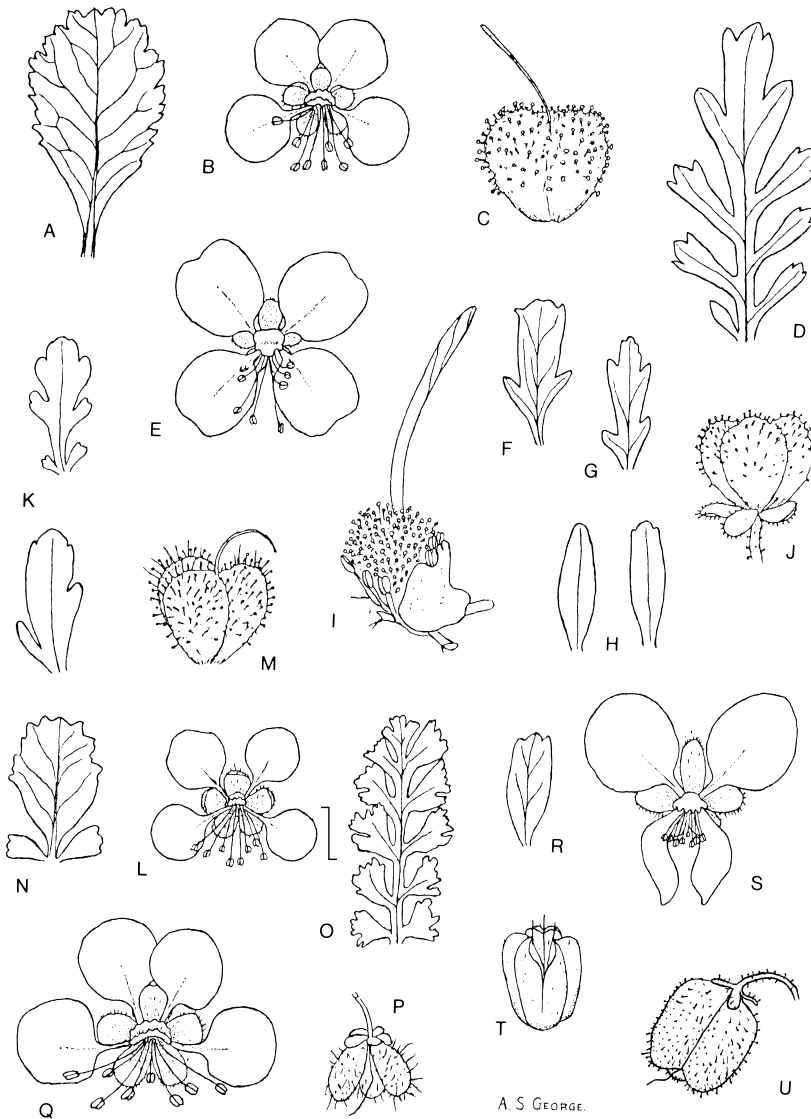
Some plants from the area in which the distribution of these two varieties overlaps show intermediate leaf morphology.

**3. Diplopeltis intermedia** A.S.George in A.S.George & G.Erdtman, *Grana Palynol.* 9: 103 (1970)

T: 2 miles (c. 3 km) W of Tenindewa, E of Geraldton, W.A., 17 Oct. 1967, *A.S.George 9217*; holo: PERTH; iso: K, MEL, both *n.v.*, *fide* A.S.George & G.Erdtman, *loc. cit.*

Shrub to 0.6 m, spreading, suckering, tomentose and sometimes sparsely hirsute with short and long simple hairs and glandular hairs, the glands usually peltate and cream-coloured. Leaves sessile or petiolate, from oblong to ovate, obovate or cuneate in outline, deeply divided or lobed, to pinnatifid, obtuse, 1–3.5 cm long, 0.4–2 cm wide, tomentose and hirsute and with glandular hairs. Pedicels 3–3.5 mm long. Sepals 1–2 mm long. Petals broadly spatulate to orbicular, 3–4 mm long including claw; claw 0.5–1 mm long. Stamens 2–4 mm long. Cocci 2.5–3.5 mm long, chartaceous, muricate, pubescent, sometimes densely so, and with long glandular hairs.

Occurs near the west coast of W.A. from Learmonth to Geraldton, in sandplain and shrub steppe communities. There are 2 varieties.



**Figure 26.** *Diplopeltis*. **A–C**, *D. petiolaris*. **A**, leaf  $\times 1.2$ ; **B**, flower  $\times 2.5$ ; **C**, fruit  $\times 4$  (**A–C**, A.George 9181, PERTH). **D–G**, *D. huegelii* var. *huegelii*. **D**, leaf  $\times 1.2$ ; **E**, flower  $\times 2.5$  (**D–E**, A.George 9189, PERTH); **F**, leaf  $\times 0.8$  (Bellevue, W.A., 1901-02, C.Andrews, K); **G**, leaf  $\times 0.8$  (W.A., -. Sandford, K). **H–J**, *D. huegelii* var. *subintegra*. **H**, leaves  $\times 1.4$ ; **I**, gynoecium  $\times 7$ ; **J**, fruit  $\times 3.5$  (**H–J**, A.George 9180, PERTH). **K–M**, *D. intermedia* var. *intermedia*. **K**, leaves  $\times 2.5$ ; **L**, flower  $\times 3.5$ ; **M**, fruit  $\times 5$  (**K–M**, A.George 9217, PERTH). **N**, *D. intermedia* var. *incana*, leaf  $\times 1.4$  (A.George 9176, PERTH). **O–Q**, *D. eriocarpa*. **O**, leaf  $\times 1$ ; **P**, fruit  $\times 1.4$  (**O–P**, Charles Knife Rd, W.A., A.George, PERTH); **Q**, flower  $\times 1.7$  (A.George 9164, PERTH). **R–T**, *D. stuartii* var. *stuartii*. **R**, leaf  $\times 0.8$  (Mt Tate, N.T., R.Tate, K); **S**, flower  $\times 3.5$  (A.George 8718, PERTH); **T**, dehiscent fruit  $\times 1.4$  (G.Chippendale 2579, NT). **U**, *D. stuartii* var. *glandulosa*, fruit  $\times 1.4$  (A.George 9147, PERTH). Reproduced by permission from *Grana Palynologica* 9: 104, 105 (1970).

Leaves oblong to ovate or cuneate in outline, deeply divided or lobed, to pinnatifid, usually less than 0.5 cm wide, tomentose, hirsute and with glandular hairs

**3a. var. intermedia**

Leaves broadly obovate to cuneate, not as deeply divided, usually more than 0.5 cm wide, grey-tomentose, sparsely hirsute and with few glandular hairs

**3b. var. incana**

**3a. Diplopeltis intermedia** A.S.George var. **intermedia**

Plant with short and long simple hairs and glandular hairs. Leaves oblong to ovate or cuneate in outline, deeply divided or lobed, to pinnatifid, mostly 0.4–0.6 cm wide.

Occurs near the coast of W.A. from S of Exmouth Gulf to the Geraldton area. Grows in sandy soils in sandplain or spinifex scrub communities. Map 135.

W.A.: Mullewa Plains, *W.E.Blackall 714* (PERTH); East Yuna, *A.C.Burns 84* (K, L, PERTH); c. 37 km SSE of Tamala Homestead, *A.S.George 9596* (CANB, NSW, PERTH); Kalbarri National Park, *A.S.George 9616* (PERTH); 104 km S of Exmouth, *K.F.Kenneally 7359* (CANB, PERTH).

Plants of this typical variety from the northern part of the species distribution (e.g. *Kenneally 7359*) show some characters tending towards var. *incana*, e.g. broadly obovate leaves.

**3b. Diplopeltis intermedia** var. **incana** A.S.George in A.S.George & G.Erdtman, *Grana Palynol.* 9: 104 (1970)

T: 68 miles (109 km) S of Learmonth, W.A., 5 Aug. 1967, *A.S.George 9176*; holo: PERTH; iso: K, MEL, both *n.v.*, *fide* A.S.George & G.Erdtman, *loc. cit.*

Plants usually grey, with short and a few long simple hairs and few glandular hairs. Leaves broadly obovate to cuneate, not as deeply divided as the typical variety, mostly 0.5–1.5 cm wide.

Occurs in the northern part of the distribution of the species from Learmonth to the Carnarvon area and near Kalbarri, W.A. Grows in sandy soils or in sand over limestone, usually in spinifex steppe or in low scrub. Map 136.

W.A.: 16 km NW of Murchison House Homestead, *A.S.George 9611* (CANB, K, NSW, PERTH); c. 10 km N of Quobba Homestead, *A.S.George 10156* (CANB, PERTH); c. 11 km E of Ningaloo Stn Homestead, *A.S.George 10231* (PERTH); 15.2 km N of Ningaloo Homestead on Yardie Creek road, *K.F.Kenneally 7355* (CANB, PERTH); Blowholes road N of Carnarvon, *W.Rogerson 213* (PERTH).

**4. Diplopeltis eriocarpa** (Benth.) Hemsley, *Hooker's Icon. Pl.* Ser. 4,8: t. 2730 (1902)

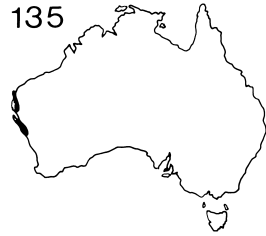
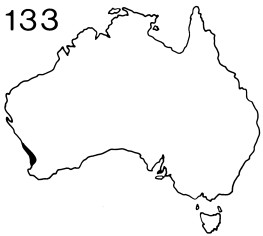
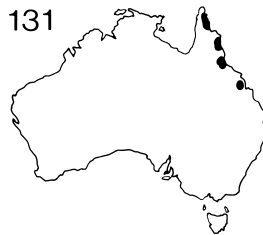
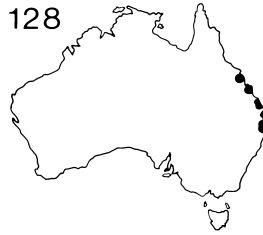
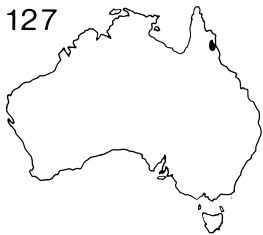
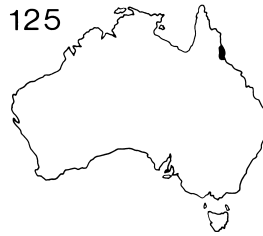
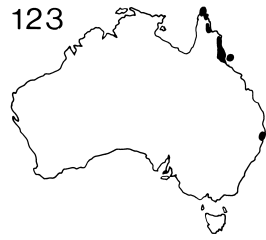
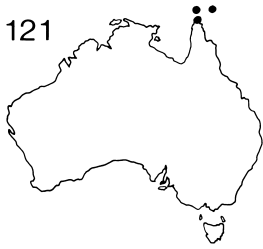
*Diplopeltis huegelii* var. *eriocarpa* Benth., *Fl. Austral.* 1: 456 (1863). T: Nickol Bay, W.A., *F.Gregory*; holo: K *n.v.*; iso: MEL *n.v.*; both *fide* A.S.George & G.Erdtman, *Grana Palynol.* 9: 106 (1970).

Shrub to 0.7 m, erect to spreading, suckering, with short curved and long straight simple hairs and glandular hairs, the glands cream-coloured. Leaves sessile, broadly ovate-oblong to obovate in outline, deeply pinnatifid almost to midrib, the lobes oblong-cuneate and sometimes again lobed, 1.5–5 cm long, to 2.5 cm wide, hirsute and tomentose and with sparse glandular hairs. Pedicels 2–3 mm long. Sepals 2.5–3 mm long. Petals orbicular, 4–6 mm long including claw; claw 1.5–2 mm long. Stamens 4.5–5 mm long. Cocci inflated, 6–7 mm long, chartaceous, densely hirsute and with sparse glandular hairs.

Occurs near the west coast of W.A. from the Port Hedland area to N of Carnarvon, including Barrow Is. Grows in red sandy loam or on red sand plains usually associated with spinifex, sometimes on sandhills near coast, occasionally in lateritic soils. Map 137.

W.A.: c. 163 km N of Carnarvon and Gascoyne R. road junction on Onslow road, *A.M.Ashby 2942* (ADW, PERTH); 8 km N of Roebourne, *A.S.George 9164* (NSW, NT, PERTH); 14 km E of road junction, S of Onslow, *A.S.George 9167* (NSW, NT, PERTH); c. 105 km N of Carnarvon, *A.S.George 9179* (PERTH); Barrow Is., *D.W.Goodall 1293* (PERTH).





121. *Arytera* sp.

124. *Mischochloa* grandissima

127. *Mischochloa* pyriformis subsp. retusus

130. *Mischochloa* australis

133. *Diplopeltis* huegelii var. huegelii

122. *Mischochloa* exangulata

125. *Mischochloa* albescens

128. *Mischochloa* anodontus

131. *Mischochloa* stipitata

134. *Diplopeltis* huegelii var. subintegra

123. *Mischochloa* lachnocarpus

126. *Mischochloa* pyriformis subsp. pyriformis

129. *Mischochloa* macrocarpa

132. *Diplopeltis* petiolaris

135. *Diplopeltis* intermedia var. intermedia

**Sect. II. Diplopholis****Diplopeltis** sect. **Diplopholis** F.Muell., *Fragm.* 3: 167 (1863)T: *D. stuartii* F.Muell.

Petals unequal, the upper pair spatulate and larger than obliquely ovate lower pair. Fruit a loculicidal capsule.

1 species endemic in Australia.

**5. Diplopeltis stuartii** F.Muell., *Fragm.* 3: 12 (1862)

T: between Mt Morphett and Bonney R., W.A., *J.Macdouall Stuart*; holo: MEL *n.v.*, *fide* A.S.George & G.Erdtman, *Grana Palynol.* 9: 107 (1970).

Perennial herb branching from base, diffuse, often prostrate with ascending stems, with short and long simple hairs and glandular hairs, or with glandular hairs only (var. *glandulosa*), the glands cream-coloured. Leaves shortly petiolate or sessile, oblong, narrowly cuneate to cuneate, 0.7–4 cm long, 0.5–1.5 cm wide, lower surface hirsute, upper surface glabrescent; apex truncate, usually with short obtuse lobes. Pedicels 3–10 mm long. Sepals 2–3 mm long. Petals paired; upper pair spatulate, 5–7 mm long including claw; claw 1–1.5 mm long; lower pair obliquely ovate, curved, 4–4.5 mm long. Stamens 2–3 mm long. Capsule transversely oblong in outline, 10–14 mm long, c. 10 mm wide, crustaceous, hirsute and with sparse glandular hairs.

Occurs in W.A. and N.T. from the Hamersley Range eastwards through the desert regions almost to the N.T.–Qld border. Usually grows in sandy soils associated with spinifex and open shrublands, occasionally in lateritic soils. There are 2 varieties.

Indumentum of simple and glandular hairs; cocci c. 10 mm long, rarely to 12 mm

**5a. var. stuartii**

Indumentum of glandular hairs only; cocci 13–14 mm long

**5b. var. glandulosa****5a. Diplopeltis stuartii** F.Muell. var. *stuartii*

Plant with simple and glandular hairs. Leaves 0.7–2.5 cm long, rarely to 3 cm. Cocci c. 10 mm long, rarely to 12 mm.

Occurs from Hamersley Range eastwards to the Gibson and northern Great Victoria Deserts in W.A., extending into the south-eastern, Tanami and central areas of N.T. Map 138.

W.A.: c. 21 km W of Browne Range, Gunbarrel Hwy, *A.S.George 5401* (PERTH); 112 km N of Sandstone towards Wiluna, *R.D.Royce 10407* (PERTH); 8 km W of Wittenoom, 15 Aug. 1974, *J.H.Willis* (MEL, PERTH). N.T.: c. 34 km N of Rabbit Flat on Tanami road, *R.C.Carolin 7918* (PERTH, SYD); Giles–Sandy Blight Junction road, c. 6 km E of W.A.–N.T. border, *A.S.George 8919* (PERTH, NSW).

**5b. Diplopeltis stuartii** var. **glandulosa** A.S.George in A.S.George & G.Erdtman, *Grana Palynol.* 9: 108 (1970)

T: 41 miles (c. 65 km) SE of Swindells Airfield, 350 miles (c. 560 km) E of Port Hedland, W.A., 31 July 1967, *A.S.George 9147*; holo: PERTH; iso: K, MEL, both *n.v.*, *fide* A.S.George & G.Erdtman, *loc. cit.*

Plants with glandular hairs only. Leaves 2.5–4 cm long, with sparse glandular hairs. Cocci 13–14 mm long.

Only known from two collections besides the type. Grows in sand with *Plectrachne schinzii*. Map 139.

N.T.: 85 km E of Three Ways on Barkly Hwy, *N.M.Henry 193* (BRI, CANB, K, NT); 29 km S of Rockhampton Downs Homestead, *A.Nicholls 574* (NT).

This variety is distinct in the genus in lacking simple hairs.

## 28. DISTICHOSTEMON

*Distichostemon* F.Muell., *Hooker's J. Bot. Kew Gard. Misc* 9: 197, 306 (1857); from the Latin *distichus* (in opposite rows) and *stemon* (stamen), referring to the arrangement of the stamens in the type species.

Type: *D. phyllopterus* F.Muell.

Shrubs, monoecious or dioecious. Indumentum of simple, spreading hairs. Leaves simple, alternate, entire, serrate, serrulate or crenulate. Inflorescence an axillary or terminal raceme or panicle, or female flowers solitary; bracts slender. Flowers regular, pedicellate. Sepals 5–10, slightly imbricate. Petals absent. Disc small. Stamens 8–74, usually in 2 to many irregular rows, free; filaments glabrous; anthers linear, apiculate, hairy especially on margins. Ovary oblong or obovoid, 3–8-lobed, usually pubescent, 3–8-locular with two ovules per locule; style filiform, often twisted; stigma simple or minutely 2–4-lobed. Fruit winged, usually triquetrous, ellipsoidal, obovoid or oblong, sometimes spherical, usually chartaceous, inflated, hairy, loculicidally dehiscent; valves dorsally or apically produced into herbaceous wings; septa membranous, shiny, pubescent. Seeds 2 per locule, shiny, globose, with marked annular, disciform, tumid base, exarillate.

A genus of 6 species endemic in tropical Australia. It approaches some species of *Dodonaea* but has a greater number of stamens except in some flowers of *Distichostemon malvaceus*.

G.Bentham, *Fl. Austral.* 1: 487 (1863); L.A.T. Radlkofer in A. Engler *Pflanzenr.* 1404–1406 (1934); S.T.Reynolds, *Austrobaileya* 2: 57–64 (1984).

- |   |   |
|---|---|
| <p>1 Fruit 8–10 mm long, 6–10 mm wide, with minute wings towards apex, 3-, or 4-locular, 3-, or 4-valved</p> <p>2 Fruit with knob-like wings only towards apex; wings 0.5–1 mm long, 0.5–3 mm wide; stamens 10–22; filaments 1–3.5 mm long</p> <p>2: Fruit with small flat wings; wings wide at apex narrowing to a ridge towards base, 2–7 mm long, 2–4 mm wide; stamens 30–74; filaments to 1 mm long</p> <p>1: Fruit usually 10–22 mm long, 8–25 mm wide, 3–8-locular; valves 3–8, with usually broad wings</p> <p>3 Fruit with 3 or 4 wings</p> <p>4 Fruit with 3 wings</p> <p>5 Stamens 10–15; fruiting pedicels to 50 mm long; wings widest about middle of fruit; leaves 1–4.2 cm long</p> <p>5: Stamens 24–74; fruiting pedicels to 22 mm long; wings widest towards apex; leaves 2–9 cm long</p> <p>6 Leaves acute or obtuse, serrate or entire, glabrous or with curved hairs; lateral nerves usually impressed above; stamens 24–34; wings 8–14 mm long and as wide</p> <p>6: Leaves obtuse, truncate or retuse, entire or crenulate, velvety or coarsely pubescent; lateral nerves not impressed above; stamens 30–74; wings 4–7 mm long, 4–14 mm wide</p> <p>4: Fruit with 4 wings</p> <p>7 Stamens 8–10; fruit narrowly winged from apex to base; wings wider at apex, 3–5 mm wide; petiole less than 2 mm long</p> <p>7: Stamens 14–74; fruit broadly winged from apex to base or winged broadly only near apex; wings 3–8.5 mm wide; petiole 3–15 mm long</p> | <p><b>2. <i>D. barklyanus</i></b></p> <p><b>6. <i>D. hispidulus</i></b></p> <p><b>3. <i>D. dodecandrus</i></b></p> <p><b>1. <i>D. filamentosus</i></b></p> <p><b>6. <i>D. hispidulus</i></b></p> <p><b>4. <i>D. malvaceus</i></b></p> |
|---|---|

- 8 Stamens 14–24; fruit densely villous, broadly winged from apex to base; wings 6–8.5 mm wide at broadest part; leaves 5–14.5 cm long **5. D. arnhemicus**
- 8: Stamens 30–74; fruit finely pubescent or puberulent; wings wider at apex, gradually or abruptly narrowing to base, 4–8 mm wide, or to 14 mm wide if wider than long; leaves 3–9 cm long, rarely less **6. D. hispidulus**
- 3: Fruit with more than 4 wings
- 9 Stamens 8–10; fruit 6–8-valved, narrowly winged from apex to base, stiffly pubescent; wings to 5 mm wide at broadest part; leaves 5.5–9 cm long, petiole 1–2 mm long **4. D. malvaceus**
- 9: Stamens 14–24; fruit 5-valved, broadly winged from apex to base, densely villous; wings 6–8.5 mm wide at broadest part; leaves 5–14.5 cm long; petiole 4–15 mm long **5. D. arnhemicus**

### 1. *Distichostemon filamentosus* S.Moore, *J. Linn. Soc., Bot.* 45: 197 (1920)

T: Palmerston [Darwin], N.T., 14 June 1886, *T.S.Lea*; holo: BM.

Illustration: S.T.Reynolds, *Austrobaileya* 2: 64 fig. 6C (1984).

Shrub to 1.5 m. Branchlets and leaves puberulent to glabrous. Leaves narrowly elliptic to ±obovate, acute to obtuse, sparsely serrate especially above middle or entire, 3.3–10 cm long, 0.8–2.8 cm wide; lateral nerves usually impressed above; petiole 5–25 mm long. Flowers solitary, axillary, or in terminal racemes; pedicels 6–18 mm long. Sepals 6–8, linear or elliptic-oblong, acuminate, often lobed, 6–8 mm long, puberulous or glabrous. Stamens 24–34; filaments 2–3.5 mm long; anthers to 4 mm long. Styles to 2 cm long. Fruit 3-locular, broadly obovoid or obtriangular, 3-winged, 11–18 mm long to 25 mm wide; wings divaricate, obtusely triangular, 8–14 mm long and wide. Fig. 27C–D.

Occurs in Darwin and Gulf areas, N.T.; usually in eucalypt forest in disturbed areas, in deep sandy soil on gentle slopes and flats. Map 140.

N.T.: Stuart Hwy, 21 km SE of Darwin, *D.Nelson 1115* (NSW, NT); Nourlangie Safari Camp, *M.Lazarides 7891* (NT); McCallum Ck (13°05'S, 130°31'E), *Bateman 539* (NT); W of Brocks Ck (13°30'S, 132°11'E), *S.T.Blake 16454* (BRI).

*D. filamentosus* is a variable species, known from few collections; it differs from other species in being glabrous or nearly so and in the acute, serrate or serrulate leaves.

### 2. *Distichostemon barklyanus* S.Reyn., *Austrobaileya* 2: 59 (1984)

T: 48 km S of Elliott, Stuart Highway, N.T., Feb. 1969, *J.Must 472*; holo: BRI; iso: NT.

Illustration: S.T.Reynolds, *Austrobaileya* 2: 64 fig. 6M (1984).

Shrub to 1 m. Shoots and branchlets pubescent. Leaves often clustered, elliptic or oblong-obovate, truncate, mucronate or obtuse, entire or ±crenulate, 2.5–6 cm long, 1–2.2 cm wide, scabrid, slightly viscid, rarely thick and velvety, pubescent to ±glabrous above, pubescent below; petiole 3–7 mm long. Flowers in small terminal racemes, rarely solitary; pedicels 2–7 mm long. Sepals 5–7, elliptic-ovate, acute, 3–5 mm long. Stamens 10–22; filaments 1–3.5 mm long; anthers to 2.5 mm long. Fruit 3-locular, obovoid or subglobose, inflated, red, with 3 or 4 minute knob-like triangular wings at upper angles, 8–10 mm long, 6–10 mm wide, rarely more, shortly puberulent; wings 0.5–1 mm long, 0.5–3 mm wide. Fig. 27J.

Occurs in N.T. and north-western Qld; common on Barkly Tableland; grows on rocky hillsides and outcrops. Map 141.

N.T.: 22 km E of Stuart Hwy on Borrooloola road, *C.Dunlop 2179* (NT); 45 km S of Willeroo Homestead, *G.Chippendale 6874* (NSW, NT); Tennant Creek, Apr. 1948, *R.A.Perry 621* (NT). Qld: Lawn Hill, *H.I.Jensen 78* (BRI); Pilpah Hill, 11 km N of Barkly Downs, *L.Pedley 1082* (BRI).

The wings are almost rudimentary and rarely continue beyond the middle of fruit, otherwise the species resembles *D. hispidulus* var. *aridus* but has fewer stamens and broader sepals.

### 3. *Distichostemon dodecandrus* Domin, *Biblioth. Bot.* 89: 360 (1927)

T: Mt Remarkable, near Pentland, Qld, Mar. 1910, *K.Domin*; holo: PR.

Illustration: S.T.Reynolds, *Austrobaileya* 2: 64 fig. 6A–B (1984).

Decumbent shrub to 1 m high. Branches rigid. Shoots pubescent. Leaves obovate or obovate-elliptic, obtuse or truncate, apiculate, entire; lamina 1–4.2 cm long, 0.6–1.7 cm wide, pubescent especially below, or glabrous; petiole 1–5 mm long. Flowers in axillary or terminal open racemes or solitary or rarely in 3-flowered cymes; pedicels 6–12 mm long, elongating to 40–50 mm in fruit. Sepals 6–10, linear, ovate-oblong or elliptic-ovate, obtuse or acute, 2–5 mm long. Stamens 10–15; filaments and anthers 1–3.5 mm long. Style 5–12 mm long. Fruit 3-locular, obtriangular or orbicular-obovoid, with 3 broad wings, inflated, 8–16 mm long, to 22 mm wide, pubescent; wings triangular, 3–8 mm long, 4–6 mm wide. Fig. 27A–B.

Occurs from Mareeba to Torrens Creek, Qld; common in yellow or red-brown sandy, pebbly soils on hillsides. Map 142.

Qld: Dimbulah–Petford road 21 km NE of Petford, *J.R.Clarkson* 2757 (BRI); 24 km SW of Charters Towers on Flinders Hwy, *P.Ollerenshaw* 1098 (BRI); SW of Woodhouse, *L.S.Smith* 4300 (BRI); Middle Hills, 10 km E of Torrens Creek, *R.H.Rebgetz* 505 (BRI); 17 km E of Torrens Creek, *A.D.Chapman* 1366 (BRI).

A variable species recognised by the rigid branches, small leaves, few stamens and long fruiting pedicels.

### 4. *Distichostemon malvaceus* Domin, *Biblioth. Bot.* 89: 359 (1927)

T: Palmer River, Qld, 10 Aug. 1873, *W.Hann* 60 & 27; syn: K.

[*D. phyllopterus* auct. non F.Muell.; J.Banks and D.Solander, *Bot. Cook's Voy.* 1: 17, t. 44 (1900); G.Bentham, *Fl. Austral.* 1: 487 (1862) *p.p. quoad* Banksian specimens]

Illustration: S.T.Reynolds, *Austrobaileya* 2: 64 fig. 6J–K (1984).

Shrub to 1.5 m high, pubescent when young, later scabridulous. Leaves oblong, elliptic or obovate, obtuse, truncate or retuse, entire or crenulate, 5.5–9 cm long, 1–2.3 cm wide, pubescent to scabrid; petiole 1–2 mm long. Flowers in small terminal or axillary open racemes, or flowers solitary; pedicels to 4 mm long. Sepals 5–7, linear, ovate-oblong, acute, 3.5–5 mm long. Stamens 8–10; filaments 3.5–5 mm long; anthers to 4 mm long. Ovary 6–8-lobed, pubescent; styles 2.5 mm long. Fruit 4–8-locular, ellipsoidal, inflated, with 4–8 narrow wings, 15–22 mm long and wide, stiffly pubescent with yellowish hairs; wings wider towards apex, 3–5 mm wide. Fig. 27E–H.

Occurs in Qld from Pascoe River, Cape York Peninsula, to near Mareeba; in open forest usually on dry sandy and gravelly ridges. Map 143.

Qld: Browns Ck, Pascoe River, *L.J.Brass* 19572 (BRI); Kennedy Rd, Tozer Gap, *C.H.Gittins* 1084 (BRI, NSW); Giant Horse Gallery, Laura, *B.P.M.Hyland* 8112 (BRI); Endeavour River, Dec. 1977, *V.Scarth-Johnson* (BRI); near Mareeba, *L.J.Webb* & *J.G.Tracey* 5907 (BRI).

May be distinguished by its 6–8-locular fruits (rarely fewer) with narrow dorsal wings from apex to base of the valves. Also characterised by the few stamens and short petioles.

### 5. *Distichostemon arnhemicus* S.Reyn., *Austrobaileya* 2: 61 (1984)

T: Mt Brockman, 12°44'S, 132°54'E, N.T., 21 Feb. 1973, *C.Dunlop* 3322; holo: BRI, iso: CANB, DNA, NSW, NT.

Illustration: S.T.Reynolds, *op. cit.* 64 fig. 6L.

Shrub to 3.5 m high, shoots pubescent. Leaves oblong or elliptic, rarely obovate, obtuse, entire, 5–14.5 cm long, 2–4.2 cm wide, pubescent; petiole 4–15 mm long. Inflorescence a terminal raceme, or raceme-like, or flowers solitary; pedicels 4–21 mm long. Sepals 6 or 7, ovate-oblong, acuminate, 3–5 mm long. Stamens 14–24; filaments 1–3 mm long; anthers 3.5–4 mm long. Ovary obcordate, 4- or 5-lobed, densely pubescent; style 1–3.5 mm long. Fruit depressed obovoid, with 4 or 5 broad wings, 8–18 mm long, to 25 mm wide, densely villous; wings 6–8.5 mm wide at apex. Fig. 27 I.

Common in mineralised areas of Arnhem Land, N.T.; in sandstone gullies, gorges and escarpments, often near creeks. Map 144.

N.T.: Tin Camp Creek, c. 32 km S of Nabarlek Mining Camp, *Hartley 13831* (NT); 11.4 km W of Mt Gilruth, *M.Lazarides 7953* (BRI, NSW, NT); Mt Basedow Range, *Hartley 13881* (NT); 6.4 km NW of El Sharana–Pine Ck Rd, *P.Martensz & R.Schodde AE413* (NT); Katherine Gorge, *M.Lazarides 7032* (NT).

Distinguished from all the other species by its broadly winged, 4- or 5-locular fruit and its often larger leaves with long slender petioles.

### 6. *Distichostemon hispidulus* (Endl.) Baillon, *Hist. Pl.* 5: 411 (1874)

*Dodonaea hispidula* Endl., *Atacta Bot.* t. 30 (1835). T: illustration by F.Bauer, probably from specimen collected by *Robert Brown* at Gulf of Carpentaria.

Shrub to 2 m high. Branchlets and peduncles pubescent. Leaves usually clustered, narrowly elliptic, obovate or elliptic-oblong, obtuse, truncate, mucronate or retuse, entire or crenulate, 1.5–9 cm long, 0.8–3.4 cm wide, velvety or coarsely pubescent; petiole 0.2–1.4 cm long. Inflorescence a terminal or axillary raceme or panicle, or flowers solitary. Flowers 5–14 mm diam.; pedicels 2–22 mm long. Sepals 5–10, elliptic, acute, pubescent. Stamens 30–74. Ovary obovoid or obcordate, truncate, or 3- or 4-lobed at apex, pubescent; style 5–25 mm long. Fruit 3- or 4-locular oblong-obovoid or ellipsoidal, pubescent or puberulent; wings divaricate or erect, broadest in upper third or quarter, 2–7 mm long, 2–14 mm wide.

Occurs in tropical W.A., N.T. and Qld. *D. hispidulus* is characterised especially by the numerous stamens (33–74). It varies greatly in the shape of the wings of the fruit and in the texture of the leaves but the extreme forms occasionally merge into the other. Three varieties are recognised here.

- |   |                                     |
|---|-------------------------------------|
| <p>1 Wings of fruit minute, 2–4 mm wide, broadest in upper quarter, narrowing to a slender ridge towards base; inflorescence with less than 10 flowers</p>                                    | <p><b>6c. var. aridus</b></p>       |
| <p>1: Wings 4–18 mm wide, erect or divaricate with broadest part towards apex or near middle; inflorescence with up to 23 flowers</p>   |                                     |
| <p>2 Wings wider towards middle of fruit, triangular; fruit on slender pedicels in a raceme-like infructescence; leaves usually soft and velvety, clustered</p>                               | <p><b>6a. var. hispidulus</b></p>   |
| <p>2: Wings broader towards apex of fruit, usually wider than long; fruit on stout pedicels, solitary or in a raceme-like infructescence; leaves usually coarse, pubescent, not clustered</p> | <p><b>6b. var. phyllopterus</b></p> |

### 6a. *Distichostemon hispidulus* (Endl.) Baillon var. *hispidulus*

Illustration: S.T.Reynolds, *op. cit.* 64 fig. 6E.

Shrub to 1.5 m. Leaves clustered, narrowly elliptic to obovate, 3–7 cm long, 1–2.5 cm wide, usually velvety each side; petiole 3–9 mm long. Inflorescence a raceme or panicle; pedicels 3–10 mm long. Sepals 5–10, 2.5–3.5 mm long. Stamens 33–74; filaments 2–2.5 mm long. Fruit winged from apex to base, 8–12 mm long, 15–18 mm wide; wings triangular, up to 8 mm wide. Fig. 26K.

Occurs throughout the range of the species, usually in red lateritic soil on undulating plains. Map 145.



**Figure 27.** A–O, *Distichostemon*. A–B, *D. dodecandrus*. A, flowering and fruiting habit  $\times 0.7$ ; B, flower  $\times 2$  (A–B, J.Clarkson 2757, BRI). C–D, *D. filamentosus*. C, fruiting habit  $\times 0.7$  (M.Lazarides 7891, NT); D, flower  $\times 2$  (M.Parker 155, NT). E–H, *D. malvaceus*. E, fruiting habit  $\times 0.7$  (J.Clarkson 3706, BRI); F, flowering habit  $\times 0.7$  (L.Webb & J.Tracey 5907, BRI); G, fruit  $\times 1$  (J.Clarkson 3706, BRI); H, seed  $\times 6$  (J.Clarkson 3255, BRI). I, *D. arnhemicus*, fruit  $\times 1$  (C.Dunlop 3322, BRI). J, *D. barklyanus*, fruit  $\times 1$  (J.Must 472, NT). K, *D. hispidulus* var. *hispidulus*, fruit  $\times 1$  (R.Perry 1764, BRI). L, *D. hispidulus* var. *aridus*, fruit  $\times 1$  (T.Henshall 1907, BRI). M–O, *D. hispidulus* var. *phyllopterus*. M, flowering habit  $\times 0.7$  (M.Lazarides 6717, PERTH); N, fruit  $\times 1$  (Wilson 10982, PERTH). O, fruit  $\times 1$  (M.Lazarides 6717, PERTH).

N.T.: Little Lagoon, Groote Eylandt, *R.L.Specht 244* (BRI); Maranboy Police Stn, *G.Chippendale 6627* (NT). Qld: Sweers Is., June 1901, *F.M.Bailey* (BRI); 16 km W of Westmoreland Stn, *R.A.Perry 1155* (BRI).

**6b. *Distichostemon hispidulus* var. *phyllopterus*** (F.Muell.) S.Reyn., *Austrobaileya* 2: 62 (1984)

*D. phyllopterus* F.Muell., *J. Bot. Kew Gard. Misc.* 9: 306 (1857). T: Victoria R., N.T., *F.Mueller*; lecto: MEL, *vide* S.T.Reynolds, *loc. cit.*; Point Pearce, N.T., *F.Mueller*; lectopara: K, *vide* S.T.Reynolds, *loc. cit.*

Illustration: S.T.Reynolds, *loc. cit.* 64 fig. 6F–H.

Shrub to 2 m. Leaves not clustered, obovate or elliptic-oblong, 4–9 cm long, 1–3.5 cm wide, softly or coarsely pubescent each side; petiole 4–14 mm long. Inflorescence a raceme or panicle, or female flowers solitary; pedicels 2–22 mm long. Sepals 6–8, 3–6 mm long. Stamens 30–52. Fruit 8–10 mm long, 12–28 mm wide; wings divaricate or erect, broadest at upper third, up to 14 mm wide. Fig. 27M–O.

Common in the Kimberley, W.A., and in north-western N.T.; grows among sandstone rocks. Map 146.

W.A.: Surveyors Pool, Mitchell Plateau, *K.F.Kenneally 5066* (PERTH); Broome, *J.Maconochie 1173* (NT, PERTH); Thompson Spring, *R.A.Perry 2947* (BRI, NT); head of Smoke Ck, SW of Lake Argyle, *A.S.Weston 12302* (PERTH). N.T.: Keep R., *A.Mitchell 327* (NT).

Specimens from near Lake Argyle and Thompson Spring have thinner leaves than usual and narrower, elongate wings on the fruit; they may represent a distinct taxon.

**6c. *Distichostemon hispidulus* var. *aridus***, S.Reyn., *Austrobaileya* 2: 63 (1984)

T: Hayfield Stn, 16°38'S, 133°17'E, N.T., Jan. 1978, *T.S.Henshall 1907*; holotype: BRI, isotype: NT.

Illustration: S.T.Reynolds, *op. cit.* fig. 6L.

Shrub to 1 m. Leaves often clustered, narrowly elliptic to obovate, 1.5–4 cm long, 0.4–1.2 cm wide, pubescent each side; petiole 2–6 mm long. Inflorescence raceme-like, or flowers solitary. Sepals 6 or 7, 4 mm long. Stamens 31–74; filaments 1 mm long. Fruit 8–10 mm long, 6–10 mm wide, wings broadest near apex, erect, triangular, obtuse, 2–7 mm long, 2–4 mm wide. Fig. 27 L.

Occurs in the Kimberley, W.A., and northern N.T.; grows on sandy plains and among sandstone rocks. Map 147.

W.A.: Glenelg R. gorge, *C.A.Gardner 9665* (PERTH); Goody Goody, *W.V.Fitzgerald 209* (PERTH). N.T.: 19 km NW of Supplejack Stn Homestead, *T.S.Henshall 2373* (NT).

Intergrades with var. *hispidulus* and possibly other taxa. Further collections are needed.

### Doubtful name

*D. phyllopterus* var. *serrulatus* F.Muell., *Ann. Rep. Govt Bot.* 1862 63: 12 (1963). T: Burke R., Qld, collector unknown; n.v.

## 29. DODONAEA

*J.G.West*

*Dodonaea* Miller, *Gard. Dict.* Abr. 4th edn (1754); after Rembert Dodoens, a Dutch physician and herbalist, 1518–1585.

Type: *D. viscosa* Jacq.



Perennial, dioecious, andromonoecious, gynomonocious, polygamo-dioecious or polygamous shrubs or small trees, often viscid. Leaves alternate, rarely opposite (*D. ericoides*), simple or pinnate, glabrous to hairy, rarely with glandular hairs (*D. glandulosa*). Inflorescence cymose. Flowers actinomorphic, inconspicuous. Sepals 3–7, free, caducous or persistent. Petals 0. Stamens 6–16, in female flowers absent or rudimentary. Disk small. Ovary 2–6–carpellate, glabrous or sometimes pubescent, usually viscid; in male flowers rudimentary or absent. Capsule 2–6–angled or 2–6–winged, membranous, coriaceous or crustaceous; the dorsal face of each carpel usually extended into a wing or appendage. Seeds arillate or exarillate; testa covered with hyaline membrane usually fused to testa, sometimes free like an envelope or partially free at margin.  $n = 14$  (18 taxa counted), *vide* J.G.West, *Brunonia* 7: 16 (1984).

A genus of c. 68 species distributed in the tropics, in temperate Africa, the Pacific and throughout Australia. Of the 61 Australian species, 59 are endemic; one extends to New Guinea, and one *Dodonaea viscosa*, is pantropical with extension to southern Africa and the Pacific.

G.Bentham, *Fl. Austral.* 1: 472–487 (1863); L.Radlkofer, *Pflanzenr.* 98: 1350–1404 (1933); J.G.West, *Brunonia* 7: 1–194 (1984).

- 1 Leaves simple, or pinnatifid, the lobes then shorter than width of lamina (*D. lobulata*)
- 2 Capsule winged, the wings extending from capsule base to apex, usually prominent and more than 2 mm wide (less than 1 mm in *D. procumbens*)
- 3 Capsule wings rounded, with their longest axis parallel to capsule axis,  $\pm$ equal in width from base to apex
- 4 Leaves various shapes, never subfiliform or cylindrical, flat, entire to regularly toothed or lobed, if linear then more than 2 mm wide and sinuolate
- 5 Leaves viscid, shiny and glabrous, or pubescent; seeds lacking hyaline membrane lifting at margin
- 6 Leaves more than 1 cm wide
  - 7 Capsule greatly inflated, not readily dehiscent, the wings 1.5–4 mm wide **18. *D. petiolaris***
  - 7: Capsule not inflated, septifragally dehiscent, the wings more than 4 mm wide
  - 8 Stamens 6–10; capsule wings 4–5.5 mm wide **1. *D. viscosa***
  - 8: Stamens 11–14; capsule wings 6–9 mm wide, rarely as narrow as 4 mm **2. *D. polyandra***
- 6: Leaves less than 1 cm wide
- 9 Leaves more than 3.5 cm long with length:width more than 5:1
- 10 Inflorescence axillary; flowers in diads, triads or 4-flowered cymes; leaves pinnatifid, lobed or regularly toothed in apical 2/3, usually less than 2.5 mm wide
  - 11 Leaves serrate, midvein flexuose; ovary pubescent; capsule 6–10.5 mm long **40. *D. ptarmicaefolia***
  - 11: Leaves pinnatifid or irregularly 2–12-lobed, the lobes obtuse to rounded, midvein straight; ovary glabrous; capsule 10.5–15 mm long **39. *D. lobulata***
- 10: Inflorescence terminal, more than 4-flowered; leaves entire, or irregularly sinuolate to denticulate, usually more than 2.5 mm wide
- 12 Branchlets with 2 or 3 villous rows of white hairs (Perth area, W.A.) **42. *D. hackettiana***
- 12: Branchlets glabrous to puberulent, never villous (widespread) **1. *D. viscosa***

- 9: Leaves 3.5 cm or less long with length:width less than or equal to 5:1
- 13 Leaves usually less than 2.5 mm wide, linear, pinnatifid, lobed or regularly toothed in apical 2/3
- 14 Leaves serrate, midvein flexuose; ovary pubescent; capsule 6–10.5 mm long **40. *D. ptarmicaefolia***
- 14: Leaves pinnatifid or irregularly 2–12-lobed, the lobes obtuse to rounded, midvein straight; ovary glabrous; capsule 10.5–15 mm long **39. *D. lobulata***
- 13: Leaves more than 2.5 mm wide, oblong, cuneate, angular-obovate to obovate, usually entire, if lobed or toothed then irregularly so and at apex or above middle only
- 15 Leaves 5–9 mm wide
- 16 Stamens 4 or 5; sepals persistent **12. *D. coriacea***
- 16: Stamens 6–10; sepals caducous
- 17 Erect shrub; capsule 11–28 mm wide, the wings more than 2 mm wide **1. *D. viscosa***
- 17: Prostrate shrub; capsule 8–10.5 mm wide, the wings 0.5 mm wide **7. *D. procumbens***
- 15: Leaves 2–5 mm wide, or rarely as wide as 8 mm
- 18 Leaves cuneate, angular-obovate to obovate; sepals persistent
- 19 Leaves hirsute, petiolate, 3–6 mm long; capsule hirsute; inflorescence axillary **30. *D. hirsuta***
- 19: Leaves glabrous, sessile, 5–18 mm long; capsule glabrous; inflorescence terminal **16. *D. peduncularis***
- 18: Leaves linear to oblong; sepals caducous
- 20 Leaves sessile, decurrent at base (central coast, N.S.W.) **8. *D. camfieldii***
- 20: Leaves petiolate, attenuate at base (N Eyre Peninsula, S.A.) **17. *D. intricata***
- 5: Leaves not viscid, dull, glabrous; seeds with hyaline membrane lifting at margin
- 21 Leaves petiolate, rarely subsessile; lamina 3–12 cm long, 0.7–4.7 cm wide, acuminate to obtuse; capsule septifragally dehiscent
- 22 Leaves irregularly serrulate, 0.6–1.2 cm wide; inflorescence a 3–6-flowered cyme; pedicels less than 3 mm long **13. *D. serratifolia***
- 22: Leaves entire or sinuate, 1–4.7 cm wide; inflorescence a panicle; pedicels more than 4 mm long
- 23 Capsules 13–19 mm long; body of carpel more than 12 mm long; leaves 1–3 cm wide, concolorous; sepals persistent **3. *D. lanceolata***
- 23: Capsules 9.5–16 mm long; body of carpel less than 12 mm long; leaves 1–4.7 cm wide, paler beneath; sepals caducous **4. *D. triquetra***
- 21: Leaves sessile, 0.8–4.5 cm long, 0.3–1.5 cm wide, obtuse or rounded, rarely mucronate
- 24 Capsule septidically dehiscent, the wings 0.5–1 mm wide; leaves obovate; pedicels less than 3 mm long **6. *D. bursariifolia***
- 24: Capsule septifragally dehiscent, the wings 1–4 mm wide; leaves linear to oblanceolate; pedicels more than 3.5 mm long **5. *D. amblyophylla***
- 4: Leaves subfiliform, cylindrical or narrowly linear, less than 2 mm wide, terete or 4-ribbed or channelled above or flat, entire

- 25 Branchlets puberulent; leaves falcate, not rigid, 1.2–4 cm long, rarely to 5 cm
- 26 Leaves 2.5–5 cm long, scattered; stamens 8 (north-eastern N.S.W., south-eastern Qld) **15. *D. falcata***
- 26: Leaves 1.2–2.2 cm long, crowded and obscuring branches; stamens 5 or 6 (Tas.) **37. *D. filiformis***
- 25: Branchlets glabrous; leaves straight, usually erect, often rigid, 4–10.5 cm long, or rarely as short as 3 cm
- 27 Leaves linear, flat, 1–6 mm wide; flowers in panicles **1. *D. viscosa***
- 27: Leaves subfiliform, terete or 4-ribbed or grooved above, 1 mm wide; flowers in few-flowered cymes
- 28 Leaves terete or 4-ribbed, rigid, acute, usually pungent; inflorescence axillary (W.A.) **41. *D. rigida***
- 28: Leaves grooved above, not rigid, obtuse; inflorescence terminal (Qld) **14. *D. filifolia***
- 3: Capsule wings rounded or pointed, oblique, with their longest axis perpendicular to the capsule axis, larger at capsule apex than at base
- 29 Leaves elliptic, 1–3.3 cm wide, with length:width less than 5:1
- 30 Capsule septically dehiscent, wings not extending to central axis at base and apex of capsule **31. *D. platyptera***
- 30: Capsule septifragally dehiscent, wings extending to central axis at base and apex of capsule **34. *D. rhombifolia***
- 29: Leaves usually linear, lanceolate or oblanceolate, rarely narrowly elliptic, 0.1–1.3 cm wide, with length:width more than 5:1
- 31 Leaves linear, rigid, 1–2.5 mm wide **32. *D. stenophylla***
- 31: Leaves oblanceolate, linear or narrowly elliptic, 2–13 mm wide
- 32 Capsule septically dehiscent, the wings 2.5–5.5 mm wide; leaves sessile or petiole 3–12 mm long **43. *D. pachyneura***
- 32: Capsule septifragally dehiscent, wings 4.5–10 mm wide; leaves sessile
- 33 Leaves all simple, 5–13 mm wide; body of capsule 3- or 4-lobed from above **35. *D. truncatiales***
- 33: Leaves simple or rarely irregularly pinnate, 2–5 mm wide body of capsule 4- or 8-angled from above **36. *D. heteromorpha***
- 2: Capsule globose, not prominently winged, the appendage at capsule apex only, usually lobe-like or horn-like or sometimes absent, or rarely a wing, less than 1.5 mm wide
- 34 Capsule appendage usually rounded and lobe-like, less than 2.5 mm wide, rarely a wing less than 1.5 mm wide (*D. baueri* and *D. bursariifolia*), sometimes absent
- 35 Seeds with hyaline membrane not lifting at margin, arillate or with slightly enlarged funicle
- 36 Leaves elliptic, rarely obovate, 1–3.2 cm wide; petiole more than 2 mm long; flowers in cymes or panicles **. 47. *D. aptera***
- 36: Leaves linear to obovate, 0.1–1 cm wide, sessile or petiole less than 2 mm long flowers solitary or in diads or triads
- 37 Leaves opposite, pubescent or rarely glabrescent **50. *D. ericoides***
- 37: Leaves alternate, glabrous or sparsely puberulent
- 38 Leaves 1–3 mm wide, linear to oblong (rarely narrowly elliptic in *D. teppe*)

- 39 Sepals 4, caducous; leaves entire or with 1–4 irregular teeth (W.A.) **51. D. pinifolia**
- 39: Sepals 3 or 4, persistent; entire to sinuate (S.A.)
- 40 Leaves 1–2 mm wide; capsule 5–7 mm long **58. D. hexandra**
- 40: Leaves 2–3 mm wide, rarely as narrow as 1 mm; capsule 4–5 mm long **59. D. teperi**
- 38: Leaves 3–10 mm wide, rarely as narrow as 2 mm, oblanceolate to obovate (rarely orbicular in *D. baueri*)
- 41 Sepals less than 3 mm long, persistent; leaves 0.5–1.8 cm long **49. D. baueri**
- 41: Sepals usually more than 3 mm long, caducous; leaves 1–4 cm long **52. D. humifusa**
- 35: Seeds with hyaline membrane lifting at margin, exarillate
- 42 Leaves obtuse or rounded, glabrous; capsule glabrous, the appendages 0.5–1 mm wide **6. D. bursariifolia**
- 42: Leaves tri-dentate or 3-lobed at apex, rarely truncate or acute, pilose on margin and midrib or pubescent or glabrous; capsule sparsely pilose or pubescent, rarely glabrous, the appendages 1–2.5 mm wide
- 43 Pedicels 1–2 mm long; leaves 0.7–1.2 cm long, tri-dentate or 3-lobed in distal 1/3 of leaf **54. D. trifida**
- 43: Pedicels 3.5–10 mm long; leaves 1.2–6 cm long, acute or if -dentate or 3-lobed then only in distal 1–2 mm of leaf **55. D. triangularis**
- 34: Capsule appendage up-curved and horn-like, rarely rounded and lobe-like in *D. pinifolia*, 1–8 mm wide
- 44 Leaves flat, 3–10 mm wide, usually oblanceolate to obovate, rarely narrowly elliptic **48. D. ceratocarpa**
- 44: Leaves convex above, 1–2 mm wide, rarely to 3 mm, usually linear or filiform, rarely narrowly elliptic or obovate
- 45 Stamens 8; leaves 8–35 mm long **51. D. pinifolia**
- 45: Stamens 6; leaves 2–10 mm long
- 46 Leaves appearing clustered at nodes; obtuse and recurved, 2-grooved below, the margins revolute; capsule 4.5–6 mm long **56. D. caespitosa**
- 46: Leaves solitary at nodes, acute, not recurved, the margins revolute but not 2-grooved below; capsule 3–3.5 mm long, rarely to 5.5 mm **57. D. divaricata**
- 1: Leaves compound, the leaflets longer than width of rachis
- 47 Capsule without appendage
- 48 Sepals 3; leaves excluding petiole 0.2–0.6 cm long (Qld) **60. D. macrossanii**
- 48: Sepals 4; leaves excluding petiole 0.5–4.5 cm long
- 49 Vegetative parts with glandular hairs; leaflets less than 2 mm long; capsule 2-valved (W.A.) **61. D. glandulosa**
- 49: Vegetative parts lacking glandular hairs; leaflets more than 2 mm long; capsule 4-lobed (S.A.) **53. D. humilis**
- 47: Capsule prominently winged
- 50 Capsule wings rounded, with their longest axis parallel to the capsule axis,  $\pm$ equal in width from base to apex; leaflets usually less than 12 mm long
- 51 Leaflets linear to linear-oblanceolate, less than 2 mm wide
- 52 Petiole 1–3 mm long; capsule less than 7.5 mm long **38. D. subglandulifera**
- 52: Petiole 2.5–24 mm long; capsule more than 8 mm long

## SAPINDACEAE

*Dodonaea*

- 53 Leaflets 11–23, or rarely as few as 9, irregularly sinuolate **19. D. sinuolata**
- 53: Leaflets 2–10, or rarely as many as 12, entire
- 54 Branchlets puberulent; petiole less than 7 mm long, leaflets 4.5–9 mm long **25. D. concinna**
- 54: Branchlets glabrous; petiole more than 9 mm long, leaflets 8–13.5 mm long, rarely to 25 mm **26. D. stenozyga**
- 51: Leaflets various shapes, mostly narrowly to broadly obovate, never linear or linear-oblongate, more than 2 mm wide
- 55 Lateral leaflets 10–46, or rarely as few as 8, if less than 10 then hirsute; leaves imparipinnate
- 56 Capsule densely hirsute, wing margins denticulate; plant hirsute to pubescent
- 57 Capsule less than 16 mm wide, the wings 3–4 mm wide; leaves excluding petiole 1.5–3.5 cm long **20. D. rupicola**
- 57: Capsule 16–24 mm wide, the wings 5–7 mm wide; leaves excluding petiole 0.8–2.2 cm long **21. D. vestita**
- 56: Capsule glabrous or sparsely pubescent, wing margins entire; plant at least in part glabrous (e.g. inner sepal surface or capsule)
- 58 Flowers solitary; body of fruiting carpel (excluding wing) more than 12.5 mm long **24. D. pinnata**
- 58: Flowers in diads to panicles, never solitary; body of fruiting carpel (excluding wing) less than 12.5 mm long
- 59 Petiole 1–8 mm long; leaflets angular-obovate to obovate, rarely oblong
- 60 Lateral leaflets 6–14; capsule 4-winged **9. D. boroniifolia**
- 60: Lateral leaflets 16–32; capsule 3-winged **23. D. multijuga**
- 59: Petiole 8–21 mm long, or rarely as short as 6 mm; leaflets oblong to oblanceolate
- 61 Leaves excluding petiole more than 7 cm long; lateral leaflets 28–46 **11. D. polyzyga**
- 61: Leaves excluding petiole less than 6 cm long; lateral leaflets 8–26, rarely as many as 30
- 62 Capsule 9.5–13 mm; leaflets 1–2 mm wide, irregularly sinuolate (Qld, N.S.W.) **19. D. sinuolata**
- 62: Capsule 6.5–9 mm long; leaflets 2–3 mm wide, entire (W.A.) **45. D. larreoides**
- 55: Lateral leaflets 2–10, rarely as many as 12, if 12 then leaves paripinnate and terminated by a very small tooth or lobe, glabrous or pubescent
- 63 Leaves paripinnate, with a small terminal lobe or tooth usually less than 1 mm long; leaflets 5.5–20 mm long
- 64 Capsule 5–6-winged, more than 10 mm long, inflated; pedicels 8–13 mm long; petiole usually more than 8 mm long **10. D. physocarpa**
- 64: Capsule 4-winged, less than 10 mm long, not inflated; pedicels less than 3 mm long; petiole less than 7 mm long **29. D. oxyptera**
- 63: Leaves imparipinnate, the terminal leaflet smaller than laterals, but not tooth- or lobe-like and usually more than 1 mm long; leaflets 1.5–9 mm long

- 65 Capsule 6–7.5 mm long, septicidally dehiscent; leaflets 0.8–1.5 mm wide 28. *D. adenophora*
- 65: Capsule more than 9 mm long, septifragally dehiscent; leaflets 1–4.5 mm wide
- 66 Lateral leaflets 6–14 9. *D. boroniifolia*
- 66: Lateral leaflets 2–8, or rarely as many as 10
- 67 Leaves glabrous; terminal leaflet acute, recurved and hooked; sepals persistent 22. *D. uncinata*
- 67: Leaves puberulent; terminal leaflet obtuse to rounded, not hooked; sepals caducous 27. *D. microzyga*
- 50: Capsule wings rounded or pointed, oblique, their longest axis perpendicular to the capsule axis, larger at capsule apex than at base; leaflets usually more than 12 mm long
- 68 Leaves usually simple, sometimes irregularly pinnate with 1–10 irregularly-spaced leaflets 36. *D. heteromorpha*
- 68: Leaves imparipinnate with 4–15 pairs of leaflets
- 69 Leaflets more than 3 mm wide, lanceolate, oblique 44. *D. megazyga*
- 69: Leaflets less than 3 mm wide, linear, not oblique
- 70 Pedicels sparsely puberulent; capsule 4-winged; leaves excluding petiole 4.5–9.5 cm long (Qld) 33. *D. tenuifolia*
- 70: Pedicels glabrous; capsule 3-winged, or rarely 4-winged; leaves excluding petiole 1.5–5.2 cm long (W.A.) 46. *D. inaequifolia*

### 1. *Dodonaea viscosa* Jacq., *Enum. Syst. Pl.* 19 (1760)

T: Jamaica, *H.Sloane*; lecto: BM, *fide* J.G. West, *Brunonia* 7: 30 (1984).

*Dodonaea ovata* Dum.-Cours., *Bot. Cult.* 2nd edn, 7: 327 (1814). T: cultivated, from Australia; *n.v.*

Dioecious or polygamo-dioecious spreading or erect shrub or tree to 8 m. Leaves simple, sessile or petiolate, linear to obovate or spatulate, rarely cuneate to angular-obovate, obtuse to acuminate, sometimes rounded and mucronate, rarely emarginate or 3-toothed, entire to irregularly sinuate or denticulate, attenuate to cuneate at base; lamina 1–15 cm long, 0.1–4 cm wide, glabrous; petiole 2.5–18 mm long. Flowers in terminal panicles; pedicels 3–9 mm long. Sepals 3 or 4, lanceolate to ovate, 1.3–3 mm long, caducous. Stamens 6–10, usually 8. Ovary pubescent or glabrous. Capsule 2–4-winged, broadly elliptic to transversely elliptic in lateral view, 8.5–28 mm long, 11–28 mm wide, glabrous; wings 3–10 mm wide, membranous or sometimes coriaceous; dehiscence septifragal. Fig. 28A–D.

Occurs throughout Australia and extends to tropical areas of Asia, America and Africa and to temperate southern Africa; also in New Zealand and widespread on Pacific islands. There are 7 subspecies.

*Dodonaea viscosa* is a polymorphic species with much leaf variability in Australian material. Most populations consist of plants typical of only one subspecies, but particularly in southern Australia, some populations contain individuals showing integration between subspecies. The typical form of the species (subsp. *viscosa*) is the most consistent morphologically, while subsp. *spatulata* is the most variable.

The leaves, fruits and wood of *Dodonaea viscosa* are used various purposes. In Australia, where it is known as Native Hops, the capsules were used by early colonists as a substitute for true hops in making yeast and beer. Grown widely for horticultural purposes in Australia; used in Africa as a hedge plant and in other countries as a sand binder and in marshland reclamation.

The synonym given above cannot be accurately applied to any one subspecies until the type has been examined.

- 1 Leaves elliptic, rarely obovate-elliptic, 2–4 cm wide, with length:width 3–4:1; capsule 2-winged or rarely 3-winged,  $\pm$ orbicular in lateral view; body of carpel (excluding wing) more than 7 mm wide **1a. subsp. viscosa**
- 1: Leaves variable, rarely elliptic, 0.1–2.5 cm wide, with length:width usually more than 4:1; capsule 3–4-winged, broadly elliptic to transversely elliptic in lateral view; body of carpel (excluding wing) less than 6 mm wide
- 2 Leaves linear, lanceolate to narrowly elliptic or rarely oblanceolate, with length:width 5–15:1, rarely to 30:1
- 3 Leaves lanceolate to narrowly elliptic, more than 1 cm wide **1b. subsp. burmannia**
- 3: Leaves linear-lanceolate, linear to narrowly oblanceolate, less than 1 cm wide
- 4 Leaves linear-lanceolate, narrowly tapered at apex and base; petiole 6.5–18 mm long **1c. subsp. angustifolia**
- 4: Leaves linear to narrowly oblong, rarely oblanceolate, not narrowly tapered at apex, sessile or petiole 1–10 mm long
- 5 Leaves 0.1–0.6 cm wide, with length:width more than 7.5:1, linear to narrowly oblanceolate, rarely oblanceolate, sessile **1d. subsp. angustissima**
- 5: Leaves 0.6–1.6 cm wide, with length:width less than 7.5:1, usually obovate to spatulate, sometimes oblanceolate, sessile or tapering to petiole 1–10 mm long **1g. subsp. spatulata**
- 2: Leaves obovate to spatulate or cuneate to angular-obovate, with length:width usually less than 6:1
- 6 Leaves cuneate to angular-obovate, or narrowly obovate; lamina 1.2–3 cm long, usually with length:width less than 3.5:1, apex truncate or obtuse, shortly apiculate or sometimes irregularly 2–3-toothed, rarely emarginate **1e. subsp. cuneata**
- 6: Leaves obovate to spatulate; lamina 2.3–7.5 cm long, usually with length:width more than 3.5:1
- 7 Leaves 1–2.5 cm wide, mucronate; petiole 3.5–20 mm long **1f. subsp. mucronata**
- 7: Leaves 0.6–1.6 cm wide, broadly acute to obtuse, sometimes shortly apiculate, sessile or petiole 1–10 mm long **1g. subsp. spatulata**

### 1a. *Dodonaea viscosa* Jacq. subsp. *viscosa*

*Dodonaea repanda* Thonn. in Schum., *Beskr. Guin. Pl.* 194 (1827); *Dodonaea viscosa* var. *vulgaris* Benth. f. *repanda* (Thonn. in Schum.) Radlk. in C.F.P. Martius, *Fl. Bras.* 13(3): 646 (1900). T: from Volta (probably R.); *n.v.*

*Dodonaea viscosa* var. *vulgaris* Benth., *Fl. Austral.* 1: 476(1863), p.p. as to *Beckler* collection. T: Hasting R., N.S.W. *H. Beckler*; syn: G.

Illustrations: H.Sloane, *Nat. Hist. Jamaica* 2: t. 162 fig. 3 (1725); R.Capuron, *Mem. Mus. Natl. Hist. Nat.*, Ser. B, Bot. 19: 25, t. 4 figs 12–16 (1969).

Dense, spreading shrub to 2 m. Leaves petiolate, elliptic, rarely obovate-elliptic, broadly acute or obtuse, sometimes with a short abrupt point, irregularly sinuate, broadly attenuate at base; lamina 7–12.5 cm long, 2–4 cm wide; petiole 2.5–6 mm long. Capsule 2-winged, or rarely 3-winged,  $\pm$ orbicular in lateral view, 15–23 mm long, 20–25 mm wide; wings 4–4.5 mm wide. Fig. 28A.

Occurs along the north-eastern Qld coast and offshore islands and S to north-eastern N.S.W. near Port Macquarie. Extends to New Guinea and tropical regions of America, Africa and Asia. Grows in coastal situations in sand, often on dunes close to the foreshore. Map 48.

Subsp. *viscosa* is the most distinctive subsp. in the species, distinguished by the orbicular capsules and larger leaves. The related species *D. polyandra* is distinguished by its larger leaves and greater number of stamens.

Qld: Weary Bay, *V.Scarth-Johnson 756A* (BRI); Bloomfield Reach, 1.6 km E of Bloomfield R., *L.S.Smith 11013* (BRI, CANB); Port Douglas Beach, *L.S.Smith & L.Pedley 10013* (BRI); S end of Ramsay Beach, Hinchbrook Is., Aug. 1970, *A.Thorsborne* (BRI). N.S.W.: near Port Macquarie, *O.D.Evans 2268* (CANB).

**1b. *Dodonaea viscosa* subsp. *burmanniana* (DC.) J.West, *Brunonia* 7: 37 (1984)**

*Dodonaea burmanniana* DC., *Mem. Soc. Phys. Genève* 1: 447 (1822); *D. viscosa* var. *vulgaris* f. *burmanniana* (DC.) Radlk. in C.F.P.Martius, *Fl. Bras.* 13(3): 646 (1900). T: Ceylon, 1815, *J.P.B.Delessert*; syn: G-DC; Bengal, 1821, *J.Leschenault*; syn: G-DC.

*Dodonaea nematoidea* Sherff, *Amer. J. Bot.* 33: 499 (1946). T: Biggenden Bluff, Biggenden, Qld, 17 May 1931, *C.T.White 7679*; holo: A *n.v.*; iso: BRI, NY *n.v.*

[*Dodonaea lanceolata* auct. non F.Muell.: G.Bentham, *Fl. Austral.* 1: 475 (1863), p.p., as to Clarence R., *Beckler*]

Illustrations: R.Capuron, *Mem. Mus. Natl. Hist. Nat.*, Ser. B, Bot. 19: 25, t. 4 fig 17 (1969).

Large shrub or small tree to 6 m. Leaves petiolate, lanceolate to narrowly elliptic, acute, entire to irregularly sinuate, attenuate at base; lamina 6.5–10 cm long, rarely to 15 cm, 1.4–2.3 cm wide; petiole 6–18 mm long. Capsule 3- or 4-winged, broadly elliptic to transversely elliptic in lateral view, 8.5–20 mm long, rarely to 28 mm, 11–22 mm wide, rarely to 28 mm; wings 3–6 mm wide, rarely to 10 mm.

Occurs on the east coast from Cairns, north-eastern Qld, to Grafton, north-eastern N.S.W. Also in tropical regions of America, Africa and Asia. In Australia grows in wet sclerophyll forest or woodland, often on rocky slopes and hills. Map 49.

Qld: Rockland Springs, 40 km WSW of Duaringa, *C.Gittins 864* (BRI, NSW); 16 km ENE of Mareeba, *R.Hoogland 8530* (A, BRI, CANB, K, L, US); 14 km N of Bowen, *P.Sharpe 58–59* (BRI). N.S.W: Glenugie Peak, 16 km SE of Grafton, *K.Thurtell & R.Coveny 3861* (NSW).

**1c. *Dodonaea viscosa* subsp. *angustifolia* (L.f.) J.West, *Brunonia* 7: 39 (1984)**

*Dodonaea angustifolia* L.f., *Suppl. Pl.* 218 (1782); *D. viscosa* var. *angustifolia* (L.f.) Benth., *Fl. Austral.* 1: 476 (1863); *D. viscosa* var. *linearis* f. *angustifolia* (L.f.) Sherff, *Amer. J. Bot.* 32:214 (1945). T: from India; lecto: LINN, Smith Hb. no. 673.3, *vide* J.G.West, *op. cit.* 30.

*Dodonaea salicifolia* DC., *Mem. Soc. Phys. Genève* 1: 447 (1822). T: cultivated in Paris from east coast of Australia, 1821, Museum de Paris; syn: G-DC; Bois de Requette, Paris; syn: G-DC.

*Dodonaea umbellata* G.Don, *Gen. Hist.* 1: 674 (1831). T: from Australia, *collector unknown*, herb. Lambert; *n.v.*

*Dodonaea kingii* G.Don, *Gen. Hist.* 1: 674 (1831). T: from Australia, *collector unknown*, herb. Lambert; *n.v.*

*Dodonaea viscosa* var. *linearis* (Harvey & Sonder) Sherff, *Amer. J. Bot.* 32: 214 (1945); *D. thunbergiana* var. *linearis* Harvey & Sonder, *Fl. Cap.* 1: 242 (1860). T: near Kochman's Kloof, at Gauritz R., *Mundt*; syn: *n.v.*; near Uitenhage and Graaf Reynet, *Ecklon & Zeyher*; syn: *n.v.*

Illustrations: R.Capuron, *Mem. Mus. Natl. Hist. Nat.*, Ser. B, Bot. 19: 25, t. 4 fig. 18 (1969).

Compact shrub to 15 m. Leaves petiolate, linear-lanceolate, acute to acuminate, entire to irregularly sinuate, narrowly attenuate at base; lamina 5.5–10 cm long, rarely to 14 cm, 0.5–1 cm wide; petiole 6.5–18 mm long. Capsule similar to subsp. *burmanniana*.

Occurs in the Darling Downs region of south-eastern Qld, on the slopes and tablelands in N.S.W. and in eastern Vic.; grows in dry sclerophyll forest or woodland, often in rocky areas. Also in the Americas, Asia and the Pacific, and from tropical to southern Africa. Map 150.

Qld: Porters Gap, *N.Michael 2979* (BRI, CANB); Amiens, c. 14 km WNW of Stanthorpe, *L.Pedley 1507* (BRI, CANB). N.S.W.: 2 km N of Central Tilba, foot of Mt Dromedary, *M.D.Crisp 2155* (AD, CBG); Warrumbungle National Park, *C.R.Dunlop 582–583* (CBG). Vic.: S side of Lake Mallacoota on Lakeside Drive, *J.G.West 838–839* (AD, CANB, NSW).

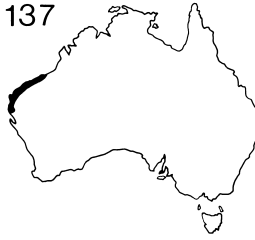
*Dodonaea umbellata* and *D. kingii* are placed here in synonymy on the basis of the descriptions given by Don.



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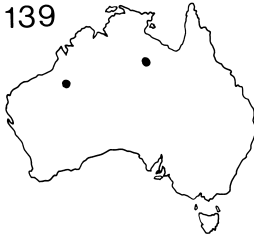
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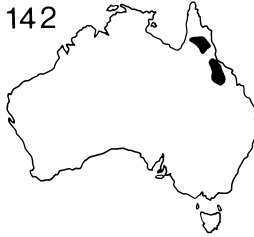
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136. *Diplopeltis intermedia*  
var. *incana*

139. *Diplopeltis stuartii*  
var. *glandulosa*

142. *Distichostemon*  
*dodecandrus*

145. *Distichostemon hispidulus*  
var. *hispidulus*

148. *Dodonaea viscosa*  
subsp. *viscosa*

137. *Diplopeltis eriocarpa*

140. *Distichostemon*  
*filamentosis*

143. *Distichostemon malvaceus*

146. *Distichostemon hispidulus*  
var. *phyllopterus*

149. *Dodonaea viscosa*  
subsp. *burmanniana*

138. *Diplopeltis stuartii*  
var. *stuartii*

141. *Distichostemon barklyanus*

144. *Distichostemon arnhemicus*

147. *Distichostemon hispidulus*  
var. *aridus*

150. *Dodonaea viscosa*  
subsp. *angustifolia*

**1d. Dodonaea viscosa** subsp. **angustissima** (DC.) J. West, *Brunonia* 7: 40 (1984)

*Dodonaea angustissima* DC., *Mem. Soc. Phys. Genève* 1: 448 (1822). T: cultivated, Williams; lecto: G-DC, *vide* J.G. West, *op. cit.* 31.

*Dodonaea attenuata* Cunn. in B. Field, *Geogr. Mem. New South Wales* 353 (1825). T: channel of Cox's R., N.S.W., A. Cunningham *s.n.*; holo: K; iso: Cox R., 1822, A. Cunningham 65; BM, CGE, W.

*Dodonaea preissiana* Miq. in Lehmann, *Pl. Preiss.* 1: 226 (1845). T: near Mt Hardy (York), W.A., 11 Sept. 1839, L. Preiss 2437; lecto: U, *vide* J.G. West, *op. cit.* 32; isolecto: G, L, MEL, P, W.

*Dodonaea denticulata* F. Muell., *Fragm.* 1: 97 (1859); *D. attenuata* var. *denticulata* (F. Muell.) Radlk., *Pflanzenr.* 98: 1378 (1933). T: Kogoneerup Valley, W.A., collector unknown; holo: MEL.

*Dodonaea attenuata* var. *linearis* Benth., *Fl. Austral.* 1: 477 (1863). T: Swan R., W.A., 1844, J. Drummond 203; lecto: K *vide* J.G. West, *op. cit.* 32; isolecto: BM, CGE, K, MEL, P, W.

*Dodonaea ptarmicaefolia* var. *subintegra* Benth., *Fl. Austral.* 1: 479 (1863); *D. attenuata* var. *subintegra* (Benth.) Radlk., *Pflanzenr.* 98: 1378 (1933). T: Swan R., W.A., 1844, J. Drummond 204; lecto: K *vide* J.G. West, *op. cit.* 32; isolecto: BM, CGE, G, K, MEL, P, W.

Illustrations: F. Turner, *Forage Pl. Australia* t. 19 (1891); L. Diels, *Bot. Jahrb. Syst.* 35: 346, fig. 42A (1904); G. M. Cunningham *et al.*, *Pl. W. New South Wales* 469 (1981); L. Costermans, *Native Trees Shrubs SE Australia* 215 (1981).

Erect shrub to 4 m. Leaves sessile, linear to narrowly oblong, sometimes oblanceolate (in arid sand dune form), acute to obtuse, sometimes obtuse, shortly apiculate, irregularly sinuate to irregularly denticulate, narrowly attenuate at base, 3–9.5 cm long, 0.1–0.6 wide; capsule similar to subsp. *burmanniana*.

Widespread in southern and central Australia from south-western W.A. extending through the Great Victoria Desert to S.A. and southern N.T., south-western and central Qld, N.S.W. and northern Vic. Grows in arid and semi-arid areas and is usually in open woodland and on sandplains, sometimes on margins of sand dune systems and on rocky outcrops. Map 151.

W.A.: 2.8 km N of Southern Cross on road to Bullfinch on edge of Lake Koorkardine, J.G. West 3365–3370 (AD, PERTH, W). N.T.: c. 13 km ENE of Mt Olga, M. Lazarides 6154 (AD, BRI, CANB, NSW). S.A.: 41 km E of Kimba on Whyalla–Kimba road, J.G. West 1896–1905 (AD, CHR, G, HO, LJU, UMO, UPA). Qld: between Yalleroi and Jericho, S.T. Blake 6793 (BRI, CANB). Vic.: 13 km W of Ouyen on road to Pinnaroo, J.G. West 1714–1717 (AD, MEL).

An unpalatable shrub that regenerates strongly in pastoral areas of western N.S.W.

Consistent morphologically in arid areas, but in higher rainfall areas intergrades with subsp. *spatulata* and occasionally with subsp. *cuneata*. Narrow-leaved forms are distinguished from sterile material of *D. stenophylla* by their broader and less rigid leaves. *D. rigida* may be distinguished by its terete or 4-ribbed leaves and axillary inflorescences.

**1e. Dodonaea viscosa** subsp. **cuneata** (Smith) J. West, *Brunonia* 7: 41 (1984).

*Dodonaea cuneata* Smith in B. Rees, *Cyclop.* 12 (1809). T: Port Jackson, N.S.W., Herb. Banks; lecto: LINN *vide* J.G. West, *op. cit.* 31; New South Wales, Gov. Phillip; syn: LINN.

*Dodonaea cuneata* Rudge, *Trans. Linn. Soc. London* 11: 296, t. 19 (1815), *nom. illeg., non* Smith (1809).

*Dodonaea cuneata* var. *coriacea* Benth., *Fl. Austral.* 1: 477 (1863). T: Murray R., F. Mueller; lecto: K, *vide* J.G. West, *op. cit.* 32.

Illustrations: E. Rudge, *loc. cit.*; G. M. Cunningham *et al.*, *Pl. W. New South Wales* 470 (1981).

Compact, spreading shrub to 3 m. Leaves sessile or shortly petiolate, cuneate to angular-ovate to narrowly obovate, truncate or obtuse, usually shortly apiculate, sometimes irregularly 2- or 3-toothed, rarely emarginate, entire to irregularly sinuate, cuneate at base; lamina 1.2–3 cm long, 0.4–0.9 cm wide, rarely to 1.2 cm; petiole when present c. 1 mm long. Capsule similar to subsp. *burmanniana*.

Occurs in south-eastern Australia; in the Murray Mallee region of S.A., in north-western Vic., on slopes and plains W of the Great Dividing Range and in the upper Hunter Valley

area of N.S.W., and in south-eastern Qld. Grows in mallee scrub in semi-arid areas and open forest in sandy loams and sometimes on rocky hillsides. Map 152.

S.A.: Mannum, 25 km N of Murray Bridge, *J.G. West 1659–1661* (AD, CANB). Qld: Blackall Range, 10 km from Mapleton towards Cooloolabin, *I.R. Telford 721–722* (CBG). N.S.W.: 6.4 km W of Matong, 25.6 km E of Narrandera on Narrandera–Coolamon road, *J.G. West 814–817* (AD, NSW). Vic.: 3 km NE of Walpeup, 25 km WSW of Ouyen, *J.G. West 1718–1719* (AD, MEL).

Can be distinguished from *D. peduncularis* by its broader, flat leaves, paniculate inflorescences and glabrous branchlets. *Dodonaea intricata* has solitary flowers and narrower, thicker leaves usually with a truncate-emarginate apex.

In eastern Vic. and on the central coast and tablelands of N.S.W. subsp. *cuneata* intergrades in leaf morphology with other subspecies, especially subsp. *spatulata*. Most Qld material has leaves with an emarginate apex. Some specimens from central western slopes of N.S.W., having intermediate morphology, may be hybrids between subsp. *cuneata* and *D. boroniifolia*.

**1f. Dodonaea viscosa subsp. mucronata** J. West, *Brunonia* 7: 42 (1984)

T: Palm Valley, 12 miles (20 km) SW of Hermannsburg Mission, 24°04'S, 132°45'E, N.T., 15 May 1955, *M. Lazarides 5302*; holotype: AD; isotype: BRI, CANB, NSW, PERTH.

[*Dodonaea viscosa* var. *spatulata* auct. non (Smith) Benth.: G. Benth., *Fl. Austral.* 1: 476 (1863), p.p.]

[*Dodonaea petiolaris* auct. non F. Muell.: F. Mueller, *Fragm.* 9: 89 (1875), p.p., as to Musgrave Range]

Erect to spreading shrub to 4 m. Leaves petiolate, usually spatulate, sometimes obovate, mucronate, entire to irregularly sinuate, broadly attenuate at base; lamina 2.5–6 cm long, 1–2.5 cm wide; petiole 3.5–20 mm long. Capsule similar to subsp. *burmanniana*.

Occurs in arid areas from Kalgoorlie to the Hamersley Range and E to the Rawlinson Range in W.A., extending to the Petermann and Macdonnell Ranges of N.T. and Musgrave and Everard Ranges of S.A., to Mt Isa area of western Qld and the plains and slopes of N.S.W. Grows on rocky hills and ranges and in associated creeks in arid areas. Map 153.

W.A.: 6.8 km N of Mt Magnet on road to Meekatharra, *J.G. West 3328–3330* (AD, PERTH). N.T.: Stanley Chasm, near Alice Springs, *R.A. Perry 5383* (AD, BRI, CANB, NSW, PERTH). S.A.: Cave Hill, Musgrave Range, *H. Eichler 17411* (AD, W). Qld: N of Mt Isa, *C. Gittins 740* (BRI, NSW). N.S.W.: Broken Hill, Sept. 1919, *A. Morris* (NSW).

On the margins of its distribution in western N.S.W. and western W.A. subsp. *mucronata* shows some intergradation with subsp. *spatulata*.

**1g. Dodonaea viscosa subsp. spatulata** (Smith) J. West, *Brunonia* 7: 43 (1984)

*Dodonaea spatulata* Sm. in B. Rees, *Cyclop.* 12 (1809); *D. viscosa* var. *spatulata* (Smith) Benth., *Fl. Austral.* 1: 476 (1863); *D. viscosa* var. *arborescens* f. *spatulata* (Smith) Sherff, *Amer. J. Bot.* 32: 214 (1945). T: Sandwich Islands, 1803, *A. Menzies*; holotype: LINN, Smith Herb. no. 673.4.

*Dodonaea asplenifolia* Rudge, *Trans. Linn. Soc. London* 11: 297, t. 20 (1815); *D. viscosa* var. *asplenifolia* (Rudge) J.D. Hook., *Fl. Tasman.* 1: 55 (1856). T: Port Jackson, N.S.W., *Hurst*; holotype: BM.

*Dodonaea oblongifolia* Link., *Enum. Pl. Hort., Berol.* 1: 381 (1821). T: cultivated in England; *n.v.*: probably destroyed, seen at B by L.A.T. Radlkofer, *Pflanzenr.* 98: 1397 (1933).

*Dodonaea conferta* G. Don, *Gen. Hist.* 1: 674 (1831). T: from Tasmania, herb. Lambert; *n.v.*

*Dodonaea asplenifolia* var. *arborescens* J.D. Hook., *J. Bot. (Hooker)* 2: 415 (1840); *D. viscosa* var. *arborescens* (J.D. Hook.) Sherff, *Amer. J. Bot.* 32: 214 (1945). T: Hobart, Tas., 27 Nov. 1840, *R.C. Gunn 377*; lecto: K *vide* J.G. West, *op. cit.* 32; isolecto: BM, CGE, NSW.

*Dodonaea cuneata* var. *rigida* Benth., *Fl. Austral.* 1: 477 (1863). T: Grampians, Vic., *F. Mueller*; lecto: K, *vide* J.G. West, *op. cit.* 32.

Illustrations: E. Rudge, *Trans. Linn. Soc. London* 11: 297, t. 20 (1815) as *D. asplenifolia*; L. Costermans, *Native Trees Shrubs Australia* 215 (1981).

Erect to spreading shrub, 1.5–4 m high. Leaves sessile or petiolate, usually obovate, sometimes spatulate, rarely elliptic, broadly acute to obtuse, sometimes obtuse or rounded, shortly apiculate, entire to irregularly sinuate or irregularly denticulate, narrowly attenuate to attenuate at base; lamina 2.3–7.5 cm long, 0.6–1.6 cm wide; petiole when present 1–10 mm long. Capsule similar to subsp. *burmanniana*. Frontispiece.

Occurs in temperate and semi-arid southern Australia, in south-eastern Qld, N.S.W., Vic. and Tas., extending to southern S.A., and with an intervening disjunct area, also in south-western W.A. Usually grows in high rainfall areas in open forest or woodlands and mallee shrublands, mostly in sandy loam. Map 154.

W.A.: 15.2 km E of Newdegate on Lake King–Newdegate road, *J.G. West 3116–3119* (AD). S.A.: 1 km W of Pillie Lake, Lincoln National Park, *J.G. West 2001–2007* (AD, CANB, CHR, HO, K, MEL). Qld: c 6 km NNW of Star Downs Stn, *L.Adams 1344* (AD, BRI, CANB, MEL, NSW). Vic.: Grampians, Mt Sturgeon, 2 km NW of Dunkeld, *J.G. West 3541–3555* (AD, BRI, CANB, K, MEL, NSW, PERTH). Tas.: Prime Seal Is., Furneaux Group, Bass Strait, *J. Whinray 774* (AD).

*Dodonaea viscosa* subsp. *spatulata* shows the greatest amount of leaf morphological variation and in certain areas, e.g. in southern and eastern N.S.W. and south-eastern S.A., intergrades with subsp. *angustissima* and subsp. *cuneata*. Subsp. *mucronata* also intergrades with subsp. *spatulata* in western N.S.W. and western W.A. Populations from the Grampians in Vic. show some distinction in leaf shape from most plants of this subspecies. They have obovate, slightly thicker, broader and more rigid leaves with irregularly denticulate margins.

Subsp. *spatulata* regenerates strongly after disturbances such as grazing, drought and fire.

## 2. *Dodonaea polyandra* Merr. & Perry, *J. Arnold Arbor.* 21: 525 (1940)

T: Western Division, Tarara, Wassi Kussa R., New Guinea, Dec. 1936, *L.J. Brass 8379*; holotype: A n.v.; iso: BRI.

*Dodonaea viscosa* var. *laurina* Britten, *Ill. Bot. Cook's Voy.* 1: 16, t. 42 (1900); *Dodonaea viscosa* var. *vulgaris* f. *burmanniana* subf. *laurina* (Britten) Radlk., *Pflanzenr.* 98: 1369 (1933). T: Lookout Point ('Cape Grafton'), Qld, 1770, *J. Banks & D. Solander*; lecto: BM *vide* D.J. McGillivray, *Telopea* 1: 67 (1975); isolecto: MEL.

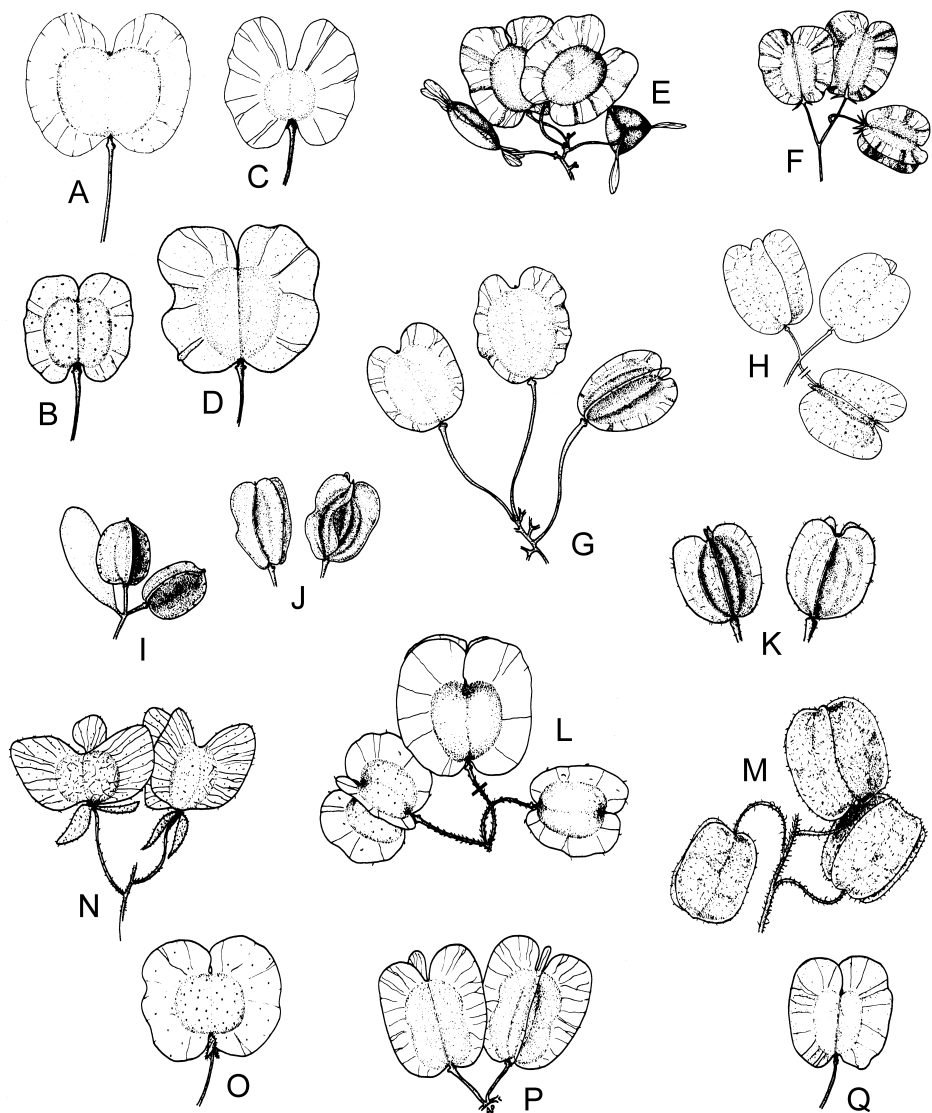
[*Dodonaea viscosa* var. *vulgaris* auct. non Benth.: G. Benth., *Fl. Austral.* 1: 476 (1863), p.p.]

Dioecious erect shrub or tree to 8 m. Leaves simple, elliptic, rarely obovate, obtuse, entire, attenuate at base; lamina 5.5–10.5 cm long, 1.6–4.2 cm wide, glabrous; petiole 3–10 mm long. Flowers in terminal panicles; pedicels 4.5–14 mm long. Sepals 4, rarely 5, linear-oblong, 2.5–3 mm long, caducous. Stamens 11–14. Ovary glabrous. Capsule 2-winged, rarely 3-winged, broadly oblong to suborbicular in lateral view, 16–28 mm long, 15–30 mm wide, glabrous; wings 6–9 mm wide, rarely as narrow as 4 mm, membranous; dehiscence septifragal. Fig. 28E.

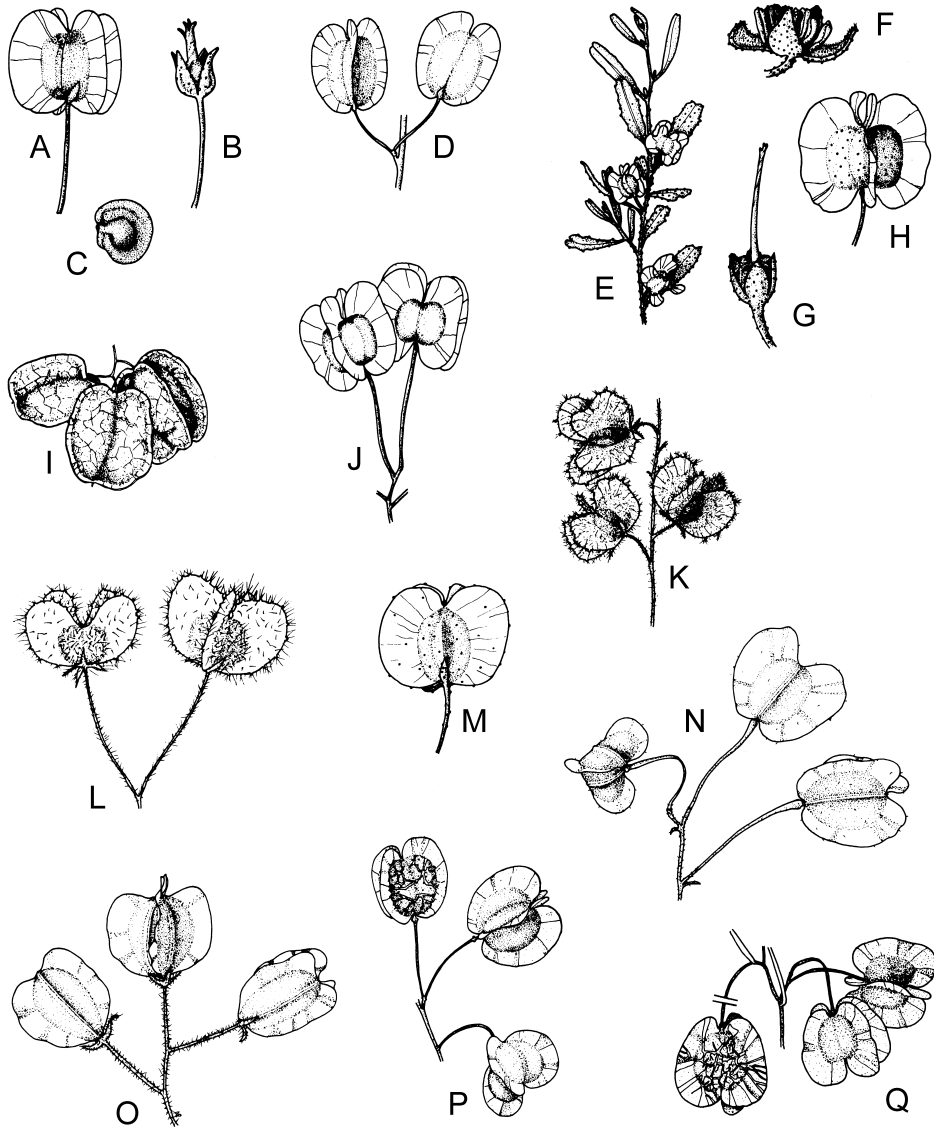
Occurs in the north and east of Cape York Peninsula, Qld, and on the off-shore islands. Also in the Western District of New Guinea. On fringes of rainforest or in open eucalypt or *Callitris* woodland, usually in sandy or gravelly soil and often near a river or creek. Map 155.

Qld: Lockerbie, 16 km WSW of Somerset, *L.J. Brass 18410* (BRI, CANB); 16 km N of Hope Vale Mission, 24 km NW of Cooktown, *C. Gittins 2188* (BRI, NSW); Browns Ck, Kennedy road, *P. Hind 266* (NSW); near McIvor area, *L.S. Smith 11158* (BRI); Lankelly Ck, *G. Stocker 825* (BRI).

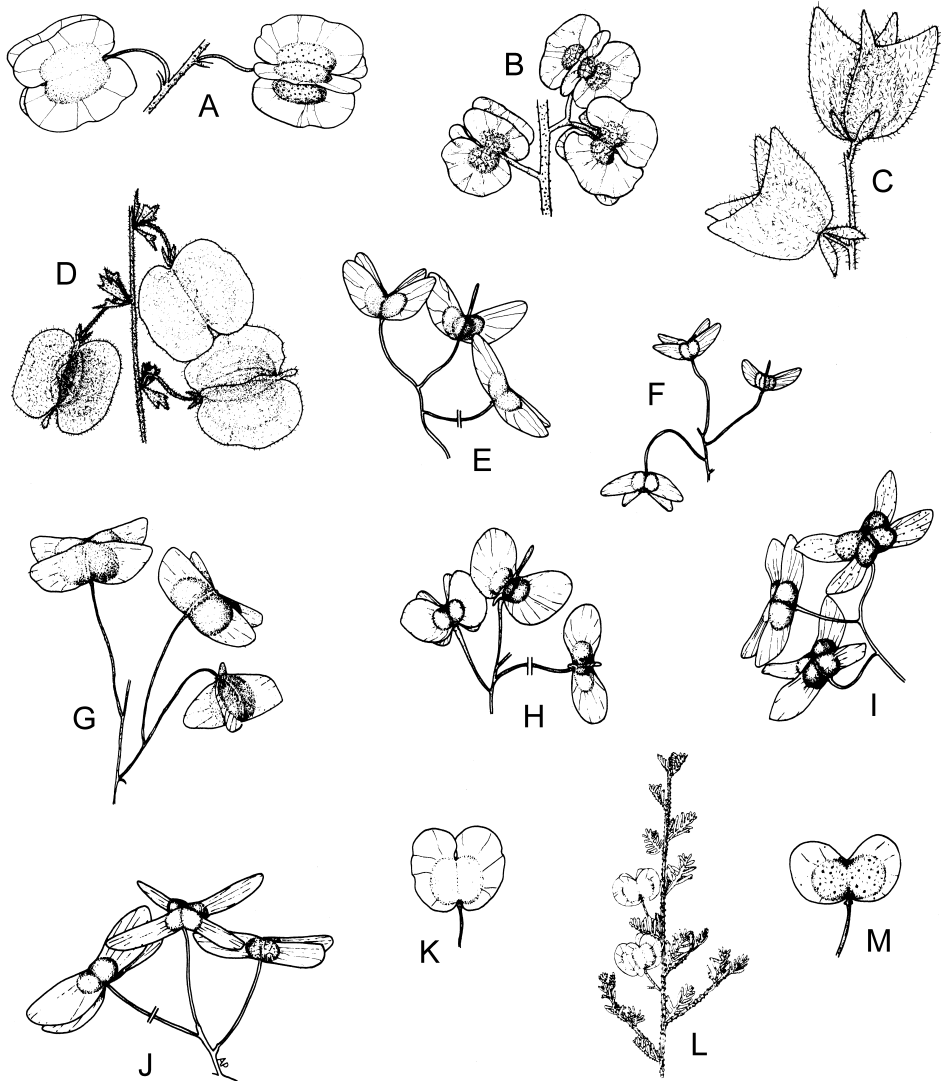
*Dodonaea polyandra* has been confused with *D. viscosa* but can be distinguished on a number of characters including its larger, elliptic, discolorous leaves and greater number of stamens.



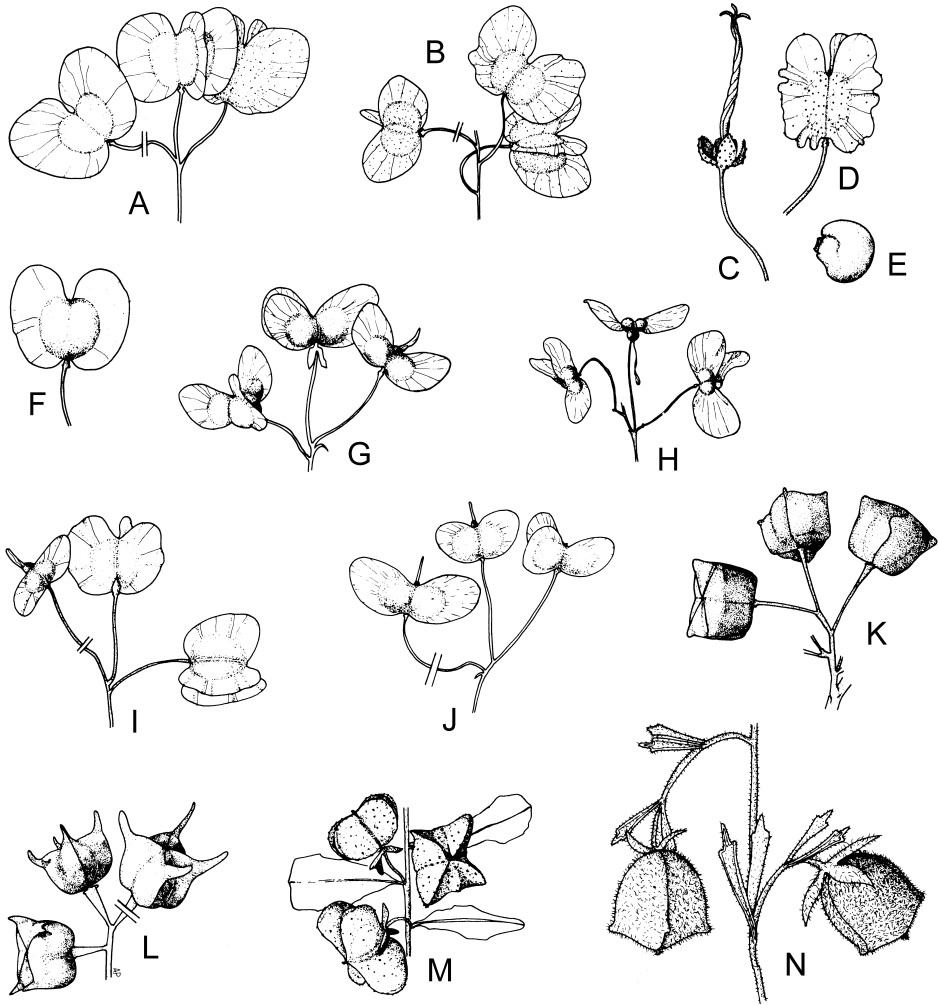
**Figure 28.** *Dodonaea* capsules. **A–D**, *D. viscosa*. **A**, *D. viscosa* subsp. *viscosa*  $\times 1$  (R.Pullen 1419, CANB); **B–D**, variation found in other subspecies  $\times 1$  (**B–D**, J.West 1224, 3475, 3554). **E**, *D. polyandra*  $\times 0.8$  (C.Gittins 2188, BRI, NSW). **F**, *D. lanceolata*  $\times 0.8$  (A.Beaglehole 44919, NT). **G**, *D. triquetra*  $\times 1$  (L.Johnson, NSW 140882). **H**, *D. amblyophylla*  $\times 1.1$  (J.West 3378, BRI; R.Royce 10203, PERTH). **I**, *D. bursariifolia*  $\times 1$  (J.West 3363, AD). **J**, *D. procumbens*  $\times 1$  (J.West 3556, AD, MEL). **K**, *D. camfieldii*  $\times 1$  (J.Boorman, NSW 140465). **L**, *D. boroniifolia*  $\times 1$  (J.Boorman, NSW 141204; Buckley, NSW 141164). **M**, *D. physocarpa*  $\times 0.8$  (M.Andrew 552, AD). **N**, *D. polyzyga*  $\times 1$  (A.Beaglehole 53316, PERTH). **O**, *D. coriacea*  $\times 1$  (A.George 14638, PERTH). **P**, *D. serratifolia*  $\times 1.1$  (R.Paine, NSW 121560). **Q**, *D. filifolia*  $\times 1.3$  (N.Speck 1927, CANB, AD, BRI). Reproduced by permission from *Brunonia* 7(1) (1984).



**Figure 29.** *Dodonaea* capsules etc. **A–C**, *D. falcata*. **A**,  $\times 1.3$  (D.Gordon 50, BRI); **B**, female flower  $\times 3$  (C.Gittins 2818); **C**, seed  $\times 3$  (D.Gordon 50, BRI). **D**, *D. peduncularis*  $\times 1.1$  (L.Johnson & E.Constable, NSW 30375). **E–H**, *D. intricata*. **E**, fruiting branchlet  $\times 0.6$  (J.West 2155, AD, CANB). **F**, male flower  $\times 3$  (P.Wilson 512, AD). **G**, female flower  $\times 3$  (K.Rohrlach 253, AD). **H**,  $\times 1.4$  (J.West 2155, AD, CANB). **I**, *D. petiolaris*  $\times 0.5$  (J.West 3332, AD). **J**, *D. sinuolata*  $\times 1$  (W.Trappnell & K.Williams 272, BRI). **K**, *D. rupicola*  $\times 1$  (P.Sharpe & S.Everist 1066, BRI). **L**, *D. vestita*  $\times 1$  (S.Everist 8055, BRI, NSW). **M**, *D. uncinata*  $\times 1$  (K.Williams 55, BRI). **N**, *D. multijuga*  $\times 1$  (J.Fletcher, NSW 140560). **O**, *D. pinnata*  $\times 0.7$  (M.Blakely, NSW 140588). **P**, *D. concinna*  $\times 1.1$  (R.Chinnock 4382, AD). **Q**, *D. stenozyga*  $\times 1$  (J.West 926, AD; R.Chinnock 3351, AD). Reproduced by permission from *Brunonia* 7(1) (1984).

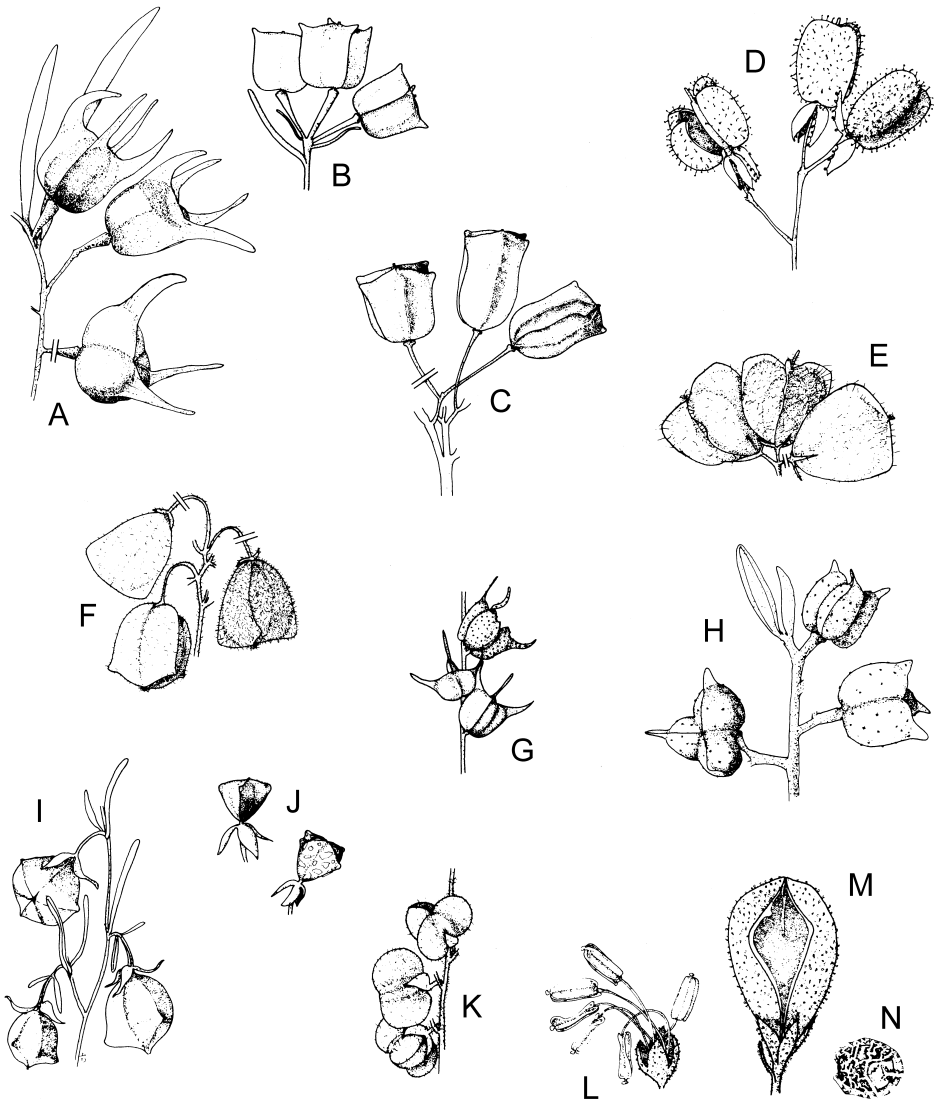


**Figure 30.** *Dodonaea* capsules etc. **A**, *D. microzyga* var. *microzyga*  $\times 1.3$  (J.West 1792, AD). **B**, *D. adenophora*  $\times 1.8$  (J.West 3358, AD, NSW). **C**, *D. oxyptera*  $\times 2$  (N.Byrnes 2531, NT, CANB). **D**, *D. hirsuta*  $\times 1$  (R.Rupp, NSW 108360). **E**, *D. platyptera*  $\times 0.8$  (A.Beaglehole 54600, NT; R.Specht 14, AD, MEL). **F**, *D. stenophylla*  $\times 0.5$  (C.Gittins 310, BRI). **G**, *D. tenuifolia*  $\times 1$  (C.Gittins 2747, BRI, NSW). **H**, *D. rhombifolia*  $\times 0.8$  (R.Coveny, NSW 140483; D.Pearson, NSW 140489). **I**, *D. truncatiales*  $\times 0.7$  (J.Boorman, NSW 140499). **J**, *D. heteromorpha*  $\times 0.6$  (J.Boorman, NSW 140521, H.Salasoo 5193, NSW). **K**, *D. filiformis*  $\times 1.1$  (R.Gunn, NSW 141143). **L–M**, *D. subglandulifera* **L**, fruiting branchlet  $\times 0.6$  (J.West 1620, AD); **M**,  $\times 1.1$  (E.Boehm, AD 96222231). Reproduced by permission from *Brunonia* 7(1) (1984).



**Figure 31.** *Dodonaea* capsules etc. **A**, *D. lobulata* ×1 (J.West 3441, 3396, AD). **B**, *D. ptarmicaefolia* ×1 (J.West 2986, 2993, AD). **C–E**, *D. rigida*. **C**, female flower ×3 (R.Carolin 5810, NSW); **D**, ×1.2; **E**, seed ×3 (J.West 3446, PERTH). **F**, *D. hackettiana* ×1.2 (J.West 3268, AD). **G**, *D. pachyneura* ×1 (A.Beaglehole 48565, AD). **H**, *D. megazyga* ×0.8 (J.Boorman, NSW 108380). **I**, *D. larreoides* ×1 (J.West 3215, AD, CANB; C.Gardner 2638, PERTH). **J**, *D. inaequifolia* ×1 (J.West 3185, AD, CANB; J.Beard 6773, PERTH). **K**, *D. aptera* ×1.3 (J.West 3248, CANB, PERTH). **L**, *D. ceratocarpa* ×1.5 (J.West 3238, AD, PERTH; & 3030, CANB). **M**, *D. baueri* ×1.6 (B.Blaylock 1566, AD). **N**, *D. ericoides* ×2 (J.West 3304, AD, PERTH). Reproduced by permission from *Brunonia* 7(1) (1984).





**Figure 32.** *Dodonaea* capsules etc. **A–B**, *D. pinifolia*. **A**,  $\times 2$  (J.West 3326, CANB); **B**,  $\times 1.9$  (J.West 3227, AD). **C**, *D. humifusa*  $\times 2$  (J.West 3061, AD; R.Chinnock 4373, AD). **D**, *D. humilis*  $\times 2$  (J.West 1559, AD). **E**, *D. trifida*  $\times 1.5$  (J.West 3046, AD). **F**, *D. triangularis*  $\times 1.8$  (C.Burgess, CBG 22950; M.Crisp 2264 & I.Telford, AD, CBG). **G**, *D. caespitosa*  $\times 2$  (J.West 3120, AD). **H**, *D. divaricata*  $\times 2$  (J.West 3220, AD, PERTH). **I**, *D. hexandra*  $\times 2$  (J.West 2289, AD). **J**, *D. tepperi*  $\times 1.7$  (J.West 1342, AD). **K**, *D. macrossanii*  $\times 2.5$  (S.Everist 3506, BRI). **L–N**, *D. glandulosa*. **L**, male flower  $\times 3$  (J.West 3147, AD, CANB); **M**,  $\times 3.5$  (J.West 3154, AD, CANB, PERTH); **N**, seed  $\times 3$  (J.West 3154, AD, CANB, PERTH). Reproduced by permission from *Brunonia* 7(1) (1984).

**3. Dodonaea lanceolata** F.Muell., *Fragm.* 1: 73 (1859)

T: Victoria River, N.T., Dec. 1855, *F.Mueller*; lecto: MEL *fide* J.G.West, *Brunonia* 7: 48 (1984); isolecto: K.

Polygamo-dioecious or polygamous erect shrub, 1–3 m high. Leaves simple, subsessile or petiolate, elliptic, sometimes lanceolate or oblong to oblanceolate, acuminate, acute or obtuse, entire or obscurely sinuate; lamina 3–10.5 cm long, 1–3 cm wide, glabrous; base attenuate and tapering into petiole or cuneate and subsessile; petiole when present 4.5–15 mm long, rarely to 28.5 mm. Flowers in terminal panicles; pedicels 5.5–12 mm long. Sepals 4, lanceolate to ovate, 1.4–2.5 mm long, persistent. Stamens usually 8, rarely 7 or to 10. Ovary glabrous. Capsule 3-winged, broadly oblong or obovate in lateral view, 13–19 mm long, 14–19 mm wide, glabrous; wings 4.5–5.5 mm wide, membranous; dehiscence septifragal. Fig. 28F.

Occurs in northern and central Australia, in the Hamersley Range and Kimberley in W.A. and widespread in N.T. and Qld. There are 2 varieties.

Leaves with petiole 4.5–15 mm long, rarely to 28.5 mm; lamina elliptic, acuminate, attenuate at base

**3a. var. lanceolata**

Leaves subsessile or rarely with petiole 1–2 mm long; lamina oblong to oblanceolate, acute or obtuse, cuneate at base

**3b. var. subsessilifolia**

**3a. Dodonaea lanceolata** F.Muell. var. **lanceolata**

Leaves elliptic, tapering to apex and base, acuminate, attenuate at base; lateral venation conspicuous; petiole 4.5–15 mm long, rarely to 28.5 mm.

Occurs in the Hamersley Range and Kimberley in W.A., widespread in N.T. and extends into western Qld. Grows on stony ridges and hills, in rocky watercourses and associated margins, often in low open woodland and hummock grassland. Map 156.

W.A.: 6.5 km W of King R., Kimberley *G.W.Carr 3362* & *A.C.Beauglehole 47140* (AD); Hamersley Range, Marandoo Mine Site, first ridge S of Mt Bruce, *M.E.Trudgen 1093* (PERTH). N.T.: base of Mt Gillen, Alice Springs, *N.T.Burbidge & M.Gray 4359* (CANB); 10 km NNE of Tennant Creek township, *J.G.West 4282–4287* (CANB, NT, AD). Qld: 12 km NE of Mt Isa on road to Lake Moondarra, *J.G.West 4295–4298* (CANB, BRI).

**3b. Dodonaea lanceolata** var. **subsessilifolia** J.G.West, *Brunonia* 7: 50 (1984)

T: Glen Geddes, Rockhampton–Marlborough road, 23°04'S, 150°17'E, Qld, 10 Oct. 1974, *K.A.W.Williams 2*; holotype: BRI.

Leaves oblong to oblanceolate, acute or obtuse, cuneate at base, subsessile, rarely with petiole of 1–2 mm long; lateral venation often obscure, especially on narrow leaves.

Occurs in eastern Qld from Cape York Peninsula to the Warrego district; mostly in open eucalypt forest, on stony hills or ranges. Map 157.

Qld: Herberton to Watsonville road, *A.W.Dockrill 347* (BRI); Corinda, c. 136 km N of Aramac, *S.L.Everist 3862* (BRI); Isla Gorge, 29 km SW of Theodore, *S.L.Everist 8092* (BRI); Stannary Hills, *C.Gittins 535* (BRI); 44 km W of Marlborough on Hwy 1, *J.G.West 4356–4359* (CANB, BRI).

**4. Dodonaea triquetra** Wendl., *Bot. Beobacht.* 44 (1798)

T: From Australia, *collector unknown*; lecto: B, photo seen, *fide* J.G.West, *Brunonia* 7: 51 (1984).

*Dodonaea dioica* DC., *Mem. Soc. Phys. Genève* 1:445 (1822). T: locality unknown, 1861, *A.Lambert*; relevant collection (G-DC).

*Dodonaea laurina* Sieber ex A.Sprengel in Sprengel, *Syst. Veg.* 16th edn, 4: *Curae Posteriores* 152 (1827). T: New South Wales, 1825, *F.W.Sieber 272*; syn: BM, FI, G, K, MEL, P, W.

*Dodonaea laurifolia* Sieber ex Loudon, *Hort. Brit.* 154 (1830). T: cultivated from Australia; *n.v.*

*Dodonaea longipes* G.Don, *Gen. Hist.* 1: 674 (1831). T: from Australia, herbarium of *G.Lambert*; *n.v.*

Illustrations: L.Costermans, *Native Trees Shrubs S.E. Australia* 214 (1981); E.R.Rotherham *et al.*, *Fl. Pl. New South Wales & S. Queensland* 56 (1975).

Dioecious or rarely polygamo-dioecious erect shrub to 3 m. Leaves simple, elliptic, sometimes lanceolate or ovate, acuminate to acute, entire or sinuate, narrowly cuneate to attenuate at base; lamina 4.5–12 cm long, 1–4.7 cm wide, glabrous; petiole 2–7 mm long. Flowers in terminal panicles; pedicels 4.3–8.5 mm long, rarely to 15 mm. Sepals 4, rarely 5, broadly triangular, 0.6–1 mm long, caducous. Stamens 8, rarely 10. Ovary glabrous. Capsule 3-winged, broadly obovate or broadly oblong in lateral view, 9.5–16 mm long, 10–15 mm wide, glabrous; wings 2–5 mm wide, membranous; dehiscence septifragal.

Occurs along the east coast of Australia from Bundaberg, south-eastern Qld, along the N.S.W. coast into eastern Vic. as far as Orbost. Grows in dry and wet sclerophyll forest usually in sand or sandstone. Map 158.

Qld: 2 km N of Coolool Beach, 130 km N of Brisbane, *P.R.Sharpe 1974* (BRI); Ungowa, Fraser Is., *D.A.Smith 119* (BRI) N.S.W.: Berowra Ck, near Crosslands junction of Calna Ck and Berowra Ck, *S.W.L.Jacobs 704* (NSW); 1.6 km S of Merimbula on Princes Hwy, *J.G.West 828–835* (AD, CANB, K). Vic.: 1.6 km E of Cabbage Tree Creek on Princes Hwy, *J.G.West 842–843* (AD).

### 5. *Dodonea amblyophylla* Diels, *Bot. Jahrb. Syst.* 35: 345, fig. 42C–E (1904)

T: Menzies, W.A., *L.Diels 5816*; lecto: PERTH *fide* J.G.West, *Brunonia* 7: 53 (1984).

Illustration: L.Radlkofer, *Pflanzenr.* 98: 1362, fig. 43C–E (1933).

Dioecious or rarely polygamo-dioecious erect shrub to 2 m. Leaves simple, sessile, linear to oblong or oblanceolate, acute or obtuse, rarely mucronate, entire, attenuate at base, 2.2–4.5 cm long, 0.4–1 cm wide, glabrous. Flowers in 4–6-flowered cymes, terminal or axillary; pedicels 4–7.5 mm long. Sepals 4, linear to lanceolate, 1.6–2 mm long, caducous. Stamens 8, rarely as few as 6. Ovary glabrous. Capsule 3-winged, rarely 4-winged, broadly oblong or obovate in lateral view, 7.5–12 mm long, 8–17 mm wide, glabrous; wings 1–4 mm wide, membranous; dehiscence septifragal. Fig. 28H.

Occurs in south-western W.A. mainly in the goldfields areas from Menzies to Lake King but extending to the western edge of the Great Australian Bight at Madura. Grows in semi-arid to arid mallee scrub communities, usually in sand in sandplain country. Map 159.

W.A.: 3.2 km beyond W edge of Lake King, *R.J.Chimnock 4149* (AD); Lake Magenta Fauna Reserve, *K.F.Kennedally 1263* (PERTH); c. 13 km N of Cundelee, N of Zanthus, *R.D.Royce 5512* (PERTH); 20 km S of Madura, *J.G.West 2687–2691* (AD, CANB, PERTH); 2.7 km E of Boorabbin, *J.G.West 3378–3383* (AD, BRI, PERTH).

*Dodonea amblyophylla* resembles *D. bursariifolia* and can be confused with it. Capsules of *D. bursariifolia* dihisce septicidally and the wings, if present, are less than 1 mm wide and usually at the apex only.

### 6. *Dodonea bursariifolia* F.Muell., *Trans. Phil. Soc. Victoria* 1: 8 (1855)

T: Murray scrub towards Wellington, S.A., Apr. 1849, *F.Mueller*; lecto: MEL *fide* J.G.West, *Brunonia* 7: 55 (1984).

*Dodonea bursariifolia* var. *major* Benth., *Fl. Austral.* 1: 482 (1863). T: Sharks Bay and Dirk Hartog Is., W.A., *I.Milne*; holo: K; iso: K.

Illustration: G.M.Cunningham *et al.*, *Pl. W. New South Wales* 470 (1981).

Dioecious or rarely polygamo-dioecious spreading shrub to 1.5 m. Leaves simple, sessile, obovate, sometimes oblanceolate or oblong, obtuse or rounded, entire, cuneate at base, 0.8–3.5 cm long, 0.3–1.5 cm wide, glabrous. Flowers paired or 3 together, rarely in a few-flowered terminal cyme; pedicels 1.5–2.6 mm long. Sepals 5, rarely 4, linear or linear-lanceolate, 1.4–3 mm long, caducous. Stamens 8, rarely as few as 5. Ovary glabrous. Capsule 3-, rarely 4-angled, oblong or obovate in lateral view, 6.5–8.5 mm long, 5–8.5 mm wide, glabrous; wings 0.5–1 mwide, sometimes above the middle of capsule only, coriaceous; dehiscence septicidal. Fig. 28 I.

Occurs in south-western W.A., southern S.A., north-western Vic. and south-western N.S.W.; in semi-arid mallee scrub communities, in sandy loam soils. Map 160.

W.A.: 16 km S of Cunderdin, *G.Keighery 176* (PERTH); Jilbadgie Rock, 36.8 km S of Southern Cross, *J.G.West 1120–1124* (AD, CANB, PERTH). S.A.: Eyre Peninsula, 32 km SW of Kimba, *K.D.Rohrlach 558* (AD); 37 km S of Lameroo, *J.G.West 2373–2382* (AD, BRI, CANB, K, MEL). Vic.: 20 km SE of Ouyen, *J.G.West 1711–1713* (AD, CBG, MEL).

### 7. *Dodonaea procumbens* F.Muell., *Trans. Phil. Soc. Victoria* 1: 8 (1855)

T: foot of Mt Sturgeon, Vic., Nov. 1853, *F.Mueller*; lecto: MEL *vide* J.G.West, *Brunonia* 7: 57 (1984); isolecto: MEL, NSW.

Dioecious or rarely polygamo-dioecious prostrate shrub to 1.5 m diam. Leaves simple, sessile, angular-obovate to oblanceolate, acute, rarely acuminate, sometimes tridentate, revolute and usually with 1–4 irregular teeth to 2.5 mm long and mostly above middle of leaf, sometimes entire, attenuate at base, 0.8–3 cm long, 0.4–0.85 cm wide, sparsely puberulent or rarely glabrous. Flowers solitary or paired; pedicels 3.5–7.5 mm long. Sepals 4 or 5, rarely to 7, linear-lanceolate, often unequal in size, 2–3 mm long, caducous. Stamens 8–10. Ovary glabrous. Capsule 4-winged, rarely 3-winged, broadly oblong in lateral with undulate valves, 11–13 mm long, 8–10.5 mm wide, glabrous; wings 0.5 mm wide, crustaceous; dehiscence septifragal. Fig. 28J.

Occurs near Burra in the Mt Lofty Range, S.A., near Dergholm and in the Grampians in south-western Vic. and in south-eastern N.S.W. in the Cooma district. Grows in open eucalypt woodland in flat, low-lying areas. Map 161.

S.A.: 29 km SSW of Burra, *J.G.West 3601–3605* (AD, CANB, MEL). N.S.W.: Michelago, *H.S.McKee 7564–7565* (CANB, NSW). Vic.: c. 6 km ENE of Dergholm P.O., *A.C.Beauglehole 38017* (MEL); 16 km SW of Stawell, *T.B.Muir 4473–4474* (MEL); Victoria Valley Hall, Grampians, *J.G.West 3556–3560* (AD, CANB, MEL, NSW, L).

Putative hybrids with features intermediate between *D. procumbens* and *D. viscosa* have been found in two populations, one in S.A., the other in south-western Vic.

### 8. *Dodonaea camfieldii* Maiden & Betche, *Proc. Linn. Soc. New South Wales* 22: 150 (1897)

T: Waterfall Creek, Nowra, N.S.W., Nov. 1888, *W.Baerlerlen*; lecto: NSW *vide* J.G.West, *Brunonia* 7: 59 (1984).

Dioecious or rarely polygamo-dioecious spreading, often prostrate shrub, 0.2–1 m high. Leaves simple, sessile, linear to oblong, acute, 1–3.5 cm long, 0.2–0.8 cm wide, glabrous or sparsely pubescent on midrib only; margin revolute, undulate, entire or sometimes irregularly dentate with teeth to 5 mm long; base decurrent, the margin & midrib extending into wings on stem. Flowers solitary or paired; pedicels 2–4 mm long. Sepals 4, rarely 5, oblong to ovate, 2–3 mm long, caducous. Stamens 8, rarely to 10. Ovary pubescent. Capsule 4-winged, broadly oblong in lateral view, 10–15.5 mm long, 9–12 mm wide, rarely to 16 mm, glabrous or sparsely pubescent; wings 1–3 mm wide, coriaceous; dehiscence septifragal. Fig. 28K.

Occurs on the central and south coast of N.S.W. from the Hawkesbury R. to Jervis Bay, mainly on Hawkesbury sandstone, usually in dry sclerophyll forest or woodland. Map 162.

N.S.W.: Wondabyne, Hawkesbury R., Oct. 1922, *W.F.Blakely & D.W.C.Shireess* (NSW); near Como, Oct. 1897, *J.H.Camfield* (NSW); Kangaroo Ck, near Waterfall, Royal National Park, Oct. 1966, *R.Coveny* (NSW); between Currajong and Drum and Drumsticks, Jervis Bay, *F.A.Rodway 1465* (NSW); 30 km SW of Nowra on Nowra–Braidwood road, *J.G.West 2571–2578* (AD, MEL, NSW).

**9. *Dodonea boroniifolia* G. Don, *Gen. Hist.* 1: 674 (1831)**

T: interior of New South Wales, 1825, *A. Cunningham*; lecto: G *fide* J.G. West, *Brunonia* 7: 60 (1984); isolecto: G, BM, CGE, W.

*Dodonea caleyana* G. Don, *Gen. Hist.* 1: 674 (1831). T: from Australia, herbarium of G. Lambert; *n.v.*

*Dodonea hirtella* Miq., *Linnaea* 18: 94 (1844). T: New South Wales, *A. Cunningham*; lecto: U *fide* J.G. West, *op. cit.* 60; isolecto: CGE.

Illustration: G.M. Cunningham *et al.*, *Pl. Western New South Wales* 470 (1981).

Dioecious or rarely polygamo-dioecious spreading or erect shrub to 2 m. Leaves imparipinnate, 0.6–2.8 cm long excluding petiole; lateral leaflets 6–14, narrowly angular-obovate to obovate, rarely oblong, entire, revolute or recurved, cuneate at base, 2.5–6.5 mm long, rarely to 9 mm, 1.5–4.5 mm wide, glabrous to pubescent; apex 3–6-toothed or -lobed, the teeth broadly acute to obtuse, the central one often recurved; petiole 1–8 mm long. Flowers paired or 3 together; pedicels 4–8 mm long. Sepals 4, lanceolate to ovate, 2–4 mm long, caducous. Stamens 8. Ovary densely pilose. Capsule 4-winged, broadly elliptic in lateral view, 10–20 mm long, 12–18 mm wide, glabrous or sometimes pubescent; wings 2.5–5 mm wide, membranous; dehiscence septifragal. Fig. 28L.

Occurs in eastern Australia from Charters Towers in north-eastern Qld, through central and eastern N.S.W. to western Vic. Grows in various habitats; in dry sclerophyll forest dominated by *Eucalyptus rossii* on sandstone, in open *Eucalyptus–Acacia* woodland and in heath communities. Map 163.

Qld: 10 km W of Mt Playfair Stn, *L.G. Adams 1350* (CANB, BRI, K, L, MEL, NSW, US); 39 km E of Cunnamulla on road to Bollon, *R. Purdie & D. Boyland 284* (BRI). N.S.W.: Mt Kaputar National Park, 48 km E of Narrabri, *R. Coveny 2309* (AD, BRI, NSW); Cocopara National Park, 30 km NE of Griffith, *J.G. West 4065* (CANB, NSW). Vic.: Beechworth Gorge, Oct. 1967, *E.M. Canning* (CBG).

A variable species throughout its distribution particularly in leaf and leaflet size and indumentum density.

In certain parts of eastern Australia *D. boroniifolia* and *D. viscosa* are sympatric. Some specimens from the central western slopes of N.S.W. show intermediate morphology and are possibly hybrids between *D. boroniifolia* and *D. viscosa*, (perhaps subsp. *cuneata*).

**10. *Dodonea physocarpa* F. Muell., *Hooker's J. Bot. Kew Gard. Misc.* 9: 197 (1857)**

T: Victoria River, N.T., Dec. 1855, *F. Mueller*; lecto: MEL *fide* J.G. West, *Brunonia* 7: 62 (1984); isolecto: MEL, K.

Illustration: K. Domin, *Biblioth. Bot.* 89: 359 (1927).

Dioecious or rarely polygamo-dioecious spreading shrub to 2 m. Leaves paripinnate, 1.3–3 cm long excluding petiole, terminated by a small tooth or lobe; leaflets usually 6–10, rarely 12, oblong to obovate, cuneate at base, 9–12 mm long, rarely to 20 mm, 2–5 mm wide, adpressed-pubescent; acute or mucronate, often 2- or 3-toothed at apex; margin entire or slightly sinuate, recurved; petiole 4–14 mm long. Flowers usually in axillary few-flowered cymes, sometimes solitary; pedicels 8–13 mm long. Sepals 4–6, lanceolate to ovate, 2–3.6 mm long, caducous. Stamens 10–12. Ovary pubescent. Capsule 5- or 6-winged, ellipsoidal, greatly inflated, 18–26 mm long, 17–25 mm wide, sparsely pubescent or glabrous; wings 1–2.5 mm wide, membranous; not readily dehiscent. Fig. 28M.

Occurs in northern Australia from the Kimberley, W.A., to the north-eastern Qld coast. Grows in low open woodlands in skeletal lateritic soils. Map 164.

W.A.: 5.5 km W of King R., *M. Andrew 552* (AD); near Thompson Spring, 2 km S of Duncan Hwy, 3 km W of NT-WA border, *J.G. West 4708* (CANB, PERTH). N.T.: S of Daly Waters, *J. Must 428* (CANB, MEL, NT); 131 km E of Top Springs Homestead, *J.G. West 4692* (CANB, DNA). Qld: 31 km from Corinda towards Westmoreland, *B.K. Simon & T. Farrell 3106* (BRI).

**11. Dodonaea polyzyga** F.Muell., *Hooker's J. Bot. Kew Gard. Misc.* 9: 197 (1857)

T: upper Victoria River, N.T., Jan. 1856, *F.Mueller*; holotype: MEL; isotype: K.

Andromonoecious or gynomonoecious erect shrub to 3 m. Leaves imparipinnate, 7.4–15 cm long excluding petiole; lateral leaflets 28–46, oblong to oblong-lanceolate, acute, acuminate or mucronate, entire, cuneate and oblique at base, 10.5–21.5 mm long, 3–6 mm wide, sparsely pubescent; terminal leaflet narrowly elliptic or lanceolate, 9–15 mm long, rarely to 23 mm, 2–4 mm wide, otherwise similar to laterals; petiole 12–21 mm long. Flowers in terminal panicles; pedicels 7–11 mm long. Sepals 4–6, ovate, 3.3–6 mm long, persistent. Stamens 10–12, rarely to 16. Ovary sparsely pubescent. Capsule 3-winged, transversely obovate in lateral view, 12–17 mm long, 21–27 mm wide, sparsely pubescent; wings 7–10 mm wide, membranous; dehiscence septifragal. Fig. 28N.

Restricted to Victoria River area, N.T., and the Kimberley, W.A. Grows in skeletal soils on rocky slopes, often with *Eucalyptus brevifolia* F.Muell. Map 165.

W.A.: Geikie Gorge, *E.N.S. Jackson 1001* (AD); 20 km SW of Lamboo Stn, *M.Lazarides 6308* (AD, CANB, NSW); 47 km SE of Halls Creek, *J.G. West 4732–4734* (CANB, PERTH). N.T.: Limbunya, *C.Dunlop 3527* (CANB, NSW, NT, PERTH); c. 11 km S of Victoria Downs Stn, *R.A. Perry 2139* (BRI, CANB).

**12. Dodonaea coriacea** (Ewart & Davies) McGillivray, *Telopea* 1: 66 (1975)

*Dodonaea peduncularis* var. *coriacea* Ewart & Davies, *Fl. N. Territory* 175 (1917). T: 70 miles (112 km) N of Camp IV, N.T. Survey, N.T., 28 June 1911, *G.F. Hill 390*; holotype: MEL.

Andromonoecious or gynomonoecious spreading shrub to 1.5 m high. Leaves simple, sessile, oblanceolate to obovate, entire or unevenly serrate, attenuate at base, 1.4–3 cm long, 0.5–0.9 cm wide, sparsely pubescent or glabrous, truncate or irregularly dentate at apex. Flowers in terminal panicles; pedicels 6.5–11.5 mm long. Sepals 4 or 5, lanceolate to ovate, 1.6–2.4 mm long, persistent. Stamens 4 or 5. Ovary pubescent on dorsal face of each carpel. Capsule 3-winged, transversely elliptic in lateral view, 11.5–18.5 mm long, 13.5–18 mm wide, sparsely pubescent or glabrous; wings 3.5–5.5 mm wide, membranous; dehiscence septifragal. Fig. 28 O.

Occurs in eremian northern Australia from the Hamersley Range, W.A., through central N.T. to the Mt Isa and Quilpie areas of western Qld. Grows in deep red sand and on quartzite and laterite hills, in grassland or open eucalypt woodland. Map 166.

W.A.: Bohemia Downs, 105 km SE of Fitzroy Crossing, *J.S. Beard 4251* (NSW, PERTH); Rhodes Ridge, Hamersley Range, *M. Trudgen 396* (PERTH). N.T.: c. 55 km NE of Tanami, *G. Chippendale 5642* (NSW, MEL, PERTH); c. 55 km NNE of Barrow Creek Township, *M. Lazarides 5827* (AD, CANB, NSW, PERTH). Qld: 68 km N of Dajarra, *W.G. Trapnell & K.A. Williams 143* (BRI).

**13. Dodonaea serratifolia** McGillivray, *Telopea* 1: 66 (1975)

T: Grassy creek, Gibraltar Range National Park, N.S.W., 13 Dec. 1966, *R. Paine*; holotype: NSW.

Polygamo-dioecious erect shrub to 1.5 m. Leaves simple, narrowly elliptic, acute or obtuse, irregularly serrulate, attenuate at base; lamina 3.5–7.2 cm long, 0.6–1.2 cm wide, glabrous; petiole 1–2.5 mm long. Flowers in 3–6-flowered cymes; pedicels 2–2.5 mm long. Sepals 4, ovate, 2–2.3 mm long, caducous. Stamens 6–8. Ovary glabrous. Capsule 3- or 4-winged, broadly elliptic or broadly obovate in lateral view, 14–17 mm long, 13–15 mm wide, glabrous; wings 4–5 mm wide, membranous; dehiscence septifragal. Fig. 28P.

Restricted to a few populations E of Glen Innes on northern tablelands of N.S.W. Grows in dry sclerophyll forest in granitic soil. Map 167.

N.S.W.: Gibraltar Range National Park, *R. Coveny 5702* & *N. Lander* (BRI, CANB, NSW); Gibraltar State Forest, *J.B. Williams 646* (NSW); near Mt Slow, Oct. 1966, *J.B. Williams* (NSW).

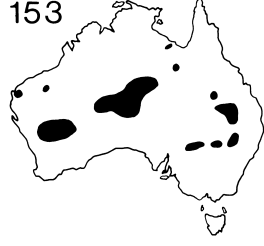
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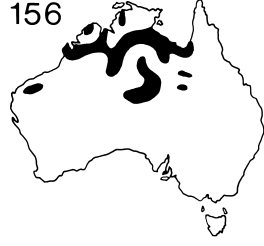
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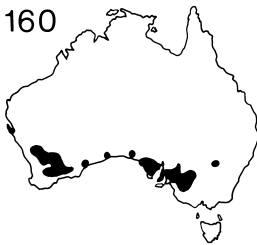
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151. *Dodonaea viscosa*  
subsp. *angustissima*

154. *Dodonaea viscosa*  
subsp. *spatulata*

157. *Dodonaea lanceolata*  
var. *subsessilifolia*

160. *Dodonaea bursariifolia*

163. *Dodonaea boroniifolia*

152. *Dodonaea viscosa*  
subsp. *cuneata*

155. *Dodonaea polyandra*

158. *Dodonaea triquetra*

161. *Dodonaea procumbens*

164. *Dodonaea physocarpa*

153. *Dodonaea viscosa*  
subsp. *mucronata*

156. *Dodonaea lanceolata*  
var. *lanceolata*

159. *Dodonaea amblyophylla*

162. *Dodonaea camfieldii*

165. *Dodonaea polyzyga*

**14. Dodonaea filifolia** Hook. in T.Mitchell, *J. Exped. Trop. Australia* 241 (1848)

T: Mt Mudge area, Qld, 19 July 1846, *T.L.Mitchell* 212; holo: K; iso: BM.

*Dodonaea acerosa* Lindl. in T.Mitchell, *J. Exped. Trop. Australia* 273 (1848). T: ?Mt Faraday area, Qld, 14 Sept. 1846, *T.L.Mitchell* 352; holo: CGE; iso: P.

Dioecious erect shrub or small tree to 5 m. Leaves simple, sessile, linear-filiform, grooved or channelled or rarely flat above, convex below, obtuse, entire, not constricted at base, 5.5–10.5 cm long, rarely shorter, 0.1 cm wide, glabrous. Flowers in 5- or 6-flowered terminal cymes; pedicels 3.3–7.5 mm long. Sepals 4, lanceolate, 1.2–1.5 mm long, caducous. Stamens 8. Ovary glabrous or sometimes sparsely pubescent. Capsule 4-winged, rarely 3-winged, broadly elliptic in lateral view, 9.5–12.5 mm long, 11.5–13 mm wide, glabrous; wings 2.5–4 mm wide, membranous, sometimes coriaceous; dehiscence septifragal. Fig. 28Q.

Occurs in eastern Qld from Ingham in the north to the northern Darling Downs in the south and westwards to Cunnamulla. Grows in low open eucalypt forest on sandstone plateaus and hills and also in sandy soil among sandstone rocks. Map 168.

Qld: 10 km NE of Valley of Lagoons Homestead, Upper Burdekin R., *D.F.Blaxell* 509 (BRI, NSW); 25 km W of Pentland, *A.D.Chapman* 1327 (AD, BRI, CANB); Blackdown Tableland, 32 km SE of Blackwater, *R.J.Henderson* 729, *S.B.Andrews* & *P.Sharpe* (BRI, CANB, MEL); Port Curtis District, Many Peaks Range, *I.Olsen* 349 (BRI, NSW); Natham Gorge, 20 km SSW of Cracow, *N.H.Speck* 1927 (AD, BRI, CANB, MEL, PERTH).

*Dodonaea filifolia* can be confused with *D. falcata* and *D. rigida*. *D. falcata* differs from *D. filifolia* in having shorter, falcate leaves, broader, ovate sepals and reflexed pedicels. *D. rigida* can be distinguished on its rigid leaves which are 4-angled or terete in cross section and its simple, linear juvenile leaves. *D. filifolia* has pinnate juvenile foliage.

**15. Dodonaea falcata** J.West, *Brunonia* 7: 69 (1984)

T: Bald Rock Creek, Girraween National Park, NE of Wallangarra, Qld, 31 Aug. 1969, *I.R.Telford* 1326; holo: CBG; iso: BRI.

[*Dodonaea filifolia* auct. non Hook.: G.Bentham, *Fl. Austral.* 1: 478–479 (1863), p.p.]

Illustration: E.R.Rotherham *et al.*, *Fl. Pl. New South Wales & S. Queensland* 128 (1975), as *Dodonaea filifolia*.

Dioecious or rarely polygamo-dioecious erect shrub to 2 m. Leaves simple, sessile, linear or subfiliform, concave or channelled above, convex below, falcate, entire, not constricted at base, 2.5–5 cm long, 0.1 cm wide, glabrous; obtuse and often recurved at apex. Flowers in 3- or 4-flowered terminal cymes, rarely paired. Sepals 4, ovate, 1.5–2.5 mm long, persistent. Stamens 8. Ovary sparsely pubescent. Capsule 4-winged, transversely elliptic in lateral view, 9.5–12 mm long, 11–14 mm wide, sparsely puberulent; wings 2.5–4 mm wide, membranous; dehiscence septifragal. Fig. 29A–C.

Occurs from Stanthorpe-Wallangarra area of the Darling Downs in south-eastern Qld, extending south to Sydney, N.S.W. Grows on granite or sandstone hills, usually in dry sclerophyll forest. Map 169.

Qld: 10 km SW of Warwick, *R.Coveny* 1948 (NSW); 3.3 km SE of Glen Aplin, *C.H.Gittins* 2818 (BRI, NSW). N.S.W.: Blue Gum road, Kenthurst, Oct. 1961, *C.Burgess* (CBG); Putty road, 40 km S of Singleton, Dec. 1961, *C.Burgess* (CBG); Pilliga Scrub, 58 km S of Narrabri, *G.Kleinschmidt* 130 (BRI).

**16. Dodonaea peduncularis** Lindl. in T.Mitchell, *J. Exped. Trop. Australia* 361 (1848)

T: Depot Camp near Mt Sowerby, Qld, 1846, *T.L.Mitchell* 319; lecto: CGE, *vide* J.G.West, *Brunonia* 7: 70 (1984); isolecto: L.

*Dodonaea pubescens* Lindl. in T.Mitchell, *J. Exped. Trop. Australia* 342 (1848). T: Mt Pluto area, Qld, 20 Sept. 1846, *T.L.Mitchell* 357; lecto: CGE, *vide* J.G.West, *op. cit.* 71; isolecto: CGE, NSW.

Illustration: G.M.Cunningham *et al.*, *Pl. W. New South Wales* 472 (1981).



Dioecious spreading shrub to 2 m. Leaves simple, sessile, angular-obovate to oblanceolate, usually conduplicate or with concave upper surface, entire, attenuate at base, 0.5–1.8 cm long, 0.2–0.5 cm wide, glabrous; apex sometimes entire and acute or usually 3-toothed, rarely 4-toothed, the central tooth longest and usually recurved. Flowers in terminal few-flowered cymes or solitary; pedicels 2.5–7.5 mm long, rarely to 10 mm. Sepals 4, lanceolate to ovate, 1.3–2.4 mm long, persistent. Stamens 8. Ovary glabrous or rarely pubescent. Capsule 4-winged, broadly oblong or rarely broadly obovate in lateral view, 7–12.5 mm long, 8–12.5 mm wide, rarely to 18 mm, glabrous; wings 2–3.5 mm wide, membranous; dehiscence septifragal. Fig. 29D.

Widespread in N.S.W. and southern Qld; extends from Griffith area of southern N.S.W. to the Darling Downs and Leichhardt districts of south-eastern Qld & as far as Jericho in the N and Charleville to the W. Grows in semi-arid, undulating or flat country, usually in sandy soils or on sandstone hills in mallee-broombush associations, open woodlands and hummock grassland. Map 170.

Qld: c. 27 km WSW of Rolleston township, *M.Lazarides & R.Story 31* (AD, BRI, CANB, PERTH); 19 km S of Gurulmundi, *K.A.W.Williams 75065* (BRI). N.S.W.: Warialda, July 1905, *J.L.Boorman* (AD, NSW, BRI); 4 km W of Komarah, 50 km E of Griffith, *M.D.Crisp 1517* (AD, CBG); Pilliga forest, between Narrabri and Coonabarabran, *L.Pedley 1614* (BRI).

*Dodonea peduncularis* resembles *D. viscosa* subsp. *cuneata* in fruit and some leaf characters, but the two can be distinguished by the glabrous branchlets, paniculate inflorescence and broader, flat leaves of the latter taxon. In sterile material *D. peduncularis* has been confused with *D. triangularis*. The two species differ greatly in flower and fruit characters and *D. peduncularis* has narrower, conduplicate or concave, rigid leaves that are always glabrous.

#### 17. *Dodonea intricata* J.West, *Brunonia* 7: 72 (1984)

T: Eyre Peninsula, Barber Hill, 7 km SE of Hiltaba Homestead, Gawler Range, 32°12'S, 135°07'E, S.A., *J.G.West 2155*; holotype: AD; isotype: CANB, NSW.

Dioecious spreading shrub to 1 m. Leaves simple, oblong or rarely oblanceolate or narrowly elliptic, glabrous to puberulent, truncate-emarginate or sometimes obtuse or irregularly 2- or 3-toothed, entire, unevenly sinuate or with very small regular teeth or lobes; base attenuate to cuneate; lamina 0.7–1.7 cm long, 0.3–0.5 cm wide; petiole 1–3.5 mm long. Flowers solitary or paired; pedicels 2.5–5 mm long. Sepals 4, ovate to broadly oblong, 1.5–2.5 mm long, caducous. Stamens 8. Ovary glabrous. Capsule 4-winged, broadly to transversely elliptic in lateral view, 10–13 mm long, 9–14 mm wide, usually glabrous, sometimes sparsely pubescent; wings 2–4 mm wide, membranous; dehiscence septifragal. Fig. 29E–H.

Restricted to the Gawler Range of Eyre Peninsula in S.A.; on granite hills and rocky outcrops, mainly with *Melaleuca* spp. Map 171.

S.A.: Mount Ive, *N.Donner 3256* (AD); 0.7 km to Corrobinnie Hill from Stock Route, *P.Lang 1234a & b* (AD); Scrubby Peak, 40 km NNE of Minnipa, *J.G.West 2178–2184* (AD, CANB, MEL, NSW, PERTH); 11.3 km E of Nonning Homestead, 3 km SW of Miccollo Hill, *J.G.West 2201–2205* (AD, BM); Yandinga Falls, 1 km W of Minnipa–Yardea road, *P.G.Wilson 510–512* (AD, IA, K).

*Dodonea intricata* can be distinguished from *D. viscosa* subsp. *cuneata* by its solitary flowers and narrower, oblong, thicker leaves, usually with a truncate-emarginate apex.

#### 18. *Dodonea petiolaris* F.Muell., *Fragm.* 3: 13 (1862)

T: Darling River, N.S.W., *Neilson s.n.*; holotype: MEL 84120.

Illustration: G.M.Cunningham *et al.*, *Pl. W. New South Wales* 472 (1981).

Dioecious erect shrub to 2 m. Leaves simple, broadly lanceolate to ovate, often conduplicate and recurved, acute, entire to sinuate, undulate, attenuate to truncate at base; lamina 2.5–4.5 cm long, rarely to 6.6 cm, 0.8–2.5 cm wide, glabrous; petiole 7.5–14 mm long. Flowers in terminal panicles; pedicels 2.5–5.5 mm long, rarely to 8 mm. Sepals

5, linear-lanceolate, 1.2–2.5 mm long, persistent. Stamens 6–10. Ovary glabrous. Capsule 3-winged, broadly oblong to ellipsoidal in lateral view, greatly inflated, 16–30 mm long, rarely to 38 mm, 12–25 mm wide, rarely to 30 mm, glabrous; wings 1.5–4 mm wide, membranous; not readily dehiscent. Figs 23,29 I.

Occurs in central W.A., central N.T., south-western Qld and north-western N.S.W.; on rocky hills and ranges and on gibber plains of arid and semi-arid areas. Map 172.

W.A.: Mt William Lambert, Gunbarrel Hwy, A.S.George 5454 (PERTH); Mt Magnet, 2 km NW of Mt Magnet township, *J.G.West* 3331–3335 (AD, CANB, PERTH). N.T.: c. 45 km NNE of Lucy Creek Stn, *M.Lazarides* 5910 (AD, BRI, CANB, PERTH). Qld: 59 km NW of Quilpie, *W.G.Trapnell & K.A.Williams* 250 (BRI). N.S.W.: Mount Oxley, 33 km ESE of Bourke, *E.F.Constable* 4504 (AD, NSW, U).

### 19. *Dodonaea sinuolata* J.West, *Brunonia* 7: 75 (1984)

T: Texas, Qld, Sept. 1910, *J.L.Boorman s.n.*; holotype: NSW 142640; isotype: W.

[*Dodonaea tenuifolia* auct. non Lindl.: F.Mueller, *Fragm.* 9: 85 (1875) p.p.]

[*Dodonaea adenophora* auct. non Miq.: G.Bentham, *Fl. Austral.* 1: 486 (1863) p.p.]

Dioecious spreading shrub to 3 m. Leaves imparipinnate, 1.4–2.8 cm long excluding petiole, rarely to 3.6 cm; lateral leaflets 8–14, rarely as many as 22, linear or oblanceolate to linear-obtriangular, irregularly and finely sinuate to entire, or irregularly sinuate to denticulate, broadly acute to obtuse or irregularly 3-toothed, narrowly cuneate to attenuate at base, 5–15.5 mm long, 1–2 mm wide, glabrous or sparsely puberulent; terminal leaflet shorter and lobe-like, otherwise similar to laterals; petiole 6–20 mm long. Flowers in 3- or 4-flowered axillary cymes, rarely to 6-flowered; pedicels 4.5–10 mm long. Sepals 4, ovate, 1.7–3 mm long, caducous. Stamens 8. Ovary glabrous. Capsule 4-winged, rarely 3-winged, broadly elliptic to broadly oblong in lateral view, 9.5–13 mm long, 10–15 mm wide, glabrous; wings 3–5.5 mm wide, coriaceous; dehiscence septifragal. Fig. 29J.

Occurs in north-eastern N.S.W. and southern Qld. There are 2 subspecies.

Leaflets linear, broadly acute to obtuse, irregularly and finely sinuate to entire

**19a. subsp. sinuolata**

Leaflets oblanceolate to linear-obtriangular, usually 3-toothed, rarely obtuse at apex, irregularly sinuate to denticulate

**19b. subsp. acrodentata**

### 19a. *Dodonaea sinuolata* J.West subsp. *sinuolata*

Illustration: E.R.Rotherham *et al.*, *Fl. Pl. New South Wales & S. Queensland* 122 (1975), as *Dodonaea tenuifolia*.

Leaves 1.4–3 cm long; leaflets linear, broadly acute to obtuse, irregularly and finely sinuate to entire; petiole 6–13 mm long.

Occurs on the tablelands and western slopes of north-eastern N.S.W. from Scone in the Hunter Valley and the Warrumbungle Mts, extending north to Toowoomba in south-eastern Qld. Grows in rocky sites in open forest or woodland. Map 173.

Qld: Gladfield, Jan. 1891, *C.J.Gwythe* (BRI); Durikai State Forest, W of Warwick, *W.J.F.McDonald* 1156 (BRI). N.S.W.: Warialda, July 1905, *J.L.Boorman* (NSW); 5 km SE of Mt Wombo, 23 km WSW of Singleton, *R.Coveny* 5603 & *S.W.L.Jacobs* (AD, CANB, NSW); Deriah State Forest, 25 km E of Narrabri, *R.Pullen* 10388 (CANB, NSW).

### 19b. *Dodonaea sinuolata* subsp. *acrodentata* J.West, *Brunonia* 7: 77 (1984)

T: Maranoa district, 123 km SE of Charleville, Qld, 30 Aug. 1973, *W.G.Trapnell & K.A.Williams* 272; holotype: BRI.

Leaves 1.7–3.6 cm long; leaflets oblanceolate to linear-obtriangular, usually irregularly 3-toothed at apex, the central tooth recurved, rarely obtuse, irregularly sinuate to irregularly denticulate; petiole 9.5–20 mm long. Fig. 25.

Occurs in southern Qld from Thargomindah to St George and N to Tambo. Grows in red sandy loam and on stony ridges in arid and semi-arid areas. Map 174.

Qld: 12.8 km NNW of Quilpie, *D.Boylard 3078* (BRI); 4 km S of Dillalah Siding on Mitchell Hwy, *R.Purdie 672E* (BRI); between Beechal Creek & 48 km SW of Charleville on Quilpie road, Aug. 1969, *R.G.Silcock* (BRI, CANB); Eulo–Thargomindah road, Simmons, *per B.Copley 5090* (AD); c. 177 km SW of Charleville, *K.A.W.Williams 71* (BRI).

## 20. *Dodonea rupicola* C.White, *Queensland Naturalist* 6: 13 (1926)

T: Elimbah, Mt Saddleback, Qld, 11 Sept. 1926, *C.T.White 3225*; lecto: BRI, *vide* J.G.West, *Brunonia* 7: 77 (1984); isolecto: BRI, K, SING.

Dioecious spreading shrub to 1 m. Leaves imparipinnate, 1.5–3.5 cm long excluding petiole; lateral leaflets 10–18, oblong to oblanceolate, acute, often recurved, entire or sometimes undulate, recurved or revolute, cuneate at base, 4–9.5 mm long, 2–4 mm wide, densely hirsute; terminal leaflet lobe-like, otherwise similar to laterals; petiole 3–8 mm long. Flowers in terminal panicles; pedicels 2–2.5 mm long. Sepals 4, lanceolate or sometimes ovate-lanceolate, 2.5–4 mm long, persistent. Stamens 8. Ovary hirsute. Capsule 4-winged, transversely elliptic in lateral view, 7.5–9 mm long, 12–15 mm wide, densely hirsute; wing 3–4 mm wide, coriaceous; dehiscence septifragal. Fig. 29K.

Restricted to the Glasshouse Mts, N of Brisbane, Qld. Grows among rocks on top of or at the base of the mountains. Map 175.

Qld: Wildhorse Mt, Beerwah Forestry area, *J.A.Elsol 149* (BRI); Mt Saddleback, Glasshouse Mts, *T.Stanley & J.Clarkson 8* (BRI); Mt Miketeebumulgrai (Mt Saddleback), 5 km W of Elimbah, *I.R.Telford 3415, 3417–3418* (CBG, NSW); Mt Saddleback, Aug. 1969, *K.A.W.Williams* (BRI).

The capsules of *D. rupicola* and *D. vestita* are often confused. *D. vestita* has smaller leaves covered with golden hairs, longer pedicels, longer filaments and anthers, and larger capsules.

## 21. *Dodonea vestita* Hook. in T.Mitchell, *J. Exped. Trop. Australia* 265 (1848)

T: Belyando River area, Qld, 31 Aug. 1846, *T.L.Mitchell 278*; holo: K.

*D. vestita* var. *glabrescens* Benth. ex Britten, *Ill. Bot. Cook's Voy.* 1: 16, t. 43 (1900). T: Endeavour R., Qld, 1770, *J.Banks & D.Solander*; syn: MEL, NSW, P, W.

Dioecious shrub to 1.5 m. Leaves imparipinnate, 0.8–2.2 cm long excluding petiole; leaflets 8–14, obovate to oblong, acute to obtuse, often 2- or 3-toothed, entire, revolute, cuneate at base, 3.5–9 mm long, 2–5 mm wide, hirsute, the hairs usually golden-yellow; terminal leaflet lobe-like, otherwise similar to laterals; petiole 1.5–4.5 mm long. Flowers in 2–4-flowered cymes, axillary or terminal; pedicels 7.5–13 mm long. Sepals 4, rarely as many as 6, ovate to ovate-lanceolate, 3–5 mm long, persistent or sometimes caducous. Stamens 8–12. Ovary hirsute, some hairs grouped into tufts. Capsule 4-winged, rarely 5-winged, transversely obovate to transversely elliptic in lateral view, 8.5–15 mm long, 16–24 mm wide, hirsute, the hairs usually golden-yellow; wings 5–7 mm wide, coriaceous; dehiscence septifragal. Fig. 29L.

Occurs in south-eastern Qld from Miles in the Darling Downs to Aramac in the Mitchell district. Usually grows in shallow rocky soil on sandstone slopes, in open eucalypt forest or dry sclerophyll forest. Map 176.

Qld: 45 km SSE of Blackall, *G.R.Beeston 1137c* (BRI); 10 km S of Isla Gorge Lookout, 37 km S of Theodore, *L.A.S.Johnson 7196 & B.G.Briggs* (AD, BRI, MEL, NSW); Bauhinia Downs–Rolleston road, 32 km W of Bauhinia Downs, *R.W.Johnson 2801* (BRI); 59 km NW of Quilpie, *W.G.Trappnell & K.A.W.Williams 306* (BRI); 3 km W of Gurulmundi, *K.A.W.Williams 75055* (BRI).

*Dodonea vestita* and *D. rupicola* have very similar capsules. *D. vestita* has smaller leaves with golden hairs, longer pedicels, longer filaments and anthers, and larger capsules. The taxonomic position of *D. vestita* var. *glabrescens* is in doubt. The type and time 19th century collections from the same area differ from typical *D. vestita* in having linear-oblong leaflets without teeth at the apex, and capsules with less dense indumentum

and narrower wings. Further material and field work are needed to determine the status of this taxon.

**22. *Dodonaea uncinata* J. West, *Brunonia* 7: 80 (1984)**

T: 17.6 km from Paluma on Ewan road, Mt Spec area, Qld, 18 Sept. 1974, *K.A.W. Williams* 55; holotype: BRI.

Dioecious spreading shrub, to 1 m. Leaves imparipinnate, 0.4–1 cm long excluding petiole; lateral leaflets 6–8, rarely 4, obovate to angular-obovate, concave above, 3-toothed, rarely to 6-toothed, entire, cuneate at base, 2.6–5 mm long, rarely to 7 mm, 1.5–3 mm wide, glabrous; terminal leaflet shorter, usually strongly recurved or hooked, otherwise similar to laterals; petiole 3–5.5 mm long. Flowers solitary, paired or 3-together; pedicels 3–6.5 mm long. Sepals 4, lanceolate to ovate, 1.6–3 mm long, persistent. Stamens 8. Ovary glabrous. Capsule 4-winged, transversely obovate or transversely elliptic in lateral view, 11–16 mm long, 8.5–14 mm wide, glabrous; wings 3–4.5 mm wide, membranous; dehiscence septifragal. Fig. 29M.

Confined to the Mt Spec area NW of Townsville, Qld; in open forest or woodland, usually in sandstone soils. Map 177.

Qld: W of Paluma, *C. Gittins* 501 (BRI); between Paluma and Mt Spec, NW of Townsville, *R. Hill*, per *J.G. West* 3583 (AD); Mt Spec, 64 km WNW of Townsville, *J. Vessey* 209 (BRI); c. 5 km E of Running R. on Gregory Hwy, *L.J. Webb* & *J.G. Tracey* 3331 (BRI); 7 km SE of Hidden Valley on Paluma–Hidden Valley road, 80 km NW of Townsville, *J.G. West* 4336–4345 (CANB, BRI, AD).

**23. *Dodonaea multijuga* G. Don, *Gen. Hist.* 1: 674 (1831)**

T: Liverpool Plains, N.S.W., 1825, *A. Cunningham* s.n.; lectotype: W, *vide* *J.G. West*, *Brunonia* 7: 81 (1984); isolectotype: G.

[*Dodonaea hirtella* auct. non Miq.: *F. Mueller*, *Pl. Victoria* 1: 89 (1862)]

Dioecious erect shrub to 1.5 m. Leaves imparipinnate, 2–4.8 cm long excluding petiole; lateral leaflets 16–28, rarely to 32, oblong to broadly obovate or sometimes obtriangular or angular-obovate, rarely linear, broadly acute to obtuse, sometimes mucronate, sometimes obscurely 2- or 3-toothed, entire or sinuate, revolute, cuneate & oblique at base, 4–7 mm long, rarely as short as 1.5 mm, 1–4 mm wide, pubescent; terminal leaflet lobe-like, otherwise similar to laterals; petiole 3.5–8 mm long. Flowers in axillary panicles; pedicels 7–14 mm long. Sepals 4, rarely 5, lanceolate, 3–4 mm long, caducous. Stamens 8, rarely 9 or 10. Ovary densely pubescent. Capsule 3-winged, broadly to transversely obovate in lateral view, 13–16.5 mm long, 15–20 mm wide, sparsely pubescent; wings 3–4 mm wide, coriaceous; dehiscence septifragal. Fig. 29N.

Occurs in the central and northern coast and tablelands regions of N.S.W. extending to Moreton district of south-eastern Qld. Grows on sandstone in sandy soils often associated with creek and river banks in dry sclerophyll forests. Map 178.

Qld: Moreton district, Mt Beerburum, June 1974, *P.S. Lavarack* (BRI). N.S.W.: Khyber Pass, Mt Sheridan, 90 km E of Rylstone, *J. Carrick* 3235 (AD); Cabbage Tree Creek, 22 km NW of Batemans Bay, *M.D. Crisp* 2048–2049 (AD, CBG); near Mt Belmore State Forest, Casino, Oct. 1955, *R.J. Turner* (NSW); Endrick River crossing, 5 km E of Nerriga, *J.G. West* 2579–2586 (AD, CANB, NSW).

*Dodonaea multijuga* and *D. pinnata* have similar fruit shapes and general leaf morphology; *D. pinnata* has shorter, pubescent fruiting pedicels, smaller, persistent sepals, 4-winged capsules and flowers in terminal inflorescences.

**24. *Dodonaea pinnata* Sm. in B. Rees, *Cyclop.* 12 (1809)**

T: New South Wales, N.S.W., 1805, *Earl St Vincent* s.n.; holotype: LINN.

*Serjania australis* Spreng., *Syst.* 2: 248 (1825). T: Australia, collector unknown; n.v.

Dioecious spreading shrub to 1.5 m. Leaves imparipinnate, 1.4–3.8 cm long excluding petiole; lateral leaflets 10–16, rarely to 26, narrowly angular-obovate to narrowly obovate or sometimes linear-oblongate or ovate, acute, entire, revolute, cuneate at base, 4–9

mm long, 2–2.5 mm wide, densely hirsute; the terminal leaflet small, lobe-like, otherwise similar to laterals; petiole 4–5.5 mm long. Flowers solitary; pedicel 3.5–6.5 mm long, rarely to 9 mm. Sepals 4 or 5, ovate or sometimes ovate-lanceolate, 1.6–4.5 mm long, persistent. Stamens 8–10, rarely 11 or 12. Ovary hirsute. Capsule 4-winged, transversely to broadly elliptic or broadly obovate in lateral view, 14–21 mm long, 15.5–18 mm wide, rarely to 22 mm, glabrous or rarely with a few hairs on wing margins; wings 3.5–6 mm wide, coriaceous; dehiscence septifragal. Fig. 29 O.

Confined to the Hawkesbury and Nepean River systems near Sydney in the central coast area of N.S.W. Grows on sandstone or in sandy soil in dry sclerophyll forest. Map 179.

N.S.W.: c. 1.5 km NW of Berowra, Sept. 1935, *W.F. Blakely* (NSW); Maroota, 24 May 1961, *C. Burgess* (AD, CBG); Wisemans Ferry, on Hawkesbury R., Aug. 1915, *J.B. Cleland* (AD); Boorai Creek, Colo River area, Oct. 1966, *H. Fairley-Cunninghame* (NSW); E bank of Nepean River, 5 km NW of Mulgoa, *J.G. West 2561–2565* (AD, CANB).

*Dodonea pinnata* can be distinguished from *D. multijuga* by its shorter, pubescent fruiting pedicels, smaller, persistent sepals, 4-winged capsules and flowers in terminal inflorescences.

## 25. *Dodonea concinna* Benth., *Fl. Austral.* 1: 487 (1863)

T: south-western Australia, *F. Mueller*; holo: MEL 84090.

[*Dodonea adenophora* auct. non Miq.: *F. Mueller, Fragm.* 1: 98 (1859)]

Dioecious erect, rounded & compact shrub to 1.5 m. Leaves paripinnate, 0.4–0.8 cm long excluding petiole, usually terminated by a small tooth or lobe; leaflets 4–12, linear, concave or channelled above, acute or obtuse, entire, narrowly cuneate at base, 4.5–9 mm long, 0.7–1 mm wide, puberulent or sometimes glabrous; petiole 2.5–6 mm long. Flowers solitary, paired or 3-together; pedicels 3.6–5.5 mm long. Sepals 4, ovate, 2–2.4 mm long, caducous. Stamens 8. Ovary glabrous. Capsule 4-winged, rarely 3-winged, broadly elliptic in lateral view, 9–11 mm long, 8.5–12.5 mm wide, glabrous; wings 2.5–4 mm wide, coriaceous; dehiscence septifragal. Fig. 29P.

Occurs in south-western W.A. from the Pingrup–Borden area to the Oldfield River E of Ravensthorpe in eucalypt mallee scrub. Map 180.

W.A.: 6 km SW of Ravensthorpe, *R.J. Chinnock 4382* (AD); 16 km S of Jerramungup, *K. Newbey 1343* (PERTH); c. 12 km NNW of Ongerup, *M.D. Tindale 3894* (AD, NSW); 30 km N of Borden, *J.G. West 1033–1037* (AD, CANB, PERTH); 12.6 km E of Ravensthorpe, *J.G. West 2954–2960* (AD, CANB, PERTH).

*Dodonea concinna* resembles *D. stenozyga*, which has longer leaves with petioles greater than 9 mm long and fewer leaflets (often only 2), which are often falcate and recurved at the apex.

## 26. *Dodonea stenozyga* F. Muell., *Fragm.* 1: 98 (1859)

T: Darling River, N.S.W., *J. Dallachy & T.H. Goodwin s.n.*; holo: MEL 84138; iso: BM, K, MEL.

Dioecious erect, rounded shrub to 1.5 m. Leaves paripinnate, sometimes terminated by a small tooth or lobe, including petiole 1–3.8 cm long; leaflets 2–6, rarely to 10, linear, terete or concave or channelled above, falcate or sometimes more or less flat & straight, obtuse, often recurved, entire, 8–13.5 mm long, rarely to 25 mm, 0.5–2 mm wide, glabrous; petiole 9.5–20 mm long, rarely to 24 mm. Flowers usually paired or 3-together, rarely solitary; pedicels 4–8.5 mm long. Sepals 4, oblong-lanceolate to ovate, 1.5–3.2 mm long, caducous. Stamens 7 or 8. Ovary glabrous. Capsule 4-winged, broadly elliptic or broadly obovate in lateral view, 8.5–14.5 mm long, 10–17 mm wide, glabrous; wings 3–6.5 mm wide, coriaceous; dehiscence septifragal. Fig. 29Q.

Widespread in southern Australia from southern W.A. to western Vic. A shrub of semi-arid mallee scrub or open eucalypt woodland. Map 181.

W.A.: 22 km NW of Mt Ragged, A.S. George 7409 (PERTH); 24.2 km S of Pingrup on Ongerup–Pingrup road, J.G. West 3081–3084 (AD, PERTH). S.A.: Yorke Peninsula, 2 km N of Pine Point, B.J. Blaylock 1541 (AD, W); on W.A.–S.A. border, 4 km S of Eyre Hwy, J.G. West 2681–2686 (AD, CANB, PERTH). Vic.: 80 km W of Red Cliffs, c. 3 km S of Yarrara, Nov. 1964, T. Henshall (BRI, CANB, MEL, NSW).

Can be distinguished from *D. concinna* by its longer leaves with petioles greater than 9 mm long and a smaller number of leaflets.

**27. *Dodonaea microzyga* F. Muell., *Ann. Rep. Govt Bot.* 1862–3: 12 (1863)**

T: Neales River, S.A., J. Macdouall Stuart s.n.; holotype: MEL 84115.

Dioecious spreading shrub to 1.5 m. Leaves imparipinnate, 0.3–1.2 cm long excluding petiole; lateral leaflets 2–10, oblanceolate to broadly obovate, rarely narrowly spatulate, concave above, obtuse, rounded or obscurely toothed or notched, cuneate at base, 1.6–8 mm long, 1–3 mm wide, puberulent; entire or irregularly sinuate, rarely toothed; terminal leaflet shorter and lobe-like in var. *acrolobata*, similar to laterals in var. *microzyga*; petiole 1.5–5 mm long. Flowers solitary or paired; pedicels 3.5–5 mm long. Sepals 4, ovate, 1.8–2.6 mm long, caducous. Stamens 8, rarely 9 or 10. Ovary pubescent. Capsule 3-winged, rarely 4-winged, broadly to transversely elliptic in lateral view, 10–13.5 mm long, 10–17.5 mm wide, glabrous or rarely with few hairs on body of carpels; wings 2.5–5 mm wide, membranous; dehiscence septifragal.

Occurs in inland areas of southern W.A., in eremian S.A., extending to southern N.T., western Qld and far north-western N.S.W. There are 2 varieties.

Leaves with 2 or 3 pairs of lateral leaflets and a terminal leaflet of similar shape and size; leaflets entire, usually less than 4 mm long

**27a. var. *microzyga***

Leaves with 3 or 4, rarely 5 pairs of lateral leaflets and a terminal leaflet less than half their length; lateral leaflets irregularly sinuate, usually greater than 4 mm long

**27b. var. *acrolobata***

**27a. *Dodonaea microzyga* F. Muell. var. *microzyga***

Illustrations: G.M. Cunningham *et al.*, *Pl. W. New South Wales* 472 (1981); J.E. Brown, *Forest Fl. S. Australia* t. 30 (1882).

Leaves 0.3–0.9 cm long, with 2 or 3 pairs of lateral leaflets; leaflets 1.6–3.5 mm long, rarely to 5 mm, 1–3 mm wide, entire, usually obtuse or rounded, rarely toothed or notched. Fig. 30A.

Widely distributed in arid S.A., extending to southern N.T., western Qld and far north-western N.S.W. Grows in a variety of arid habitats; mostly on stony rises, hills and ridges of laterite, ironstone, granite or quartzite, usually as a component of open woodland or shrubland. Map 182.

N.T.: 51 km NNE of Angas Downs Stn, M. Lazarides 6133 (AD, BRI, CANB, NSW). S.A.: North West region, 19.5 km NW of Cheesman Junction, W.R. Barker 3018 (AD); Flinders Ranges, 18 km W of Wirrealpa Homestead, 18 km E of Blinman, J.G. West 1790–1792 (AD). Qld: 6 km ENE of Verdun Valley Stn, R. Purdie 1018 (BRI). N.S.W.: Peak Hill near Milparinka, L. Richley 1320 (NSW).

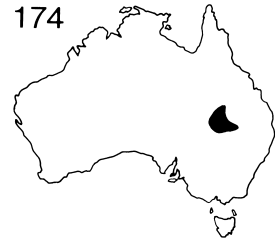
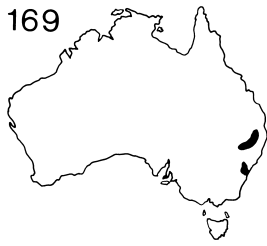
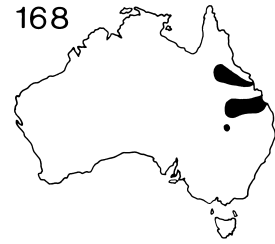
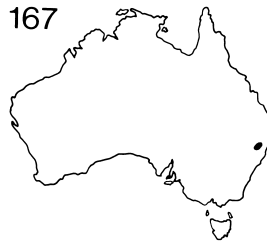
**27b. *Dodonaea microzyga* var. *acrolobata* J. West, *Brunonia* 7: 88 (1984)**

T: 12.1 km E of Fraser Range, 74.8 km W of Balladonia Hotel, 32°03'S, 122°57'E, W.A., 15 Dec. 1978, J.G. West 3512; holotype: AD.

Illustration: L. Radlkofer, *Pflanzenr.* 98: 1388 fig. 44C (1933).

Leaves 0.6–1.2 cm long, with 3 or 4, rarely 5, pairs of lateral leaflets; lateral leaflets 3.5–8 mm long, 1.5–3 mm wide, irregularly sinuate, rarely entire, irregularly toothed or notched, or rarely rounded at apex; terminal leaflet lobe-like, shorter than laterals.

Occurs in W.A. from Meekatharra to Norseman and Fraser Range and E to the Great Victoria Desert; grows in open eucalypt woodland or mallee shrubland. Map 183.



166. *Dodonaea coriacea*  
 169. *Dodonaea falcata*  
 172. *Dodonaea petiolaris*  
 175. *Dodonaea rupicola*  
 178. *Dodonaea multijuga*

167. *Dodonaea serratifolia*  
 170. *Dodonaea peduncularis*  
 173. *Dodonaea sinuolata*  
 subsp. *sinuolata*  
 176. *Dodonaea vestita*  
 179. *Dodonaea pinnata*

168. *Dodonaea filifolia*  
 171. *Dodonaea intricata*  
 174. *Dodonaea sinuolata*  
 subsp. *acrodentata*  
 177. *Dodonaea uncinata*  
 180. *Dodonaea concinna*

W.A.: Fraser Range, *T.E.H.Aplin 1794* (AD, PERTH); 21 km E of Neale Junction, Great Victoria Desert, *A.S.George 8425* (PERTH); Mt Walter, 90 km NE of Southern Cross, *K.Newbey 8818* (PERTH); c. 3 km S of Gabanintha, *N.H.Speck 1105* (AD, CANB, PERTH); 36.4 km E of Norseman on Hwy 1, *J.G.West 3493–3499* (AD, CANB, PERTH).

*Dodonaea microzyga* shows much variability in leaf morphology, especially in W.A. where var. *acrolobata* shows intergradation with *D. lobulata*. Putative hybrids with intermediate leaf morphology have been found in locations where both species occur in W.A.

Sterile material of *D. microzyga* var. *acrolobata* and *D. adenophora* may be confused. Where the two species are sympatric *D. microzyga* var. *acrolobata* has longer leaves with broader & more numerous leaflets. *D. adenophora* has smaller, septicial, centrally constricted capsules, shorter pedicels and smaller sepals.

## 28. *Dodonaea adenophora* Miq., *Linnaea* 18: 95 (1844)

*Thouinia adenophora* Miq. in Lehm., *Pl. Preiss.* 1: 224 (1845). T: Darling Range, W.A., *L.Preiss 2442*; lecto: U fide J.G.West, *Brunonia* 7: 90 (1984); isolecto: MEL.

[*Dodonaea boroniifolia* auct. non G.Don: W.E.Blackall & B.J.Grieve, *W. Austral. Wildfl.* 2: 326 (1956)]

Dioecious erect or spreading shrub to 2.5 m. Leaves imparipinnate, 0.4–0.8 cm long excluding petiole; lateral leaflets 4–6, rarely 2 or 3, narrowly obovate to obovate, concave, sometimes conduplicate, obtuse, rarely toothed, at apex, entire and narrowly cuneate at base, 1.5–3.5 mm long, rarely to 5 mm, 0.8–1.5 mm wide, puberulent; the terminal leaflet usually smaller, sometimes lobe-like, otherwise similar to laterals; petiole 1–3 mm long. Flowers solitary or sometimes paired; pedicels 2–3.5 mm long. Sepals 4, ovate, 1–1.8 mm long, caducous. Stamens 6–8. Ovary pubescent. Capsule 4-winged, transversely elliptic in lateral view, contracted along central axis, 6–7.5 mm long, 8–10 mm wide, sparsely pubescent on body of carpels and sometimes on wing margins; wings 1.5–2.5 mm wide, membranous; dehiscence septicial. Fig. 30B.

Widespread in southern W.A., from Pindar and Mt Magnet to Narembeen and Norseman and as far E as Zanthus. A shrub of semi-arid and arid mallee scrub and open woodland communities in granitic sands and red sandy loams. Map 184.

W.A.: 10 km W of Agnew, *J.S.Beard 6579* (PERTH); 8 km N of Mt Andrew, 118 km ESE of Norseman, *K.Newbey 7772* (PERTH); Pindar, 20 Sept. 1968, *M.E.Phillips* (AD, CBG, NSW); 2.6 km E of Campion & 7 km W of Warralakin, *J.G.West 3358–3361* (AD, NSW, PERTH); 10 km W of Broad Arrow on road to Ora Banda, *J.G.West 3429–3431* (AD, CANB).

Sterile material can be confused with *D. microzyga* var. *acrolobata*, but the latter has longer leaves with broader and more numerous leaflets. *D. adenophora* has smaller, septicial capsules, shorter pedicels and smaller sepals.

Putative hybrids between *D. adenophora* and *D. inaequifolia* have been found in a few locations where the two species occur together.

## 29. *Dodonaea oxyptera* F.Muell., *Hooker's J. Bot. Kew Gard. Misc.* 9: 197 (1857)

T: Arnhem Land, N.T., *F.Mueller*; lecto: MEL 84116 fide J.G.West, *Brunonia* 7: 93 (1984); isolecto: K.

Dioecious or rarely polygamo-dioecious spreading shrub to 2 m. Leaves paripinnate, 0.3–3 cm long excluding petiole, terminated by a small tooth or lobe; leaflets 4–8, rarely to 12, oblong to oblanceolate or obovate, acute to acuminate, entire, recurved, obliquely cuneate at base, 5.5–11 mm long, rarely to 14 mm, 1.5–4 mm wide, densely pubescent; petiole 3.5–7 mm long. Flowers solitary or paired; pedicels 1.5–2.5 mm long. Sepals 4, ovate to lanceolate, 1.6–2 mm long, persistent. Stamens 6–8. Ovary pubescent or pilose. Capsule 4-winged, transversely obovate in lateral view, 5.5–8 mm long, 9–10.5 mm wide, densely pilose-pubescent to villous; wings 2–3.5 mm wide, coriaceous; dehiscence septifragal. Fig. 30C.



Occurs in northern Australia from the Kimberley, W.A., to the Gulf of Carpentaria and Arnhem Land, N.T., and north-western Qld. Usually grows in skeletal soils on stony ridges in eucalypt woodland. Map 185.

W.A.: Pseudomys Hills, Drysdale River National Park, *K.Kenneally 4112* (PERTH). N.T.: Mitchell Ranges, Arnhem Land, *N.Byrnes 2684* (CANB, DNA, K, L, NSW, NT); 83 km SW of Dorisvale Stn, Aug. 1949, *R.A.Perry* (BRI, CANB, NSW); 40 km SW of Borroloola on Carpentaria Hwy, *J.G.West 4663–4665* (CANB, DNA). Qld: Alexander River crossing on Cloncurry–Burketown road, *R.C.Carolin 8845* (AD, SYD).

**30. *Dodonea hirsuta*** (Maiden & Betche) Maiden & Betche, *Proc. Linn. Soc. New South Wales* 38: 245 (1913)

*Dodonea peduncularis* var. *hirsuta* Maiden & Betche, *Proc. Linn. Soc. New South Wales* 27: 57 (1902). T: Jennings, N.S.W., Oct. 1901, *J.L.Boorman s.n.*; holotype: NSW 108357; isotype: W 6941.

Dioecious erect shrub to 1.5 m. Leaves simple, obtriangular or angular-obovate to narrowly angular-obovate and conduplicate, truncate, 3–5-toothed, entire, revolute, cuneate or rarely attenuate at base, 0.3–0.6 cm long, 0.3–0.5 cm wide, hirsute; petiole 0.5–0.8 mm long. Flowers solitary; pedicel 4.5–7 mm long. Sepals 4, lanceolate, 1.5–2.6 mm long, persistent. Stamens not seen. Ovary densely pubescent. Capsule 3-winged, rarely 4-winged, transversely elliptic to orbicular in lateral view, 11–15.5 mm long, 12–17 mm wide, hirsute; wings 2.5–4.5 mm wide, coriaceous; dehiscence septifragal. Fig. 30D.

Confined to south-eastern Qld and north-eastern N.S.W. in the Stanthorpe–Wallangarra–Torrington area with an extension further E in N.S.W. to Copmanhurst. Grows on granite hillsides and on sandstone in dry sclerophyll forest or heathland. Map 186.

Qld: near Jollys Falls, parish of Stanthorpe, *T.J.Bowen 563* (BRI); Mt Norman, 7 km NE of Wallangarra, *I.R.Telford 3113* (CBG, NSW). N.S.W.: Mt Mullengen, 6 km E of Ramornie, July 1922, *W.F.Blakely & D.W.Shiress* (NSW); Wallangarra, July 1904, *J.L.Boorman* (MEL, NSW); 8 km S of Coaldale, *S.Clarke, J.Pickard & R.Coveny 1891* (BRI, MEL, NSW).

Plants from the Copmanhurst populations have longer, usually almost sessile leaves which are attenuate at the base and often conduplicate.

**31. *Dodonea platyptera*** F.Muell., *Hooker's J. Bot. Kew Gard. Misc.* 9: 197 (1857)

T: Fitzmaurice R., N.T., Oct. 1855, *F.Mueller s.n.*; lectotype: MEL 84127 *fide* J.G.West, *Brunonia* 7: 95 (1984); isotype: K.

*Dodonea hansenii* F.Muell., *Victorian Naturalist* 8: 93 (1891). T: Stuart R., Qld, 1891, *S.Johnson s.n.*; lectotype: MEL 84096, *fide* J.G.West, *loc. cit.*; isotype: MEL, BRI, K.

Dioecious erect shrub or small tree to 6 m, rarely to 10 m. Leaves simple, elliptic, acute, rarely retuse or obtuse, entire, attenuate at base; lamina 3.5–8.8 cm long, 1–3.3 cm wide, glabrous or sparsely pubescent on margin and midrib; petiole 6–12 mm long. Flowers in axillary few-flowered cymes or terminal panicles; pedicels 7.5–10 mm long. Sepals 4, oblong, 2.3–2.7 mm long, caducous. Stamens 8. Ovary pubescent. Capsule 3- or 4-winged, depressed-obovate in lateral view, 7–15 mm long, 20–30 mm wide, glabrous; wings 8–11.5 mm wide, coriaceous or sometimes membranous; dehiscence septifragal. Fig. 30E.

Occurs in the Kimberley, W.A., northern N.T. and northern Qld. Grows in coastal sites associated with dunes, often on the edge of rainforest or in monsoon scrub and further inland in low open forest or semi-deciduous vine thickets in sandy soils. Map 187.

W.A.: Port Warrender, Admiralty Gulf, NW Kimberley, *J.S.Beard 8449* (CANB, PERTH); Hann River, 13 km from Gibb River homestead on Derby road, *I.R.Telford 6045 & G.Butler* (CBG). N.T.: Shoeing Tree Creek Outstation, *A.C.Beaglehole 54600* (AD); Nightcliff, Darwin, *R.L.Specht 14* (AD, BRI, NSW, MEL). Qld: 8.5 km NW of Weipa Mission, *R.L.Specht & R.B.Salt W492* (BRI).

**32. *Dodonaea stenophylla*** F.Muell., *Fragm.* 1: 72 (1859)

T: Upper Burdekin R., Qld, Nov. 1856, *F.Mueller s.n.*; lecto: MEL, *vide* J.G.West, *Brunonia* 7: 96 (1984); isolecto: K.

Dioecious erect shrub to 4 m. Leaves simple, erect, rigid, sessile or tapering to a petiole 5–7 mm long, linear, acute, entire and revolute, attenuate at base; lamina 3–10.5 cm long, 0.1–0.25 cm wide, glabrous. Flowers usually in axillary few-flowered cymes, rarely in terminal panicles; pedicels 2–15 mm long. Sepals 4, lanceolate or ovate, 1.2–1.8 mm long, caducous. Stamens 8. Ovary glabrous or rarely pubescent near apex. Capsule 4–, rarely 3-winged, depressed-obovate in lateral view, 5–11 mm long, 11–15 mm wide, glabrous; wings 3.5–8 mm wide, membranous; dehiscence septicial. Fig. 30F.

Widespread in southern Qld, also in New England area of N.S.W. and one collection E of Daly Waters in N.T. Grows in mixed shrubland, in open eucalypt woodland, dry forest or hummock grassland with *Eucalyptus melanophloia* F.Muell., usually on sandstone or red sandy soil or on limestone and basalt outcrops. Map 188.

N.T.: 96 km E of Daly Waters, *N.Byrnes 2553* (NSW, NT, CANB). Qld: 11 km N of Craigie Stn, *M.Lazarides 3721* (BRI, CANB); 12 km NE of Mt Isa, *J.G.West 4306–4311* (BRI, CANB); Enniskillen, *C.T.White 12393* (BRI). N.S.W.: Bingara, Sept. 1907, *J.L.Boorman* (NSW).

Leaves of *D. stenophylla* and the narrow-leaved forms of *D. viscosa* subsp. *angustissima* are very similar, but where the two taxa occur together the leaves of the latter subspecies are broader and less rigid. The fruits are very different.

**33. *Dodonaea tenuifolia*** Lindl. in T.Mitchell, *J. Exped. Trop. Australia* 248 (1848)

T: Belyando R., Qld, 25 July 1846, *T.L.Mitchell 209*; holo: CGE; iso: NSW.

*Dodonaea macrozyga* F.Muell., *Fragm.* 4: 135 (1864). T: sources of the Cape R., Qld, *E.Bowman 175*; holo: MEL; probable iso: MEL, NSW.

Dioecious spreading shrub to 3 m. Leaves imparipinnate, 4.5–9.5 cm long excluding petiole; leaflets 9–25, linear, usually shallowly channelled above, broadly acute to obtuse, entire, narrowly cuneate at base, 9–22 mm long, rarely to 30 mm, 1–2 mm wide, glabrous; petiole 8.5–18 mm long. Flowers in 6–10-flowered axillary cymes; pedicels 6.5–9 mm long. Sepals 4, ovate, 1.5–1.6 mm long, caducous. Stamens not seen. Ovary glabrous. Capsule 4-winged, transversely oblong in lateral view, 4.5–5 mm long, rarely to 9 mm, 10.5–20 mm wide, glabrous; wings 2.5–5 mm wide, rarely to 9 mm, coriaceous; dehiscence septifragal. Fig. 30G.

Occurs in south-eastern Qld, in a few widely separated populations from the Cape R. in the north to Roma in the south and Enniskillen inland. Grows on rocky hillsides, often associated with open eucalypt forest. Map 189.

Qld: Lexington, N of Springsure, *S.T.Blake 6995* (BRI, CANB); 11 km N of Yoothoppinna Stn, Injune district, *C.Gittins 2747* (BRI, NSW); Thomby Range, *D.M.Gordon 45* (BRI); E of Tambo, *W.T.Jones 3716* (CANB); Table Mt, *P.A.O'Shanesy 1285* (MEL).

**34. *Dodonaea rhombifolia*** Wakef., *Victorian Naturalist* 72: 22, fig. 1 (1955)

T: lower Hume R., Vic., Jan. 1874, *F.Mueller s.n.*; holo: MEL 84136; iso: NSW, K.

Illustration: L.Costermans, *Native Trees Shrubs S.E. Australia* 214 (1981).

Dioecious erect shrub to 2 m. Leaves simple, elliptic, rarely obovate, acute, entire, revolute, attenuate at base; lamina 4.5–8.2 cm long, 1.4–2.7 cm wide, glabrous, usually white-spotted below; petiole 4–10.5 mm long. Flowers in axillary few-flowered cymes; pedicels 3.5–8.5 mm long. Sepals 4, lanceolate to ovate, 2–3.4 mm long, caducous. Stamens 8. Ovary glabrous. Capsule 4-winged, depressed-obovate or transversely elliptic in lateral view, 10–13 mm long, 15–24 mm wide, glabrous; wings 6–8.5 mm wide, membranous; dehiscence septifragal. Fig. 30H.

Occurs in north-eastern Vic. and south-eastern N.S.W., with disjunct areas in the Warrumbungle Mts and Gloucester area of north-eastern N.S.W. Often grows in rocky granitic or basaltic soil by creeks. Map 190.

N.S.W.: Guneemooroo Stn, Warrumbungle Mts, *E.F.Constable* 36 (NSW); Gloucester Bucketts, W of Gloucester, Sept. 1965, *R.Coveny* (NSW); Upper Tuross R. area, The Scout, Apr. 1971, *I.Olsen* (NSW); Mt Naman, 34 km NW of Coonabarabran, *H.Streimann* 765 (A, AD, BRI, CBG, K, L, NSW). Vic.: Snowy R. gorge tract, E of Butchers Ridge, *N.A.Wakefield* 4688 (MEL).

### 35. *Dodonea truncatiales* F.Muell., *Fragm.* 2: 143 (1861)

*Dodonea calycina* var. *truncatiales* (F.Muell.) Domin, *Biblioth. Bot.* 89: 358 (1927), *nom. illeg.*

T: Towamba R., Vic., Sept. 1860, *F.Mueller s.n.*; lecto: MEL 84144 *fide* J.G.West, *Brunonia* 7: 100 (1984).

[*Dodonea calycina* A.Cunn. ex A.Gray, *U.S. Expl. Exped., Bot., Phan.* 1: 262 (1854), *nom. nud.*]

*Dodonea calycina* var. *genuina* Domin, *Biblioth. Bot.* 89: 358 (1927), *nom. illeg.*

Dioecious or rarely polygamo-dioecious erect shrub to 3 m. Leaves simple, sessile, erect, narrowly elliptic, rarely oblanceolate or linear, acute, rarely mucronate, entire or denticulate, sometimes dentate, revolute; lamina 5.5–10 cm long, rarely to 13.5 cm, 0.5–1.3 cm wide, glabrous; attenuate at base, extending as a rib or small wing down the stem. Flowers in axillary cymes; pedicels 3–8.5 mm long, rarely to 14 mm. Sepals 4, lanceolate to ovate, 1.5–3.5 mm long, caducous. Stamens 8. Ovary pubescent. Capsule 3- or 4-winged, depressed-obovate to transversely oblong in lateral view, 5.5–8 mm long, 17–25 mm wide, glabrous or sparsely puberulent; wing 7–10 mm wide, rarely as narrow as 4.5 mm, membranous; dehiscence septifragal. Fig. 30 I.

Occurs in the central and south coast and central tablelands regions of N.S.W. and in eastern Vic., in dry sclerophyll forest in sandstone, often near rivers. Map 191.

N.S.W.: Nepean R., Douglas Park, *E.F.Constable* 6225 (NSW); Mt Yengo, 16 km S of Howes Valley, *E.F.Constable* 7159 (AD, MEL, NSW); Green Gully, 2 km S of Glen Davis P.O., *M.D.Crisp* 2214 & *I.R.Telford* (AD, BRI, CBG); Nowra showgrounds, J.G.West 2566–2570 (AD, CANB, NSW). Vic.: 5 km SE of Genoa, *J.G.West* 840–841 (AD).

### 36. *Dodonea heteromorpha* J.West, *Brunonia* 7: 101 (1984)

*Dodonea truncatiales* var. *heterophylla* Maiden & Betche, *Proc. Linn. Soc. New South Wales* ser. 2, 29: 738 (1905). T: Mudgee Road, 4 miles (c. 6 km) from Dubbo, N.S.W., 13 Oct. 1904, *R.H.Cambage* 1062; lecto: NSW *fide* J.G.West, *loc. cit.*

[*Dodonea truncatiales* auct. non F.Muell.: *N.A.Wakefield*, *Victorian Naturalist* 72: 23–25, fig. 2 (1955)]

Illustration: G.M.Cunningham *et al.*, *Pl. W. New South Wales* 473 (1981)

Dioecious erect shrub to 3 m. Leaves sessile, usually simple, sometimes irregularly pinnate with 1–10 leaflets; simple leaves 3.5–8.3 cm long, 0.2–0.5 cm wide; leaflets 0.6–3 cm long, 0.2–0.3 cm wide; lamina of simple leaves and leaflets linear to linear-lanceolate, acute, entire and revolute, attenuate at base, glabrous. Flowers in axillary cymes; pedicels 3.5–10 mm long, rarely to 12.5 mm. Sepals 4, ovate, 1.5–2.3 mm long, caducous. Stamens 8. Ovary glabrous. Capsule 4-winged, transversely oblong in lateral view, 5–6.5 mm long, 15–25 mm wide, glabrous; wings 6.5–10 mm wide, membranous or rarely coriaceous; dehiscence septifragal. Fig. 30J.

Occurs widely in N.S.W. west of the Great Dividing Range and in south-eastern Qld, with one record from western Vic. Grows in semi-arid areas in skeletal soils with mallee ironbark or on red soil plains in open woodland. Map 192.

Qld: between Dalby & Kogan, Aug. 1961, *M.E.Phillips* (CBG); Little Mt Edwards, 15 km W of Boonah, *P.R.Sharpe* & *B.Lebler* 2418 (BRI). N.S.W.: Goonoo State Forest, 17 km SW of Mendooran, *M.D.Crisp* 4427–4428 (AD, CBG); c. 10 km NNW of Tullamore, *H.Salasoo* 5193 (NSW). Vic.: Mt Zero, Grampians, 1894, *W.E.Matthews* (MEL).

*Dodonaea heteromorpha* is the only species with both simple and compound mature foliage.

**37. *Dodonaea filiformis* Link, *Enum. Hort. Berol.* 1: 381 (1821)**

T: Cultivated, Paris, 'Dodonaea filiformis hort. berolia'; neo: FI *fide* J.G.West, *Brunonia* 7: 103 (1984).

*Dodonaea ericaefolia* G.Don, *Gen. Hist.* 1: 674 (1831). T: specimen in Lambert's herbarium; *n.v.*

*Dodonaea salsolifolia* A.Cunn. ex Hook., *London J. Bot.* 1: 251 (1834). T: Tasmania, R.C.Gunn *s.n.*; lecto: K *fide* J.G.West, *loc. cit.* .

[*Dodonaea angustissima* auct. non DC.: D.F.L. von Schlechtendal, *Linnaea* 17: 640 (1843)]

Dioecious erect shrub to 2 m. Leaves simple, obscuring branches, sessile, linear, concave or channelled above, convex or ridged below, obtuse, entire, narrowly cuneate at base, 1.2–2.2 cm long, 0.05–0.1 cm wide, glabrous. Flowers solitary or in 3- or 4-flowered terminal cymes; pedicels 1–3 mm long. Sepals 4 or 5, oblong or linear to linear-lanceolate, 0.6–1.5 mm long, longer in female than male flowers, caducous. Stamens 5, rarely 6. Ovary glabrous. Capsule 3-winged, transversely elliptic in lateral view, 9.5–11 mm long, 12–16.5 mm wide, glabrous; wings 3–5 mm wide, membranous; dehiscence septifragal. Fig. 30K.

An endemic Tasmanian species; widespread in the eastern half of the island. Grows in dense riverine *Leptospermum* scrub and in sclerophyll forest in gravelly or rocky soils. Map 193.

Tas.: Russell R., Upper Huon, A.V.Giblin H162 (BRI, HO); New Norfolk, 11 Dec. 1840, R.Gunn (NSW); Distillery Ck, Launceston, Dec. 1961, King (MEL); Shannon R. at junction of Ouse R., A.Moscal 727 (HO); 7.5 km NE of Bagdad, J.G.West 4792–4796 (CANB, HO).

**38. *Dodonaea subglandulifera* J.West, *Brunonia* 7: 105 (1984)**

T: Peep Hill, Sutherlands, 145 km NE of Adelaide, S.A., 13 Nov. 1936, E.F.Boehm *s.n.*; holotype: AD 96222231.

*Dodonaea adenophora* var. *ovata* Ewart, *Proc. Roy. Soc. Victoria* ser. 2, 19: 39 (1907). T: sent from Adelaide by J.H.Brown to F.Mueller in 1884; holotype: MEL 101394.

[*Dodonaea tenuifolia* auct. non Lindl.: L.A.T.Radlkofer, *Pflanzenr.* 98: 1387–1389 (1933), p.p.]

Dioecious or rarely polygamo-dioecious erect shrub to 2 m. Leaves imparipinnate, 0.7–1.6 cm long excluding petiole; lateral leaflets 8–16, linear, obtuse, narrowly cuneate at base, 3–7.5 mm long, 0.8–1.5 mm wide, glabrous; margin entire or very rarely with 1 or 2 teeth near the apex; terminal leaflet shorter, otherwise similar to laterals; petiole 1–3 mm long. Flowers paired or 3 together; pedicels 3.5–6.5 mm long. Sepals 3 or 4, ovate, 1.6–2.5 mm long, caducous. Stamens 6–8. Ovary sparsely pubescent. Capsule 3- or 4-winged, transversely elliptic to transversely obovate in lateral view, 6.5–7 mm long, 10–15 mm wide, sparsely pubescent; wings 3–4 mm wide, coriaceous to membranous; dehiscence septifragal. Fig. 30L–M.

Occurs in only a small number of isolated localities in semi-arid areas of south-eastern S.A. Map 194.

S.A.: 5 km N of Wallaroo, Upper Yorke Peninsula, B.Copley 2883 (AD); Peterborough, 3 April 1932, E.H.Ising (AD); W of Sutherlands, Murray Mallee, E.N.S.Jackson 367 (AD, NSW); Sedan, F.Rothe 1360 (MEL); 9.6 km S of Port Wakefield on Princes Hwy, J.G.West 1620 (AD).

**39. *Dodonaea lobulata* F.Muell., *Linnaea* 23: 372 (1853)**

T: Flinders & Elders Ranges, S.A., Oct. 1851, F.Mueller; lecto: MEL 84108 *fide* J.G.West, *Brunonia* 7: 107 (1984); isolecto: MEL, FI.

Illustrations: E.R.Rotherham *et al.*, *Fl. Pl. New South Wales & S. Queensland* 147 (1975); G.M.Cunningham *et al.*, *Pl. W. New South Wales* 471 (1981).

Dioecious erect shrub to 3 m high. Leaves sessile, irregularly pinnatifid or irregularly 2–12-lobed in apical 2/3, entire in basal 1/3, rarely whole leaf entire; lobes elliptic to

linear-oblong, obtuse to rounded, 1–1.5 mm long, rarely to 5 mm; lamina linear to linear-oblongate, obtuse, narrowly attenuate at base, 1.5–5.5 cm long, 0.1–0.25 cm wide, glabrous to puberulent. Flowers paired or 3 together; pedicels 3–6.5 mm long. Sepals 3 or 4, ovate, 1.6–2.7 mm long, caducous. Stamens 6–8. Ovary glabrous. Capsule 3-winged, rarely 4-winged, transversely elliptic or broadly obovate in lateral view, 10.5–15 mm long, 14–21 mm wide, glabrous; wings 4–7 mm wide, coriaceous to membranous; dehiscence septifragal. Fig. 31A.

Occurs in arid areas of southern Australia; in W.A. from Leonora to Mt Ragged but absent from the Nullarbor Plain; throughout arid southern S.A. to the Broken Hill and Cobar areas of western N.S.W. Grows on rocky slopes, hills and ridges of various rock types and in clay and sandy loams, in arid open woodland or shrubland. Map 195.

W.A.: Mt Jackson, 68 km NNW of Koolyanobbing, *K.Newbey 9101* (PERTH); 4 km S of Menzies on road to Kalgoorlie, *J.G.West 3441–3445* (AD, C, CANB, PERTH, W). S.A.: Gawler Ranges, 15 km NE of Mt Ive Homestead, *V.Jaegermann 177* (AD); Bibliando Stn, S side of The Bluff, *J.G.West 382–385* (AD, CANB, MEL). N.S.W.: Tundulya Stn, 40 km SE of Louth, *C.W.E.Moore 5689* (CANB).

In W.A. *D. lobulata* shows variation in leaf morphology, and putative hybrids with *D. microzyga* var. *acrolobata*, intermediate in leaf shapes, sometimes occur.

In some areas *D. lobulata* is an important forage plant for domestic animals. It is also heavily grazed by feral goats.

Can be distinguished from *D. ptarmicaefolia* by the latter's regular, serrate broader leaves, pubescent ovary and smaller capsules.

#### 40. *Dodonea ptarmicaefolia* Turcz., *Bull. Soc. Imp. Naturalistes Moscou* 25(2): 155 (1852)

T: south-western W.A., 1850, *J.Drummond 5th Coll. 248*; syn: BM, G, K, MEL.

Dioecious erect shrub to 4 m. Leaves simple, sessile or rarely petiolate, linear, rarely oblong or lanceolate, acute, recurved, attenuate at base, 2–5.3 cm long, 0.1–0.3 cm wide, rarely to 0.6 cm, glabrous, serrate with serrations 1–1.5 mm long, usually entire in lower 1/3; petiole 3–8 mm long. Flowers in 3- or 4-flowered axillary cymes; pedicels 3.5–7.5 mm long. Sepals 3, rarely 4, ovate, 1.5–2 mm long, caducous. Stamens 6, rarely as many as 8. Ovary pubescent. Capsule 3-winged, rarely 4-winged, transversely elliptic or transversely obovate in lateral view, 6–10.5 mm long, 10–16 mm wide, glabrous; wings 3–5 mm wide, membranous; dehiscence septifragal. Fig. 31B.

Occurs in south-western W.A. from Tammin to Peak Charles, in sandy or granitic loams in mallee scrub. Map 196.

W.A.: Tarin Rock, 20 km W of Lake Grace, *A.M.Ashby 1930* (AD); Phillips R. crossing, 15 km SW of Ravensthorpe on road to Ongerup, *L.A.R.Haegi 1046* (AD); c. 126 km S of Coolgardie, *P.R.Jefferies 641028* (PERTH); Peak Charles, 100 km SW of Norseman, *J.G.West 2913–2919* (AD, CANB, K, L, NSW, PERTH); 15.2 km E of Newdegate, *J.G.West 3111–3115* (AD, PERTH).

Can be distinguished from *D. lobulata* by its regular, serrate broader leaves, its pubescent ovary and smaller capsules. Plants in the Peak Charles population have broader, shorter leaves and sometimes longer serrations than the typical form.

#### 41. *Dodonea rigida* J.West, *Brunonia* 7: 111 (1984)

T: 18.4 km N of Broad Arrow, 42.5 km S of Comet Vale, 30°17'S, 121°15'E, W.A., 13 Nov. 1978, *J.G.West 3459*; holotype: AD; isotype: PERTH.

[*Dodonea filifolia* auct. non Hook.: F.Mueller & R.Tate, *Trans. & Proc. Roy. Soc. S.Australia* 16: 343 (1896)]

Dioecious erect shrub to 2 m. Leaves simple, sessile, rigid, erect, subfiliform, terete or 4-ribbed, acute, sometimes pungent, entire, 3.4–7.5 cm long, rarely to 10.2 cm, 0.1 cm wide, glabrous. Flowers in 3- or 4-flowered axillary cymes; pedicels 4.5–7.5 mm long. Sepals 3 or 4, broadly ovate, 1.4–1.7 mm long, caducous. Stamens not seen. Ovary

glabrous. Capsule 3- or 4-winged, broadly elliptic in lateral view, 10–15 mm long, 14–17 mm wide, glabrous; wings 4–6.5 mm wide, membranous; dehiscence septifragal. Fig. 31C–E.

Occurs in southern eremean W.A. from Paynes Find to the Gibson and Great Victoria Deserts. Grows on sand dunes, rocky ironstone rises, by sandy creeks and in red sandy loam in arid shrubland. Map 197.

W.A.: Poison Ck, 80 km N of Leonora, *R.C.Carolin 5810* (NSW); Miss Gibson Hill, SW of Warburton, A.S.George *4076* (PERTH); 7 km N of Windarling Peak, 90 km NNW of Koolyanobbing, *K.Newbey 9116* (PERTH); c. 11 km S of Wongawol Ck, *N.H.Speck 1299* (BRI, CANB, MEL, PERTH); 18.7 km S of Menzies, *J.G.West 3452–3455* (AD, NSW).

The narrow-leaved forms of *D. viscosa* subsp. *angustissima* can be confused with *D. rigida*. The former has flat leaves and terminal inflorescences. *D. rigida* can be distinguished from *D. filifolia* from Qld by its rigid leaves which are 4-angled or terete in cross section and its simple juvenile leaves.

#### 42. *Dodonaea hackettiana* W.Fitzg., *J. W. Austral. Nat. Hist. Soc.* 2: 21 (1905)

T: Kings Park, Perth, W.A., Aug. 1904, *J.Sheath*; holotype: NSW 144256.

Dioecious erect shrub to 4.5 m. Leaves simple, sessile, narrowly elliptic, acute, entire, attenuate at base, 3–5.5 cm long, 0.4–0.9 cm wide, sparsely pubescent on midrib and margin. Flowers in terminal panicles; pedicels 1.8–4.5 mm long. Sepals 3, rarely 4 in male flowers, ovate, 1.6–2.1 mm long, caducous. Stamens 6, rarely 8. Ovary pubescent. Capsule 3-winged, transversely elliptic in lateral view, 9.5–13 mm long, 12.5–17 mm wide, glabrous; wings 3.5–5.5 mm wide, membranous; dehiscence septifragal. Fig. 31F.

Confined to a very small area around Perth, W.A.; grows in limestone soil in open eucalypt forest. Map 198.

W.A.: near Perth, July 1904, *W.V.Fitzgerald* (NSW); Kings Park, *J.W.Green & B.Stokes 297* (PERTH); Kings Park, Perth, 1911, *J.Sheath* (AD, NSW, PERTH); 1 km S of Bibra Lake, *J.G.West 3262–3267* (AD, CANB, NSW, PERTH); 24 km S of Perth, S of Thompson Lake, *J.G.West 3268–3271* (AD, CANB, L, MEL, PERTH).

This species is distinct in the genus in having 2 or 3 rows of dense white hairs on the branchlets and extending to the branches. These hairs distinguish *D. hackettiana* from *D. viscosa*.

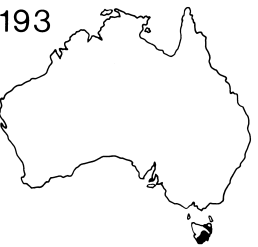
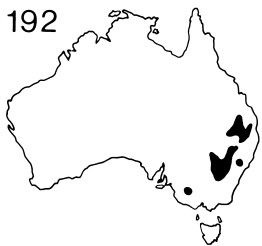
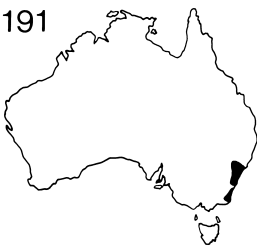
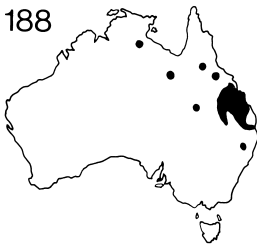
#### 43. *Dodonaea pachyneura* F.Muell., *Pl. Coll. Capricornic W. Australia* by *H.S.King* 2 (1886)

T: between the Gascoyne and Fortescue Rivers, W.A., 1885, *H.S.King*; holotype: MEL 84118.

Dioecious erect shrub to 4 m. Leaves simple, sessile or tapering to a petiole 3–12 mm long, or lamina linear or oblanceolate, acute, obtuse or mucronate, entire or irregularly denticulate, attenuate at base, 2–6 cm long, 0.2–0.7 cm wide, glabrous, rarely sparsely puberulent on midrib and margin. Flowers in few-flowered axillary cymes; pedicels 1.5–4 mm long. Sepals 3, rarely 4, broadly lanceolate to ovate, 1.2–1.7 mm long, caducous or sometimes persistent. Stamens 6, rarely as many as 8. Ovary glabrous. Capsule 3-winged, rarely 4-winged, depressed-ovate in lateral view, 6–9 mm long, 11–16 mm wide, glabrous; wings 2.5–5.5 mm wide, membranous; dehiscence septifragal. Fig. 31G.

Occurs in Hamersley and Robinson Ranges of W.A. extending south to Meekatharra; on rocky hillsides and ironstone ridges or in red sandy or stony soils. Map 199.

W.A.: Circular Pool, Dale Gorge, Hamersley Range National Park, *W.R.Barker 1980–1982* (AD); Beasley R., 68 km N of Ashburton Downs, *R.J.Chinmock 3911* (AD); Meekatharra, *C.Gardner 2314* (PERTH); Henry R., Barlee Range, *R.D.Royce 6554* (AD, PERTH); c. 13 km W of Mileura–Nookawarra road, *N.H.Speck 1009* (AD, BRI, CANB, PERTH).



181. *Dodonaea stenozyga*

184. *Dodonaea adenophora*

187. *Dodonaea platyptera*

190. *Dodonaea rhombifolia*

193. *Dodonaea filiformis*

182. *Dodonaea microzyga*  
var. *microzyga*

185. *Dodonaea oxyptera*

188. *Dodonaea stenophylla*

191. *Dodonaea truncatiales*

194. *Dodonaea subglandulifera*

183. *Dodonaea microzyga*  
var. *acrolobata*

186. *Dodonaea hirsuta*

189. *Dodonaea tenuifolia*

192. *Dodonaea heteromorpha*

195. *Dodonaea lobulata*

**44. Dodonaea megazyga** (F.Muell.) F.Muell. ex Benth., *Fl. Austral.* 1: 483 (1863)

*Dodonaea viscosa* var. *megazyga* F.Muell., *Pl. Victoria* 1: 86 (1862). T: Hastings R., N.S.W., *H.Beckler s.n.*; lecto: MEL 84112 *vide* J.G.West, *Brunonia* 7: 115 (1984); isolecto: K, L, MEL (2 sheets), U (2 sheets).

Dioecious erect shrub or small tree to 5 m. Leaves imparipinnate, 7.2–14.5 cm long excluding petiole, rarely to 20.5 cm; leaflets 19–31, rarely as few as 13, lanceolate, usually oblique, acute, entire, revolute, cuneate at base, 17–24.5 mm long, rarely to 42 mm long, 4–7.5 mm wide, puberulent; petiole 18.5–30 mm long, rarely to 47.5 mm. Flowers in many-flowered axillary cymes; pedicels 2.2–7 mm long. Sepals 3 or 4, lanceolate to broadly ovate or broadly oblong, 1.8–2.7 mm long, caducous. Stamens 8. Ovary sparsely pubescent. Capsule 3-winged, depressed-obovate in lateral view, 7.5–10.5 mm long, 13.5–22.5 mm wide, glabrous; wings 4.5–8 mm wide, membranous; dehiscence septifragal. Fig. 31H.

Occurs from Sydney area N through eastern N.S.W. to just north of the border in south-eastern Qld. Grows in dry sclerophyll forest or on margins of rainforest, usually in sandstone. Map 200

Qld: Lamington National Park, *C.T.White 11877* (BRI). N.S.W.: Frenchs Ck, Bulga State Forest, *P.Burgess 127* (NSW); Malara State Forest, 24 km ENE of Tenterfield, *E.F.Constable 1175B* (NSW); 45 km SW of Gloucester, *R.Coveny 14* (NSW); by Williams R., 64 km N of Singleton, *R.Schodde 3202* (A, AD, B, CANB, L, NSW, P, WELT).

**45. Dodonaea larreoides** Turcz., *Bull. Soc. Imp. Naturalistes Moscou* 31(1): 408 (1858)

T: south-western W.A., 1845, *J.Drummond 3rd Coll. 213*; syn: BM, CGE, G, K, MEL, P, W.

*Dodonaea foliolosa* F.Muell., *Fragm.* 2: 182 (1861); based on *D. multijuga* F.Muell.; *D. multijuga* F.Muell., *Fragm.* 1: 219 (1859), *nom. illeg., non* G.Don, *Gen. Hist.* 1: 674 (1831). T: Murchison R., W.A., *A.Oldfield s.n.*; holotype: MEL; iso: U.

Dioecious erect shrub to 4 m. Leaves imparipinnate, 2.5–5 cm long excluding petiole; leaflets 17–31, oblong to obovate, acute to obtuse, rarely mucronate, recurved, often 2- or 3-toothed, entire and recurved, cuneate and oblique at base, 5–7 mm long, 2–3 mm wide, glabrous or sparsely pubescent on margin; petiole 7–13 mm long. Flowers in few-flowered axillary cymes; pedicels 7–10 mm long. Sepals 3, rarely 4, ovate, 2.3–2.5 mm long, caducous or sometimes persistent. Stamens and ovary not seen. Capsule 3-winged, rarely 4-winged, transversely obovate in lateral view, 6.5–9 mm long, 10–13 mm wide, glabrous; wings 3–4 mm wide, membranous; dehiscence septifragal. Fig. 31 I.

Occurs in south-western W.A. from Ajana north of Geraldton, south to Cunderdin. Grows in sandy or calcareous grey loams or laterites in semi-arid mallee scrub and woodlands. Map 201.

W.A.: near Yuna, 34 km E of Northampton, *A.M.Ashby 305* (AD); Ajana, *C.A.Gardner 1999* (PERTH); c. 11 km N of Watheroo on Geraldton Hwy, *R.Melville 4112* & *J.Calaby* (K, NSW, MEL); c. 14 km E of Moonijin, E of Wongan Hills, *K.Newbey 1988* (PERTH); 3 km E of Dumbo Well, 8 km N of Lake Hinds, 25 km NW of Wongan Hills township, *J.G.West 3215–3217* (AD, CANB, NSW, PERTH).

**46. Dodonaea inaequifolia** Turcz., *Bull. Soc. Imp. Naturalistes Moscou* 31(1): 408 (1859)

T: south-western W.A., 1848, *J.Drummond 4th Coll. 258*; syn: BM, CGE, G, K, MEL, W.

*Dodonaea leptozyga* F.Muell., *Fragm.* 1: 219 (1859). T: Murchison R., W.A., *A.Oldfield*; lecto: MEL *vide* J.G.West, *Brunonia* 7: 117 (1984); isolecto: MEL, W.

[*Dodonaea concinna* auct. non Benth.: F.Mueller, *Fragm.* 9: 87 (1875), p.p.]

Dioecious erect shrub to 5 m. Leaves imparipinnate, 1.5–5.2 cm long excluding petiole; leaflets 17–23, linear, channelled above, convex below, obtuse, rarely tri-dentate at apex, entire, narrowly cuneate at base, 2–13 mm long, rarely to 23.5 mm, 0.5–1.5 mm wide, usually sparsely pubescent or rarely glabrous; petiole 7–17.5 mm long, rarely to 25 mm.



Flowers in 2–6-flowered axillary cymes; pedicels 3–8.5 mm long. Sepals 3 or 4, ovate, 1.5–3.5 mm long, caducous. Stamens 6, rarely 7 or 8. Ovary glabrous, or sparsely pubescent near apex. Capsule 3-winged, rarely 4-winged, depressed-obovate in lateral view, 4.5–7.5 mm long, 9–16 mm wide, glabrous; wings 2–5 mm wide, membranous; dehiscence septifragal. Fig. 31J.

Occurs in south-western W.A. from Dirk Hartog Is. to Southern Cross; usually in granitic or lateritic soils in semi-arid mallee heath, mallee scrub or open woodland. Map 202.

W.A.: Mollerin, N of Tammin, *K.M.Allan* 45 (PERTH); 18.2 km N of Southern Cross on Bullfinch road, *R.J.Chinnock* 3103 (AD); c. 11 km N of Murchison R. bridge, NW Coastal Hwy, *R.Filson* 8560 (MEL, PERTH); East Fisherman Paddock, Dirk Hartog Is., *A.S.George* 11530 (PERTH); 0.5 km E of Pithara, *J.G.West* 3223–3224 (AD, PERTH).

Putative hybrids between *D. inaequifolia* and *D. adenophora* have been found in a few locations where both species occur together.

#### 47. *Dodonea aptera* Miq. in Lehm., *Pl. Preiss.* 1: 225 (1845)

T: Arthurs Head (Fremantle) and Garden and Rottne Islands, W.A., 9 Nov. 1839, *L.Preiss* 2439; lecto: U fide J.G.West, *Brunonia* 7: 118 (1984); isolecto: MEL, P.

*Dodonea sororia* Miq. in Lehm., *Pl. Preiss.* 1: 225 (1845). T: Rottne Is., W.A., Aug. 1839, *L.Preiss* 2388; lecto: U fide J.G.West, *loc. cit.*; isolecto: MEL, L, P, W.

Dioecious erect shrub to 3.5 m. Leaves simple, elliptic, rarely obovate, obtuse, sometimes retuse, entire, attenuate at base; lamina 2.2–6 cm long, 1–3.2 cm wide, glabrous; petiole 4–10.5 mm long, rarely shorter. Flowers in terminal cymes or panicles; pedicels 3–7 mm long. Sepals 4, lanceolate, 2.5–3 mm long, caducous. Stamens 8. Ovary glabrous. Capsule 4-angled, subglobose, transversely obovate or broadly oblong in lateral view, 5–6 mm long, 6–7 mm wide, glabrous; appendages usually present, lobe-like, at capsule apex only, 0.5–1 mm wide, crustaceous; dehiscence septifragal. Fig. 31K.

Occurs in the coastal area of south-western W.A. from Geraldton south to Yallingup. Grows on coastal limestone cliffs or on shallow sand over limestone, usually in open eucalypt woodland. Map 203.

W.A.: Geraldton, *R.Coveny* 3014 (AD, MEL, NSW, PERTH); 2 km on Cliff Head road, *H.Demarz* 7152 (PERTH); below Devils Elbow, Bindaring Parade, Peppermint Grove (Perth), *A.S.George* 14842 (PERTH); Yalgorup National Park, *S.Paust* 1336 (PERTH); 0.5 km E of Canal Rocks, 32 km W of Bussleton, *J.G.West* 3246 & 3248 (AD, CANB, PERTH).

#### 48. *Dodonea ceratocarpa* Endl., *Enum. Pl.* 13 (1837)

T: King George Sound, W.A., *C.Huegel*; holo: W.

*Dodonea pterocaulis* Miq. in Lehm., *Pl. Preiss.* 1: 225 (1845). T: near Tjallop (Kent District), W.A., 17 Nov. 1840, *L.Preiss* 2440; lecto: U fide J.G.West, *Brunonia* 7: 120 (1984); isolecto: G.

[*Dodonea oblongifolia* auct. non Link: L.A.T. Radlkofer, *Pflanzenr.* 98: 1396 (1933)]

Dioecious spreading shrub to 2.5 m. Leaves simple, sessile, oblanceolate to obovate, rarely narrowly elliptic, acute or mucronate, entire, revolute, attenuate at base, 1.4–3 cm long, rarely to 5.6 cm, 0.3–1 cm wide, glabrous. Flowers in 3- or 4-flowered terminal cymes; pedicels 1.5–3 mm long. Sepals 4, ovate, 2–3.5 mm long, caducous. Stamens 8. Ovary sparsely pubescent. Capsule 4-angled, rarely 3-angled, excluding appendages globose or sometimes broadly oblong in lateral view, including appendages 4.5–8 mm long, 5–8.5 mm wide, rarely to 11 mm, glabrous; appendages horn-like, at capsule apex only, 1–3 mm wide, crustaceous; dehiscence septifragal. Fig. 31L.

Restricted to coastal region of south-western W.A. from Perth to Israelite Bay. Grows on coastal headlands and cliffs and further inland on granite and limestone outcrops, in low forest and mallee heath communities. Map 204.

W.A.: Mara Bridge, Pallinup R., between Albany & Jerramungup, Nov. 1968, *E.M.Canning* (CBG, NSW); Boyatup Hill, 110 km E of Esperance, *H.Eichler* 20067 (AD, C, CANB, PERTH); Helena R., c. 3 km

from Mundaring Weir, *A.S. George 6775* (PERTH); 2.5 km SE of Cape Naturaliste, *J.G. West 3234–3245* (AD, BRI, E, H, K, L, MEL, NSW, PERTH, W); 30 km S of Mt Ragged on road to Israelite Bay, *P.G. Wilson 10072* (PERTH).

#### 49. *Dodonaea baueri* Endl., *Enum. Pl.* 13 (1837)

T: 3 km SW of Black Hill, Mt Remarkable National Park, 50 km SE of Port Augusta, 32°51'S 138°03'E, S.A., 11 Oct. 1975, *J.G. West 1170*; neo: AD *fide* J.G. West, *Brunonia* 7: 121 (1984); isoneo: CANB.

*Dodonaea deflexa* F. Muell., *Trans. Phil. Soc. Victoria* 1: 8 (1855). T: Murray R., S.A., April 1849, *H. Behr*; lecto: MEL *fide* J.G. West, *loc. cit.*

Dioecious spreading or sometimes prostrate shrub to 1 m high. Leaves simple, obovate, rarely broadly oblong or orbicular, truncate or rounded, irregularly 3–6-toothed, recurved, undulate, unevenly dentate or repand, narrowly cuneate at base; lamina 0.5–1.8 cm long, 0.3–1 cm wide, glabrous to sparsely puberulent; petiole 0.5–1.5 mm long. Flowers solitary or rarely 2 together; pedicels 2–3.2 mm long. Sepals 4, rarely 5, ovate, 1.6–2.8 mm long, persistent. Stamens 8. Ovary glabrous. Capsule 4-angled, rarely 3- or 5-angled, transversely oblong in lateral view, 4–5 mm long, 5.5–10 mm wide, sparsely puberulent; appendages sometimes present, lobe-like or rarely a narrow wing, above middle of capsule only, 0.5–1 mm wide, crustaceous; dehiscence septifragal. Figs 24, 31M.

Occurs in southern districts and Flinders Ranges of S.A.; usually on rocky hillsides and exposed sites on mountain ridges as a low understorey shrub, in red-brown sandy loam in mallee scrub. Map 205.

S.A.: Finnis, 55 km SSE of Adelaide, *N. Donner 3758* (AD); Northern Flinders Ranges, Edeowie Ck, 55 km N of Hawker, *T.R.N. Lothian 1240* (AD); 4 km S of Macgillivray, 25 km S of Kingscote, Kangaroo Is. *J.G. West 1274* (AD, PERTH); Barber Hill, 7 km SE of Hiltaba Homestead, Gawler Ranges, *J.G. West 2163* (AD); Venus Bay, 8 km W of Port Kenny, Eyre Peninsula, Aug. 1947, *J.H. Willis* (MEL).

#### 50. *Dodonaea ericoides* Miq. in Lehm., *Pl. Preiss.* 1: 227 (1845)

T: south-western W.A., *L. Preiss 2435*; lecto: U *fide* J.G. West, *Brunonia* 7: 124 (1984); isolecto: MEL.

*Dodonaea cryptandroides* Diels in Diels & E. Pritzel, *Bot. Jahrb. Syst.* 35: 347 (1904). T: Darling Ra., W.A., Apr. 1901, *E. Pritzel 295*; lecto: AD *fide* J.G. West, *loc. cit.*; isolecto: G, K, NSW, P, W.

Dioecious erect shrub to 0.8 m. Leaves simple, opposite, rigid, erect, sessile, linear or rarely narrowly oblanceolate, acute, decurrent at base, 0.2–1.5 cm long, 0.1–0.2 cm wide, pubescent or rarely glabrescent; margin strongly revolute, entire or often with 2–4 lobes or teeth at or above middle. Flowers solitary; pedicel 0.5–2 mm long. Sepals 4, ovate, 2.5–5.5 mm long, persistent. Stamens 8. Ovary pubescent. Capsule 4-angled, subglobose or broadly obovate in lateral view, 4–9 mm long, 5–8 mm wide, densely pubescent and grey-tomentose; appendages lobe-like, at or above middle of capsule, 0.5–1 mm wide, crustaceous; dehiscence septifragal. Fig. 31N.

Restricted to a few populations in south-western W.A. from Geraldton south to Wannamal. Grows in woodland and low heath on rocky lateritic hillsides. Map 206.

W.A.: Mt Lesueur, *C. Gardner 9090* (PERTH); c. 11 km E of Wannamal, *A.S. George 5938* (PERTH); 32 km E of Greenhead, *G. Keighery 330* (PERTH); Jurien Bay, *R.D. Royce 7709* (PERTH); Howatharra Hill Reserve, 34 km NE of Geraldton, *J.G. West 3299–3308* (AD, BRI, CANB, CBG, K, L, MEL, NSW, PERTH).

*Dodonaea ericoides* is the only species in the genus with opposite leaves.

The woodland habitats in which *D. ericoides* has been found have been widely cleared for agriculture and the species is now limited to a very few populations.

#### 51. *Dodonaea pinifolia* Miq. in Lehm., *Pl. Preiss.* 1: 227 (1845)

T: near St. Ronan Well, York, W.A., 12 Apr. 1840, *L. Preiss 2438*; lecto: W *fide* J.G. West, *Brunonia* 7: 125 (1984); isolecto: G, L, MEL, U.

*Empleurosma virgata* Bartl. in Lehm., *Pl. Preiss.* 2: 228 (1848). T: Mt Currie, near York, W.A., 15 Apr.

1840, *L.Preiss 2166*; syn: FI, G, MEL, P, W.

*Dodonea pinifolia* var. *submutica* Benth., *Fl. Austral.* 1: 480 (1863); *Dodonea submutica* (Benth.) Domin, *Vestn. Král. České Společn. Nauk, Tr. Mat.-Prír.* 1921–22, 2: 62 (1923). T: south-western W.A., *J.Drummond 4th coll.* 255; holo: K; iso: BM, G, MEL, W.

Dioecious or rarely polygamo-dioecious spreading shrub to 1 m. Leaves simple, sessile, linear, sometimes terete, rarely oblong or obovate, acute or rarely obtuse, revolute, entire or with 1–4 irregular teeth or lobes to 2 mm long, attenuate at base, 0.8–3.5 cm long, 0.1–0.3 cm wide, glabrous or rarely puberulent. Flowers solitary or 2 or 3 together; pedicels 1–4 mm long. Sepals 4, ovate or rarely lanceolate, 2–3.5 mm long, caducous. Stamens 8. Ovary pubescent. Capsule 4-angled, rarely 3-angled, excluding appendages globose or obovoid or broadly oblong in lateral view, including appendages 4.5–11.5 mm long, 5–11.5 mm wide, rarely to 20 mm, glabrous; appendages usually horn-like, sometimes lobe-like, at capsule apex only, 0.5–8 mm wide, crustaceous; dehiscence septifragal. Figs 32A–B, 33.

Widespread in south-western W.A. from Cue and Geraldton to the Stirling Range, Ravensthorpe, Peak Charles and Cape Arid National Park. Grows in rocky situations, in granite and sandy soils in open mallee scrub, mallee heath, woodland and dry sclerophyll forest. Map 207.

W.A.: Peak Charles, *L.Haegi 968* (AD); Wongan Hills, *K.F.Kenneally 2308* (PERTH); c. 26 km S of Pithara, *J.R.Knox 651045* (PERTH); 15 km N of Kellerberrin, *J.G.West 3189–3194* (AD, BM, CANB, CBG, L, PERTH); Cue, *J.G.West 3324–3327* (AD, CANB, PERTH).

Very variable in leaf shape, capsule shape, and size and shape of the fruit appendages. A coloniser following disturbance such as fire or roadside disturbances.

*Dodonea pinifolia* and *D. humifusa* can be distinguished by the flat, oblanceolate to obovate leaves, longer pedicels and smaller, lobe-like capsule appendages of *D. humifusa*.

## 52. *Dodonea humifusa* Miq. in Lehm., *Pl. Preiss.* 1: 226 (1845)

T: Hay district, W.A., Oct. 1840, *L.Preiss 2441*; lecto: U *vide* J.G.West, *Brunonia* 7: 128 (1984); isolecto: G, MEL, W, L.

Dioecious or rarely polygamo-dioecious prostrate shrub to 1 m diam. Leaves simple, sessile, oblanceolate to obovate, rarely linear, acute, sometimes mucronate, attenuate at base, 1–2.5 cm long, rarely to 4 cm, 0.2–0.8 cm wide, glabrous or puberulent on margin and midrib; margin revolute, entire or with 1 or 2 teeth, rarely 3 or 4, usually near apex. Flowers solitary; pedicel 5–22 mm long. Sepals 4, rarely 5, ovate, 2.3–5 mm long, caducous. Stamens 8, rarely 9. Ovary glabrous or puberulent. Capsule 4-angled, rarely 3- or 5-angled, broadly obovoid or rarely oblong in lateral view, 4–8.5 mm long, 4.5–8 mm wide, glabrous; appendages sometimes absent or lobe-like, at capsule apex, 0.5–1 mm wide, crustaceous; dehiscence septifragal. Fig. 32C.

Restricted to south-western W.A. from the Stirling Range north to Narrogin and east to Jerramungup; grows in open *Eucalyptus wandoo* woodland in sandy loam. Map 208.

W.A.: 13 km SE of Jerramungup on Gairdner R., *R.J.Chinmook 4377* (AD); Fisher Road turnoff, Kojonup–Frankland road, A.S.George *14992* (PERTH); Narrogin, Apr. 1904, *A.Morrison* (BRI); Stirling Range National Park, 31.4 km S of Borden, *J.G.West 3057, 3061, 3063* (AD, BRI, PERTH); 21.2 km NW of Katanning on road to Wagin, *J.G.West 3088–3089* (AD, MEL).

Can be distinguished from *D. pinifolia* by its flat, oblanceolate to obovate leaves, longer pedicels and smaller, lobe-like capsule appendages.

## 53. *Dodonea humilis* Endl., *Atakta Bot.* t. 31 (1835)

T: holo: F.Bauer's illustration in Endlicher, *Atakta Bot.* t. 31, 1835; probable iso: Memory Cove (Bay IX), S.A., 22 Feb. 1802, *R.Brown*; BM, CANB, MEL, *vide* J.G.West, *Brunonia* 7: 129 (1984).

[*Dodonea boroniifolia* auct. non G.Don: J.G.O.Tepper, *Trans. & Proc. Roy. Soc. S.Australia* 3: 37 (1880)]

Dioecious spreading shrub to 1 m. Leaves imparipinnate, 0.9–2.6 cm long excluding petiole, rarely to 4.5 cm; lateral leaflets 2–14, obtriangular, obovate, rarely oblanceolate, entire, attenuate to broadly cuneate at base, 3–8 mm long, 2–7 mm wide, glabrous or sometimes with sparse hairs on midrib below; apex 3–7-toothed, terminal leaflet elliptic or obovate, entire or rarely toothed or divided, smaller than laterals; petiole 1–4 mm long. Flowers solitary or in 3–5-flowered terminal cymes; pedicels 1.5–4 mm long. Sepals 4, lanceolate to ovate, 1.8–2.8 mm long, persistent. Stamens 8. Ovary glabrous. Capsule 4-lobed, oblong in lateral view, 4.5–7 mm long, 4.5–6 mm wide, with dense glandular hairs; appendages absent; dehiscence septifragal. Fig. 32D.

Occurs in southern S.A. on Eyre, Yorke and Fleurieu Peninsulas and on Kangaroo Is. A shrub of mallee scrub on limestone or calcareous soils overlying limestone. Map 209.

S.A.: Pondalowie Bay, 10 km NW of Stenhouse Bay, Yorke Peninsula, *B.Blaylock 31* (AD, MEL); Eyre Pen., 32 km N of Cummins, *M.Fagg 479* (AD); 6 km W of Malinong, *M.Sharrad 335 & 341* (AD); Flinders Chase National Park, 0.5 km N of Rocky R. mouth, Kangaroo Is., *J.G.West 1314–1319* (AD, CANB, NSW); Lincoln National Park, 3 km S of Memory Cove, *J.G.West 2020–2025* (AD, CANB, K).

Besides this species only *D. glandulosa* has glandular hairs.

Putative hybrids occasionally arise with *D. hexandra* in areas where both species occur.

#### 54. *Dodonaea trifida* F.Muell., *Fragm.* 9: 88 (1875)

*Dodonaea humifusa* var. *hirtella* Benth., *Fl. Austral.* 1: 483 (1863). T: south-western W.A., *J.Drummond 5th coll.* 249; holo: K; iso: BM, G, MEL.

Dioecious erect shrub to 1 m. Leaves simple, sessile, angular-obovate or sometimes obtriangular, tri-dentate or 3-lobed above middle, rarely the three lobes dividing again, entire and revolute below middle, cuneate at base, 0.7–1.2 cm long, 0.4–1 cm wide, glabrous or pilose on margin and midrib. Flowers in 3–5-flowered terminal cymes; pedicels 1–2 mm long. Sepals 4–6, linear to lanceolate, rarely elliptic, 1.6–4.3 mm long, persistent. Stamens 8. Ovary densely pilose. Capsule 3-angled, subglobose, obovate or broadly angular-obovate in lateral view, 7–10 mm long, 7.5–10 mm wide, sparsely pilose; appendages usually lobe-like, above middle of capsule, 1–2.5 mm wide, coriaceous; dehiscence septifragal. Fig. 32E.

Known from only four populations on the south coast of W.A. from Albany to Kundip. Grows as an undershrub in coastal scrub or low forest, in sandy and gravelly soils. Map 210.

W.A.: Kundip, *K.Newbey 2630* (PERTH); near Thumb Peak, *K.Newbey 2729* (PERTH); Mount Melville, Albany, *K.Newbey 3046* (PERTH); Beaufort Inlet, 0.5 km N of Miller Point on road to Bremer Bay road, *J.G.West 3035–3046* (AD, BRI, CANB, K, L, MEL, NSW, PERTH).

#### 55. *Dodonaea triangularis* Lindl. in T.Mitchell, *J. Exped. Trop. Australia* 219 (1848)

T: Mount Faraday area, Qld, 1 July 1846, *T.L.Mitchell 198*; lecto: CGE *fide* J.G.West, *Brunonia* 7: 132 (1984); isolecto: NSW.

*Dodonaea mollis* Lindl. in T.Mitchell, *J. Exped. Trop. Australia* 212 (1848). T: Maranoa R., Qld, 22 Sept. 1846, *T.L.Mitchell 308*; lecto: CGE *fide* J.G.West, *loc. cit.*

*Dodonaea trigona* Lindl. in T.Mitchell, *J. Exped. Trop. Australia* 236 (1848). T: Balmy Ck, Qld, July 1846, *T.L.Mitchell 178*; holo: CGE.

*Dodonaea lindleyana* F.Muell., *Pl. Victoria* 1: 88 (1862), *nom. illeg.*

Dioecious or rarely polygamo-dioecious shrub to 3 m. Leaves simple, subsessile or with petiole 1–3 mm long; lamina usually obovate, sometimes oblanceolate, cuneate or angular-obovate, rarely spatulate or elliptic, acute, usually tri-dentate or 3-lobed at apex, otherwise entire and revolute, attenuate to broadly cuneate at base, 1.2–3.5 cm long, rarely to 6 cm, 0.6–3 cm wide, pubescent, sometimes on midrib and margin only, rarely glabrous. Flowers solitary or in 3–6-flowered axillary or terminal cymes; pedicels 3.5–10 mm long. Sepals 4, rarely 5, lanceolate, 1.2–3 mm long, persistent. Stamens 6–8. Ovary



196. *Dodonaea ptarmicaefolia*  
 199. *Dodonaea pachyneura*  
 202. *Dodonaea inaequifolia*  
 205. *Dodonaea baueri*  
 208. *Dodonaea humifusa*

197. *Dodonaea rigida*  
 200. *Dodonaea megazyga*  
 203. *Dodonaea aptera*  
 206. *Dodonaea ericoides*  
 209. *Dodonaea humilis*

198. *Dodonaea hackettiana*  
 201. *Dodonaea larreoides*  
 204. *Dodonaea ceratocarpa*  
 207. *Dodonaea pinifolia*  
 210. *Dodonaea trifida*

densely pubescent. Capsule 3-angled, rarely 4-angled, subglobose or broadly obovate in lateral view, 6–9 mm long, 8.5–11.5 mm wide, sparsely pubescent or sometimes glabrous; appendages usually present, lobe-like, usually above middle of capsule only, 1–2 mm wide, crustaceous or coriaceous; dehiscence septifragal, very rarely septicial. Figs 32F, 34.

Occurs in Hunter Valley region of N.S.W. and in south-eastern Qld extending N to Pentland and W to Tambo. Grows on ranges in dry sclerophyll forests or woodlands, in skeletal granitic and sandstone soils. Map 211.

Qld: Callide open cut, 25 km NE of Biloela, *L.A.S.Johnson 7128* & *B.G.Briggs* (NSW); c. 6 km W of Weranga, Tara Line, *L.S.Smith 11332* (BRI); Robinson Gorge, 20 km WNW of Glenhaughton Homestead, *I.R.Telford 5610* (AD, BRI, CBG). N.S.W.: Sandy Hollow, Aug. 1963, *C.Burgess* (CBG); 8 km S of Bulga, Feb. 1968, *R.Coveny* (NSW).

*Dodonaea triangularis* is very variable in indumentum density and leaf morphology.

**56. *Dodonaea caespitosa*** Diels in Diels & E.Pritzel, *Bot. Jahrb. Syst.* 35: 347, fig. 43A–B (1904)

T: fig. 43A–B, *Bot. Jahrb. Syst.* 35: 348; lecto *vide* J.G.West, *Brunonia* 7: 133 (1984).

Dioecious spreading, compact shrub to 0.5 m. Leaves simple, sessile, linear, sometimes terete, obtuse and recurved at apex, revolute, entire or with 1–4 irregular teeth above middle, not constricted at base, 0.2–1 cm long, c. 0.1 cm wide, glabrous or sparsely puberulent. Flowers solitary, subsessile. Sepals 3, ovate, 1.5–2.3 mm long, caducous. Stamens 6. Ovary glabrous. Capsule 3-angled, rarely 4-angled, excluding appendages globose, including appendages 4.5–6 mm long, 5–9 mm wide, glabrous; appendages horn-like, at capsule apex, 1–3 mm wide, crustaceous; dehiscence septifragal. Fig. 32G.

Occurs in south-western W.A. from Koorda to Mt Ragged. Grows in mallee scrub and mallee heath communities, often in granitic soils and associated with granite outcrops. Map 212.

W.A.: 40 km W of Mt Ragged, *C.A.Gardner 12973* (PERTH); Cape Arid National Park, *R.D.Royce 10155* (PERTH); Munglinup R. crossing, 81 km E of Ravensthorpe, *J.G.West 2946–2953* (AD, CANB, MEL, NSW, PERTH); 13.8 km N of Hopetoun, *J.G.West 2979–2983* (AD, PERTH); 9 km E of Southern Cross, *P.G.Wilson 3493* (AD).

**57. *Dodonaea divaricata*** Benth., *Fl. Austral.* 1: 481 (1863)

T: between Moore and Murchison Rivers, W.A., 1853, *J.Drummond 96*; lecto: K *vide* J.G.West, *Brunonia* 7: 135 (1984); isolecto: BM, MEL.

[*Dodonaea ericoides* auct. non Miq.: N.Turczaninow, *Bull. Soc. Imp. Naturalistes Moscou* 31(1): 407 (1858)]

Dioecious spreading shrub to 0.5 m. Leaves simple, sessile, linear, rarely narrowly elliptic or obovate, acute, entire or with 1–4 irregular teeth, attenuate at base, 0.3–0.8 cm long, 0.1–0.3 cm wide, puberulent. Flowers solitary; subsessile or with pedicels 0.5 mm long. Sepals 3, rarely 4 or 5, linear, 1.5–2 mm long, caducous. Stamens 6. Ovary glabrous or pubescent. Capsule 3-angled, excluding appendages globose, including appendages 3–5.5 mm long, 4–6 mm wide, glabrous; appendages horn-like, at capsule apex, 1–3 mm wide, crustaceous; dehiscence septifragal. Fig. 32H.

Occurs in south-western W.A. from Three Springs south to Narembeen. Grows in mixed open mallee scrub, low wandoo woodland and in mallee heath. Map 213.

W.A.: c. 21 km W of Quairading on road to York, *A.S.George 8074* (PERTH); Wongan Hills, Aug. 1925, *E.H.Ising* (AD); c. 19 km E of Ballidu, *R.D.Royce 2139* (PERTH); Pithara, *J.G.West 3218–3221a* (AD, CANB, NSW, PERTH); 11.2 km N of Watheroo, *J.G.West 3277–3280* (AD, BRI, L, MEL, PERTH).



**Figure 33.** *Dodonaea pinifolia*.  
Photograph — J.G.West.



**Figure 34.** *Dodonaea triangularis*.  
Photograph — M.Fagg.



**Figure 35.** *Buchanania obovata*.  
Photograph — A.S.George



**Figure 36.** *Semecarpus australiensis*.  
Photograph — K.A.W.Williams.

**58. *Dodoniaea hexandra*** F.Muell., *Trans. & Proc. Victorian Inst. Advancem. Sci.* 1: 117 (1855)

T: Port Lincoln, S.A., *C.Wilhelmi*; lecto: MEL *fide* J.G.West, *Brunonia* 7:136 (1984); isolecto: BM, K, W.

Dioecious spreading shrub to 0.6 m. Leaves simple, sessile, linear, channelled below, convex above, acute, entire, strongly revolute, attenuate at base, 0.6–1.4 cm long, rarely to 3.5 cm, 0.1–0.2 cm wide, glabrous. Flowers solitary, rarely paired; pedicels 1–1.5 mm long. Sepals 3, ovate, 1.5–3.6 mm long, persistent. Stamens 6. Ovary glabrous. Capsule 3-angled, globose or angular-obovate in lateral view, 5–7 mm long, 5–8 mm wide, glabrous; appendages often absent, or if present lobe-like, at capsule apex, to 0.5 mm wide, crustaceous; dehiscence septifragal. Fig. 32 I.

Occurs in southern S.A.; in alkaline soils in mallee scrub communities, particularly in mallee broombush. Map 214.

S.A.: 8 km W of Mt Verran, Eyre Peninsula, *C.R.Alcock 1577* (AD); 20 km SW of Kingscote, Kangaroo Is., *Hj. Eichler 15441* (AD); Yandinga Gorge, 5 km N of Minnipa, Gawler Range, *A.E.Orchard 2228* (AD); S of Mallee View Homestead, Monarto, *J.G.West 1348* (AD, L); 2.6 km N of Winulta, Yorke Peninsula, *J.G.West 1452* (AD).

In areas where *D. hexandra* is sympatric with *D. humilis* putative hybrids occasionally occur.

**59. *Dodoniaea tepperi*** F.Muell. ex Tepper, *Trans. & Proc. Roy. Soc. S. Australia* 3: 176, 178 (1880)

T: near Ardrossan, S.A., 1880, *J.G.O.Tepper 957*; lecto: MEL *fide* J.G.West, *Brunonia* 7: 139 (1984); isolecto: AD, MEL.

Dioecious or rarely polygamo-dioecious spreading shrub to 0.6 m. Leaves simple, subsessile, linear, oblong or narrowly elliptic, acute or obtuse, revolute, entire or irregularly sinuate or repand, attenuate at base, 0.8–1.4 cm long, 0.1–0.3 cm wide, glabrous. Flowers solitary; pedicel 1–2.6 mm long. Sepals 3 or 4, ovate, 1.8–3.3 mm long, persistent. Stamens 6–8. Ovary glabrous. Capsule 3- or 4-angled, subglobose or broadly obovate in lateral view, 4–5 mm long, 5–5.5 mm wide, glabrous; appendages often absent, or lobe-like, to 0.5 mm wide, crustaceous; dehiscence septifragal. Fig. 32J.

A very rare species now known from only a few disjunct populations in semi-arid mallee areas of S.A. It occurs in the Monarto area of the Murraylands, the southern Flinders Ranges and was collected last century on Fleurieu Peninsula S of Adelaide, on Yorke Peninsula near Ardrossan, in the Gawler Ranges of northern Eyre Peninsula and in southern Eyre Peninsula near Port Lincoln. Map 215.

S.A.: Port Elliot, 1894, *J.Hussey* (MEL); Port Lincoln, *R.Schomburgk* (AD); Monarto, *A.G.Spooner 4535* (AD); Spencer Gulf, 1880, *J.G.O.Tepper* (MEL, NSW); Monarto South, 16 km NW of Murray Bridge, *J.G.West 1342* (AD, CANB).

*Dodoniaea tepperi* may have been more widespread in the semi-arid mallee shrublands before much of the area was cleared for agriculture. Its spasmodic occurrence and morphological similarity to *D. hexandra*, with which it usually occurs, suggests that it may be of hybrid origin. *D. viscosa* is probably the other parent.

**60. *Dodoniaea macrossanii*** F.Muell. & Scortech., *Chem. & Druggist* 4: *Australas. Suppl.* 69 (1882)

T: Miles, Qld, Dec. 1881, *B.Scortechini*; lecto: MEL *fide* J.G.West, *Brunonia* 7: 140 (1984); isolecto: MEL.

Dioecious spreading shrub to 0.3 m. Leaves imparipinnate, 0.2–0.6 cm long excluding petiole; lateral leaflets usually 4, sometimes 2 or 6, obtriangular, angular-obovate or obovate, obtuse or 2- or 3-toothed at apex, sometimes divided to half length of leaflet, otherwise entire, cuneate at base, 1.8–4 mm long, 1–3.2 mm wide, hirsute; terminal leaflet elliptic or obovate, entire, or rarely toothed or divided, 1–2 mm long, 0.7–0.9 mm wide,



otherwise similar to laterals; petiole 0.8–1.4 mm long, rarely to 2.5 mm. Flowers solitary; pedicel 0.7–0.8 mm long. Sepals 3, ovate, 1.5–2 mm long, persistent. Stamens 6. Ovary pubescent. Capsule 3– or rarely 4-lobed, transversely elliptic in lateral view, 2–3.5 mm long, 4–6 mm wide, hirsute, sometimes sparsely so or pubescent; appendages absent; dehiscence septifragal. Fig. 32K.

Occurs in the Darling Downs region of south-eastern Qld and near Yetman in north-eastern N.S.W. Map 216.

Qld: 40.7 km N of Chinchilla, *R.Coveny 6814* & *P.Hind* (BRI, NSW); c. 96 km E of St George, 25 Aug. 1961, *B.Phillips* (CBG); 5 km from Miles on road to Wandoan, 22 Aug. 1977, *E.Ross* (BRI); Chinchilla, *B.Copley 5078* (AD). N.S.W.: 10.4 km W of Yetman, Oct. 1971, *B.Lane* (NSW).

### 61. *Dodonea glandulosa* J.West, *Brunonia* 7: 142 (1984)

T: 2.3 km NW of Kulin, 32°40'S, 118°09'E, W.A., 29 Nov. 1978, *J.G.West 3154*; holotype: AD; iso: CANB, K, PERTH.

Dioecious or rarely polygamo-dioecious erect shrub to 0.6 m. Leaves imparipinnate, 0.5–1.8 cm long excluding petiole; leaflets 11–19, rarely 9, oblong to transversely oblong, sometimes broadly obovate, obtuse, strongly recurved, entire and revolute, cuneate at base, 0.8–1.8 mm long, 0.8–1.8 mm wide, pubescent and with glandular hairs; petiole 0.5–1 mm long. Flowers solitary; pedicel 0.5–1 mm long. Sepals 4, ovate to lanceolate, 1–2.5 mm long, persistent. Stamens 5 or 6, or rarely 7 or 8. Ovary with glandular hairs and pubescent. Capsule 2-valved, obovoid or rarely ellipsoidal, 6–8 mm long, 4–5.5 mm wide, with glandular hairs and pubescent or sometimes with glandular hairs only; appendages absent; dehiscence septifragal. Fig. 32L–N.

Restricted to the Kulin and Hatters Hill (E of Lake King) areas of south-western W.A. Grows in semi-arid mixed mallee scrub in red-brown loamy clay with laterite and quartz nodules. Map 217.

W.A.: 9.6 km S of Hatters Hill, *R.J.Chimnock 4965* (AD); c. 2.5 km N of Kulin, *K.Newbey 3427* (PERTH); 2.3 km NW of Kulin on road to Corrigin, *J.G.West 3144–3154* (AD, CANB, PERTH, K, MEL, NSW); 64 km W of 90-mile Tank, Daniels–Lake King road, *E.Wittwer 1454* (PERTH).

*Dodonea humilis* is the only other species with glandular hairs.

### Doubtful and excluded names

*Dodonea viscosa* var. *vulgaris* f. *schiedeana* (Schltdl.) Radlk. in C.F.P. Martius, *Fl. Bras.* 13(3): 646 (1900)

*D. schiedeana* Schltdl, *Linnaea* 18: 33 (1844). T: Mexico, *Schiede*; n.v.

Radlkofer, *Pflanzenr.* 98: 1369 (1933), cited specimens from Norfolk Is. and Qld of f. *schiedeana*, but none of the Australian material examined appears to belong to this taxon.

*Dodonea heterophylla* Colla, *Hort. Ripul.* App. 2: 347 (1826).

T: Australia, collector unknown; n.v.

This name, based on horticultural material, refers to either *D. viscosa* or *D. triquetra*. It cannot be determined to which of these two species the name applies.

## 30. COSSINIA

*Cossinia* Commerson ex Lam., *Encycl.* 2: 132, t. 265 (1786); named after M. de Cossigni, a French naturalist.

Type: *C. pinnata* Comm. ex Lam.

Shrubs or trees, usually monoecious, with saponin in bark and pericarp; indumentum stellate, of both dense fine pale sessile hairs and scattered, dark, large, coarse stipitate hairs. Leaves paripinnate or imparipinnate; leaflets 3–7, apiculate. Panicles terminal or axillary; cymules cincinnate. Flowers irregular. Calyx deeply 5-lobed; lobes imbricate. Petals 4–6, imbricate, shortly clawed, scales and crests absent. Disc unilateral or complete. Stamens 5–8, excentric, anterior to disc. Ovary stipitate, anterior to disc, 3-locular; ovules 2 per locule; style filiform; stigma ±capitate. Capsule obovoid, 3-sulcate, apiculate; lobes inflated, 2-seeded, loculicidally 2-valved, septifragal; valves subcrustaceous, hairy outside, glabrous inside. Seed orbicular, exarillate.

A genus of 4 species occurring in Mascarene Islands, New Caledonia, Fiji and Australia; 1 species in Australia.

G.Bentham & J.D.Hooker, *Gen. Pl.* 1: 397 (1867); H.Baill., *Nat. Hist. Pl.* 5: 364–366, t. 393–396 (1878); L.A.T.Radlkofer, *Pflanzenr.* 98: 1337–1341, t. 41 (1933). S.T.Reynolds, *Austrobaileya* 1: 485–488 (1982).

**Cossinia australiana** S.Reyn., *Austrobaileya* 1: 486 (1982)

T: Bingera, Qld, 26 Oct. 1948, *L.S.Smith 4140*; holo: BRI.

Illustration: S.T.Reynolds, *op. cit.*, fig. 38.

Slender trees to 7 m. Shoots, branchlets, leaf axes and peduncles pubescent. Leaves trifoliolate or pinnate; rachis 0.5–4.5 cm long; leaflets 3–5, occasionally to 7, opposite, narrowly elliptic or obovate-oblong, obtuse to acuminate, oblique at base, 2–7.5 cm long, 1–3 cm wide, puberulent to glabrous above, pubescent below; petiolules to 2 mm long; petiole 1.2–4.3 cm long. Panicles corymb-like, 2–5 cm long and wide; peduncles slender; pedicels 2–4 mm long, pubescent. Calyx lobes ovate or oblong, 3–4.5 mm long, tomentose. Petals 5, broadly ovate or elliptic, 4.5–5.5 mm long, tomentose outside. Disc oblique, saucer-shaped with lobed ridge on one side, glabrous. Stamens 8. Capsule stipitate, obovoid-obcordate, 1.5–1.8 cm long, 1.2–1.6 cm wide, pubescent. Fig. 10A.

Occurs in central and south-eastern Qld; in scrub relicts, on red volcanic soil. Map 218.

Qld: Booyal, SW of Biggenden–Bruce Highway junction, *G.P.Guymer & L.W.Jessup 373* (BRI); Milman near Rockhampton, *L.J.Webb 1549* (BRI).

*Cossinia australiana* is distinguished by its 2 kinds of stellate hairs, its pinnate or trifoliolate leaves and its fragile capsules.

## ACERACEAE

*H.J.Hewson*

Trees or shrubs, andromonoecious, androdioecious or dioecious. Leaves opposite, simple or compound, exstipulate. Inflorescence a raceme, corymb, fascicle or panicle. Flowers regular, unisexual or bisexual. Sepals 4 or 5, free or basally connate. Petals 4 or 5, free, imbricate or absent. Disc usually present, extra- or intra-staminal. Stamens 4–12, usually 8, hypogynous or perigynous. Ovary superior; carpels usually 2, fused; styles 2, free or fused basally; stigmatic surface an inner terminal strip. Ovules 2 per locule; placentation

## ACERACEAE

axile. Fruit a winged schizocarp, usually a double samara splitting into 2 one-sided mericarps. Seeds without endosperm.

A family of 2 or more genera and 110–200 species from the temperate to tropical regions of the northern hemisphere, mostly in uplands and mountains; 1 species naturalised in Australia.

F.Pax, *Aceraceae, Pflanzenr.* 8: 1–91 (1902).

### ACER

*Acer* L., *Sp. Pl.* 2: 1054 (1753), *Gen. Pl.* 5th edn, 474 (1754); from the Latin *acer* (sharp), named because the wood was sought for making spear and lance heads.

Type: *A. pseudoplatanus* L.

Trees or shrubs, deciduous or evergreen, monoecious, andromonoecious, androdioecious or dioecious. Stamens 4–10, hypogynous or perigynous. Ovary bilobed. Fruit laterally compressed; mericarps winged on one side only.

F.Pax, *Monographie der Gattung Acer, Bot. Jahrb. Syst.* 6: 287–374, 7: 177–263 (1885–6), 11: 72–83 (1889), 16: 393–404 (1892).

\**Acer pseudoplatanus* L., *Sp. Pl.* 2: 1054 (1753)

T: from Greece and Austria, *collector unknown; n.v.*

Illustration: S.Ross-Craig, *Draw. Brit. Pl.* 6: t. 55 (1952).

Tree to 30 m tall, deciduous, monoecious. Leaves mostly palmate, 5-lobed, glaucescent below; lamina 7–16 cm long, usually slightly narrower than wide, 5-nerved, cordate at base; lobes ovate to ovate-oblong, acute to acuminate, coarsely and irregularly serrate; petiole 4–20 cm long, often red. Inflorescence a terminal, elongate, pendulous panicle to 20 cm long; flowers 60–100, andromonoecious. Sepals 5, ovate, c. 3 mm long. Petals 5, narrowly ovate, c. 4 mm long, pale green. Stamens 8, hypogynous, inserted within disc. Ovary tomentose. Fruit 3.5–5.0 cm wide; wings divaricate, c. 2.5 cm long. *Sycamore, Sycamore Maple.*

Occasionally naturalised as a garden escape in Vic. and Tas., see T.D.Raphael, *Pap. Proc. Roy. Soc. Tasmania* 89: 147–150 (1955); J.H.Willis, *Handb. Pl. Victoria* 2: 360 (1973). No collections seen. Map 219.

## BURSERACEAE

*H.J.Hewson*

Trees or shrubs, usually dioecious, sometimes bisexual, resiniferous. Leaves alternate, usually compound, imparipinnate, mostly crowded at end of branchlets; stipules usually present (in Australia). Inflorescence a racemose panicle, sometimes ultimately cymose, or a spike, axillary or terminal, bracteate. Flowers 3–5-merous. Sepals valvate, usually connate. Petals free. Stamens equal to or twice as many as petals, free or united, sometimes adnate to disc. Disc intrastaminal. Ovary superior; carpels usually fused, with 2 axile, pendulous ovules per carpel; style simple; stigma globular. Fruit a drupe; seeds without endosperm.

A family of 16 genera and 600 species occurring throughout the tropics; 2 genera native in Australia.

## BURSERACEAE

G.Bentham, Burseraceae, *Fl. Austral.* 1: 376–378 (1863); A.Engler, Burseraceae, *Nat. Pflanzenfam.* 2nd edn, 19a: 405–456 (1931); P.W.Leenhouts, Burseraceae, *Fl. Males.* ser. 1, 5: 209–296 (1956).

Flowers bisexual, 5–merous

**1. GARUGA**

Flowers unisexual, 3–merous

**2. CANARIUM**

### 1. GARUGA

*Garuga* Roxb., *Pl. Coromandel* 3: 5, t. 208 (1811); from the Indonesian name for the type species.

Type: *G. pinnata* Roxb.

Trees or shrubs, deciduous. Leaves compound, stipulate; leaflets often with stipellae. Panicles axillary near ends of branchlets, appearing before the leaves. Flowers bisexual, 5-partite, perigynous, with hypanthium. Sepals free. Stamens 10, free, with a disc lobe between each filament. Ovary on short gynophore; carpels 5, fused. Drupe of 1–5 pyrenes.

A genus of 4 species from south-eastern Asia to Melanesia; one species in Australia.

C.Kalkman, VI. Revision of the genus *Garuga* Roxburgh, *Blumea* 7: 459–472 (1953).

***Garuga floribunda* Decne., *Nouv. Ann. Mus. Hist. Nat.* 3: 477 (1834)**

T: from Timor, *collector unknown*; holo: G; iso: NY, both *n.v.*, *fide* C.Kalkman, *Blumea* 7: 463 (1953).

#### var. **floribunda**

Illustrations: C.Kalkman, *op. cit.* 7: fig. 3 (1953); P.W.Leenhouts, *Fl. Males.* ser. 1, 5: 212–217, figs 2b, 5, 6 (1956); D.Burger, *Seedlings of some tropical trees and shrubs mainly of South East Asia* fig. 14 (1972).

Tree to 35 m tall, buttressed. Branches leaf-scarred, glabrescent. Leaves crowded at branch ends, glabrescent; leaflets in 4–15 pairs below terminal leaflet, elliptic, oblong-lanceolate to lanceolate, acuminate, 5–19 cm long,  $\pm$ stipellate; base oblique, cordate to cuneate; margin irregular to entire; stipules oblong, 5–8 mm long, caducous. Panicle to 30 cm long; peduncle to 10 cm long. Flowers tomentose. Sepals deltoid, 1.5–2.5 mm long. Petals c. twice as long as sepals. Stamens slightly didynamous. Hypanthium 1–2 mm long. Ovary globular; style equal to stamens; stigma 5-lobed. Fruit oblique, broadly pyriform, to 9 mm long and 12 mm wide, black-purple. Fig. 37A–B.

Occurs in vine thickets and rainforest in the Kimberley, W.A., and north Qld. Map 220.

W.A.: Mitchell Plateau, *K.F.Kenneally 6686* (CANB, PERTH). Qld: 15°02'S, 145°01'E, *S.T.Blake 14575* (BRI); 11°05'S, 143°02'E, *H.S.Curtis 4* (BRI); Lockerbee, *B.Hyland 2534* (BRI); 14°15'S, 144°10'E, *B.Hyland 4855* (BRI).

The timber is durable and easy to work. The fruit is edible.

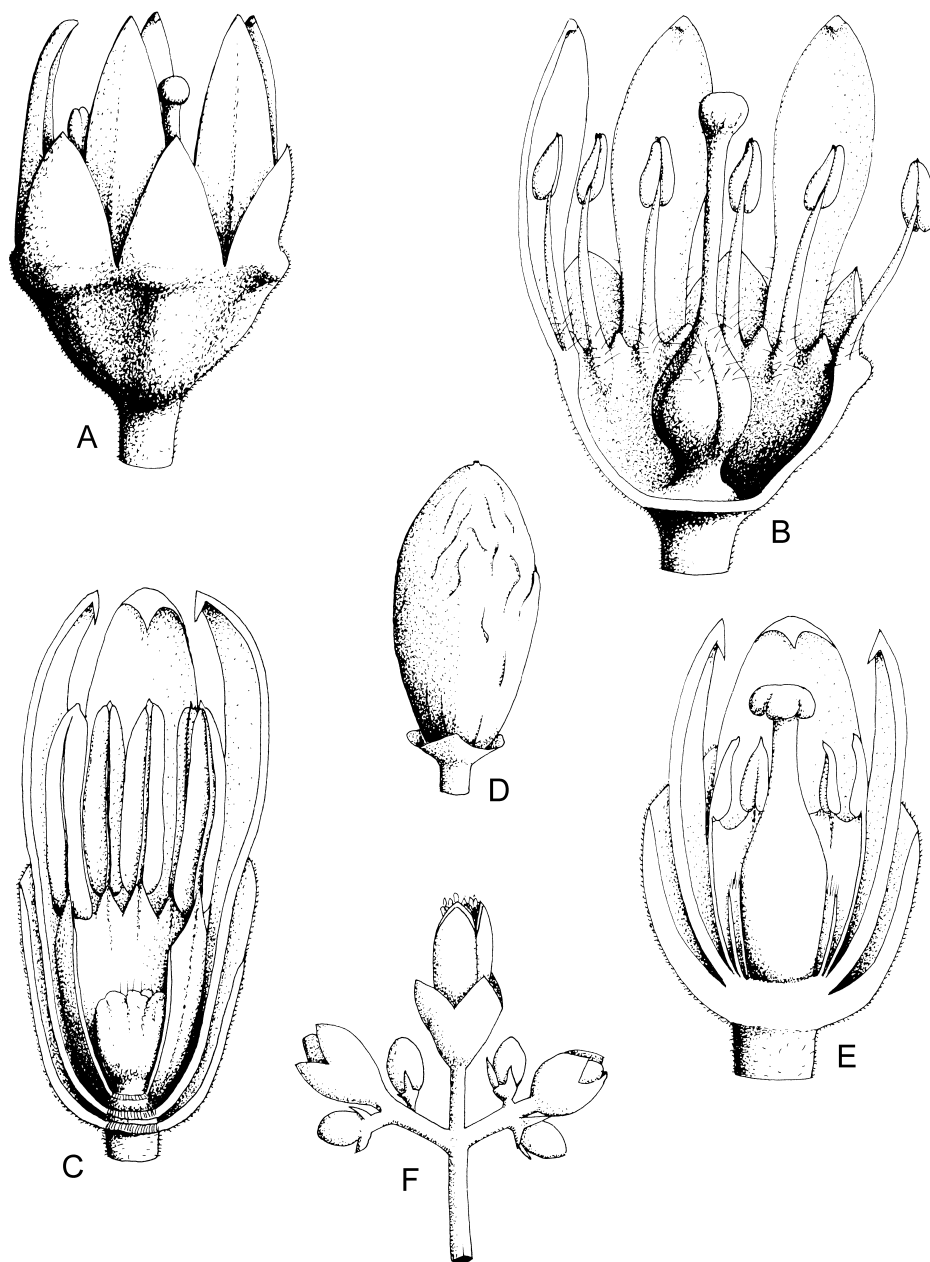
### 2. CANARIUM

*Canarium* L., *Herb. Amb.* 10 (1754); named after *kanari*, a Malay name for *C. commune* L.

Type: *C. indicum* L.

*Sonzaya* Marchand in Baill., *Adansonia* 8: 64, 71, t. V bis (1867–1868). T: *S. australiana* (F.Muell.) Marchand

Trees or shrubs, evergreen or deciduous, dioecious. Leaves mostly compound, usually stipulate. Inflorescence an axillary or terminal panicle, cyme, raceme or spike. Flowers 3-partite. Sepals usually fused basally. Petals usually imbricate. Stamens 6, free or



**Figure 37.** A–B, *Garuga floribunda*. A, opening bud  $\times 11$ ; B, flower with 1 side removed,  $\times 13$  (A–B, J.Beard 8244, PERTH). C–D, *Canarium australianum* var. *australianum*. C, flower with 1 side removed,  $\times 11$  (N.Byrnes 2823, DNA); D, fruit  $\times 2$  (P.Wilson 11527, PERTH). E, *Canarium australianum* var. *glabrum*, female flower with 1 side removed,  $\times 11$  (R.Jones & B.Meehan 301, DNA). F, *Canarium australianum* var. *velutinum*, part of inflorescence  $\times 1.6$  (T.Hartley 14765, PERTH).

connate, sometimes epipetalous, sometimes adnate to disc, sterile and reduced in female flowers. Disc intrastaminal, usually 6-lobed, well-developed in male flowers. Drupe with a 3-locular stony pyrene.

A genus of 100 species in tropical and subtropical regions from Africa through Asia to the Pacific Islands; 4 species native in Australia, 2 endemic.

P.W.Leenhouts, The genus *Canarium* in the Pacific, *Bernice P. Bishop Mus. Bull.* 216: 1–53 (1955); P.W.Leenhouts, Flora Malesiana Precursores XI. New Taxa in *Canarium*, *Blumea* 8: 181–194 (1955); P.W.Leenhouts, Revision of the Burseraceae of the Malaysian area in a wider sense. Xa. *Canarium* Stickm., *Blumea* 9: 275–647 (1959).

- |    |   |                            |
|----|---|----------------------------|
| 1  | Leaflets thinly coriaceous; lateral veins at angle of 70°–80° to midrib, the reticulations between them prominent |                            |
| 2  | Lateral veins 15–24 pairs; male flowers 4–5 mm long   | <b>1. C. australianum</b>  |
| 2: | Lateral veins 8–12 pairs; male flowers 8–12 mm long   | <b>2. C. vitiense</b>      |
| 1: | Leaflets coriaceous; lateral veins at angle of 50°–70° to midrib, the reticulations between them not prominent    |                            |
| 3  | Leaflets 1–7, often 3; petiole cylindrical  | <b>3. C. australasicum</b> |
| 3  | Leaflets 5–7, often 7; petiole flattened above  | <b>4. C. muelleri</b>      |

### 1. *Canarium australianum* F.Muell., *Fragm.* 3: 15 (1862)

*Sonzaya australiana* (F.Muell.) Marchand in H.Baill., *Adansonia* 8: 64, 71, t. V bis (1867–68); *C. australasicum* Benth., *Fl. Austral.* 1: 377 (1863), *orth. var.* T: Burdekin R., Qld, *E.Fitzalan s.n.*; syn: *n.v.*; Sweers Island, Qld, *D.Henne s.n.*; lecto: BR *n.v.*, *fide* P.W.Leenhouts, *Blumea* 9: 421 (1959).

Tree to 30 m tall. Leaflets 7–15, ovate, rounded to acute, 7–11 cm long, sometimes to 18 cm, glabrous or hairy; base usually oblique with longer side decurrent; margins entire to dentate; lateral veins 15–24 pairs, at 60°–80° to midrib; stipules caducous. Panicle to 25 cm long; male inflorescences larger and denser than female. Male flowers: sepals c. 2.5 mm long; petals 4–5 mm long; stamens half connate; disc pubescent, c. 1 mm high, deeply 6-grooved; ovary obsolete. Female flowers: sepals c. 3.5 mm long; petals c. 6.5 mm long; stamens connate for almost entire length; disc glabrous, c. 1 mm high, 6-lobed; ovary tomentose. Fruit ovoid, c. 2 cm long; seed 1.

There are 3 varieties in northern Australia, in W.A., N.T. and Qld; 2 of them also occur in New Guinea. The wood has been used for pick and axe handles, furniture and in joinery. The resin is used by aborigines in making spears.

- |    |  |                              |
|----|--|------------------------------|
| 1  | Lower surface of leaf glabrous           | <b>1b. var. glabrum</b>      |
| 1: | Lower surface of leaf hairy              |                              |
| 2  | Indumentum a tomentum of appressed hairs | <b>1a. var. australianum</b> |
| 2: | Indumentum velutinum                     | <b>1c. var. velutinum</b>    |

### 1a. *Canarium australianum* F.Muell. var. *australianum*

Leaflets densely appressed-tomentose beneath. Fig. 37C–D.

Occurs in open forest and rainforest in New Guinea and Australia; in the Kimberley, W.A., Arnhem Land, N.T. and northern Qld. Map 221.

W.A.: Cockatoo Is., Dec. 1953, *W.Bateman* (CANB). N.T.: Guy Caves, 14°36'S, 132°32'E, May 1978, *C.Ellis* (CANB). Qld: Lockerbie near Somerset, *L.J.Brass 18551* (CANB); Aurukun Mission, *C.S.Christian 28* (CANB); 32 km N of Laura, *B.Hyland 5172* (CANB).

**1b. *Canarium australianum* var. *glabrum* Leenh., *Blumea* 8: 189 (1955)**

T: South Bay, Bickerton Is., N.T., 15 June 1948, *R.L.Specht* 571; holo: L; iso: CANB; also K, LAE, *n.v.*, *vide* P.W.Leenhouts, *loc. cit.*

Leaflets glabrous or minutely and sparsely hairy beneath. Fig. 37E.

Occurs in open forest and rainforest in New Guinea and Australia; in the Kimberley, W.A., northern N.T. and northern Qld. Map 222.

W.A.: near Cape Bertholet, Dampierland, *K.F.Kenneally* 6074 (CANB, PERTH); near Kununurra, *D.H.MacKenzie* 691102–9 (CANB). N.T.: Maria Is., Gulf of Carpentaria, *C.R.Dunlop* 2760 (CANB); Oenpelli, *R.L.Specht* 1074 (CANB). Qld: Gorge Ck near Mareeba, *H.S.McKee* 9178 (CANB).

**1c. *Canarium australianum* var. *velutinum* Hewson, *Fl. Australia* 25: 202 (1984)**

T: Cone Hill, Cape Domett, W.A., *T.G.Hartley* 14765; holo: CANB; iso: PERTH.

Leaflets velutinous beneath. Fig. 37F.

Occurs in open forest and rainforest in the Kimberley, W.A., Arnhem Land, N.T., and northern Qld. Map 223.

W.A.: Prince Regent River Nature Reserve, *K.F.Kenneally* 2095 (PERTH); near Point Coulomb, Dampierland, *K.F.Kenneally* 5899 (PERTH). N.T.: Nangala, *H.Reeve* 475 (CANB). Qld: Mungana Caves, *L.J.Webb* 666 (CANB).

The branches are used to make pipes and the seeds are eaten by the aborigines; tree trunks have been used for dugout canoes.

**2. *Canarium vitiense* A.Gray, *U.S. Expl. Exped., Phan.* 1: 373 (1854)**

T: Mathuata, Vanua Levu, Fiji, 1838–1842, *Wilkes Exped. s.n.*; holo: GH; iso: K, P; all *n.v.*, *vide* P.W.Leenhouts, *Blumea* 9: 451 (1959).

Shrub or tree to 20 m tall. Leaflets 3–9, elliptic, acuminate, to 12 cm long; base rounded to cuneate, slightly decurrent; margin entire; lateral veins 8–12 pairs, at 70°–80°, with midrib; stipules caducous. Inflorescence a raceme or panicle to 12 cm long; male inflorescences larger and denser than female. Male flowers: sepals 7–8 mm long, pilose; petals to 13 mm long, pilose outside; stamens adnate to disc; disc to 1 mm high, variable in shape, upper region with long, stiff, spreading hairs; ovary obsolete. Female flowers: sepals 5 mm long; petals 7 mm long; stamens 6, adnate to disc; disc less than 1 mm high, 6-lobed, ciliate; ovary pilose. Fruit fusiform, to 3 cm long; seed 1.

Occurs in rainforest in northern Qld. Map 224.

Qld: Wyvuri, 17°20'S, 146°00'E, *B.Hyland* 3058 RFK (CANB).

The fruit is edible.

**3. *Canarium australasicum* (F.M.Bailey) Leenh., *Blumea* 7: 159 (1952)**

*Bursera australasica* F.M.Bailey, Queensland Bot. Bull. 5: 8 (1892); *Protium australasicum* (F.M.Bailey) Sprague, Bull. Misc. Inform. 1912: 370 (1912); [*Bursera australiana* H.J.Lam, Ann. Jard. Bot. Buitenzorg 42: 139 (1932) orth. var.]; [*Protium australianum* H.J.Lam, loc. cit., orth. var.]; *Canarium baileyianum* Leenh., Bernice P.Bishop Mus. Bull. 216: 45, fig. 19 (1955), nom. superfl. T: Eumundi, Qld, May 1892, J.F.Bailey & J.H.Simmonds s.n.; holo: BRL.

Illustration: P.W.Leenhouts, *Bernice P.Bishop Mus. Bull.* 216: fig. 19 (1955).

Tree to 40 m tall, sometimes buttressed. Leaves simple or with 3–7 leaflets, mostly trifoliate, exstipulate; leaflets lanceolate, oblong or obovate, rounded to acuminate, entire, to 18 cm long; base cuneate or oblique; lateral veins less than 12 pairs, at 60°–65° with midrib. Panicle to 12 cm long. Male flowers: sepals 1 mm long, glabrous; petals c. 4 mm long, glabrous; stamens 6, free, inserted on disc; ovary obsolete. Female flowers not seen. Fruit globular, c. 1 cm long; seed 1.

Occurs in coastal rainforest in Qld and north-eastern N.S.W. Map 225.

Qld: Davies Logging Area, State Forest Reserve 607, *A.W.Dockrill 52* (CANB). N.S.W.: Palm Vale, Cudgera Ck, *W.A.W. de Beuzeville FRI 7833* (CANB); Minyon, near Lismore, *W.A.W. de Beuzeville FRI 7891* (CANB); Whian Whian, near Lismore, *W.T.Jones 3170* (CANB).

The name *Canarium australasicum* Benth. is an orthographic variant of *C. australianum* F.Muell., Bentham having referred to the publication of Mueller's name. Such a variant has no status and does not affect other names. Consequently the name *C. baileyana* Leenh. is superfluous.

The species is closely related to *C. muelleri* and may not be specifically distinct.

#### 4. *Canarium muelleri* F.M.Bailey, *Cat. Indig. Naturalised Pl. Queensland* 106 (1890)

T: Johnstone R., Qld, *T.L.Bancroft s.n.*; holotype: BRI.

Tree to 30 m tall, buttressed. Leaves with 5 or mostly 7 leaflets, exstipulate; leaflets ovate, elliptic or lanceolate, rounded to acuminate, entire, to 10 cm long; base oblique or cuneate, scarcely decurrent; lateral veins less than 12 pairs, at 50°–70° with midrib. Inflorescence a panicle. Male flowers: sepals 1–1.5 mm long, glabrous or puberulous; petals c. 4 mm long; stamens 6; ovary obsolete. Female flowers: sepals 1–1.5 mm long, glabrous or puberulous; petals c. 4 mm long; stamens 6, inserted on margin of disc; disc glabrous; ovary tomentose. Fruit ovoid, c. 2 cm long.

Occurs in rainforest in northern Qld. Map 226.

Qld: Gadgarra, *C.Barnard 8* (CANB); Kuranda, *F.H.J.Chrome 244* (CANB); Python Logging Area, 17°10'S, 145°35'E, *A.K.Irvine 710* (CANB).

The timber is suitable for cabinet work and plywood.

## ANACARDIACEAE

*L.W.Jessup*

Trees, shrubs or (not in Australia) climbers, often with acrid sap in resin ducts. Leaves alternate, rarely opposite, simple and/or compound; stipules absent. Inflorescence terminal and/or axillary, panicate, ultimately cymose, rarely flowers in glomerules or cupules. Flowers bisexual or unisexual. Sepals 5, sometimes 4 or 6, usually connate at base. Petals 5, sometimes 4, free, imbricate or valvate, rarely contorted. Stamens equal to, or twice, number of sepals or petals; anthers longitudinally dehiscent, usually introrse; staminodes often present in females. Disc usually present, intra- or extrastaminal. Ovary usually superior, free or partly or wholly immersed in disc; carpels 1–3, rarely 5–12, 1–12-locular, sometimes only basally connate with usually only 1 fertile; ovule 1 per locule, pendulous, apotropous; styles and stigmas 1–12; pistillode often present in males. Fruit drupaceous, sometimes subtended by enlarged perianth or receptacle, 1–12-locular, seed 1, rarely up to 12. Seeds with little or no endosperm; testa adherent to or free from endocarp; embryo straight or curved.

A family of c. 70 genera and 600 species, mostly pantropical and subtropical but also in temperate regions; 9 genera (2 endemic) and 13 species (3 naturalised) in Australia.

G.Bentham, *Anacardiaceae, Fl. Austral.* 1: 488–492 (1863); A.Engler, *Anacardiaceae*, in A. & C. de Candolle, *Monogr. Phan.* 4: 171–500, t. 4–15 (1883); Ding Hou, *Anacardiaceae, Fl. Males.* ser. 1, 8: 395–548 (1978).

The family contains economically important food plants such as mango (*Mangifera indica* L.), cashew nut (*Anacardium occidentale* L.) pistachio nut (*Pistacia vera* L.) and hog plum (*Spondias cytherea* Sonnerat). Oriental lacquer is a natural varnish obtained from the sap of *Rhus verniciflua* Stokes, and several species of *Schinopsis* Engl. are an



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211. *Dodonaea triangularis*  
 214. *Dodonaea hexandra*  
 217. *Dodonaea glandulosa*  
 220. *Garuga floribunda*  
 var. *floribunda*  
 223. *Canarium australianum*  
 var. *velutinum*

212. *Dodonaea caespitosa*  
 215. *Dodonaea tepperi*  
 218. *Cossinia australiana*  
 221. *Canarium australianum*  
 var. *australianum*  
 224. *Canarium vitiense*

213. *Dodonaea divaricata*  
 216. *Dodonaea macrossanii*  
 219. *Acer pseudoplatanus*  
 222. *Canarium australianum*  
 var. *glabrum*  
 225. *Canarium australasicum*

## ANACARDIACEAE

important source of tannin. The resinous sap of various species of *Rhus* L., *Gluta* L., *Melanochyla* Hook.f., *Semecarpus* L.f. and *Swintonia* Griff. will cause severe skin irritation on contact.

### KEY TO GENERA

- 1 Leaves simple
- 2 Carpels 4–6, connate only at base, only 1 fertile; fruit less than 2 cm long, scarcely fleshy **1. BUCHANANIA**
- 2: Carpels 3, ± fully syncarpous, or carpel 1; fruit more than 2 cm long with a fleshy mesocarp or hypocarp
- 3 Dioecious; styles 3, terminal; stamens or staminodes 5; fruit with a fleshy hypocarp **3. SEMECARPUS**
- 3: Andromonoecious; style 1, eccentric; fertile stamen usually 1, with or without staminodes; fruit with a fleshy mesocarp **2. MANGIFERA**
- 1: Leaves compound
- 4 Leaves opposite; female flowers in a cupule; staminodes absent **9. BLEPHAROCARYA**
- 4: Leaves alternate; female flowers not in a cupule; staminodes present
- 5 Ovary multilocular; styles more than 3 **4. PLEIOGYNIUM**
- 5: Ovary unilocular; styles 1 or 3, or style obscure
- 6: Stamens or staminodes 5; style obscure **8. RHUS**
- 6: Stamens or staminodes 10; style or styles conspicuous
- 7 Fruit with a spongy mesocarp with resin cells; petals white
- 8 Fruit obliquely ellipsoidal or ovoid, purple-black; leaflets petiolulate **5. EUROSCHINUS**
- 8: Fruit globular, bluish-pink to red; leaflets sessile or subsessile **6. SCHINUS**
- 7: Fruit with a woody mesocarp; petals red **7. RHODOSPHAERA**

### 1. BUCHANANIA

*Buchanania* Spreng., *J. Bot. (Schrader)* for 1800, 2: 234 (1802); after F. Buchanan-Hamilton (1762–1829), Scottish physician and botanist in the Bengal medical service, later superintendent of the Calcutta Botanic Garden.

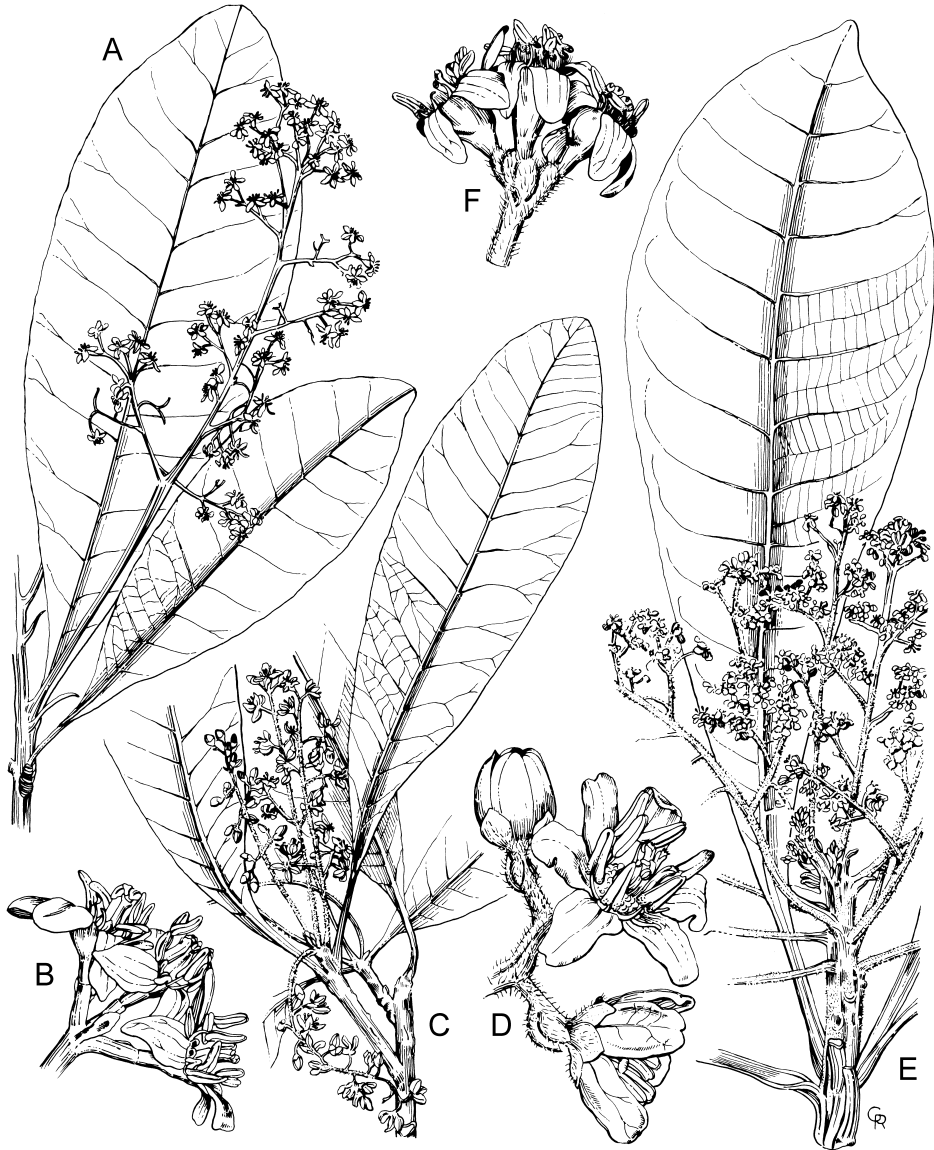
Type: *B. lanzan* Spreng.

*Coniogeton* Blume, *Bijdr. Fl. Ned. Ind.* 1156 (1826). T: *C. arborescens* Blume.

Trees. Leaves simple, alternate, entire. Inflorescences axillary. Flowers bisexual. Calyx lobes 5, rarely 4 or 6. Petals 5, rarely 4 or 6, imbricate, glabrous. Stamens twice number of petals; filaments subulate, glabrous; anthers basifixed, often sagittate. Disc cupular, crenulate, sulcate outside. Carpels 4–6, connate only at base; fertile carpel 1, with a reduced style and obsolete stigma, 1–locular; ovule 1, basally attached by an erect filiform funicle; sterile carpels with a prominent stigma and functioning as gynobasic styles. Drupe usually ± lens-shaped; exocarp and mesocarp thin; endocarp woody or bony. Seed with testa free from endocarp; cotyledons free, plano-convex.

A genus of about 25 species in tropical Asia, Malesia, Micronesia, Melanesia, Polynesia and Australia; 3 species in Australia, 1 or 2 endemic.

The above description of the genus is a departure from previous literature where the gynoeceum is described as apocarpous and the fertile carpel receiving pollen directly by a terminal stigma. *Buchanania* Spreng. and probably also *Androtium* Stapf exhibit an extreme form of partial syncarpy already observed in *Dracontomelon* Blume and *Koordersiodendron* Engl.



**Figure 38.** A–F, *Buchanania*. A–B, *B. arborescens*. A, flowering habit  $\times 0.7$ ; B, inflorescence  $\times 4$  (A–B, L.Smith 11031, BRI). C–D, *B. obovata*. C, flowering habit  $\times 0.7$ ; D, inflorescence  $\times 4$  (C–D, K.Kenneally 4479, PERTH). E–F, *B. mangoides*. E, flowering habit  $\times 0.7$ ; F, inflorescence  $\times 4$  (E–F, L.Smith 4020, BRI).

The Australian species belong to the ser. *Sagittatae* Engl.

- 1 Floral bracts oblong, subulate, usually absent at articulation of pedicel, sometimes present well below articulation or pedicel not articulate; petiole usually not laterally ridged; panicles more than 10 cm long **1. B. arborescens**
- 1: Floral bracts ovate, present just below articulation of pedicel; petiole usually bearing lateral ridges decurrent from lamina; panicles less than 10 cm long
- 2 Bracts overlapping base of calyx **2. B. obovata**
- 2: Bracts not overlapping base of calyx **3. B. mangoides**

### 1. *Buchanania arborescens* (Blume) Blume, *Mus. Bot.* 1: 183 (1850)

*Coniogeton arborescens* Blume, *Bijdr. Fl. Ned. Ind.* 1156 (1826). T: Java, collector unknown; n.v.

*B. muelleri* Engl. in A. & C. de Candolle, *Mongr. Phan.* 4: 190 (1883). T: Darwin, Mar. 1870, *J. Schultz* 490; lecto: K fide L.W. Jessup, *Fl. Australia* 25: 203 (1985); isolecto: MEL.

[*B. angustifolia* auct. non Roxb.: G. Bentham, *Fl. Austral.* 1: 490 (1863) p.p.]

Illustration: Ding Hou, *Fl. Males.* ser. 1, 8: 416 (1978).

Tree to 15 m (in Australia). Branchlets pubescent, glabrescent. Leaves obovate, oblong-obovate or oblanceolate, obtuse, sometimes acuminate, subcoriaceous, glabrous; lamina usually 5–26 cm long, 2–7 cm wide; base narrowly cuneate, decurrent; secondary veins mostly 9–22 pairs; tertiary veins scalariform-reticulate; petiole  $\pm$ plano-convex, 0.5–2.5 cm long. Panicles to 22 cm long,  $\pm$ appressed-pubescent, glabrescent; pedicels articulate 0.5–1 mm below base of calyx, or not articulate, sometimes with subtending bracts. Calyx lobes broadly ovate or rounded, 0.7–1 mm long, glabrous. Petals oblong-elliptic, 3–4 mm long, glabrous. Anthers 1–1.8 mm long; filaments 0.9–1.2 mm long. Carpels to 1.5 mm long; fertile one pilose. Drupe c. 10 mm diam. Fig. 38A–B.

Occurs in north-western N.T. and from Torres Strait to Hinchinbrook Is. in Qld; also extends to Solomon Is. and SE Asia; grows in open forest, gallery and littoral forest, evergreen and semideciduous vine forest. Map 227.

N.T.: South Alligator River, c. 3 km SE of El Sharana, *M.O. Rankin 1474* (DNA); c. 16.6 km ESE of Noranda Mining Camp, *R. Schodde AE46* (DNA). Qld: Thursday Is., *J.R. Clarkson 3800* (BRI); near SW corner of Timber Reserve 9 (Lankelly & Pandanus Creeks), *B. Hyland 5415* (BRI, QRS); Bloomfield Beach, c. 1.6 km N of Bloomfield River mouth, *L.S. Smith 11031* (BRI).

### 2. *Buchanania obovata* Engl. in A. & C. de Candolle, *Mongr. Phan.* 4: 187 (1883)

T: Escape Cliffs, N.T. (not Qld), *C. Hulls*; iso: BRI, MEL.

*B. muelleri* var. *pilosa* Engl. in A. & C. de Candolle, *Mongr. Phan.* 4: 190 (1883). T: Port Darwin, N.T., *Schultz 508*; syn: BRI, MEL; Victoria River, N.T., *F. Mueller*; syn: BRI, MEL.

*B. oblongifolia* W. Fitzg., *J. & Proc. Roy. Soc. W. Australia* 3: 166 (1918). T: Mt Rason, W.A., 28 July 1905, *W.V. Fitzgerald 1295*; syn: PERTH, n.v.; between Isdell & Precipice Ranges, W.A., Sept. 1905, *W.V. Fitzgerald 1497*; syn: PERTH n.v.; also cited from Hann, Barnett, Isdell, King and Ord Rivers, Bell Ck and Wyndham, W.A. all n.v.

[*B. angustifolia* auct. non Roxb.: G. Bentham, *Fl. Austral.* 1: 490 (1863) p.p.]

[*B. latifolia* auct. non Roxb.: W.V. Fitzgerald, *J. & Proc. Roy. Soc. W. Australia* 3: 166 (1918)]

[*B. lucida* auct. non Blume: C.A. Gardner, *W. Austral. Forest Dept. Bull.* 32: 60 (1923)]

[*B. florida* auct. non Schauer: J.W. Green, *Census Vasc. Pl. W. Australia* 63 (1981)]

Shrub or tree to 15 m. Branchlets rusty-villous or tomentose, glabrescent. Leaves obovate to oblong-obovate, obtuse, rounded or sometimes retuse, coriaceous, villous to glabrous; lamina mostly 5–25 cm long, 1.5–8 cm wide; base narrowly cuneate, decurrent; secondary veins mostly 13–21 pairs; tertiary veins scalariform-reticulate; petiole  $\pm$ laterally ridged, 0.5–1.5 cm long. Panicles to 10 cm, rarely 18 cm long, villous or sparsely pilose; pedicels articulate just below base of calyx, there subtended by an ovate bract 1.8–2 mm long and 2 bracteoles 1–1.5 mm long. Calyx lobes broadly ovate, 0.8–1 mm long, pilose, ciliate.

Petals oblong-elliptic, 3–3.8 mm long, mostly glabrous. Anthers 1.3–1.8 mm long; filaments 1.5–1.7 mm long. Carpels to 1.8 mm long; fertile one villous. Drupe c. 13 mm diam. Figs. 35, 38C–D.

Occurs in the Kimberley, W.A., north-western N.T., and north-western Qld, mostly in eucalypt or mixed open woodland or forest. Map 228.

W.A.: Mt Trafalgar, Prince Regent River Nature Reserve, A.S.George 12667 (PERTH); 43.8 km N of C.R.A. Campsite on Port Warrender track, Mitchell Plateau, N Kimberley, K.F.Kenneally 8558 (PERTH). N.T.: Nourlangie Creek, N.Byrnes 2800 & P.Martensz (BRI, DNA); c. 11.6 km N of Mudginbarry, P.Martensz AE 164 (DNA). Qld: Adels Grove via Camooweal, A. de Lestang 384 (BRI).

This species shows remarkable variation in leaf size and shape and in density of indumentum.

### 3. *Buchanania mangoides* F.Muell., *Fragm.* 7: 23 (1869)

T: Family Is., Qld, *J.Dallachy*; holo: MEL; iso: BRI.

Tree to 13 m. Branchlets rusty-villous or tomentose. Leaves oblong-obovate, obtuse or abruptly acuminate, subcoriaceous, glabrescent; lamina mostly 12–30 cm long and 3–7 cm wide; base narrowly cuneate, decurrent; secondary veins mostly 12–16 pairs; tertiary veins scalariform; petiole laterally ridged, 2–2.5 cm long. Panicles to 17 cm long, tomentose or villous. Pedicels articulate just below base of calyx, there subtended by an ovate bract c. 1 mm long and 2 bracteoles 0.5 mm long. Calyx lobes ±rounded, 0.7–1 mm long, glabrous. Petals oblong-ovate, 2–2.5 mm long. Anthers 1–1.2 mm long; filaments 1.4–1.7 mm long. Carpels 1.5–1.8 mm long. Drupe not seen. Fig. 38E.

Known only from NE Qld from the three collections here cited. Habitat not recorded. Map 229.

Qld: Snapper Is., L.S.Smith 4020 (BRI); Bedarra Is., L.J.Webb 1097 (BRI).

Presumed extinct by J.Leigh *et al.*, *Extinct and Endangered Plants of Australia* 145–146 (1984), but now known from the two localities cited above.

## 2. MANGIFERA

*Mangifera* L., *Sp. Pl.* 200 (1753), *Gen. Pl.* 5th edn, 93 (1754); from *mangas* or *mango* (vernacular name of the fruit) and the Latin *ferre* (to bear), in reference to the plant that bears the mango.

Type: *M. indica* L.

Andromonoecious trees. Leaves simple, alternate, entire. Inflorescence terminal and/or axillary. Pedicels articulate. Sepals 4 or 5. Petals 4 or 5, imbricate, sometimes bearing glandular ridges on inner surface. Disc mostly extrastaminal. Fertile stamens 1 or 2, rarely (not in Australia) 5–12, with or without staminodes. Anthers dorsifixed. Ovary 1–locular, abortive in male flowers. Style eccentric or lateral; stigma simple. Fruit a drupe; exocarp coriaceous; mesocarp fleshy; endocarp woody and fibrous. Seed with testa free from endocarp, sometimes polyembryonic. Embryo straight; cotyledons plano-convex.

A genus of c. 35 species from India to the Solomon Islands. One species naturalised in Australia.

S.K.Mukherjee, Origin, distribution and phylogenetic affinity of the species of *Mangifera* L., *J. Linn. Soc., Bot.* 55: 65–83 (1953).

### \**Mangifera indica* L., *Sp. Pl.* 200 (1753)

T: from India, *collector unknown*; *n.v.*

Illustrations: W.J.Hooker, *Bot. Mag.* 76: t. 4510 (1850); J.W.Pursglove, *Tropical Crops, Dicotyledons* 1, fig. 2 (1968).

Tree, to 20 m in Australia. Branchlets glabrescent. Leaves oblong-elliptic or oblong-lanceolate, acuminate, acute or obtuse, subcoriaceous, glabrous; lamina mostly 10–30 cm long, 2–7 cm wide; base acute; secondary veins mostly 15–25 pairs; petiole 2–6 cm long. Panicles tomentose; bracts ovate or triangular, 2–4.5 mm long; pedicels 1–1.5 mm long. Sepals 5, ovate. Petals 5, oblong-ovate to oblong-obovate, with 3–5 ridges inside near base. Disc thick, broadly 5-lobed, papillose. Fertile stamen usually 1; anther 0.8 mm long; filament 1.8–2.2 mm long. Staminodes minute or to 1 mm. Ovary obliquely ovoid or depressed-globular; style eccentric, 1.5–2 mm long. Pistillode in males minute. Drupe obliquely ovoid, mostly 10–15 cm long, yellow to reddish-yellow. *Mango*. Fig. 39A–B.

Originally from Indo-Burma region, widely cultivated throughout the tropics for its edible fruit. There are numerous cultivars. Cultivated in Australia and reported to be naturalised in a few places in coastal NE Qld, Cape York Peninsula and Torres Strait islands. Map 230.

Qld: bank of Mossman River, Mossman, *H.Flecker 2127* (BRI); Yam Is., Torres Strait, 24 Apr. 1972, *M.Lawrie* (BRI).

### 3. SEMECARPUS

*Semecarpus* L.f., *Suppl. Pl.* 25, 182 (1782), derived from the Greek *sema* (sign, token) and *karpos* (fruit), in reference to the characteristic fruit which in some species is surrounded by an enlarged, fleshy hypocarp.

Type: *S. anacardium* L.f.

Trees or shrubs, dioecious, rarely polygamous. Leaves simple, alternate, entire, often minutely papillose on abaxial surface. Inflorescence terminal and/or axillary; pedicels articulate. Calyx 5-lobed. Petals 5, usually imbricate. Disc intrastaminal. Male flowers: stamens 5, alternating with petals; filaments subulate, glabrous; anthers dorsifixed; pistillode present. Female flowers: staminodes present; ovary superior, 1-locular with 1 ovule; styles 3, divergent; stigmas transverse-oblong or subreniform. Fruit a drupe, 1-locular, often laterally compressed, on or immersed in fleshy hypocarp formed by calyx and floral axis. Exocarp and mesocarp fleshy, resinous; endocarp crustaceous. Seed testa free from endocarp; embryo straight; cotyledons free, plano-convex.

A genus of c. 60 species, in SE Asia, Malesia and Pacific Islands; 1 native species in Australia.

***Semecarpus australiensis*** Engl. in A. & C. de Candolle, *Monogr. Phan.* 4: 482 (1883)

T: Cape York, Qld, *W.Hill*; syn: K *n.v.*; Albany Island, N.T., *Armstrong*; syn: K *n.v.*; Port Essington, N.T., *Armstrong*; syn: K *n.v.*; Rockingham Bay, Qld, *collector unknown*; syn: B *n.v.*

*S. anacardium* var. *parvifolia* Benth., *Fl. Austral.* 1: 491 (1863). T: Port Essington, N.T., *Armstrong*; holo: K *n.v.*

*S. australiensis* var. *obtusifolius* Domin, *Biblioth. Bot.* 89: 339 (1927). T: not designated.

*S. australiensis* var. *macrophyllus* Domin, *loc. cit.* T: Waterfall Creek near Yarrabah, Qld, Jan. 1910, *K.Domin*; *n.v.*; Cape York, *W.Hill 108*; *n.v.*

Illustration: F.M.Bailey, *Comp. Cat. Queensland Pl.* fig. 98. (1913).

Tree to 40 m. Branchlets glabrescent. Leaves oblong-obovate, oblanceolate or elliptic, obtuse, acuminate or acute, subcoriaceous; lamina mostly 10–30 cm long and 4–12 cm wide; base narrowly cuneate; secondary veins 10–20 pairs; petiole 1–2.5 cm long. Panicles puberulous, glabrescent. Male flowers sessile; calyx lobes triangular, 0.5 mm long, puberulous; petals ovate, c. 1.5 mm long, glabrous; anthers 0.8 mm long; filaments 2 mm long; disc 1.6 mm diam., pubescent; pistillode a tuft of hairs. Female flowers: pedicels to 1 mm long; calyx lobes 0.7 mm long; petals 3.5–4 mm long, puberulous or glabrous; staminodes 1.8–2 mm long; disc c. 3.5 mm diam., pubescent; ovary pubescent; styles 1



**Figure 39.** A–B, *Mangifera indica*. A, male flower in inflorescence  $\times 2$ ; B, hermaphrodite flower in inflorescence  $\times 2$  (A–B, L.Jessup 498, BRI). C–F, *Semecarpus australiensis*. C, male flowering habit  $\times 0.7$  (J.Maconochie & N.Byrnes 1010, DNA); D, male inflorescence  $\times 4$  (N.Byrnes 1010, BRI). E, fruiting habit  $\times 0.7$ ; F, female flower  $\times 2$  (E–F, L.Jessup 582, BRI).

mm long. Drupe obliquely transverse-ellipsoidal, compressed, 2–3 cm wide, eccentrically beaked. Hypocarp orange. *Tar Tree*, *Marking Nut*. Figs 36, 39C–F.

Occurs in north coastal N.T. and north-eastern Qld; also extends to the Aru Is., New Guinea and New Britain; grows in lowland semi-evergreen and semi-deciduous mesophyll vine forest. Map 231.

N.T.: Caledon Bay, *N.Byrnes 958* (♀) (DNA); Smith Point, Coburg Peninsula, *C.R.Dunlop 5177* (♂) (DNA). Qld: Claudie River, *A.Dockrill 542* (♂) (BRI, QRS); Murray Is., Torres Strait, *M.Lawrie 20* (♀) (BRI); Red Is. Point, c. 25 km SW of Cape York, *L.S.Smith 12575* (♂) (BRI).

#### 4. PLEIOGYNIUM

*Pleio gynium* Engl. in A. & C. de Candolle, *Monogr. Phan.* 4: 255 (1883); from the Greek *pleion* (more) and *gyne* (female) in reference to the large number of carpels in the flower.

Type: *P. solandri* (Benth.) Engl.

Dioecious trees. Leaves alternate, mostly imparipinnate; leaflets opposite or subopposite, entire. Inflorescences axillary. Calyx 5–, rarely 4– or 6-lobed. Petals 5, rarely 4 or 6, imbricate. Male flowers: stamens 10, rarely 8–12, inserted below margin of disc; anthers dorsifixed, introrse; disc depressed-conical, crenate, surrounding central pistillode. Female flowers: staminodes similar to stamens but smaller; disc annular, radially furrowed; ovary depressed obovoid, crown-like with 8–12 styles on upper margin, 8–12–, rarely 5–locular with 1 pendulous ovule per locule. Fruit drupaceous, 5–12–seeded; exocarp membranous; mesocarp fleshy outside, woody inside; endocarp bony. Embryo curved; cotyledons free, plano-convex.

A genus of 1 or 2 species in Malesia, Melanesia, Polynesia and Australia; 1 species in Australia.

Ding Hou, *Pleio gynium*, *Fl. Males.* ser. 1, 8: 474–476 (1978).

##### ***Pleio gynium timorense* (DC.) Leenh., *Blumea* 7: 159 (1952)**

*Iceia timorensis* DC., *Prodr.* 2: 78 (1825). T: from Timor, collector unknown; *n.v.*

*Owenia cerasifera* F.Muell., *Hooker's J. Bot. Kew Gard. Misc.* 9: 305 (1857); *Pleio gynium cerasiferum* (F.Muell.) R.Parker, *Forest Fl. Punjab* 2nd edn, 560 (1924). T: Burdekin River, Qld, *F.Mueller*; *n.v.*

*Spondias solandri* Benth., *Fl. Austral.* 1: 492 (1863); *Pleio gynium solandri* (Benth.) Engl. in A. & C. de Candolle, *Monogr. Phan.* 4: 255, t. 7 figs 1–10 (1883). T: Endeavour River, Qld, July–Aug. 1770 *J.Banks & D.Solander*; *n.v.*; Keppel Bay, Shoalwater Bay, Broad Sound & Northumberland Islands, Qld, *R.Brown*; *n.v.*

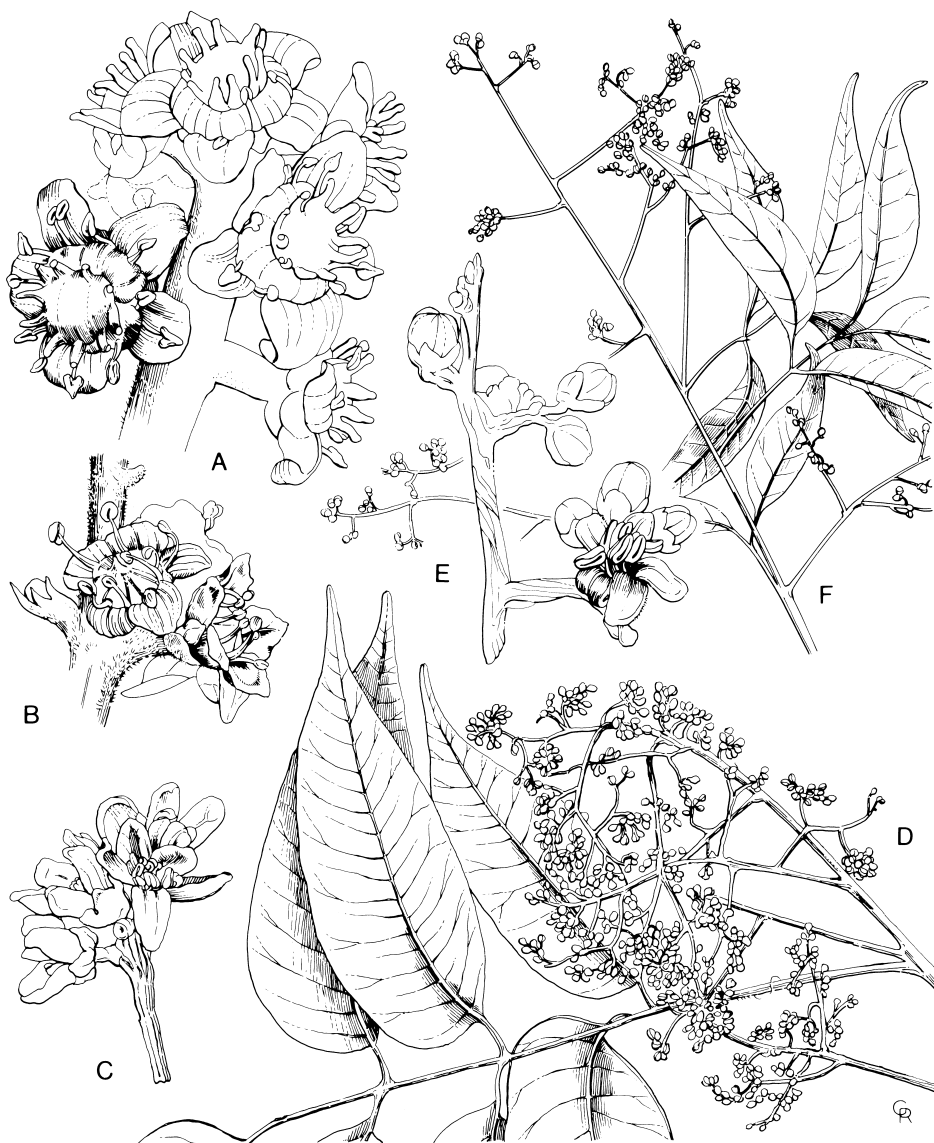
*Spondias pleio gynina* F.Muell., *Fragm.* 4: 78 (1864). T: Bowen River, Qld, *E.Bowman*; syn: MEL; Port Denison, Qld, *J.Dallachy*; syn: MEL.

*Pleio gynium cerasiferum* var. *glabratum* Domin, *Biblioth. Bot.* 89: 338 (1927). T: Castle Hill, near Townsville, Qld, Feb. 1910, *K.Domin*; *n.v.*; Gladstone, Qld, *A.Dietrich 177, 1221*; *n.v.*

Illustration: A.W.Hill, *Ann. Bot.* 47: 883 fig. 11 (1933).

Tree to 20 m. Branchlets pubescent to glabrous. Leaflets mostly 5–11, lanceolate, elliptic or ovate, acute, acuminate or obtuse, often asymmetric, pubescent to glabrous, mostly 4–10 cm long and 2–6 cm wide; base acute, obtuse or attenuate, often unequal-sided; secondary veins mostly 8–10 pairs, often with pilose pocket-domatia; lateral petiolules 2–6 mm long; terminal petiolule 10–30 mm long. Calyx lobes ovate to suborbicular, 0.6–1 mm long. Petals ovate, 1.7–3.8 mm long. Male flowers: anthers 0.7–0.9 mm long; filaments 1.3–2.3 mm long. Female flowers: ovary 2.5 mm diam.; styles 1 mm long. Fruit depressed-obovoid, 2–2.5 cm long, 2–3.8 cm diam., dark purple. *Burdekin Plum*. Fig. 40A–B.





**Figure 40.** A–B, *Pleogynium timorense*. A, female inflorescence  $\times 4$  (L.Jessup 564, BRI); B, male inflorescence  $\times 4$  (L.Jessup 563, BRI). C–D, *Euroschinus falcata* var. *falcata*. C, female inflorescence  $\times 4$  (S.Everist 8108, BRI); D, male flowering habit  $\times 0.7$  (B.Gray 2193, BRI). E–F, *Euroschinus falcata* var. *angustifolia*. E, male inflorescence  $\times 4$ ; F, male flowering habit  $\times 0.7$  (E–F, E.Richard 5, BRI).

Occurs from the Mary River to Cape York, Qld, extending to the Phillipines and Cook Islands; grows in open forest, littoral forest and seasonally dry semi-evergreen vine forest and thicket. Map 232.

Qld: Stannary Hills, Dec. 1908, *T.L.Bancroft* (♂) (BRI); Cape Melville, *B.Hyland 4822* (♂) (BRI, QRS); 40 mile scrub, *A.K.Irvine 158* (♀) (BRI, QRS); Boyne Island, S of Gladstone, *T.Stanley 78195* & *E.Ross* (♀) (BRI); Moore Park Creek, 8 km W of Bundaberg, *P.R.Sharpe 2217* & *R.M.Dowling* (♀) (BRI).

Some specimens with densely pubescent foliage and inflorescence axes bear the features of *P. hapalum* A.C.Smith from Fiji. As intermediates between the glabrous and densely pubescent forms do exist it seems wise to recognise only one variable species in Australia at the present time.

In describing the fruit, Ding Hou, *loc. cit.*, recorded the internal structure differently from A.W.Hill, *loc. cit.* The latter's interpretation is supported here.

The thin, fleshy layer on the fruit is reported to be edible when ripe.

## 5. EUROSCHINUS

*Euroschinus* J.D. Hook. in Benth. & Hook.f., *Gen. Pl.* 1: 417, 422 (1862), from the Greek *euros* (east), and *Schinus*, a related S American genus.

Type: *E. falcata* Hook.f.

Polygamous trees. Leaves alternate, mostly paripinnate. Leaflets alternate, opposite or subopposite, entire. Inflorescences terminal or in upper axils. Calyx lobes 5, rarely 4. Petals 5, rarely 4, imbricate. Stamens 10, inserted below margin of disc; anthers dorsifixed, introrse. Staminodes present in female. Disc with 10 lobes between filaments, cupular and supporting a pistillode in males, shallowly cupular and supporting ovary in female and hermaphrodite flowers. Ovary 1-locular with 1 laterally-attached ovule. Style 1, stigmas 3. Fruit a drupe, 1-locular; exocarp membranous; mesocarp spongy with numerous resin cells; endocarp thin, cartilaginous, compressed. Seed 1; testa free from endocarp. Embryo straight; cotyledons free, plano-convex; radicle curved.

A genus of 6 species, 4 in New Caledonia, 1 in New Guinea and New Britain and 1 endemic in Australia.

***Euroschinus falcata*** Hook.f. in Benth. & Hook.f., *Gen. Pl.* 1: 422 (1862)

T: Sunday Island, Qld, 1 Oct. 1848, *J.MacGillivray*; syn: K.

Illustration: W.D.Francis, *Austral. Rainforest Trees* figs 139, 140 (1970).

Tree to 30 m. Branchlets pubescent to glabrous. Leaflets 4-10, acuminate, asymmetric with curved midvein, mostly 3.5-10 cm long; secondary veins mostly 6-11 pairs, sometimes with hair-tuft domatia; petiolules 5-12 mm long. Inflorescence mostly 5-15 cm long, pubescent or puberulous; flowers on pedicels 0.2-0.5 mm long. Calyx lobes obtusely triangular, 0.2-0.4 mm long. Petals oblong-ovate. Male flowers: anthers 1-1.5 mm long; filaments c. 1 mm long; disc 0.8-1 mm diam.; pistillode 0.5-1 mm long. Female flowers: staminodes c. 1 mm long; ovary ovoid or subglobular, c. 1 mm long; style 0.2 mm long. Drupe obliquely ellipsoidal or ovoid, mostly 7-8 mm long, purple-black; style eccentric. *Ribbonwood*, *Blush Cudgerie*.

Occurs from Cape York Peninsula, Qld, to the Shoalhaven R., N.S.W. There are two varieties.

Leaflet length mostly less than 4 times width

**1a. var. falcata**

Leaflet length mostly more than 4 times width

**1b. var. augustifolia.**

**1a. *Euroschinus falcata* Hook.f. var. *falcata***

*E. parvifolia* S.Moore, *J. Linn. Soc., Bot.* 45: 197 (1920). T: Hunter River, N.S.W., *R.Brown* (Cumberland Islands, Qld, *vide* S.Moore, *loc. cit.*); holo: BM.

Bark shallowly fissured. Leaflets ovate or lanceolate, mostly 2–8 cm wide, puberulous or glabrous; base acute, attenuate or obtuse. Petals 2.2–2.6 mm long. Fig. 40C–D.

Common in several types of rainforest and in ecotones from Cape York Peninsula, Qld, to the Shoalhaven R., N.S.W. Map 233.

Qld: The Fisheries, Goldsborough, *B.Gray 2193* (BRI, QRS); Upper Brookfield, Brisbane, *L.W.Jessup 21* (BRI); N bank of Pascoe River mouth, *L.J.Webb & J.G.Tracey 13330* (BRI).

**1b. *Euroschinus falcata* var. *angustifolia* Benth., *Fl. Austral.* 1: 491 (1863)**

T: Rockhampton, Qld, *Thozet*; lecto: K *vide* L.W.Jessup, *Fl. Australia* 25: 203 (1985).

Bark fissured, ±tessellated. Leaflets narrowly lanceolate, mostly 0.8–2.5 cm wide, glabrous; base attenuate. Petals 2.4–3.5 mm long. Fig. 40E–F.

Occurs from the Mitchell River to the Boyne River, Qld, in eucalypt open forest and in semi-evergreen and deciduous vine thickets Map 234.

Qld: Stannary Hills, 1908, *T.L.Bancroft BRI 071803* (BRI); New Zealand Gully on Boyne River, *I.Cowie 31* (BRI); Mt Morgan, *E.Richard 5* (BRI).

**6. SCHINUS**

*Schinus* L., *Sp. Pl.* 1: 388 (1753), *Gen. Pl.* 5th edn, 184 (1754); the Latin transcription of the old Greek name for the tree *schinos*, a species of *Pistacia* that resembles *Schinus* in its sap.

Type: *S. molle* L.

Shrubs or trees, dioecious or sometimes polygamodioecious. Leaves alternate, simple (not in Australia) or imparipinnate; rachis slightly winged; leaflets sessile or subsessile. Sepals 4 or 5. Petals 4 or 5. Male flowers: stamens 8–10, inserted below margin of disc, the alternipetalous ones longer; anthers dorsifixed, introrse; disc lobed between filaments; pistillode present. Female flowers: staminodes 8–10; ovary seated on disc, 1–locular, with 1 ovule suspended shortly below apex; styles 3, rarely 4, united at base; stigmas 3, rarely 4. Fruit a drupe; exocarp membranous, shining, fragile, separating from mesocarp at maturity; mesocarp resinous, adhering to bony endocarp.

A genus of c. 28 species, native to S America. Several species naturalised and cultivated in other parts of the world. 2 species naturalised and cultivated in Australia.

F.A.Barkley, A study of *Schinus* L., *Lilloa* 28: 5–110 (1957).

Leaflets usually 17 or more, lanceolate to linear lanceolate; length 3–6 times width; branchlets pendulous

**1. *S. molle***

Leaflets usually 9, occasionally 7–13, obovate or elliptic; length 1.5–3 times width; branchlets not pendulous

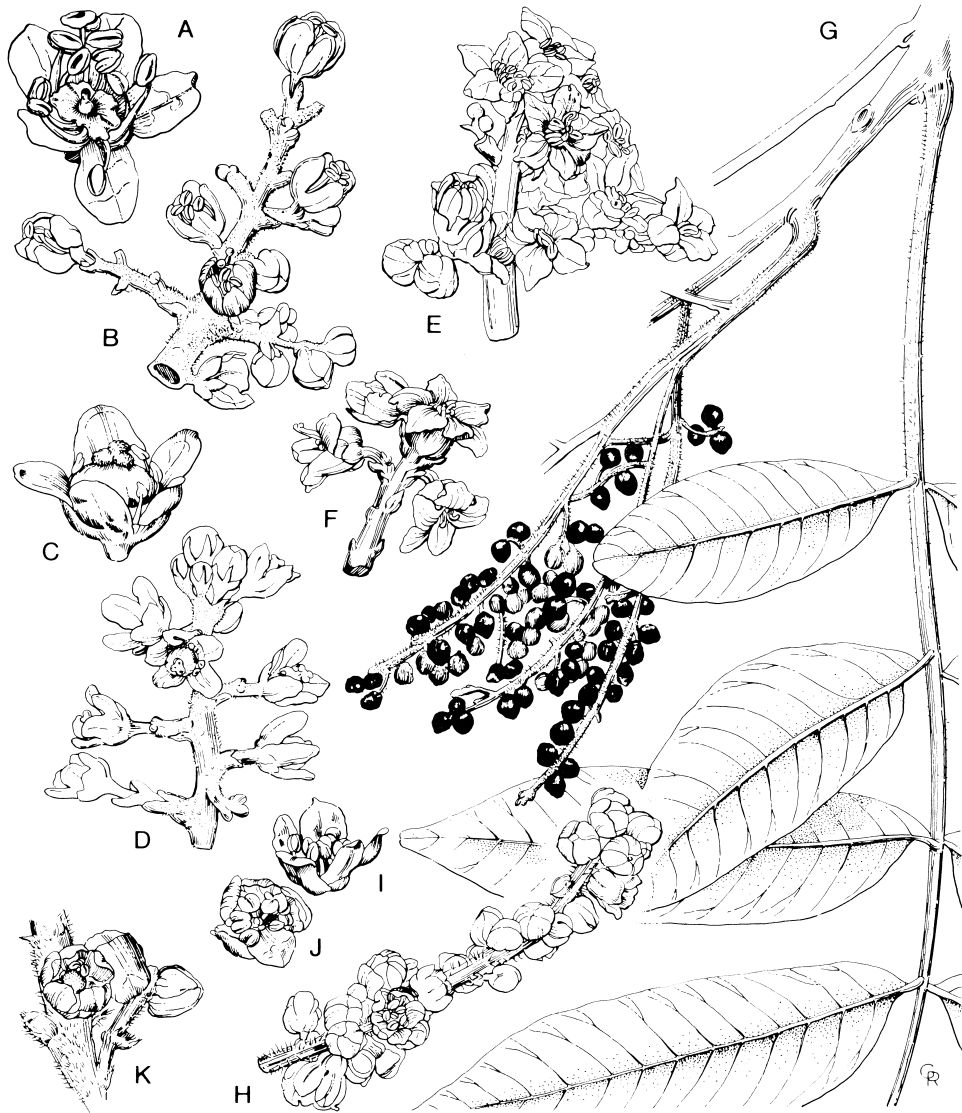
**2. *S. terebinthifolia***

**1. \**Schinus molle* L., *Sp. Pl.* 1: 388 (1753)**

var. ***areira*** (L.) DC., *Prodr.* 2: 74 (1825)

*S. areira* L., *Sp. Pl.* 1: 389 (1753). T: from Brazil and Peru, collector unknown; *n.v.*

Tree to 10 m; branchlets slender, pendulous. Leaflets 17–35, sessile, alternate or subopposite, lanceolate to linear-lanceolate, acute, mucronate, entire or remotely serrulate, 15–50 mm long, 2–10 mm wide; terminal leaflet often reduced; base obtuse; secondary veins mostly 20–30 pairs. Inflorescence a thyrse, terminal or in upper axils, glabrous or puberulous; pedicels 1–2 mm long. Sepals broadly ovate, ciliate, 0.3–0.5 mm long. Petals



**Figure 41.** A–D, *Schinus terebinthifolia*. A, male flower  $\times 8$ ; B, male inflorescence  $\times 4$  (A–B, L.Jessup 565, BRI). C, female flower  $\times 8$ ; D, female inflorescence  $\times 4$  (C–D, L.Jessup 566, BRI). E–F, *Rhodosphaera rhodantha*. E, male inflorescence  $\times 2$ ; F, female inflorescence  $\times 2$  (E–F, K.Williams 75110, BRI). G–K, *Rhus taitensis*. G, female fruiting habit  $\times 0.7$  (L.Smith 3257, BRI); H, male inflorescence  $\times 2$ ; I, side view of male flower  $\times 4$ ; J, front view of male flower  $\times 4$  (H–J, B.Gray 2429, BRI); K, female inflorescence  $\times 4$  (V.Scarth-Johnson 742A, BRI).

elliptic to obovate, glabrous, 1.8–2.5 mm long. Male flowers: anthers 0.5 mm long; filaments alternately 0.5 mm and 1.4 mm long; disc saucer-shaped. Female flowers: staminodes c. 0.4 mm long; disc cup-shaped; ovary subglobular; styles 0.5 mm long. Drupe subglobular, c. 6–7 mm diam., bluish-pink to red. Pepperina, Pepper Tree.

Probably originally from Bolivia, S Brazil, Paraguay and N Argentina, distributed by Spanish colonists as a spice producing ornamental. Now cultivated and naturalised in many warm temperate regions, in Australia in S.A., southern Qld, western and central eastern N.S.W. and Vic.; widely planted but not naturalised in southern W.A. Map 235.

S.A.: Hundred of Wiltunga, c. 140 km NNW of Adelaide, *B.Copley 52* (♂) (AD). Qld: Swan Creek, ENE of Warwick, *G.Gordon 8* (♂) (BRI); c. 2 km S of Oakey on Toowoomba road, 27 Nov. 1975, *T.Stanley & J.Clarkson* (♀) (BRI). N.S.W.: near Broken Hill, *A.Morris 2769* (♀) (BRI). Vic.: Reedy Swamp, 5 km NW of Shepparton, *A.C.Beauglehole 63883* (♀) (MEL).

The fruits have been used as a substitute for pepper.

**2. \**Schinus terebinthifolia*** Raddi, *Mem. Mat. Fis. Soc. Ital. Sci. Modena, Pt. Mem. Fis.* 18: 399 (1820)

T: not designated.

Shrub or tree to 7 m; branchlets not pendulous. Leaflets 7–13, mostly 9, sessile, opposite, obovate or elliptic, obtuse, entire or serrulate-crenulate, 1.5–5 cm long, 1–3 cm wide; base obtuse; secondary veins 7–14 pairs. Inflorescence an axillary panicle, puberulous; pedicels 0.7–1 mm long. Sepals broadly ovate, glabrous or sparsely puberulous, c. 0.7 mm long. Petals ovate, obtuse, glabrous, c. 1.3 mm long. Male flowers: anthers 0.5 mm long; filaments alternately 0.8 mm and 1.4 mm long; disc saucer-shaped. Female flowers: staminodes c. 0.5 mm long; disc cup-shaped; ovary subglobular; styles 0.2 mm long. Drupe c. 5 mm diam., red. *Broad-leaf Pepper Tree*. Fig. 41A–D.

Native of S America. Cultivated and naturalised in eastern Qld. Map 236.

Qld: near Gympie, *L.Durrington 147* (♀) (BRI); Cubberla Creek, Fig Tree Pocket, Brisbane, *L.W.Jessup 565* (♂), *566* (♀) (BRI); Bingera, *L.S.Smith 4113* (♂) (BRI); Mackay, *T.Stanley 78250 & E.Ross* (♀) (BRI).

## 7. RHODOSPHAERA

*Rhodospaera* Engl., *Bot. Jahrb. Syst.* 1: 423 (1881); derived from Greek *rhodon* (rose) and *sphaera* (a ball) in reference to the fruits which were originally described as being reddish.

Type: *R. rhodanthema* (F.Muell.) Engl.

Dioecious trees. Leaves alternate, imparipinnate. Leaflets sub-opposite, entire, sinuate in juveniles. Inflorescence terminal and axillary. Sepals 5, imbricate. Petals 5, imbricate. Male flowers: stamens 10, inserted below margin of disc; anthers dorsifixed, introrse; disc with 10 lobes between filaments, saucer-shaped with a central cavity; pistillode absent. Female flowers: staminodes 10, similar to stamens but smaller; disc shallowly cupular; ovary seated on disc, subglobular, 1–locular with 1 ovule suspended from top of erect basally-attached funicle; styles 3; stigmas depressed-globular or slightly lobed. Fruit a drupe; exocarp chartaceous; mesocarp thick, woody; endocarp bony, compressed. Seed solitary; testa thin, membranous. Endosperm absent; cotyledons free, flat.

Monotypic, endemic in south-eastern Qld and north-eastern N.S.W.

**1. *Rhodospaera rhodanthema*** (F.Muell.) Engl., *Bot. Jahrb. Syst.* 1: 424 (1881)

*Rhus rhodanthema* F.Muell., *Quart. J. & Trans. Pharm. Soc. Victoria* 1: 43 (1858). T: Moreton Bay, Qld, *F.Mueller*; syn: MEL.

*Rhus elegans* W.Hill, *Cat. Nat. Industrial Products Queensland, London Int. Exhib.* 21 (1862). T: not

designated.

Illustrations: F.M.Bailey, *Queensland Fl.* 1: fig. 11 (1899); W.D.Francis, *Austral. Rainforest Trees* figs 137, 138 (1970).

Tree to 20 m. Branchlets with lenticels. Leaflets 4–11, oblong-ovate, acuminate, often asymmetric with curved midvein, glabrescent; base obtuse, shortly attenuate; secondary veins 9–13 pairs, mostly with hair-tuft domatia; petiolules 3–5 mm long. Inflorescence mostly 10–20 cm long, pubescent or puberulous, glabrescent; pedicels 1–2 mm long, bracteate. Sepals ovate, ciliolate, 1.8–2 mm long. Petals oblong-obovate, 3-veined, recurved, 3–3.5 mm long, often ciliolate, pink-red. Male flowers: anthers 1–1.2 mm long; filaments 0.8–1 mm long; disc 1–1.3 mm diam. Female flowers: staminodes 1–1.2 mm long; disc 1.5–1.7 mm diam.; ovary 1 mm long, glabrous; styles 0.5 mm long. Drupe subglobose, 8–11 mm diam.; exocarp thin, glossy, dark brown. *Deep Yellow Wood*. Fig. 41E–F.

Occurs from the Mary River and Bunya Mtns, Qld, S to the Macleay River, N.S.W. in moist and dry complex notophyll vine forest. Map 237.

Qld: road to O'Reillys Guest House, Lamington National Park, *L.W.Jessup 495* (♂) (BRI); Gold Creek reservoir, Brisbane, 4 Apr. 1966, *B.Lebler & J.Gillieatt* (♀) (BRI); Imbil, 31.6 km S of Gympie, *E.H.F.Swain 48* (♀) (BRI); Christmas Ck, c. 43 km S of Beaudesert, *K.A.W.Williams 75110* (♂) (BRI). N.S.W.: c. 1.6 km up hill from Willi Willi Creek, *H.C.Hayes, J.Turner & D.J.McGillivray 2478* (♂) (BRI).

## 8. RHUS

*Rhus* L., *Sp. Pl.* 1: 265 (1753), *Gen. Pl.* 5th edn., 129 (1754); the Latin transcription of the Greek *rhous*, the name of the sumac.

Type: *R. coriaria* L.

Trees or (not in Australia) shrubs, sometimes lianes. Leaves alternate, compound or (not in Australia) simple. Inflorescence terminal and axillary. Flowers unisexual or (not in Australia) bisexual. Calyx lobes 5. Petals mostly 5, imbricate. Disc present. Male flowers: stamens 5; anthers dorsifixed, introrse to latrorse; pistillode present. Female flowers: staminodes present; ovary 1-locular with 1 ovule attached to wall near base by a long funicle; style sometimes obscure; stigmas 3, free or united. Fruit a drupe, 1-locular, 1-seeded; exocarp membranous; mesocarp ±resinous; endocarp coriaceous, crustaceous or bony. Seed with testa adhering to or free from endocarp. Embryo straight; cotyledons free, flat.

About 200 species in most tropical, subtropical and temperate regions; 1 species in Australia.

### Subgen. I. *Melanococca*

*Rhus* subgen. *Melanococca* (Blume) Briz., *J. Arnold Arbor.* 44: 63 (1963)

*Melanococca* Blume, *Mus. Bot.* 1: 236 (1850). T: *M. tomentosa* Blume.

*Rhus* sect. *Melanocarpace* Engl., *Bot. Jahrb. Syst.* 1: 380 (1881). T: *R. taitensis* Guillemin.

*Duckera* F.Barkley, *Amer. Midl. Naturalist* 28: 472 (1942) *nom. superfl.* T: *D. taitensis* (Guillemin) F.Barkley.

Subgen. *Melanococca* is distinguished by the fruit being black and the exocarp not separating from the mesocarp.

**\**Rhus taitensis*** Guillemin, *Ann. Sci. Nat. Bot. ser. 2*, 7: 361 (1837)

*R. simarubaefolia* var. *taitensis* (Guillemin) Engl. in A. & C. de Candolle, *Monogr. Phan.* 4: 451 (1883); *Duckera taitensis* (Guillemin) F.Barkley, *Lilloa* 23: 253 (1950). T: Tahiti, *Bertero & Moerenhout*; n.v.

*R. rufa* Teysmann & Binnend., *Natuurk. Tijdschr. Ned.-Indië* 27: 52 (1863). T: Manado; n.v.

*R. panaciformis* F.Muell., *Fragm.* 7: 22 (1869). T: Valley of Lagoons, Qld, 21 June 1864, 23 Mar. 1867, *J.Dallachy*; syn: MEL.

*R. retusa* Zoll. ex Engl. in A. & C. de Candolle, *Monogr. Phan.* 4: 450 (1883). T: Java, *H.Zollinger 3463*; n.v.

Dioecious tree to 30 m. Branchlets pubescent, with prominent lenticels. Leaflets mostly 11–19, elliptic, oblong-elliptic or lanceolate, obtuse to acuminate, ±pubescent on undersurface, mostly 4–15 cm long and 1.5–5 cm wide; base often asymmetric, obtuse or acute; secondary veins mostly 9–16 pairs; lateral petiolules 2–5 mm long; terminal petiolule 15–30 mm long. Calyx lobes broadly ovate, ciliate, 0.8–1 mm long. Petals narrowly ovate, elliptic or obovate, glabrous outside, pilose inside in lower half, 2–2.5 mm long. Disc 10-lobed. Male flowers: stamens inserted below alternate disc sinuses; anthers 0.8–1 mm long; filaments 1–1.2 mm long. Female flowers: ovary ovoid to subglobose, papillose, sometimes pilose. Style obscure; stigmas ±united. Drupe subglobose, 4–8 mm diam., black. Fig. 41 G–K.

Occurs from Cooktown to Ingham, Qld, extending also from the Philippines and Java to Tahiti; grows in coastal lowland complex mesophyll vine forest. Map 238.

Qld: Dunk Island, July 1909, *E.J.Banfield* (♀) (BRI); near Wyvuri Holding, *B.Hyland 6007* (♂) (BRI, QRS); Gap Creek, Bloomfield, *V.Scarth-Johnson 742A* (♀) (BRI); Etty Bay, near Innisfail, *L.S.Smith 3257* (♀) (BRI); S slope of Cardwell Gap, A. & *M.Thorsborne 54* (♂) (BRI).

**EXCLUDED SPECIES**

*Rhus viticifolia* F.Muell. ex Benth., *Fl. Austral.* 1: 489 (1863).

This is *R. tomentosa* L. from southern Africa. Doubtfully recorded for Australia by Bentham. No subsequent collections from Australia are known.

**9. BLEPHAROCARYA**

*Blepharocarya* F.Muell., *Fragm.* 11: 15 (1878); from the Greek *blepharon* (eyelid) and *karyon* (nut), referring to the ciliate fruit.

Type: *B. involucrigera* F.Muell.

Dioecious trees. Shoots pubescent, glabrescent. Leaves opposite, pinnate; leaflets ±opposite; petiole ridged. Inflorescence terminal and axillary. Male flowers numerous, in bracteate glomerules. Sepals 4, connate at base. Petals 4, imbricate. Disc flat, annular, pilose. Stamens 8, exserted, inserted below disc margin; anthers dorsifixed, introrse. Pistillode columnar, pilose apically. Female flowers inside a cupule of partly coherent and connate, bracteate, puberulous cyme branches. Sepals 4, basally connate. Petals 4, ±sepaloid. Staminodes absent. Disc raised-annular, undulate, pilose. Ovary compressed, obliquely ovoid, 1-locular; ovule 1. Style eccentric, filiform, dilated at stigma. Cupule opening by numerous branched valves. Fruit dry, indehiscent, compressed, subreniform, ciliate. Seed 1; endosperm absent.

An endemic genus of 2 species sometimes placed in a separate family, Blepharocaryaceae.

H.K.Airy Shaw, Blepharocaryaceae, in *Diagnoses of new families, new names, etc.*, for the seventh edition of Willis's "Dictionary", *Kew Bull.* 18: 254 (1965).



**Figure 42.** A–D, *Blepharocarya involucrigera*. A, fruit  $\times 0.7$  (L.Pedley 1863, BRI). B, male flower  $\times 8$ ; C, male inflorescence  $\times 2$  (B–C, B.Hyland 5457, BRI); D, male habit  $\times 0.7$  (L.Brass 19827, BRI). E–G, *Blepharocarya depauperata*. E, female fruiting habit  $\times 0.7$  (W.Bateman 20, BRI). F, female flower with part of perianth removed  $\times 10$  (M.Lazarides 7663, BRI). G, fruit  $\times 3$  (L.Pedley 1863, BRI).



Leaflets 10–18, acute or acuminate; staminal filaments 1.5–1.7 mm long; style 0.8 mm long

**1. *B. involucrigera***

Leaflets 4–7, obtuse or emarginate; staminal filaments 2–2.5 mm long; style 2 mm long

**2. *B. depauperata*****1. *Blepharocarya involucrigera*** F.Muell., *Fragm.* 11: 16 (1878)

T: Endeavour River, Qld, *W.A.Persietz*; syn: MEL; isosyn: BRI.

Illustration: F.M.Bailey, *Compr. Cat. Queensland Pl.* fig. 94 bis. (1913).

Tree to 40 m. Leaves mostly 15–40 cm long; leaflets 10–18, elliptic or lanceolate, acute or acuminate, subcoriaceous; lamina mostly 5–15 cm long and 1.5–4.5 cm wide; base acute or obtuse; secondary veins mostly 13–19 pairs; petiolules 5–15 mm long. Male flowers: sepals ovate, 0.8–1 mm long, pubescent outside, glabrous inside; petals elliptic or ovate, 1.6–1.8 mm long, glabrous; anthers 0.5 mm long; filaments 1.5–1.7 mm long. Female flowers: sepals and petals oblong-ovate, 1–1.3 mm long, pubescent outside, glabrous inside; ovary pilose; style 0.8 mm long; cupule to 2 cm long. Fruit 4 mm long, 7–8 mm wide, pilose; marginal hairs to 4 mm long. Fig. 42A–D.

Occurs from Cape York to the Atherton Tableland, Qld; in evergreen, semideciduous and deciduous vine forest and thicket. Map 239.

Qld: Bonanza Creek, Upper Peach River, *L.J.Brass 19827* (♂) (BRI); 3.2 km N of Rocky River, *B.Hyland 5457* (♂) (BRI, QRS); Kairi–Tinaroo Dam Road, *A.K.Irvine 1798* (♂) (BRI, QRS); Hann River, 80 km NW of Laura, *L.Pedley 1863* (♀) (BRI); Kuranda, *L.J.Webb & J.G.Tracey 5690* (♀) (BRI).

**2. *Blepharocarya depauperata*** Specht in R.L.Specht and C.P.Mountford, *Records Amer.–Austral. Sci. Exped. Arnhem Land 3. Bot. Pl. Ecol.* 253 (1958).

T: Oenpelli, N.T., *R.L.Specht 1209A*; holo: BRI.

Illustration: R.L.Specht & C.P.Mountford, *op. cit.* 254, fig. 9.

Tree to 13 m. Leaves mostly 7–15 cm long; leaflets 4–7, oblong-obovate or elliptic, obtuse or emarginate, coriaceous, mostly 3.5–7 cm long and 1.5–3.5 cm wide; base obtuse or acute; secondary veins mostly 10–14 pairs; petiolules 3–10 mm long. Male flowers: sepals triangular, 0.5–0.8 mm long, pubescent outside, glabrous inside; petals elliptic or ovate, 1.7–1.9 mm long, pubescent outside, glabrous inside; anthers 0.6–0.7 mm long; filaments 2–2.5 mm long. Female flowers: sepals narrowly triangular, 1.3 mm long, densely pilose outside, glabrous inside; petals oblong, 1 mm long, densely pilose outside apically, glabrous inside; ovary glabrous; style 2 mm long. Cupule to 1.7 cm long; fruit 3 mm long, 6 mm wide, pilose; marginal hairs to 3 mm long. Fig. 42E–G.

Occurs in north western N.T.; in open forest and on the edge of semi-evergreen vine forest mostly at the foot of sandstone escarpments or on rocky ridges. Map 240.

N.T.: South Alligator Mine, 7 km SE of UDP Falls, *C.R.Dunlop 4583* (♂) (DNA); 13°22'S, 132°32'E (c. 16 km N of El Sharana), *M.Lazarides 7663* (♀) (BRI); 13 km SSW of Twin Falls, *M.Lazarides 8977* (♀) (DNA); Koongarra area, *M.O.Rankin 1408* (♂) (BRI, DNA); Nourlangie Rock, *R.Schodde AE23* (♀) (BRI).

# SIMAROUBACEAE

*H.J.Hewson*

Trees or shrubs dioecious, monoecious or bisexual. Leaves mostly alternate, pinnately compound or simple, stipulate or exstipulate. Inflorescence axillary or terminal, a raceme, panicle, thyrses or dichasial cyme. Flowers 3–8-merous, bisexual, polygamous or unisexual, regular, hypogynous. Sepals fused at base. Petals free, sometimes absent. Stamens twice as many as petals or as many as and alternate with them; filaments often with a basal appendage. Disc usually present, intra-staminal, sometimes forming a gynophore. Ovary superior; carpels free or fused; ovules usually solitary, apical and pendulous to basal and ascending. Fruit a capsule, samara, drupe or drupaceous, berry or schizocarp. Endosperm scarce or absent.

A pantropical to warm-temperate family of 25 genera and 150 species; 4 genera with 6 species native and 1 introduced in Australia.

G.Bentham, *Simaroubeae*, *Fl. Austral.* 1: 372–376 (1863) p.p.; H.P.Nooteboom, *Simaroubaceae*, *Fl. Males.* ser. 1, 6: 193–226 (1962) p.p.

## KEY TO GENERA

- 1 Leaves compound; stamens 4–10
  - 2 Stamens 8 or 10; flowers in panicles or few-flowered cymes
    - 3 Flowers bisexual, in few-flowered cymes; fruit drupaceous; stipules spinescent **2. HARRISONIA**
    - 3: Flowers unisexual, in panicles; fruit a samara; stipules, if present, not spinescent **4. AILANTHUS**
  - 2: Stamens 4; flowers in thyrses **3. BRUCEA**
- 1: Leaves simple; stamens 8–12 **1. QUASSIA**

## 1. QUASSIA

*Quassia* L., *Sp. Pl.* 2nd edn, 1: 553 (1762); named in honour of G.Quassi, a Surinam Negro who discovered medicinal properties in an American species of the genus.

Type: *Q. amara* L.

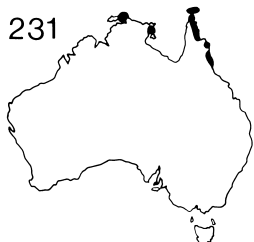
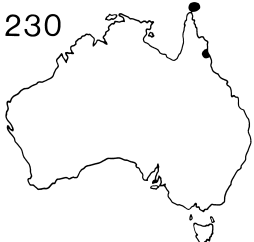
*Simaba* Aublet, *Hist. Pl. Guiane* 400, t. 153 (1775). T: *S. guianensis* Aublet.

*Samadera* Gaertner, *Fruct.* 2: 352, t. 156, fig. 3 (1791). T: *S. indica* Gaertner

*Hyptiandra* Hook.f. in G.Bentham & J.D.Hooker, *Gen. Pl.* 1: 281, 293 (1862). T: *H. bidwillii* Hook.f.

Trees or shrubs, bisexual (in Australia) or monoecious. Leaves simple (in Australia), alternate, petiolate, usually with pitted glands on lower surface, exstipulate. Inflorescence axillary or terminal, clustered, racemose, paniculate or umbellate. Flowers 4–6-merous. Calyx lobed. Petals imbricate or contorted, longer than calyx. Stamens twice as many as petals, appendiculate. Disc cylindrical or subglobose. Carpels free or cohering basally; styles fused; stigma stellate to capitate; ovule apical. Fruit drupaceous, sometimes woody.

A genus of c. 40 species, pantropical and subtropical; 2 species, possibly 3, endemic in Australia, all in the section *Samadera* (Gaertner) Nooteb., which is considered a distinct genus by some workers. The status and delimitation of closely related genera requires further investigation.



226. *Canarium muellerii*  
 229. *Buchanania mangoides*  
 232. *Pleiogynium timorense*  
 235. *Schinus molle*  
 var. *aerea*  
 238. *Rhus taitensis*

227. *Buchanania arborescens*  
 230. *Mangifera indica*  
 233. *Euroschinus falcata*  
 var. *falcata*  
 236. *Schinus terebinthifolia*  
 239. *Blepharocarya involucrigera*

228. *Buchanania obovata*  
 231. *Semecarpus australiensis*  
 234. *Euroschinus falcata*  
 var. *angustifolia*  
 237. *Rodosphaera rhodanthema*  
 240. *Blepharocarya depauperata*

H.P.Nooteboom, Generic delimitation in Simaroubaceae tribus Simaroubeae and a conspectus of the genus *Quassia* L., *Blumea* 11: 509–528 (1962). C. Feuillet, Le statut des genre *Quassia* L., *Samadera* Gaertn., *Simaba* Aubl. et *Simarouba* Aubl. (Simaroubaceae), *Bull. Jard. Bot. État* 53: 510–511 (1983).

Flowers in axillary clusters; petals less than 5 mm long; drupelets 0.5–1 cm long

1. *Q. bidwillii*

Flowers in pseudo-umbels; petals more than 5 mm long; drupelets 3–4 cm long

2. *Q. baileyana*

### 1. *Quassia bidwillii* (Hook.f.) Nooteb., *Blumea* 11: 519 (1962)

*Hyptiandra bidwillii* Hook.f. in G.Bentham & J.D.Hooker, *Gen. Pl.* 1: 293–294 (1862); *Samadera bidwillii* (Hook.f.) Oliver in J.D.Hooker, *Icon. Pl.* ser. 4, 5: t. 2449 (1896); *Simaba bidwillii* (Hook.f.) Feuillet, *Bull. Jard. Bot. État* 53: 510 (1983). T: Wide Bay, Qld, *J.C.Bidwill s.n.; n.v.*

Illustration: D.Oliver, *op. cit.*

Shrub or small tree to 6 m tall. Leaves ovate, lanceolate or narrowly elliptic, obtuse; lamina 8–15 cm long, glabrous, or silky-pubescent below; petiole c. 4 mm long. Flowers bisexual, in axillary clusters; pedicels 1–4 mm long. Calyx 4- or 5-lobed; lobes c. 1 mm long. Petals 4 or 5, imbricate in bud, ovate, c. 2.5 mm long, glabrous or slightly hairy outside, red. Stamens 8 or 10; filaments broadly dilated, abruptly constricted near apex, 1.5–2 mm long, villous. Ovary villous, of 4 or 5 carpels; style c. 1 mm long; stigma 5-lobed; ovules 1 or 2 per carpel. Fruit of 1–4 drupelets, each ovoid or ellipsoidal, 0.5–1 cm long, glabrous or puberulent, red. Fig. 43C.

Occurs in rainforest or on rainforest margins from Cape York Peninsula, Qld, south to north-eastern N.S.W. Map 241.

Qld: Jardine R., *L.J.Brass 18888* (BRI, CANB); Tozer Range, *L.J.Brass 19393* (BRI, CANB); Maryborough, 29 Oct. 1948, *M.S.Clemens* (BRI, CANB); Mt Carter, *B.Hyland 7558* (CANB); Maryborough, *W.R.Petrie 1084* (BRI).

This taxon requires revision. It possibly includes two or three species. There is a large geographical discontinuity in Queensland. Moreover, A.G.Floyd, *New South Wales Rainforest Trees* 8: 38 (1979) stated, 'the New South Wales specimens appear to differ from those in Queensland in their less conspicuous venation, cauline floral clusters, slender flower stalks and larger smooth fruits'.

### 2. *Quassia baileyana* (Oliver) Nooteb., *Blumea* 11: 519 (1962)

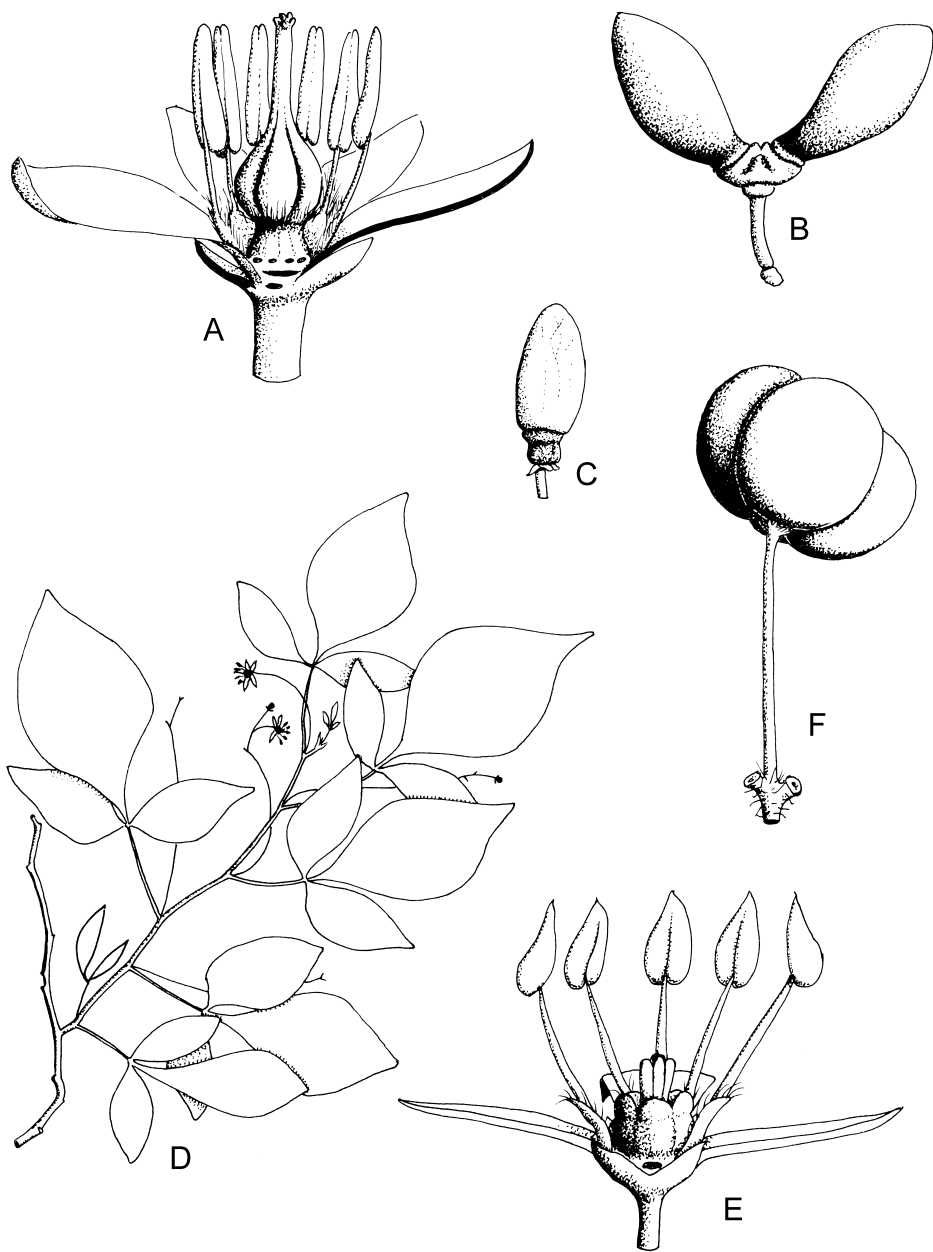
*Samadera baileyana* Oliver in J.D.Hooker, *Icon. Pl.* ser. 4, 5: t. 2450 (1896); *Hyptiandra bidwillii* var. *grandiuscula* F.M.Bailey & F.Muell. ex F.M.Bailey, *Syn. Queensland Fl.* Suppl. 3: 12 (1890); *Simaba baileyana* (Oliver) Feuillet, *Bull. Jard. Bot. État* 53: 510 (1983). T: Palm Camp, at 4,000 ft, Bellenden Ker, Qld, June 1889, *F.M.Bailey s.n.*; holotype: BRI.

Illustration: D.Oliver, *loc. cit.*

Tree to 8 m tall. Leaves obovate to oblanceolate, or elliptic, acuminate; lamina mostly 9–19 cm long, sometimes to 25 cm, glabrous; venation prominent; petiole 1–2 cm long. Flowers bisexual, in pedunculate pseudo-umbels. Calyx 5-lobed, c. 1 mm long. Petals 5, oblong, 6–10 mm long, glabrous, pink to red. Stamens 10; filaments slender, glabrous above, hirsute, expanded and coherent at base, 4–6 mm long. Carpels 5, glabrous above disc, hirsute at base; style c. 3 mm long; stigma 5-lobed. Fruit of 1–5 drupelets, each ovoid or ellipsoidal, 3–4 cm long, orange to brown, articulating above disc. Fig. 43A–B.

Occurs in rainforest in northern Qld. Map 242.

Qld: Barong Logging Area, *B.Gray 2637* (QRS); Windin Logging Area, *V.K.Moriarty 2068* (BRI, CANB); Mt Bartle Frere, *R.F.Thorne & G.Tracey 22754* (BRI); Mt Bartle Frere, *R.F.Thorne & W.T.Jones 20929* (BRI); Boonjie, 17°21'S, 145°39'E, Mar. 1954, *K.J.White* (BRI).



**Figure 43.** A–C, *Quassia*. A–B, *Q. baileyana*. A, flower with 1 side removed,  $\times 5$  (V.Moriarty 2068, CANB); B, fruit  $\times 0.6$  (B.Gray 2637, QRS). C, *Q. bidwillii*, fruit  $\times 1.8$  (L.Brass 18888, CANB). D–F, *Harrisonia brownii*. D, flowering branch  $\times 0.6$ ; E, flower with 1 side removed  $\times 9$  (D–E, Groote Eylandt, N.T., D.Levitt, DNA); F, fruit  $\times 3.5$  (C.Dunlop 5400, DNA).

**2. HARRISONIA**

*Harrissonia* R.Br. ex Adr. Juss., *Mém. Mus. Hist. Nat.* 12: 517, t. 28 (1825), *nom. cons.*; named in honour of Charles Harrison who wrote a book on fruit trees, published in 1825.

Type: *H. brownii* Adr. Juss.

Trees or shrubs, usually thorny, bisexual. Leaves imparipinnate, stipulate; stipules spinescent, caducous. Inflorescence axillary or terminal, cymose, paniculate or thyrsoid, bracteate. Calyx 4- or 5-lobed. Petals 4 or 5, slightly imbricate. Stamens 8 or 10, appendiculate. Disc thick. Ovary 4- or 5-lobed, corresponding to carpels; styles free or fused at base; ovules apical, pendulous. Fruit drupaceous with 1-5 pyrenes or nuts. Endosperm present.

A genus of 4 species in tropical regions of Africa, SE Asia and through Malaysia to Australia; 1 species native in Australia in W.A., N.T. and Qld.

***Harrissonia brownii*** Adr. Juss., *Mém. Mus. Hist. Nat.* 12: 540, t. 28 (1825)

T: from Timor, *collector unknown; n.v.*

Tree to 4 m tall or a shrub, sometimes sprawling. Leaves sometimes in clusters, trifoliate; leaflets usually ovate, acuminate, entire or irregularly serrate, glabrous or sparsely pubescent or pilose below; terminal leaflet largest, to 8.5 cm long; lateral leaflet to 5 cm long; base attenuate or oblique; stipules conical, 0.5-1.2 mm long. Inflorescence few-flowered, to 7 cm long; peduncles 1.5-5 cm long; flowers 4-merous. Calyx lobes c. 0.5 mm long. Petals lanceolate to oblong, to 5 mm long, green-white or yellow. Stamens 8, shorter than or equal to petals; appendage a bilobed basal ligule, 1-1.5 mm long. Disc cylindrical, 8-10-lobed. Styles 4, to 2.5 mm long, connate; ovary c. 1 mm long. Fruit frequently a single globose drupe, 4-5 mm diam., black; compound fruits deeply lobed. Fig. 43D-F

Occurs from the Philippines south through eastern Malaysia to New Guinea and northern Australia. Grows in vine thicket or monsoon scrub in the Kimberley, W.A., the islands of N.T. and the Gulf of Carpentaria and Cape York Peninsula, Qld. Map 243.

W.A.: SW of Crystal Head, Port Warrender, *T.Farrell 976* (PERTH); Mitchell Plateau, *J.Petheram 410* (DNA). N.T.: Waranguyu Lagoon, Elcho Island, *C.Dunlop 3810* (DNA); Angurugu, Groote Eylandt, Feb. 1973, *D.Levitt* (BRI, CANB, DNA).

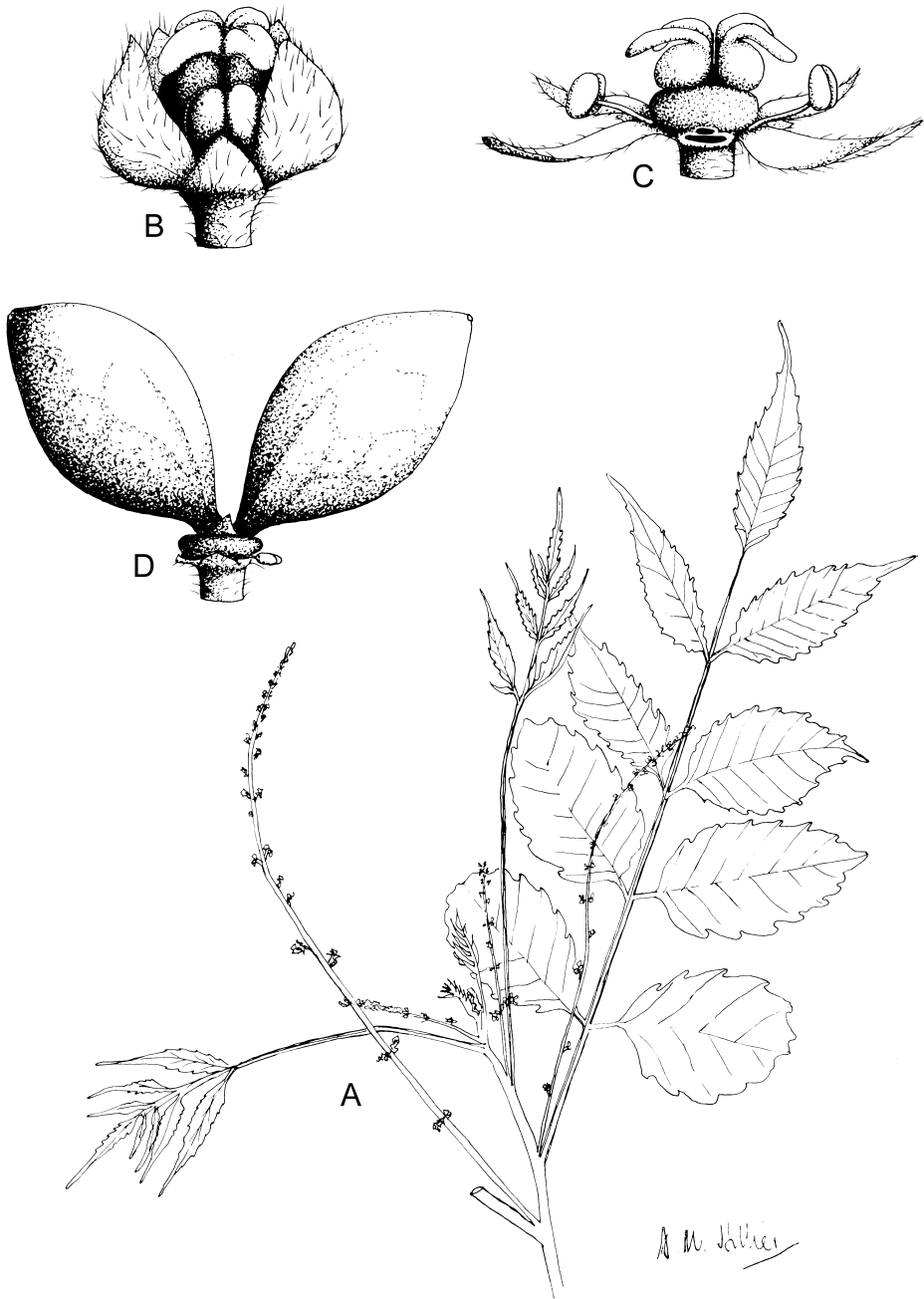
**3. BRUCEA**

*Brucea* J.F.Miller, *Icon. Anim. Pl.* t. 25 (1779-1780), *nom. cons.*; named in honour of James Bruce (1730-1794), a Scottish explorer of Africa.

Type: *B. antiodysenterica* J.F.Miller

Shrubs or trees, monoecious, dioecious or bisexual. Leaves imparipinnate, exstipulate. Inflorescence cymose with axillary, bracteate, raceme-like thyrses. Sepals 4, fused at base. Petals 4, free, imbricate. Stamens 4, vestigial or absent in female flowers; filaments without basal appendage. Disc thick, 4-lobed. Carpels 4, free, vestigial in male flowers; styles free or cohering at base; ovule 1, pendulous. Fruit drupaceous; drupelets with thin pericarp and hard endocarp. Endosperm present.

There are 6 species in the genus in tropical regions from Africa east to Australia; 1 species is native in Australia.



**Figure 44.** *Brucea javanica* **A**, male habit  $\times 0.6$ ; **B**, male bud, showing 1 stamen and stigmas,  $\times 16$ ; **C**, male flower, with 1 sepal and stamen removed,  $\times 16$  (**A–C**, M.Rankin 1575, DNA); **D**, fruit with 2 fertile carpels  $\times 10$  (M.Rankin 1691, DNA).

**1. Brucea javanica** (L.) Merr., *J. Arnold Arbor.* 9: 3, t. 10 (1928)

*Rhus javanica* L., *Sp. Pl.* 1: 265 (1753). T: Java, *Osbeck s.n.*; *n.v.*

*Brucea amarissima* (Lour.) Merr., *Philipp. J. Sci.* 10c: 18 (1915); *Gonus amarissimus* Lour., *Fl. Cochinch.* 2: 658 (1790). T: from India and China, *collector unknown*; *n.v.*

*Brucea sumatrana* Roxb., *Hort. Bengal.* 12 (1814), *Fl. Indica* 1: 469 (1820). T: cultivated from seed from Sumatra, *Ewer s.n.*; *n.v.*

Illustration: H.P.Nooteboom, *Fl. Males.* ser. 1, 6: 210, fig. 12 (1962).

Shrub or tree to 10 m tall, dioecious or bisexual. Leaflets 3–15, usually 5–7, ovate-oblong to ovate-lanceolate, acuminate to 13 cm long, serrate, each serration with an abaxial, marginal gland terminating a lateral vein, glabrous or sparsely pubescent or velutinous; base oblique. Inflorescence raceme-like, to 60 cm long. Sepals pubescent, to 1 mm long. Petals 1–2 mm long, green-white to green-red or green-purple. Stamens c. 1 mm long. Drupelets 1–4 together, each ovoid or ellipsoidal, 4–10 mm long, slightly 2-ribbed. Fig. 44.

Occurs from Sri Lanka through SE Asia to Australia. In Australia occurs on offshore islands and coastal regions of northern W.A., N.T. and Qld. Map 244.

W.A.: Augustus Island, *P.G.Wilson 10776* (♀) (PERTH); South Maret Island, *N.G.Marchant 72/288* (♀) (PERTH). N.T.: Refuge Bay, Elcho Island, *C.Dunlop 3924* (♀) (DNA); Gunn Point, *M.O.Rankin 1575* (♂) (DNA). Qld: Port Douglas, *W.T.Jones 623* (CANB).

Bark and roots have been used by aborigines for the treatment of toothache.

**4. AILANTHUS**

*Ailanthus* Desf., *Hist. Acad. Roy. Sci. Mém. Math. Phys. (Paris, 4°)* 1786: 265, t. 8. (1788), *nom. cons.*; from the Chinese *ailanto* (the Tree of Heaven), the first-named species in the genus.

Type: *A. glandulosus* Desf. = *A. altissima* (Miller) Swingle

Trees, dioecious, evergreen or deciduous. Leaves alternate, pinnate, stipulate or exstipulate; leaflets opposite or subopposite, with abaxial surface glands. Inflorescence an axillary panicle. Calyx 5-, rarely 6-lobed. Petals 5, rarely 6, longer than calyx. Male flowers: stamens 10; filaments without basal appendage; disc 10-lobed; carpels vestigial or absent. Female flowers: stamens reduced or absent; disc 10-lobed; carpels 2–5, free; styles free or connate; ovule 1, pendulous. Fruit a samara. Seed without endosperm.

A genus of 5 species mostly in tropical and subtropical regions from Turkestan through India, Asia and Australia to the Solomon Islands; 2 are native in Australia and 1 introduced.

1 Leaflets toothed; petals woolly at base

1. *A. altissima*

1: Leaflets entire; petals glabrous or puberulous

2 Leaflets 3–15 cm long; petals subglabrous or glabrous, 2.5–5 mm long; stigmas peltate

2. *A. triphysa*

2: Leaflets 10–40 cm long; petals puberulous, 6–10 mm long; stigmas stellate

3. *A. integrifolia*

**1. \*Ailanthus altissima** (Miller) Swingle, *J. Washington Acad. Sci.* 6: 495 (1916)

*Toxicodendron altissimum* Miller, *Gard. Dict.* 8th edn (1768). T: China, *collector unknown*; *n.v.*

*Ailanthus glandulosus* Desf., *Hist. Acad. Roy. Sci. Mém. Math. Phys. (Paris, 4°)* 1786: 265, t. 8 (1788). T: China, *collector unknown*; *n.v.*

*Ailanthus rhodoptera* F.Muell., *Fragm.* 3: 43 (1863). T: cultivated in New England, N.S.W., *collector unknown*; *n.v.*

Illustrations: N.C.W.Beadle, *Stud. Fl. N.E. New South Wales* 4: fig. 246 A2–3 (1980); A.Cronquist,



*Integrated Syst. Classif. Fl. Pl.* fig. 5.56 (1981); T.D.Stanley & E.M.Ross, *Fl. S.E. Queensland* 1: fig. 73D (1984).

Deciduous tree to 8 m tall, suckering from roots to form dense thickets. Leaves mostly with 4 or 5 pairs of leaflets, glabrous or puberulous; leaflets ovate, acute to acuminate, 4–13 cm long, soft, oblique and lobed or dentate near base with abaxial gland near tip of each lobe; stipules caducous, c. 0.5 mm long. Calyx lobes c. 1 mm long. Petals ovate, inrolled, c. 3 mm long, woolly on inner surface and lower margins, white. Stamens in 2 whorls, dimorphic, half to equal petal-length in male flowers, shorter in female. Carpels 5, glabrous; styles connate in lower half; stigmas connate, peltate. Samara c. 4 cm long and 1 cm wide, yellow-red. *Tree of Heaven*.

Native of China, now widely cultivated around the world. In Australia it is an escape from cultivation in Qld, N.S.W. and Vic. Map 245.

Qld: Allora, *W.T.Jones 2360* (♀) (BRI, CANB); Stanthorpe, Dec. 1962, *W.T.Jones* (♀) (BRI); c. 35 km ESE of Texas, 28°57'S, 151°27'E, *L.Pedley 4057* (BRI); Warwick, Nov. 1947, *J.Ryby* (♂) (BRI). N.S.W.: Grafton, *C.T.White 11157* (♂) (BRI).

## 2. *Ailanthus triphysa* (Dennst.) Alston, *Handb. Fl. Ceylon* 6: 41 (1931)

*Adenanthera triphysa* Dennst., *Schlüssel Hortus Malab.* 32 (1818). T: H.A.Rheede, *Hortus Malab.* 6: t. 15 (1686); from Malabar; *n.v.*

*Ailanthus malabarica* DC., *Prodr.* 2: 89 (1825). T: from Malabar; *n.v.*

*Ailanthus imberbiflora* F.Muell., *Fragm.* 3: 42 (1863). T: near Rockhampton, Qld, *A.Thozet s.n.*; *n.v.*

*Ailanthus imberbiflora* var. *macartneyi* F.M.Bailey, *Queensland Dept. Agric. Bot. Bull.* 10: 21 (1895). T: Forest Hill, Mackay, Qld, Jan. 1895, *W.Macartney*; ?syn: BRI 69399, 69400; *loc. id.*, Dec. 1894, *W.Macartney I*; ?syn: BRI.

Illustration: N.C.W.Beadle, *Stud. Fl. N.E. New South Wales* 4: fig. 246 A1 (1980).

Evergreen tree to 30 m tall, rarely to 45 m. Leaves with 6–30 pairs of leaflets, to 70 cm long; leaflets mostly ovate-lanceolate to oblong-lanceolate, falcate, acuminate, entire, 3–15 cm long, rarely more, glabrous or pubescent below; base cuneate, oblique; stipules caducous, c. 0.5 mm long. Calyx lobes less than 1 mm long. Petals elliptic, 2.5–5 mm long, glabrous or nearly so. Stamens 3–6 mm long, shorter in female flowers. Carpels 2–4, glabrous; styles connate or free at base; stigmas connate, peltate. Samara 4.5–8 cm long, 1.5–2.5 cm wide. *White Bean*, *White Siris*.

Native of India, extending through SE Asia to Australia. In Australia occurs from Cape York Peninsula, Qld, south to northern N.S.W., especially in coastal rainforest. Map 246.

Qld: Cannonvale, *W.T.Jones 2036, 3534* (CANB); D'Aguilar Range, NW of Brisbane, *V.K.Moriarty 1635* (BRI, CANB); Kilcoy, 26°05'S, 152°03'E, Oct. 1977, *D.Perrin* (♂) (BRI); Brookfield, *L.J.Webb 1530* (CANB); Rockhampton, *C.T.White 8188* (♂) (BRI).

## 3. *Ailanthus integrifolia* Lam., *Encycl.* 3(2): 417 (1792)

### subsp. *integrifolia*

T: from Malacca, *collector unknown*; *n.v.*

Evergreen tree to 60 m tall. Leaves to 2 m long, exstipulate, with 2–9 pairs of leaflets; leaflets falcate, acuminate, entire, 10–40 cm long, 4–15 cm wide, glabrous above, pubescent below, with hair-tuft domatia; base oblique. Calyx irregularly lobed; lobes 1–4 mm long. Petals ovate, 6–10 mm long, puberulous. Stamens c. half length of petals, shorter in female flowers. Carpels 5, puberulous; styles connate at base; stigma stellate. Samara 11–22 cm long, 2.5–5 cm wide.

Occurs from Malaysia through Australia to the Solomon Islands; in Australia occurs on Cape York Peninsula. Map 247.

Qld: Alexandra Cooper Creek, *B.Hyland 3336* (BRI, CANB); Claudie River, *A.Irvine 215* (BRI); Clump Point, *L.S.Smith 5023* (BRI); South Johnstone R., *L.J.Webb 617* (CANB).

*Ailanthus*

SIMAROUBACEAE

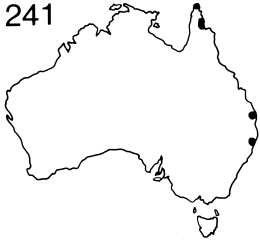
**EXCLUDED NAME**

*Ailanthus punctata* F.Muell., *Fragm.* 3: 42 (1862)

T: MacConnell's Brush, *L.Leichhardt s.n.*; syn: *n.v.*; Richmond River, N.S.W., *C.Moore s.n.*; syn: *n.v.*

This is *Pentaceras australis* Hook.f., in the family Rutaceae.

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241. *Quassia bidwillii*

244. *Brucea javanica*

247. *Ailanthus integrifolia*

242. *Quassia baileyana*

245. *Ailanthus altissima*

243. *Harrisonia brownii*

246. *Ailanthus triphysa*

## APPENDIX

### New taxa, combinations and lectotypifications

New taxa, combinations and lectotypifications occurring in this Volume of the *Flora of Australia* are formally published here. The families are arranged in the same order as in the text; taxa are alphabetic within families. For economy the entries are brief; the treatment in the main text is more comprehensive. The date of publication of this Volume will be given in Volume 46.

### SAPINDACEAE

*S.T.Reynolds*

***Arytera bifoliolata*** S.Reyn., sp. nov.

Species *Arytera distyli* (F.Muell. ex Benth.) Radlk. primo aspectu similis sed foliolis plerumque 2–3 plo majoribus, domatiis absentibus, inflorescentia paniculiformi, et endocarpo praeter suturas parce villosas glabro, differt.

T: Lockerbie, Cape York Peninsula, Qld, 5. Dec. 1962, *B.P.M.Hyland* 2533 ; holo: BRI.

Occurs in northern N.T. and on Cape York Peninsula, Qld, growing in rainforest bordering mangroves on sandstone and lateritic soil.

The specific epithet refers to the bifoliolate leaves.

***Arytera dictyoneura*** S.T.Reyn., sp. nov.

*Arytera distyli* (F.Muell. ex Benth.) Radlk. affinis, a qua ramulis, petiolis et axibus foliorum ferrugineo-pubescentibus vel villosis, foliolis bijugis subtiliter reticulato-nervatis, et domatiis obscuris vel absentibus, differt.

T: c. 6 km from Forest Station on Scott Rd, NE of Boyne R. crossing, Bulburin State Forest 391, Qld, Dec. 1981, *W.J.F.McDonald* 3439 ; holo: BRI.

Known only from the type area.

Named from the Greek *dictyon* (net) and *neuron* (nerve), in reference to the leaf venation.

***Arytera divaricata*** F.Muell., *Trans. & Proc. Philos. Inst. Victoria* 3: 25 (1859)

*Nephelium divaricatum* (F.Muell.) F.Muell. ex Benth., *Fl. Austral.* 1: 467 (1863). T: Moreton Bay, Qld, *W.Hill*; lecto (here chosen): MEL 75411.

This sheet agrees with the description. Another sheet at MEL, probably collected by Mueller at the same locality, is *Arytera distylis*.

***Arytera pauciflora*** S.Reyn., sp. nov.

Ab speciebus aliis Australiensibus inflorescentia plerumque ramiflora, parva, pauciflora, cymosa vel racemosa, differt. Ad *Aryteram divaricatam* F.Muell. accedit, a qua foliolis 1–vel 2–jugis oppositis subtiliter reticulatis, differt.

T: Johnstone R., Qld, March 1915, *N.Michael s.n.*; holo: BRI, iso: BRI.

Occurs from Cooktown to Tully, N Qld, growing on ridges in scrubby rainforest.

Named from the Latin *paucus* (few) and *flos* (flower), in reference to the inflorescence.

**Cupaniopsis dallachyi** S.Reyn., sp. nov.

*Cupaniopse anacardioide* (A.Rich.) Radlk. primo aspectu maxime similis, a qua ramulis plerumque dense lenticellatis, foliolis in sicco crassioribus, domatiis secus costam dispositis, et fructibus obovoideis vel ellipsoideis, praecipue differt.

T: Jaggan, near Malandar, Qld, c. 17°23'S, 145°36'E, 30 Sept. 1980, *G.C.Stocker 1773*; holotype: BRI, iso: QRS.

Occurs in N Qld from S of Ravenshoe to near Daintree, growing in rainforest.

Named after John Dallachy (1808–1871) whose collections of plants from the Rockingham Bay area included a number of new species in Sapindaceae as well as other families.

**Diploglottis diphylostegia** (F.Muell.) F.M.Bailey, *Proc. Roy. Soc. Queensland* 1: 148 (1884)

*Cupania diphylostegia* F.Muell., *Fragm.* 5: 145 (1866); *Diploglottis cunninghamii* var. *diphylostegia* J.F.Bailey, *Queensland Agric. J.* 5: 396 (Oct. 1899); *Diploglottis cunninghamii* var. *muelleri* F.M.Bailey, *Queensland Fl.* 1: 287 (1899), based on *Cupania diphylostegia* F.Muell.; *D. australis* var. *muelleri* (F.M.Bailey) Radlk., *Pflanzenr.* 98: 1226 (1933). T: Meunga Ck, Rockingham Bay, Qld, 30 Sept. 1865, *J.Dallachy*; lecto (here chosen): MEL 104164.

The lectotype is a good flowering specimen that agrees with the original description. Other sheets collected by Dallachy in 1865 are either sterile or poor flowering material.

**Elattostachys megalantha** S.Reyn., sp. nov.

Ab *Elatostachyde xylocarpa* (A.Cunn. ex F.Muell.) Radlk. foliolis et floribus majoribus, domatiis si praesentibus inconspicuis et venis lateralibus foliolorum in costam decurrentibus, differt. Lamina foliolorum 10–16 cm longa, 3.5–6.5 cm lata. Lobi calycis 4–4.5 mm longi. Petala 6.5–7 mm longa.

T: State Forest Reserve 700, Gadgarra, Qld, 8 Jan. 1975, *B.P.M.Hyland 3166*; holotype: BRI, iso: QRS.

Known only from around Gadgarra, Qld. Grows in rainforest.

The epithet is derived from the Greek *mega-* (large) and *anthos* (flower).

**Elattostachys microcarpa** S.Reyn., sp. nov.

Ab speciebus ceteris Australiensibus foliolis 2–6-jugis tenuioribus, plerumque regulariter serrulatis et nervosis, et fructibus minoribus (8–12 mm longis), differt.

T: Cedar Bay, N of Bloomfield R., Qld, (15°49'S, 145°20'E), Jan. 1973, *L.J.Webb & J.G.Tracey 13275*; holotype: BRI.

Occurs in N Qld from the McIlwraith Range to near Cairns. Grows in semideciduous forest on rocky hillsides.

Named from the Greek *micro-* (small) and *carpos* (fruit), in reference to the characteristically small fruit.

**Elattostachys xylocarpa** (A.Cunn. ex F.Muell.) Radlk., *Act. Congr. Amsterdam* 112 (1877).

*Cupania xylocarpa* A.Cunn. ex F. Muell., *Trans. & Proc. Philos. Inst. Victoria* 3: 27 (1859) T: Brisbane R., Qld, *A. Cunningham*; lecto (here chosen) = K, photo seen.

The lectotype agrees with the original description.

**Harpullia frutescens** F.M.Bailey in Meston, *Rep. Bellenden-Ker Exped.* 36 (1889)

T: Mulgrave River, Qld, 1889, *F.M.Bailey*; lecto (here chosen) : BRI 72386.

The lectotype is a good fruiting specimen that agrees with the original description. Syntypes are either sterile or poor specimens, or are without a collector's name.

**Mischocarpus albescens** S.Reyn., sp. nov.

Ab speciebus aliis Australiensibus *Mischocarpi* foliolis angustioribus (1–3 cm latis) pagina in fera albescencia domatiis solitariis ad basin, differt.

T: China Camp, N of Daintree, Qld, 24 May 1970, *L.S.Smith s.n.*; holo: BRI.

Occurs in N Qld, extending S to Williams R., N.S.W.; grows in rainforest.

The specific epithet is derived from the Latin *albescens* (whitish), in reference to the whitish lower surface of the leaflets.

**Mischocarpus australis** S.Reyn., sp. nov.

*Mischocarpo sundiaco* Blume affinis, a qua petiolis dorsiventraliter complanatis, foliolis 1–vel 2–jugis, inflorescentia ramosissima, fructus valvis dense villosis, differt.

T: near O'Reilly's Guest House, Lamington National Park, Qld, 28°13'S, 153°10'E, 14 April 1970, *L.J.Webb & J.G.Tracey 13205*; holo: BRI.

Occurs in SE Qld, extending S to the Williams R., N.S.W.; grows in rainforest.

The specific epithet, from the Latin *australis* (southern), refers to the geographical range relative to that of the other species of the genus.

**Mischocarpus macrocarpus** S.Reyn., sp. nov.

*Mischocarpo sundaico* Blume affinis, a qua foliolis 3–4–jugis sine domatiis, paniculis ramosissimis cymulis longistipitatis et capsulis majoribus (plerumque 3–3.8 cm longis), differt.

T: near Millaa Millaa Lookout, State Forest Reserve 650, Qld, 17°29'S, 145°34'E, 1 June 1982, *F.Crome 886*; holo: BRI.

Occurs in N Qld from the Atherton Tableland to Eungella, growing in rainforest between 800 and 1500 m.

Named from the Greek *macros* (large) and *carpos* (fruit), in reference to the fruit.

**Mischocarpus stipitatus** S.Reyn., sp. nov.

*Mischocarpo australi* S.Reyn. affinis, a qua foliolis 2–3–jugis supra nitidis, capsulis longistipitatis (stipitibus 10–14 mm longis) valvis parce villosis septis glabris, differt.

T: State Forest Reserve 185, 17°05'S, 145°36'E, Danbulla, near Mareeba, Qld, 27 Aug. 1982, *B. Gray 2703*; holo: BRI, iso: QRS.

Occurs from Iron Range to the Eungella Range, N Qld.

The specific epithet, from the Latin *stipitatus*, refers to the long stipe of the fruit.

**Sarcopteryx martyana** (F.Muell.) Radlk., *Act. Congr. Bot. Amsterdam* 128 (1977)

T: Rockingham Bay, Qld, *J.Dallachy*; lecto (here chosen): MEL 84173.

This sheet is selected from several syntype sheets at MEL and NSW.

**Sarcotoechia cuneata** Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 9: 525, 544, 659 (1879)

T: Rockingham Bay, 2 Nov. 1870, *J.Dallachy*; lecto (here chosen): MEL 74661.

The lectotype sheet bears the best fruiting specimen among several syntype sheets.

**Sarcotoechia heterophylla** S.T.Reyn., sp. nov.

Ad *Sarcotoechiam serratam* S.T.Reyn., *accedens*, a qua foliolis majoribus (5.5–12 cm longis, 2.5–4.2 cm latis) irregulariter serrulatis, fructibus extus tomentosus, et arillo nullo vel inconspicuo, differt.

T: Eungella, Qld, 10 Nov. 1982, *K.A.W.Williams 82244*; holo: BRI.

Occurs from W of Cathu to the Eungella district, growing on ridges in rainforest.

Named from the Greek *heteros* (different) and *phylon* (leaf) in reference to the variable leaves with irregular margins.

**Sarcotoechia lanceolata** (C.White) S.T.Reyn., comb. nov.

*Toechima lanceolatum* C.White, *Contr. Arnold Arbor.* 4: 62 (1933). T: Gadgarra Reserve, Atherton Tableland, Qld, 24 May 1929, *S.F.Kajewski 1038*; holo: BRI.

This species is better placed in *Sarcotoechia* on the basis of its crestless petals and its fruiting characters.

**Sarcotoechia protracta** Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 9: 525, 544, 660 (1879)

T: Rockingham Bay, Qld, Oct. 1870, *J.Dallachy*; lecto (here chosen): MEL 74665.

The lectotype sheet bears good flowering and fruiting material and is better than the other syntypes.

**Sarcotoechia serrata** S.Reyn., sp. nov.

Ab speciebus aliis *Sarcotoechiae* foliolis minoribus (2–5.5 cm longis, 1–2.5 cm latis) regulariter et profunde serratis, indumento pilis crispatis, inflorescentiis minoribus (5–25 mm longis), et arillo minuto, differt.

T: Gadgarra, Qld, Sept. 1954, *K.J.White 895* (flower); holo: BRI; *loc. id.*, 14 Dec. 1981, *B.P.M.Hyland 11412* (fruit); para: BRI, QRS.

Named from the Latin *serratus* (serrate).

**Sarcotoechia villosa** S.Reyn., sp. nov.

Ab speciebus aliis *Sarcotoechiae* ramulis, petiolis, foliorum axibus et foliolis omnibus villosis, differt.

T: Mt Lewis, Timber Reserve 66, Qld, *V.K.Moriarty 2537*; holo: QRS.

Occurs in N Qld between Mossman and Kuranda, growing in montane rainforest.

Named from the Latin *villosus* (villous).

**Synima cordieri** (F. Muell.) Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Acad. Wiss München* 9: 513, 546 (1879).

*Cupania cordieri* F. Muell., *Fragm.* 9: 93 (1875); *Ratonia cordieri* (F.Muell.) F.M.Bailey, *Queensland Fl.* 1: 299 (1899). T: Rockingham Bay, Qld, *J. Dallachy*; lecto (here chosen): MEL 84176.

The lectotype is one of several sheets of flowering material at MEL and NSW.

**Synima macrophylla** S.Reyn., sp. nov.

Ab *Synima cordieri* (F.Muell.) Radlk. apicibus ramulorum laxè tomentosis, foliolis majoribus (9–23 mm longis), inflorescentia spicae simili non ramosa fasciculis densis cymulorum subsessilorum ferenti, differt.

T: Miriwinni, near Mt Bartle Frere, Qld, Dec. 1963, *L.J.Webb & J.G.Tracey* 8223; holo: BRI.

Occurs in N Qld from Daintree to the S Johnstone River, growing on margins of rainforest.

Named from the Greek *macros* (large) and *phyllon* (leaf).

**Toechima monticola** S.Reyn., sp. nov.

Ab *Toechimata livescente* Radlk. foliolis crassioribus coriaceis nervis lateralibus, 5–9–jugis, inflorescentia pauciflora, floribus pedicellatis, fructibus extus et plerumque velutinis, differt.

T: Mt Lewis, Qld, 16°35'S, 145°15'E, 11 Jan. 1977, *B.Gray* 218; holo: BRI, iso: QRS.

Occurs in N Qld at altitudes above 1000 m.

The specific epithet, from the Latin *mons* (mountain) and *-cola* (growing on), refers to the landform of the habitat.

**Toechima pterocarpum** S.Reyn., sp. nov.

Ab speciebus aliis Australiensibus fructibus late alatis differt. Inflorescentia et floribus ad *Toechima erythrocarpum* (F.Muell.) Radlk. accedens.

T: Bushy Creek, Jullatten, Qld, 16°37'S, 145°20'E, 10 Jan. 1983 *G. & N.Sankowsky* 231 (fruit); holo: BRI; *loc. id.*, *G. & N.Sankowsky* 289 (flowers); para: BRI.

Known only from the type locality.

Named from the Greek *pteron* (wing) and *carpos* (fruit), in reference to the winged capsule.

**BURSERACEAE**

*H.Hewson*

**Canarium australianum** var. **velutinum** Hewson, var. nov.

Ab varietatibus aliis *Canarii australiani* foliolosum pagina inferiora velutina differt.

T: Cone Hill, Cape Domett, W.A., *T.G.Hartley* 14765; holo: CANB; iso: PERTH.

Occurs in the Kimberley, W.A., and in Arnhem Land, N.T., growing in open forest and rainforest.

Named from the Latin *velutinus* (velvety) in reference to the undersurface of the leaves.



## ANACARDIACEAE

*L.W.Jessup*

**Buchanania arborescens** (Blume) Blume, *Mus. Bot.* 1: 183 (1850).

*B. muelleri* Engl. in A. & C. de Candolle, *Mongr. Phan.* 4: 190 (1883). T: Darwin, Mar. 1870, *J. Schultz* 490; lecto (here chosen) K.

Engler cited nine syntypes. This has been lectotypified because some of the syntypes are *B. muelleri* var. *pilosa* Engl.

**Euroschinus falcata** var. **angustifolio** Benth., *Fl. Austral.* 1: 491 (1983)

T: Rockhampton, Qld, *Thozet*; lecto (here chosen): K.

The lectotype is the better of the two collections cited by Bentham.

## Abbreviations and Contractions

Author abbreviations follow the *Draft Index of Author Abbreviations compiled at the Herbarium, Royal Botanic Gardens, Kew* (HMSO, London, 1980).

Journal titles are abbreviated in accordance with G.H.M. Lawrence *et al.*, *Botanico-Periodicum-Huntianum* (Hunt Botanical Library, Pittsburgh, 1968).

Other literature is abbreviated in accordance with F.A. Stafleu & R.S. Cowan, *Taxonomic Literature*, 2nd edn (Bohn, Scheltema & Holkema, Utrecht, 1976–), except that upper case initial letters are used for proper names and significant words. The *Flora of Australia* is abbreviated to *Fl. Australia*.

Abbreviations of herbaria are in accordance with P.K. Holmgren, W. Keuken & E. K. Schofield, *Index Herbariorum Part I*, 7th edn (Bohn, Scheltema & Holkema, Utrecht, 1981). Those most commonly cited in the *Flora* are:

AD	State Herbarium of South Australia, Adelaide
ADW	Waite Agricultural Research Institute, Adelaide
BM	British Museum (Natural History), London
BRI	Queensland Herbarium, Brisbane
CANB	Australian National Herbarium, Canberra
CBG	Australian National Botanic Gardens Herbarium, Canberra
DNA	Northern Territory Herbarium, Darwin
HO	Tasmanian Herbarium, Hobart
K	Royal Botanic Gardens, Kew
MEL	National Herbarium of Victoria, Melbourne
NSW	National Herbarium of New South Wales, Sydney
NT	Northern Territory Herbarium, Alice Springs
PERTH	Western Australian Herbarium, Perth
QRS	Australian National Herbarium, Atherton

Abbreviations of Australian States and Territories and nearby countries as used in statements of distribution and citation of collections.

A.C.T.	Australian Capital Territory
N.Caled.	New Caledonia
N.S.W.	New South Wales
N.T.	Northern Territory
N.Z.	New Zealand
P.N.G.	Papua New Guinea
Qld	Queensland
S.A.	South Australia
Tas.	Tasmania
Vic.	Victoria
W.A.	Western Australia

## Abbreviations and Contractions

### General abbreviations

alt.	altitude
app.	appendix
<i>auct.</i>	<i>auctoris/auctorum</i> (of an author or authors)
c.	<i>circa</i> (about)
Ck	Creek
cm	centimetre
col.	colour
coll.	collector
comb.	<i>combinatio</i> /combination
cult.	cultivated
Dept	Department
diam.	diameter
E	east
ed.	editor
edn	edition
<i>et al.</i>	<i>et alii</i> /and others
eds	editors
fam.	<i>familia</i> /family
f.	<i>forma</i> /form
fig./figs	figure/figures (in other works)
Fig.	Figure (referring to a Figure in this Volume of the <i>Flora</i> )
gen.	<i>genus</i> /genus
holo	holotype
Hwy	Highway
Is.	Island
iso	isotype
km	kilometre
lat.	latitude
lecto	lectotype
<i>loc. cit.</i>	<i>loco citato</i> (in the same work and page as just cited)
<i>loc. id.</i>	<i>loco idem</i> (in the same place as just cited)
long.	longitude
L.S.	longitudinal section
m	metre
mm	millimetre
Mt	Mount
Mtn	Mountain
Mtns	Mountains
N	north
<i>n</i>	haploid chromosome number
<i>2n</i>	diploid chromosome number
Natl	National
<i>nom. cons.</i>	<i>nomen conservandum</i> (conserved name)
<i>nom. illeg.</i>	<i>nomen illegitimum</i> (illegitimate name)
<i>nom. inval.</i>	<i>nomen invalidum</i> (name not validly published)
<i>nom. nud.</i>	<i>nomen nudum</i>
<i>nom. rej.</i>	<i>nomen rejiciendum</i> (rejected name)
nov.	<i>novus</i> /new
n. ser.	new series
<i>n.v.</i>	<i>non vidi</i> (not seen)
<i>op. cit.</i>	<i>opere citato</i> (in the work cited above)
p./pp.	page/pages
<i>p.p.</i>	<i>pro parte</i> (in part)
R.	River
Ra.	Range

## Abbreviations and Contractions

S	south
sect.	<i>sectio</i> /section
ser.	<i>series</i> /series
<i>s. lat.</i>	<i>sensu lato</i> (in a wide sense)
<i>s.n.</i>	<i>sine numero</i> (without number)
sp./spp.	species (singular/plural)
<i>s. str.</i>	<i>sensu stricto</i> (in a narrow sense)
stat.	<i>status</i> /status
Stn	(pastoral) Station
subg.	subgenus
subsp.	subspecies
suppl.	supplement
syn	syntype
synon.	synonym
T	Type (collection)
t.	<i>tabula</i> (plate)
trib.	<i>tribus</i> /tribe
T.S.	transverse section
var.	<i>varietas</i> /variety
W	west
x	basic chromosome number

## Symbols

†	taxon included in key but not treated further in text
*	naturalised taxon
[ ]	misapplied name or <i>nomen invalidum</i>

## Publication date of previous volumes

Volume 1	22 August 1981
Volume 4	12 November 1984
Volume 8	9 December 1982
Volume 22	17 May 1984
Volume 29	27 July 1982

For the publication date of Volume 25, see Volume 46.

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the 1990s, the number of people in the UK who are employed in the public sector has increased from 10.5 million to 12.5 million (12% of the population).

There are a number of reasons for this increase. One is that the public sector has become a more important part of the economy. Another is that the public sector has become a more important part of the labour market. A third is that the public sector has become a more important part of the social structure.

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