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ELAEOCARPACEAE

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ELAEOCARPACEAE

R.A. Kerrigan & D.J. Dixon

Evergreen *trees* or shrubs; indumentum of simple, sometimes gland-tipped or stellate hairs. *Leaves* simple, alternate or opposite, usually with dentate or serrate margins or entire, domatia present or absent; stipules absent or present. *Inflorescences* terminal, axillary amongst leaves or behind leaves, a raceme or panicle or cyme, fasciculate or solitary. *Flowers* bisexual rarely unisexual, 3–5-merous, superior; green, yellow or white. *Sepals* free or fused. *Petals* free, lobed toothed or split into narrow divisions, or rarely entire. *Disc* variable or absent. *Stamens* 4–many, inserted on disc or between the disc and ovary, free, often hairy; anthers basifixed, tetrasporangiate and dithecal, usually opening by apical pores or short slits, connective sometimes prolonged. *Gynoecium* of 2–7 carpels united to form a superior ovary, with as many locules as carpels, each locule with 2–20 ovules in 2 rows; styles 1, tapering with no distinct enlarged stigma present. *Fruit* a capsule, berry or drupe, fleshy or leathery. *Seeds* 1–many, with or without arillodes.

Mostly a tropical and subtropical family, excluding mainland Africa, with a few species extending to temperate zones. Placed by Cronquist (1981) in the Malvales but molecular-based classifications place the family in the Oxalidales; the family has also been enlarged to include the Tremandraceae and now consists of perhaps 12 genera and *c.* 550–600 species. In Australia six genera and *c.* 53 species occur naturally.

Some species of this family are harvested for their wood (*Aristotelia*, *Crinodendron*, *Elaeocarpus* and *Sloanea*) or cultivated as ornamentals (*Aristotelia* and *Crinodendron*).

Taxonomic references: Mabberley (2000, 2008); Hyland *et al.* (2002); Bricker (2004); Coode (2004).

- | | | |
|----|--|--------------------|
| 1 | Margins of adult leaves entire; fruit dehiscent; filaments longer than anthers | Dubouzetia |
| 1: | Margins of adult leaves serrate; fruit indehiscent; filaments shorter than anthers | Elaeocarpus |

DUBOUZETIA Pancher ex Brongn. & Gris

Trees or shrubs; indumentum of simple hairs usually on young growth or glabrous. *Stipules* minute, caducous, sometimes absent. *Leaves* alternate, domatia usually absent but present in *D. australiensis*. *Inflorescences* axillary, usually racemose, subumbellate, or solitary. *Bracts* present and resembling reduced leaves, persistent or caducous. *Flowers* 5-merous, bisexual, pendant. *Sepals* free or fused, and distinct from petals. *Petals* with 2 pockets at base, entire. *Disc* with 10 lobes, pilose or glabrous. *Stamens* more than 10, inserted on the disc or between disc and ovary, filaments longer than the anthers, sinuous or straight, glabrous or with short erect hairs. *Ovary* 3–5-locular, hairy or glabrous; style tapering, often twisted. *Fruit* dry, dehiscent, globose, ellipsoid, or obovoid, often 3–5-angled or -ribbed. *Seeds* few per loculus, hard, glossy dark brown, or black, with a twisted or spiralled waxy outgrowth from the strophiole.

Genus of 11 species; in the Moluccas, New Guinea, New Caledonia and Australia (N.T., Qld). Two species in Australia, one in the N.T.

Taxonomic reference: Coode (1987).

D. australiensis Coode

Shrub to 2.5 m tall; indumentum of appressed to ascending hyaline hairs; tomentose to pilose on twigs and leaves, new growth appearing sericeous. *Stipules* to 2 mm long, blackish, caducous, rarely persistent. *Petioles* 4–13 mm long, channelled on upper surface. *Lamina* lanceolate or elliptic to

narrowly elliptic, 36–130 mm long, 12–55 mm wide, upper surface occasionally glabrous, lower surface with minute domatia in the axils of the midvein and lateral veins; margin entire on adult foliage, glandular crenate on juvenile foliage. *Inflorescence* axillary on short contracted peduncles or rarely short leafy shoots, in groups of 5,

subumbellate to shortly racemose. *Sepals* 6–10.2 mm long, 2–4.2 mm wide, minutely puberulous, lanceolate. *Petals* obovate, 8–11 mm long, 5–6 mm wide, with 2 pockets forming at base, cream or white, glabrous except for villous hair tufts around pockets. *Disc* glabrous. *Stamens* to 4.7 mm long, puberulous. *Ovary* to 3 mm long, glabrous; style to 6 mm long, glabrous. *Fruit* 3–

5-lobed, 9–10 mm long, not seen mature. *Flowering*: Aug.–Jan. *Fruiting*: only recorded May & Dec.

Fig. 1 (*Cowie 10286*); Pl. 1 (*Cowie 10286*).

Endemic to the upper Magela Creek-East Alligator River area of the Western Arnhem Land Plateau. Grows from fissures in sandstone cliff faces.

ELAEOCARPUS L.

Trees or shrubs; indumentum of simple hairs or glabrous. *Stipules* usually present but small and caducous. *Leaves* alternate, rarely opposite. *Inflorescences* axillary or on twigs behind leaves, usually racemose. *Bracts* persistent or caducous. *Flowers* 4- or 5-merous, bisexual. *Sepals* free and distinct from petals. *Petals* free, usually toothed or incised at tip, rarely without divisions or emarginate, glabrous or hairy. *Disc* usually hairy, lobed. *Stamens* 10–many, inserted between disc and ovary, rarely on top of disc, anther connective blunt or toothed or with a group of bristles or awned. *Ovary* 2–7-locular, hairy or glabrous; style terminal and tapering. *Fruit* drupoid, not dehiscent, usually with a blue skin, succulent or fibrous around a rugose or sculptured stone. *Seeds* 1, or 1 per locule at most.

Old World tropics (excluding mainland Africa) with *c.* 350 species; about 27 in Australia, and four in the N.T.

Taxonomic references: Coode (1981); Hyland *et al.* (2003); Coode (2004).

- | | | |
|----|---|-------------------------|
| 1 | Domatia (foveoles) present on most leaves; petioles usually less than 15 mm long | 2 |
| 1: | Domatia rare or absent; petiole usually more than 15 mm long | 3 |
| 2 | Fruit globular; stamens with pale bristles at apex; leaves more than 3 times longer than wide | E. angustifolius |
| 2: | Fruit ellipsoid; stamens without bristles; leaves less than 3 times longer than wide | E. arnhemicus |
| 3 | Leaves ovate to elliptic or narrowly so, apices acuminate to caudate; stamens awned | E. culminicola |
| 3: | Leaves mostly obovate, apices mostly obtuse to rounded; stamens not awned .. | E. miegei |

E. angustifolius Blume

Tree to 40 m tall, recorded to 25 m in the N.T.; indumentum of minute hairs present on young stems but becoming glabrous. *Petiole* 5–15 (20) mm long. *Lamina* elliptic to oblong, rarely obovate, 60–180 mm long, 25–50 mm wide, base cuneate, margin serrulate-crenulate, apex acute, glabrous or sometimes finely appressed hairy, discoloured, domatia present as foveoles. *Inflorescence* ramuliflorous, racemose, to 100 mm long, minutely hairy. *Bracts* caducous. *Pedice* 9–12 mm long. *Sepals* 5, 8–11 mm long, 1–2 mm wide, glabrous or finely appressed hairy outside, minutely hairy inside. *Petals* 5, oblong-ovate, 12–15 mm long, 3–4 mm wide, white-cream; glabrous except for the margins at base, apex variously divided. *Disc* hairy. *Stamens* 35–60, *c.* 5–8 mm long, anther connective tipped

with a group of pale bristles, minutely hairy. *Ovary* subglobose, small, hairy; style tapered, 11–18 mm long, glabrous. *Fruit* globular, 15–23 mm diam., glabrous, bright blue or purple. *Stone* rugose. *Flowering*: *c.* Mar.–May. *Fruiting*: throughout the year.

Fig. 1 (*Cowie 1504*).

Australia (N.T., Qld) and New Guinea. In the N.T. this species is relatively restricted, predominantly found in wet spring-fed rainforest on the Tiwi Islands, and around Channel Point and south to Wadeye on the mainland. Few specimens are housed in DNA and this description, as is the species circumscription, is based on Coode (1984). A different circumscription is adopted in Qld, with Australian material being referred to *E. grandis* F. Muell. (Bostock & Holland 2007).

E. arnhemicus F. Muell.

Tree to 15 m, sometimes recorded as a shrub; indumentum of fine appressed to erect, clear to brown hairs, on young stems and petioles, stems often becoming glabrous. *Petiole* 3–15 mm long, with fine appressed hairs. *Lamina* narrowly elliptic to lanceolate, or elliptic to ovate, rarely obovate, 50–122 mm long, 20–53 mm wide, base cuneate, margin serrate, apex acute to acuminate, upper surface sparsely hairy with fine appressed hairs often concentrated at base of lamina near petiole and on midrib or glabrous, lower surface with fine appressed hairs or glabrous, discolorous and glossy above, domatia usually present as foveoles. *Inflorescence* axillary, supra-axillary or attached before leaves, racemose, to 60 mm long, minutely hairy. *Bracts* caducous. *Pedice*l to 5 mm long. *Sepals* 4 or 5, ovate, 2.5–3 mm long, 1.4–2 mm wide, sparsely appressed hairy. *Petals* 4 or 5, obtriangular, 2.7–4.2 mm long, 1.5–3.1 mm wide, white or cream; glabrous, apex variously divided. *Disc* hairy. *Stamens* 18–20, *c.* 1–2.2 mm long, with antrorse hairs between disc and ovary. *Ovary* globular, 0.8–1.25 mm long, hairy sometimes only at base; style tapered, 1.2–2 mm long, glabrous. *Fruit* ellipsoid, 8.2–16.5 mm long, 6.5–12.5 mm diam., glabrous, metallic blue. *Stone* deeply sculptured. *Flowering* Jan–July. *Fruiting* throughout the year.

Fig. 1 (*Brennan 756; Rankin 2438*); Pl. 2 (unvouchered).

Australia (N.T., Qld) and New Guinea. In the N.T. distributed north of 15°, from Wadeye to Groote Eylandt. Found in riparian forest, *Melaleuca* forest on the edges of billabongs, and coastal and monsoon vine forest on a variety of substrates.

E. culminicola Warb.

Tree to 14 (20) m tall; indumentum of fine appressed hairs on young stems and petioles or glabrous. *Petiole* 13–40 mm. *Lamina* narrowly elliptic to lanceolate or ovate, 67–137 mm long, 24–47 mm wide; base cuneate, margin serrate, apex acute to caudate, upper surface sparsely hairy with fine appressed hairs becoming glabrous, lower surface with fine appressed hairs or glabrous, discolorous and glossy above. *Inflorescence* attached before leaves or supra-axillary, racemose, to *c.* 40 mm long, minutely hairy or glabrous, domatia rare or absent. *Bracts* caducous. *Pedice*l to 10 mm long. *Sepals* 5, narrowly triangular, 6.8–

9 mm long, *c.* 1.5–2 mm wide, with long hairs on inner and outer surface. *Petals* 5, narrowly obtriangular, 7.5–10 mm long, 2–4.6 mm wide, white or cream; apex variously divided, with long hairs on inner and outer surface, on the outer surface mostly concentrated in the middle; base with 2 glabrous pockets inside. *Stamens* numerous *c.* 25–40, between disc and ovary, 4–4.5 mm long, covered with antrorse hairs, anther connective with prominent awn to 1–2 mm long. *Ovary* ovoid, to 1.5 mm long, glabrous; style tapered, 5–8 mm long, glabrous. *Fruit* globular to ellipsoid, 9.6–15 mm long, 7.8–12 mm diam., glabrous, blue green. *Stone* rugose. *Flowering*: *c.* July–Sept. *Fruiting*: Oct.–Nov.

Fig. 1 (*Brennan 4630*).

Australia (N.T., Qld), New Guinea and possibly the Philippines. In the N.T. this species is restricted to the D.R. and is predominantly found in the wet spring-fed rainforest or swamps of the Tiwi Islands, Channel Point and Cox Peninsula.

E. miegei Weibel

Tree to 35 m tall, to 20 m in the N.T.; indumentum of fine appressed hairs on young stems and petioles or glabrous. *Petiole* 10–30 mm. *Lamina* oblanceolate, obovate to elliptic, 40–170 mm long, 20–75 mm wide; base cuneate, margin crenate-dentate, apex obtuse, rounded or acute; glabrous or with few appressed hairs beneath; discolorous, domatia rare or absent. *Inflorescence* borne amongst or behind the leaves, racemose, to 100 mm long, minutely hairy or glabrous. *Bracts* caducous. *Pedice*l to 10 mm long. *Sepals* 4 or 5, 4.5–5 mm long, 0.5–1 mm wide, sparsely pubescent or glabrous. *Petals* 4 or 5, obovate or oblong-obovate, *c.* 5 mm long, 1.5–2.5 mm wide, white–cream; glabrous, apex variously divided. *Disc* hairy. *Stamens* 8–15, between disc and ovary, *c.* 2–3 mm long (hairiness not known), anther connective sharply pointed. *Ovary* glabrous or rarely hairy; style tapered, 2–3 mm long, glabrous. *Fruit* ellipsoid, *c.* 17 mm long, *c.* 12 mm diam., glabrous, bright blue. *Stone* probably smooth, slightly winged. *Flowering*: Jan–July. *Fruiting* throughout the year.

Fig. 1 (*Russell-Smith 8151*).

Australia (N.T.), New Guinea and Solomon Islands. In the N.T. it is only known from one fruiting specimen collected from a rainforest on the Tiwi Islands and this description is largely based on Coode (1981).

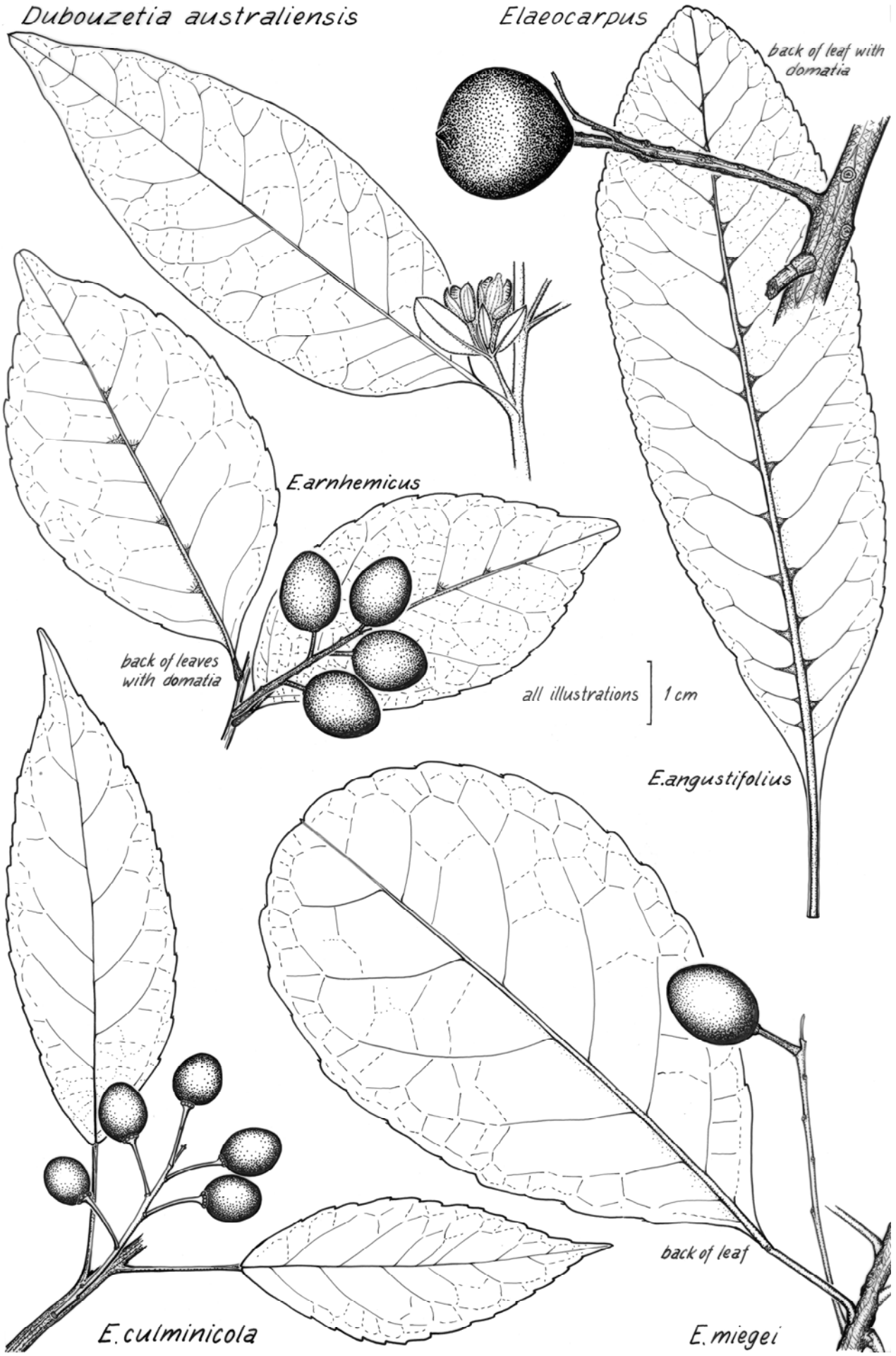


Fig. 1

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Pl. 1 *Dubouzetia australiensis* (Photos: I.D. Cowie)



Pl. 2 *Elaeocarpus arnhemicus* (Photo: B.M. Stuckey)