

Two new species of *Commersonia* (Malvaceae *sensu lato*) from south-eastern Australia

Carolyn F. Wilkins¹, Lachlan M. Copeland²
and Barbara A. Whitlock³

¹ School of Plant Biology, The University of Western Australia, Crawley, WA 6009, Australia.
email: cwil@plants.uwa.edu.au

² Botany, Centre for Ecology, Evolution and Systematics, University of New England, Armidale,
NSW 2351, Australia

³ Department of Biology, University of Miami, Coral Gables, Florida 33124, USA

Abstract

Commersonia amystia C.F.Wilkins & L.M.Copel., and *C. breviseta* C.F.Wilkins & L.M.Copel., from south-eastern Australia, are described as new and illustrated. Notes are given on their ecology and conservation status, and the distribution of each species is mapped.

Introduction

Recent cladistic analyses of morphological data (Wilkins 2002) and *ndhF* sequences (Whitlock et al. 2001) of the Lasiopetaleae confirm that together *Rulingia* R.Br. and *Commersonia* J.R.Forst & G.Forst. form a monophyletic group. Although only a few species were included in each analysis, both studies suggest that species of the two genera are intermingled, such that neither is monophyletic as currently delimited. Results of additional unpublished morphological and molecular phylogenetic analyses (Wilkins & Whitlock in prep.), with near exhaustive sampling of species in both genera, overwhelmingly supports these previous findings of monophyly of the combined *Rulingia*–*Commersonia* clade and non-monophyly of each genus.

The two new species described here, *C. amystia* and *C. breviseta*, are closely related to the type of *Rulingia*, *R. dasyphylla* (Andr.) Sweet. These three species along with *R. hermanniifolia* (J.Gay) Endl., *R. prostrata* Maiden & E.Betche, *R. rugosa* Steetz and *R. salviifolia* (Steetz) Benth., will be included in *Commersonia* in the near future (Wilkins & Whitlock in prep.). To avoid later combinations the two new species are here described as *Commersonia*.

The majority of the approximately 45 currently described species of the closely related genera *Commersonia* and *Rulingia* are confined to Australia. *Commersonia bartramia* (L.) Merr. is recorded in Australia, South East Asia and islands of the Indo-Pacific.

There are three taxa that are closely related to *C. bartramia*, which occur in New Guinea (*C. novoguineensis* (Gilli) Guymmer), in Vanuatu (*C. obliqua* Guymmer) and in Tahiti (*C. bartramia* var. *tahitensis* L.J.Dorr). *Rulingia madagascariensis* Baker is endemic to Madagascar.

From verbal communications and examination of herbarium material it appears that many taxa of *Rulingia* are poorly understood, with heterogeneous elements in the same species folders. It is difficult to distinguish between the seven species mentioned above without fruiting and flowering material and identification is further complicated by trilobed juvenile leaves, which have variable shapes and hair densities. A key for species delimitation including morphological characters for separating species is provided in a revision nearing completion.

Specimens of the two new species *C. breviseta* and *C. amystia* were included in the Flora of SE Qld (Stanley & Ross 1986, p. 87) and in Names and Distribution of Queensland Plants (Henderson 2002) as *R. hermanniifolia*. This latter species is restricted to an area between Sydney Harbour National Park and Jervis Bay in New South Wales. NSW collections of *C. breviseta* were determined as *R. dasyphylla*, *R. hermanniifolia*, or *R. rugosa* and included as such in The Flora of New South Wales (Harden 2000). The collection of *C. breviseta* from Egan Peak Victoria was determined as *R. dasyphylla*, a species included in The Flora of Victoria (Walsh & Entwistle 1996).

To clarify this situation these two new species are described prior to publication of a revision of *Commersonia/Rulingia*. In addition, *C. amystia* is rare and has special conservation requirements.

Methods

Collections of *R. dasyphylla* and closely related species from AD, BM, BRI, DNA, K, LIV, MEL, NE, NSW, NY, PERTH and W have been examined in this study, including type specimens of *R. pannosa*, *R. prostrata*, *Thomasia salviifolia* Steetz (base name for *R. salviifolia*) and *R. rugosa*. Herbarium abbreviations follow Holmgren et al. (1990). The authors have collected and studied the habit and morphological characters of *C. breviseta* and *C. amystia* in their natural habitat. Floral measurements are from rehydrated herbarium collections and vegetative measurements are from dried specimens. Density of leaf hairs is defined as scattered when the hairs are well separated, moderately dense when the hairs are just touching laterally, dense when the hairs strongly overlap with the epidermis remaining visible, and tomentose when hair density is such as to conceal the epidermis. Fruit measurements include the length of the setae on the outer surfaces.

The distribution maps were compiled from the Online Map Creation internet site (<http://www.aquarius.ifm-geomar.de/omc/>) using GMT (Generic Mapping Tools) software.

Commersonia amystia C.F.Wilkins & L.M.Copel., *sp. nov.*

Filamentis villosis et fructibus magnis pilis densis simplicibus in setis longis dispositis *R. rugosae* affinis, sed floribus per inflorescentiam paucis petalae basi supra et infra locum affixum valde gibbosa nec tantum supra locum affixum differt.

Type: New South Wales: North Western Slopes: Howell, 20 km SSW of Inverell, 29°56'S, 151°01'E, *L.M. Copeland 3615*, 16 Oct 2003 (holo: NSW; iso: BRI, CANB, K, MEL, NE, PERTH) (Specific locality details withheld for conservation reasons).

Rulingia hermanniifolia auct. non (J.Gay) Endl.: *Rulingia salviifolia* auct. non (Steetz) Benth., *Rulingia dasyphylla* auct. non (Andr.) Sweet, Stanley & Ross, Fl. SE. Qld p.87 (1986); Henderson, Names & Distrib. Qld Pl., Algae & Lichens, p.192 (2002)

Rulingia sp. (Single NP L.M. Copeland 2009) in Clarke et al. (2000)

Dwarf shrub, 10–30 × 60–70 cm, prostrate to decumbent. *Branchlets* densely hairy, with sessile, white, stellate hairs with 4–6 erect arms to 0.5 mm long, above smaller, sessile, white, stellate hairs and inconspicuous, white, clavate glands *c.* 0.15 mm long; glabrescent with red-brown, longitudinal, irregular, fine ridging. *Stipules* late caducous, green throughout, or with red apex, ovate-lanceolate to narrow-lanceolate, rarely bifid, 0.8–4.5 × 0.3–1.5 mm, adaxial surface with sparse, appressed, white, stellate hairs with 1 or 2 arms to 0.3 mm long, and rarely with sparse, white, clavate glands *c.* 0.1 mm long; margin with dense, white, 1–3 armed hairs to 0.7 mm long, abaxial surface with dense, white, stellate hairs with 3–8 erect arms to 0.5 mm long. *Mature leaf* with petiole 0.8–2.5 mm long, hairs as on distal branchlets; blade scarcely discolourous, mid green over pale green, narrowly-ovate, rarely ovate, 2.5–31.9 × 1.5–9.2 mm, base cordate, scarcely oblique; abaxial surface densely hairy to tomentose, hairs sessile, white, stellate with *c.* 6 erect arms up to 0.7 mm long on midrib, up to 0.4 mm long on blade, above a dense layer of smaller, white, stellate hairs; adaxial surface moderately hairy, with hairs sessile, white, stellate, with 1–8 erect arms up to 0.6 mm long, scattered above smaller, stellate hairs, glands absent or if present, then scattered, white, clavate and up to 0.1 mm long; margin sinuate or irregularly serrate, recurved, hence appearing entire, flat or undulate, apex obtuse or acute. *Juvenile leaves* trilobed, serrulate, up to 53 × 31 mm. *Inflorescence* a leaf-opposed cyme, 9.2–39.1 mm long, flowers (1) 2–4 (6). *Peduncle* 2.5–18 mm long, extending to 10–31 mm with fruit; *pedicel* 2–8.5 mm long; both peduncle and pedicel densely hairy, hairs sessile, white, stellate, with *c.* 6 erect arms, 0.35–0.7 mm long, over moderately dense, smaller, white, stellate hairs, and white clavate glands with red apex, up to 0.25 mm long. *Bract* inserted towards base or middle of pedicel, ovate or narrowly ovate, green, membranous, becoming red-brown, 1.8–4.2 × 0.7–2.5 mm, surfaces as in stipules above, margin entire. *Flower bud* base strongly cordate from deep pouching to contain gibbous petal base; apex sub-acute. *Epicalyx* absent. *Calyx* white throughout or base pink, 3.9–5.8 mm long, lobes elliptic, 3–4.2 × 1.6–3.3 mm (70–82% of total calyx length), apex obtuse or sub-acute; tube with deep pockets; abaxial surface has base with dense, sessile, white, stellate hairs, with 6–8 erect arms to 0.6 mm long, above smaller white, stellate hairs and occasional stalked, clavate glands to 0.2 mm long, towards apex of lobe with shorter hairs; adaxial surface with nectary of dense, clumped, clavate glands over base of rib and both sides; base of calyx and centre of lobe with dense, appressed or erect, white hairs with 1–4 arms to 0.35 mm long, and towards the margin and apex of lobes with dense, white, simple or stellate hairs, with arms to 0.15 mm long. *Petals* white, 1.8–3.2 × 2.2–3.2 mm, base becoming pale pink, obovate when flattened, very strongly gibbous (cupped) both above and below attachment to calyx; apical ligule narrowly-oblong, remaining white, 0.9–1.8 × 0.2–0.4 mm, inner and outer surfaces stellate hairy. *Staminal tube* white or pale pink, 0.1–0.4 mm long. *Staminodes* five, one inserted between each stamen, ovate, white, 2.3–2.9 × 0.6–0.8 mm, inner and outer surfaces stellate hairy. *Filaments* 0.6–1.2 × 0.15–0.25 mm, with white, stellate hairs. *Anthers* ventri-fixed, broadly-elliptic, dark red, 0.4–0.7 × 0.5–0.7 mm,

dehiscence from latrorse slits, pollen yellow. *Ovary* 5-celled, ovoid, 0.6–1 × 0.6–1 mm, locules fused laterally with no indentation, central axis with slight gap, outer surface green with pre setae outgrowths. *Ovules* 2–6 per cell. *Styles* 5, green, 0.7–1.3 mm long, glabrous, free at base, fused at sub-capitate stigmas. *Fruit* sub-globose, or ellipsoid, red-brown, wings absent, outer wall woody (c. 0.5 mm thick), capsule 5.5–6 × 7–7.2 mm excluding setae (bristles with hairs), 8–10 × 11.5–13 mm with setae included, outer surface with dense, soft, white, stellate hairs with arms up to 0.4 mm long, below dense setae, all over surface, longer at the sides (up to 3.0 mm long) than the apex (0.5–1 mm long); setae red-brown, with an apical, stiff, white, c. 6-erect-armed, stellate hair and shaft with dense, white, 1–3 erect-armed hairs. *Seed* exotesta brown with dark brown tubercles, glabrous, 1.7–1.8 mm long, 1.2–1.3 mm diam. *Aril* a cream, translucent lobe flared from hilum c. 0.3 × 0.8 mm (Fig. 1)

Specimens examined: QUEENSLAND: Lyra, *Blake 21103*, 3 Nov 1959 (CANB); Stanthorpe Rd, Ballandean, *Clemens 44484*, 16 Oct 1944 (K); Mt Fletcher, NW of Ballandean, *Halford Q2287*, 20 Oct 1994 (BRI, NSW); SW of Stanthorpe, near. Severn River, *Pedley 1466*, 29 Oct 1963 (BRI); Ballandean, *Williams s.n.* (NE30519A), 23 Aug 1975 (BRI, CANB, NE, NSW); Bald Rock Creek, Wyberba, *Williams NRAC 3*, 1 Oct 1994 (NE). NEW SOUTH WALES: Single National Park, 35 km NW of Guyra, *Clarke & Knox s.n.* (NE81450), 27 Aug 2003 (NE): *ibid.*, *Copeland 2009 & Noble*, 3 Nov 1999 (CANB, NE, NSW); *ibid.*, *Copeland 2485*, 2 Mar 2000 (NE); *ibid.*, *Fethers 28*, 22 Jun 2000 (CANB); Howell, 20 km SSW of Inverell, *Clarke & Knox s.n.* (NE81449), 27 Aug 2003 (NE); *ibid.*, *Copeland 2753*, 22 Nov 2000 (BRI, CANB, NE, NSW); Howell, *Miss Munsie 17*, Oct 1913 (NSW). (Specific locality details of all specimens withheld for conservation reasons).

Distribution: *Commersonia amystia* is currently known from two populations in the Inverell district of northern New South Wales and three populations in the Ballandean – Stanthorpe districts of southern Queensland. (Fig. 2)

Habitat and ecology: all plants observed grow in skeletal, sandy-loams amongst crevices of granitic and acid volcanic outcrops. Altitude ranges from 700 m to approximately 1050 m. Associated species include *Eucalyptus prava*, *Harmogia densifolia*, *Acacia triptera*, *Homoranthus prolixus*, *Lepidosperma laterale*, *Actinotus gibbonsii* and *Cheilanthes sieberi*.

Commersonia amystia appears to be an obligate seeder that is killed by fire but germinates in abundance shortly thereafter. At the type locality hundreds of plants were observed flowering approximately one year after a wildfire event but these appeared to be senescing two years later. The same pattern has been observed in Single National Park where all adult plants appeared to be killed by fire in 2003 but numerous seedlings were observed shortly after in 2004.

Phenology: this species is recorded as flowering in August, September and October with young fruits usually forming in October and November.

Conservation status: the species is currently known from fewer than 300 individuals in New South Wales and an unknown number of plants in southern Queensland. The only reserved population is in Single National Park where approximately 30 plants are known from a single rocky outcrop. Threats to *Commersonia amystia* include an inappropriate fire regime, grazing by feral goats and disturbance by feral pigs. This species is thought to be rare and will be submitted to relevant conservation bodies as having special conservation needs.

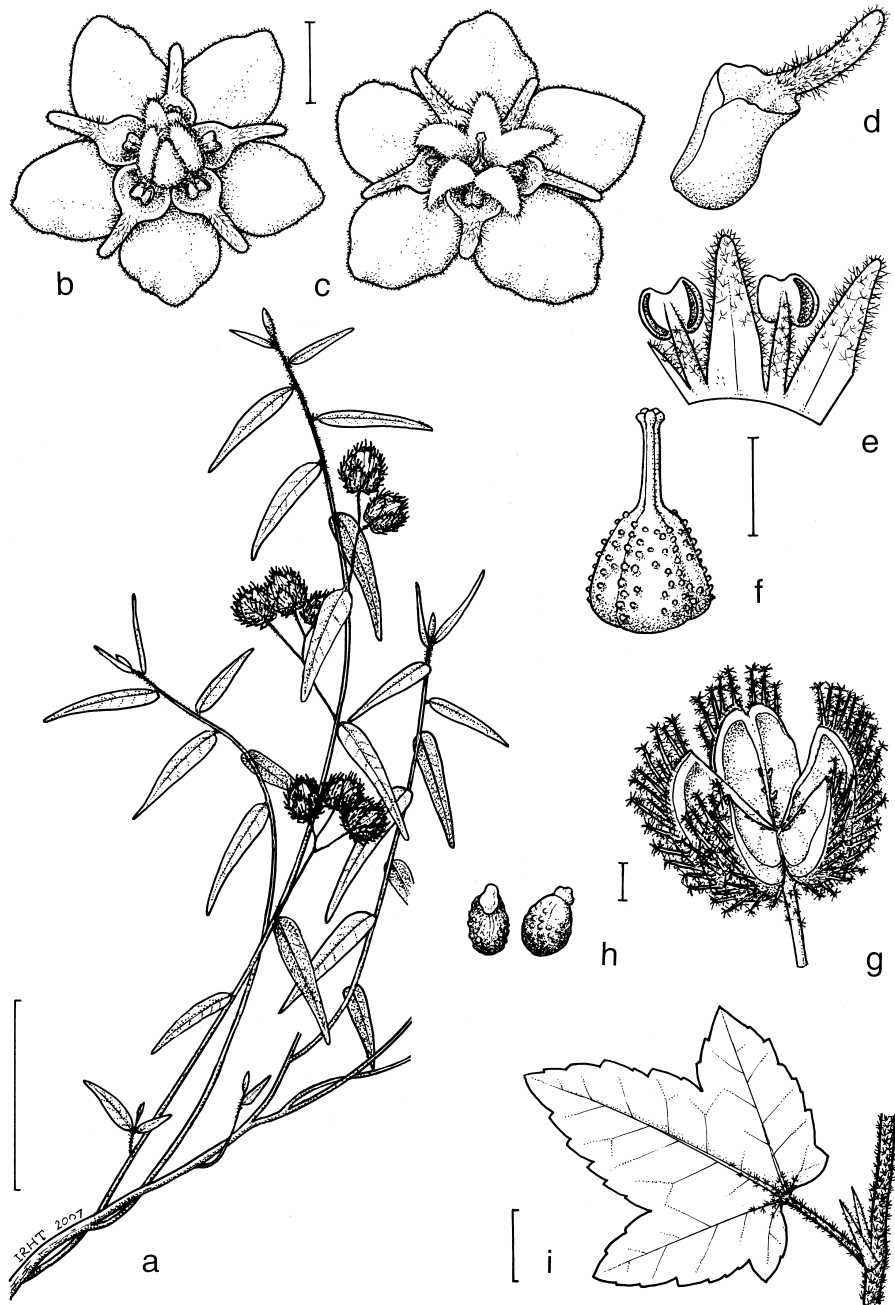


Fig. 1. *Commersonia amystia*, **a**, habit, showing fruiting branchlet; **b**, flower with staminodes incurved over ovary at dehiscence; **c**, flower with staminodes spread; **d**, petal with deeply gibbous base; **e**, stamens and staminodes; **f**, gynoecium; **g**, fruit with seed shed; **h**, seed; **i**, juvenile leaf. (a, g, h, from Williams NE 30519; b - f from type collection, Copeland 3615; i from Clarke NE 81449). Scale bars: a = 5 cm; b, c = 2 mm; d - h = 1 mm; i = 1 cm.

Etymology: the specific epithet *amystia* is Greek for large cup, and relates to the deeply gibbous petal base.

Comparison with similar species: *Commersonia amystia* appears to be most closely related to *Rulingia rugosa* in having hairy filaments, the lower surface of the leaves with a similar tomentose surface rather than dense hairs as observed in *R. dasyphylla*, and in having large fruits with dense, simple hairs on long setae. It differs from *R. rugosa* in having smooth, thin, pale green leaves, rather than rugose, mid green leaves, (1)2-4(6) flowers per inflorescence rather than 7–15, and a petal base that is obovate when flattened and strongly gibbous below and above its basal attachment, rather than ovate and gibbous only above the attachment.

Notes: *Commersonia amystia* was recognised as a new species *Rulingia* sp. (Single NP, L.M. Copeland 2009) from collections in the Single National Park / Howell areas by Clarke et al. (2000).

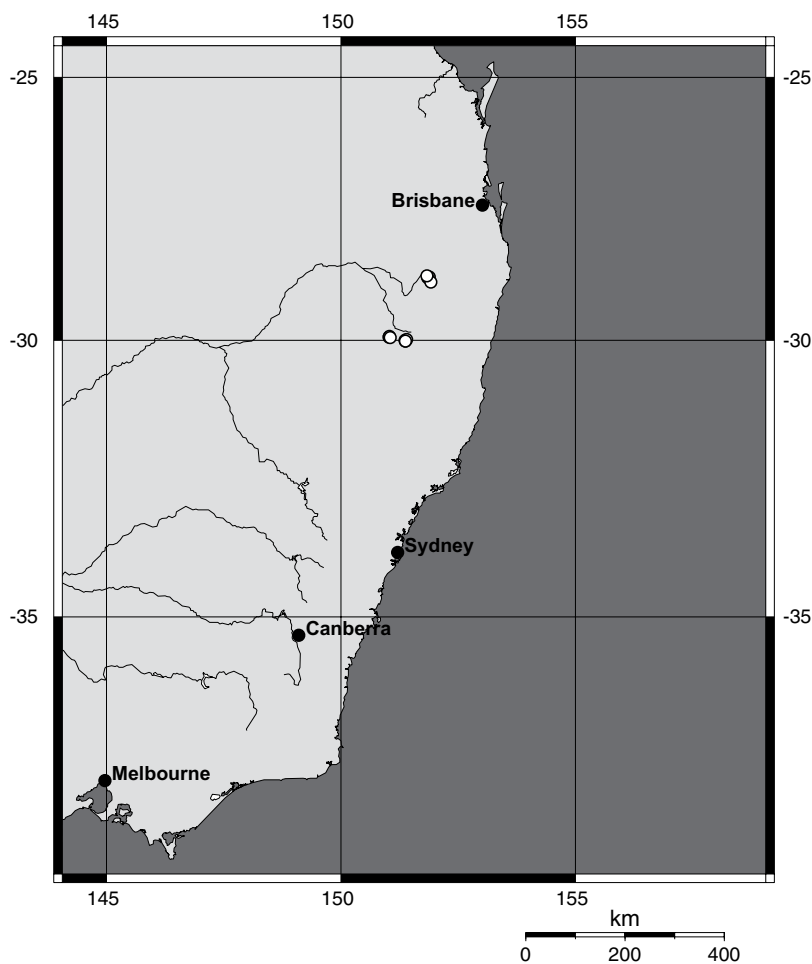


Fig. 2. Distribution of *Commersonia amystia*.

Commersonia breviseta C.F.Wilkins & L.M.Copel., *sp. nov.*

Fructibus minoribus setis ad 0.9 mm longis, pilis et glandulis scapi paucis R. hermanniifoliae similis, praecipue differt setis paucis ad apice fructi praecipue praeditis, ad invicem setis densis totae paginae, et foliis flexilibus nullimodo chartaceis.

Type: QUEENSLAND: Darling Downs district: Mt Norman, Girraween National Park, 28°52'S, 151°57'E, C.F. Wilkins 2053, L.M. Copeland & B.A. Whitlock, 21 Sep 2004 (holo: BRI; iso: CANB, K, MEL, NE, NSW, PERTH). (Specific locality details withheld for conservation reasons)

Rulingia hermanniifolia auct. non (J.Gay) Endl.: Stanley & Ross, Fl. SE. Qld p. 87(1986); Henderson, Names & Distrib. Qld Pl., Algae and Lichens, p. 192 (2002)

Rulingia dasyphylla auct. non (Andrews) Sweet, Harden, Fl. of NSW, p.p. 305-306 (2000), Walsh & Entwistle, Fl. of Victoria, p.p. 329-330 (1996); *Rulingia rugosa* auct. non Steetz, Harden, Fl. of NSW, p.p. 305-306 (2000).

Shrub, erect, 30–300 × 70–180 cm. *Branchlets* densely hairy or tomentose surface of white, sessile, stellate hairs with 3–6 erect arms up to 1.3 mm long, above smaller, white hairs and scattered, white, clavate glands up to 0.15 mm long; branches red-brown, glabrescent with longitudinal, irregular, fine ridging and lenticels. *Stipules* caducous, green with red apex, or red throughout, narrowly-lanceolate or ovate-lanceolate, rarely bifid, 1.5–8.5 × 0.4–1.9 mm, inner surface with scattered to dense 1–4 -armed, appressed, white hairs 0.3–0.7 mm long, and scattered, clavate glands to 0.1 mm long; outer surface and margin with dense, 2–6 erect-armed, white stellate hairs, arms up to 1.3 mm long. *Leaf* with petiole 1.1–6.1 mm long, hairs as on distal branchlets, mature blade mainly narrowly-elliptic, or ovate, 8–24.1 × 1.4–7.5 mm, base scarcely oblique, scarcely cordate or obtuse; abaxial surface densely hairy to tomentose with white, or white with tan centred, sessile, stellate hairs, with 6 erect arms up to 0.9 mm long, above dense, layer of small, white, stellate hairs, and rib with sparse pink, clavate glands present or absent; adaxial surface slightly rugose, with dense, white, sessile, stellate hairs with 1–6 erect, arms up to 0.9 mm long, above smaller hairs and medium density, orange-red-tipped, clavate glands up to 0.1 mm long; margin irregularly serrulate, recurved, apex rounded-acute or obtuse, juvenile leaves conspicuously tri-lobed, 45–110 × 20.1–45.1 mm. *Inflorescence* a leaf-opposed cyme, 8–35 mm long, flowers 4–16. *Bud* base cordate, apex rounded. *Peduncle* 2.5–6.2 mm long (4.5–16.8 on fruiting inflorescence). *Pedicel* 2–6.3 mm long (6–14 mm fruiting). Both peduncle and pedicel with dense, sessile, stellate hairs, 6–12 erect arms up to 1.1 mm long, over smaller white, stellate hairs and scattered to medium density, white, red-tipped, clavate glands to 0.3 mm long. *Bract* inserted towards base of, or mid pedicel, narrowly-ovate, ovate, 3.6–7.8 × 0.3–1.3 mm, surfaces as in stipules above. *Epicalyx* absent. *Calyx* base green, lobes with pink margins and white centre, 3.4–6.3 mm long, lobes ovate or elliptic, c. 65–71% of total calyx length, of variable width, 2.6–4.3 × 1.3–2.7 mm, apex acute; abaxial surface with dense, white, stellate hairs with 6 erect-arms to up 0.8 mm long, over smaller, white hairs and scattered, red-tipped, clavate glands, 0.2–0.3 mm long; adaxial surface with nectary of dense, clumped, clavate glands on the base and both sides of the rib, calyx base and central lobe with dense, white, 1–3 -armed, appressed, hairs up to 0.35 mm long, and towards the margin and apex with dense, 1–4 -armed, erect, white, simple hairs, up to 0.15 mm long. *Petals* 2.3–3.4 × 1.7–2.7 mm, cupped base pale yellow, elliptic when flattened, strongly gibbous incurved around stamen; ligule white, then becoming pale or dark pink, ligule linear-oblong, 1.3–2.3 × 0.25–0.5 mm.

Staminal tube 0.15–0.5 mm long. *Staminodes* five, one inserted between each stamen, white, ovate, both surfaces densely stellate hairy, 2–2.6 × 0.5–0.9 mm. *Filaments* white, glabrous, 0.9–1.4 × 0.1–0.2 mm. *Anthers* dark red, ventri-fixed, broadly-elliptic, 0.6–1 × 0.7–0.85 mm, dehiscence from latrorse slits, pollen yellow. *Ovary* 5-celled, ellipsoid, 0.6–0.8 × 0.7–0.8 mm, locules fused laterally with no indentation and with a gap at the central axis, outer surface green with pre setae outgrowths. *Ovules* 2–4 per cell. *Styles* 5, green, 0.5–1.3 mm long, glabrous, free at base, fused at capitate stigmas. *Fruit capsule* loculicidal, ellipsoid, brown, 2.5–3.5 × 4.3–5.5 mm, thick, woody wall to 0.4 mm thick, with scattered to moderately dense, soft, white, stellate hairs covering the outer surface of fruit and scattered, clavate glands up to 0.1 mm long present or absent, beneath scattered to moderately dense, short setae towards the upper half of the fruit, 0.5–0.9 mm long, brown, with an apical, white, 6–12 -armed stellate hair and scattered, 2–4 -armed, stellate hairs and / or red, clavate glands up to 0.1 mm long, wings absent. *Seed* dark brown, 1.6–1.8 mm long, 1.0–1.2 mm diam., exotesta strongly tuberculate, glabrous, with fine, longitudinal ridging. *Aril* a white, translucent lobe flared from hilum, c. 0.2 × 0.7 mm (Fig. 3).

Specimens examined: QUEENSLAND: Slopes of Mount Norman, Girraween National Park. *Blake 23710*, 4 Nov 1971 (BRI, K, NSW); Girraween National Park, along walking trail to Mt Norman, *Wilkins 2052*, *Whitlock & Copeland*, 30 Oct 2004 (BRI, PERTH). NEW SOUTH WALES: Washpool National Park, Granite Lookout, *Copeland 3595 & Clarke*, 5 Sep 2003 (BRI, CANB, MEL, NE, NSW); Gibraltar Range National Park, summit of Hamburger Rock, *Copeland 3893*, 29 Jan 2005 (BRI, CANB, NE, NSW, PERTH); 1 km SW of Robinsons Knob, New England National Park, *Copeland 2213 & Noble*, 1 Dec 1999 (NE); Yowaka River, *Mueller s.n.*, Sep 1860 (MEL); Torrington SRA, 1 km E of Blather Arm / Silent Grove road junction, *Nano & Copeland 58*, 21 Feb 1997 (NE); Minyon via Mullumbimby, *White 10510*, 26 Aug 1936 (BRI); W side of Gins Mt., Mt Kaputar National Park, *Harden s.n.* (NE 33201), 9 Nov 1976 (NE); 12 km WNW along Culoul Range Rd off Windsor-Singleton Rd, *Coveny & Hind 9083*, 5 Dec 1976 (NSW); Nullica State Forest, Nethercote Waterfalls. *Albrecht 978*, 26 Sep 1984 (MEL); Jingera Rock, Egan Peak, 8 km SSE of Wyndham, *Telford 3601*, 29 Oct 1973 (CANB); Valla Beach, N of Nambucca Heads, *Williams s.n.* (NE030518A) (BRI, CANB, NE, NSW, PERTH). VICTORIA: W of Genoa Peak Road on Roger Track, *Humphries & Earl, s.n.*, (no known database number), 13 Jan 1989 (MEL).

Distribution: *Commersonia breviseta* is widespread in eastern Australia ranging from Girraween National Park in far southern Queensland to Genoa in far north-eastern Victoria. Most populations occur along the Great Dividing Range although some herbarium collections are from coastal areas at lower elevations. (Fig. 4.)

Habitat and ecology: *Commersonia breviseta* occurs in rocky areas with shallow soils on a wide range of lithologies. Parent rock types include granite, acid-volcanics, rhyolite, metasediments and sandstone. Altitudes range from near sea-level to over 1150 m. The associated plant species vary greatly across its range while the vegetation communities are usually types of heath or shrubby woodland.

Commersonia breviseta appears to be an obligate seeder that is killed by fire but germinates in abundance shortly thereafter. At a population in Washpool National Park, north-eastern N.S.W., most adult plants appeared to be killed by a wildfire in January 2003 but approximately 100 young individuals were observed flowering in September of that same year. Observations of the population near Torrington also indicate that the species reaches maturity quickly after fire then senesces within five years.

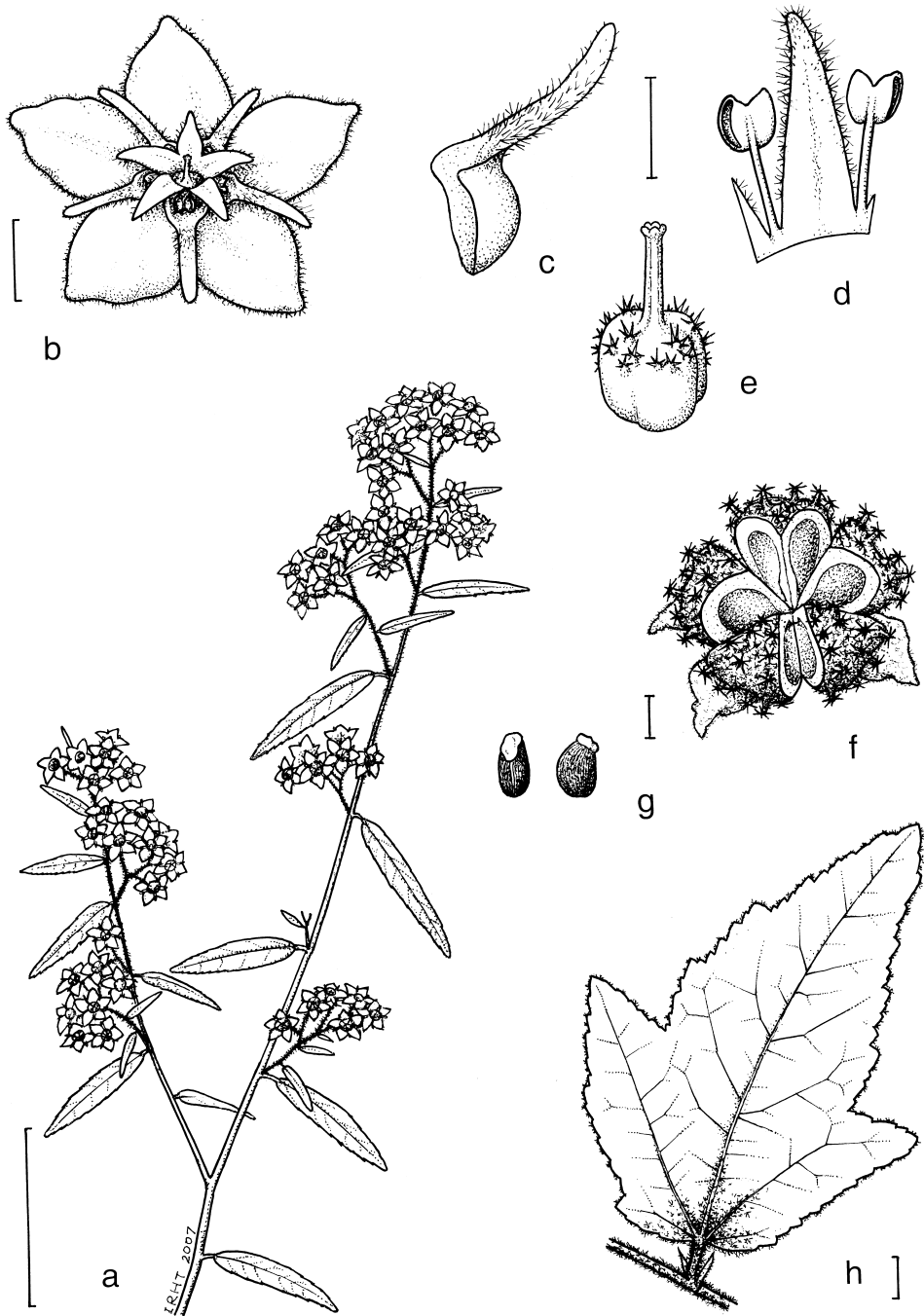


Fig. 3. *Commersonia breviseta*. **a**, habit showing flowering branchlet; **b**, flower; **c**, petal with slightly gibbous base; **d**, stamens and staminode; **e**, gynoecium; **f**, fruit with seed shed; **g**, seed; **h**, juvenile leaf. (a from type collection, Wilkins 2053; b–e from Clarke NE 81918; f, g from Copeland 3893; h from Wilkins 2060). Scale bars: a = 5 cm; b = 2 mm; c - g = 1 mm; h = 1 cm.

Phenology: flowers have been observed from September to November.

Conservation status: *Commersonia breviseta* has been widely collected since Mueller's first collection in 1860 at Yowaka River. It is widespread in eastern New South Wales, but is known from single, small populations in Queensland and Victoria. It occurs in numerous reserved areas such as Girraween, Washpool, Gibraltar Range, New England, Mt Kaputar and Deua National Parks as well as Torrington State Conservation Area. In most populations the total number of plants is relatively low, however, this species is not considered to be under threat at this time.

Etymology: the specific epithet *breviseta* is from the latin (*brevis* = short, *seta* = bristle) and refers to the short setae present on the outer surface of the fruit.

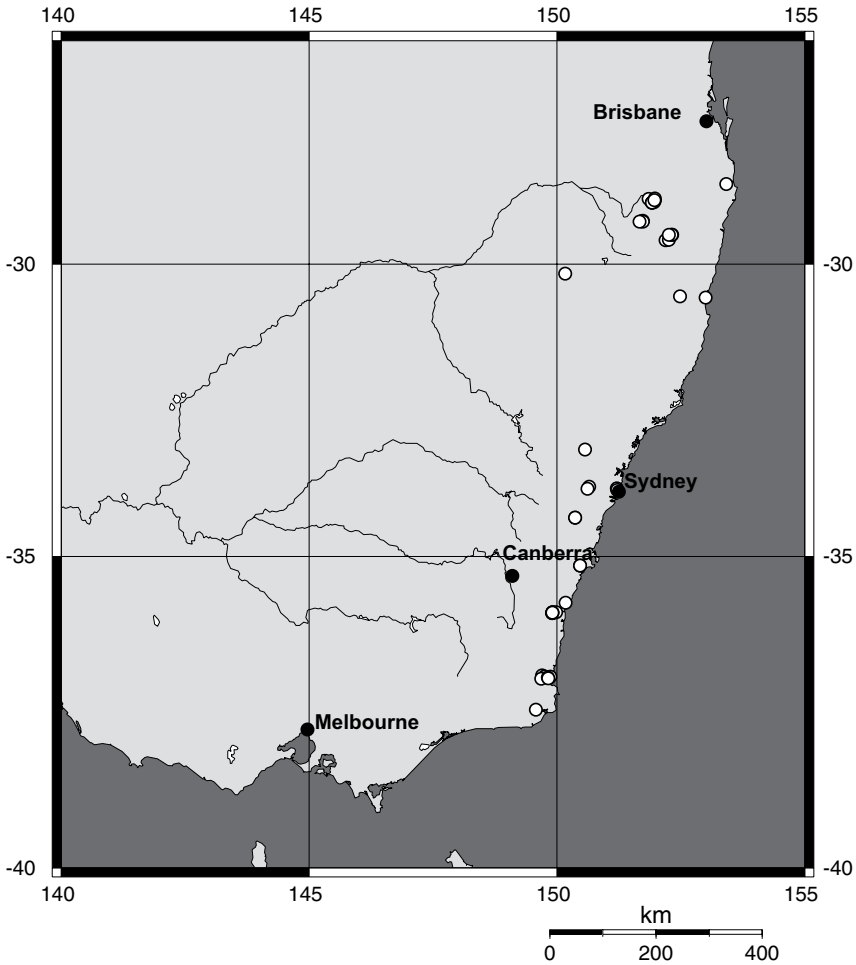


Fig. 4. Distribution of *Commersonia breviseta*.

Comparison with similar species: *Commersonia breviseta* is similar to *Rulingia hermanniifolia* in having small fruits with short setae to 0.9 mm long, the shaft of which has few hairs or glands. It differs in having a few setae mainly towards the apex of the fruit, rather than dense setae all over the surface, and differs in having leaves that are flexible rather than chartaceous. *Commersonia breviseta* is also a taller, more erect shrub.

Comment: one flower from Washpool National Park (*C. Wilkins 2052*) has small infertile anthers at the apex of the staminodes.

Acknowledgments

Sincere thanks to Paul Wilson for translation of the Latin diagnoses, to ABRS and NSF (DEB 0344009) for research funding, and Kelly Shepherd for field trip companionship and assistance, to NE and PERTH herbarium directors and staff of the School of Plant Biology at the University of Western Australia for additional assistance and provision of facilities, to directors of CANB, NSW, MEL, BRI, AD, DNA, K, BM and NE for allowing access to specimens held within their herbaria, to Ian Telford for his excellent illustrations of these species, to Peter Clarke for discussion of the fire ecology of *C. amystia* and to reviewers for helpful comments on the manuscript.

References

- Clarke PJ, Copeland LM & Noble NE (2000) The vegetation and plant species of Single National Park (Unpublished report prepared for the Glen Innes district of the NSW National Parks & Wildlife Service)
- Harden GJ (2000) Sterculiaceae. Pp. 303–314 in Harden GJ (ed) *Flora of New South Wales*, vol.1. (New South Wales University Press: Kensington)
- Henderson RJF (2002) (ed) *Names and Distribution of Queensland Plants, Algae and Lichens* ISBN 0 7345 2702 0 (PB), 0 7345 2703 9 (CD ROM) (Environmental Protection Agency, Queensland Government: Brisbane)
- Holmgren PK, Holmgren NH & Barnett LC (1990) *Index Herbariorum*. Eighth Edition. (New York Botanical Garden: New York)
- Stanley TD & Ross EM (1986) *Flora of south-eastern Queensland*, vol. 2. (Queensland Department of Primary Industries: Brisbane)
- Short PS (1996) Sterculiaceae. Pp. 324–331 in Walsh NG & Entwistle TJ (eds) *Flora of Victoria*, vol. 3. (Inkata Press: Melbourne)
- Whitlock BA, Bayer C & Baum, DA (2001) Phylogenetic relationships and floral evolution of the Byttnerioideae (“Sterculiaceae” or Malvaceae *s.l.*) based on sequences of the chloroplast gene, *ndhF*. *Systematic Botany* 26, 420–437.
- Wilkins CF (2002) *A systematic study of Lasiopetaleae* (Malvaceae *s.l.* or Sterculiaceae *s.s.*). PhD thesis at The University of Western Australia, Perth, Western Australia.