



87 RUTACEAE ¹

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Trees, shrubs or herbs or rarely woody climbers (not in Tas.). Leaves alternate or opposite; oil glands present, usually aromatic; stipules absent (stipule-like blackened glandular excrescences present on some species of *Philotheca*). Inflorescences cymose or umbellate or a panicle, 1–many-flowered. Flowers actinomorphic or rarely zygomorphic (not in Tas.), usually bisexual, usually 4–5-merous, rarely 3-merous (not in Tas.). Sepals free to fused. Petals free or fused. Stamens as many as or twice as many as petals, rarely more (not in Tas.), filaments free or fused, anthers 2-locular, often apiculate, dehiscence introrse or lateral by longitudinal slits. Nectariferous disc usually present. Carpels usually 4–5; ovary superior, 1-locular, fused or coherent at base; styles fused (in Tas.) or free; ovules 2 (also 1 or many outside Tas.) per loculus. Fruit usually of 1–5 cocci (follicles) that dehisce explosively along their inner and apical margin, also (not in Tas.) a hesperidium, berry, drupe, capsule or a samara. Seeds usually solitary (in Tas.), by abortion, in each locule.

A family of about 160 genera and 1800 species, widespread in tropical and temperate regions with major centres of diversity in southern Africa and Australia. About 45 genera (about 20 endemic, prob. 6 naturalized) and 500 species (about 450 endemic, about 10 naturalized) in all states of Australia; 8 genera and 27 species in Tasmania. Rutaceae are placed in the Sapindales and is related to the mainly tropical families Meliaceae and Simaroubaceae.

Species of *Citrus* L. and their fruits (Oranges, Lemons, Limes, Grapefruits etc.) are the most economically important and familiar members of the Rutaceae. Leaves of *Correa alba* have been used as a tea substitute on Bass Strait Islands. Many native, e.g. *Boronia*, *Eriostemon* Sm., *Correa* and *Phebalium*, and some foreign genera, e.g. the South African *Diosma* L. and *Coleonema* Bartl. & H.L.Wendl., are grown as ornamentals. *Boronia megastigma* Bartl. (SW WA) is commercially grown for the perfume industry. Rue (*Ruta graveolens* L.), the Herb of Grace, is used in both medicine and cooking. Hard and durable timber is obtained from some tropical and subtropical rainforest species.

Synonymy: Boroniaceae, Citraceae, Diosmaceae, Diplolaenaceae, Flindersiaceae.

External resources: accepted names with synonymy & distribution in Australia (APC); author & publication abbreviations (IPNI); mapping (AVH, NVA); nomenclature (APNI, IPNI).

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| 1. Leaves opposite, simple, ternate or pinnate | 2 |
| 1: Leaves alternate, simple | 5 |
| 2. Stamens 4; leaves simple or ternate | 3 <i>Zieria</i> |
| 2: Stamens 8 or 10; leaves simple, ternate or pinnate | 3 |
| 3. Petals 4, fused, if only at base; leaves simple | 4 <i>Correa</i> |
| 3: Petals 4–6, free; leaves simple, ternate or pinnate | 4 |
| 4. Petals white, usually 5 (sometimes 4-petalled flowers terminating inflorescence); leaves ternate | 1 <i>Acradenia</i> |
| 4: Petals white or pink or purple or yellow and brown, 4; leaves simple, ternate or pinnate | 2 <i>Boronia</i> |

1 This work can be cited as: Duretto MF (2009). Rutaceae, **version 2019:1**. In MF de Salas (Ed.) *Flora of Tasmania Online*. 24 pp. (Tasmanian Herbarium, Tasmanian Museum and Art Gallery: Hobart). <https://flora.tmag.tas.gov.au/treatments/rutaceae/>

2 Tasmanian Herbarium, Tasmanian Museum & Art Gallery, PO Box 5058, UTAS LPO, Sandy Bay, TAS 7005, Australia.

5. Branches and at least abaxial surface of the leaves densely lepidote; petals 5	6
5: Branches and leaves puberulous or glabrous; petals 4 or 5	7
6. Inflorescence axillary, cymose	7 <i>Nematolepis</i>
6: Inflorescence terminal, umbellate	8 <i>Phebalium</i>
7. Stamens 5, staminodes 5	<i>Coleonema</i> +
7: Stamens 10, staminodes 0	8
8. Stamens pilose; petals 4–5	5 <i>Philotheca</i>
8: Stamens glabrous; petals 5	6 <i>Leionema</i>

+ *Coleonema pulchellum* I. Williams (Diosma), a native of South Africa, is an occasional garden escape, eg. near South Arm. This ericoid species is usually a compact small shrub with yellowish foliage and white to pink small flowers. This species is considered to be sparingly naturalized in South Australia and Victoria.

1 ACRADENIA

Acradenia Kippist, *Proc. Linn. Soc. London* 2: 201 (1853).

Synonymy: *Luerssenidendron* Domin, *Biblioth. Bot.* 89(4): 843 (1930).

Tall shrubs or small trees; hairs simple. Leaves opposite, ternate. Inflorescence terminal, a cyme. Flowers usually 5-merous (rarely 4, 6 or 7-merous). Sepals free. Petals free, white, valvate. Stamens twice number of petals, all fertile, c. as long as petals; filaments erect, unfused, glabrous. Disk thick, slightly lobed. Carpels: ovules 2 in each loculus, though usually only one reaching maturity; styles fused, arising from c. middle of ovary; stigma barely differentiated from style. Follicles subwoody, transversely wrinkled.

An Australian genus of two species: *A. euodiiformis* (F. Muell.) T.G. Hartley, which is confined to the Border Ranges of Queensland and New South Wales, and *A. frankliniae* of Tasmania.

Key reference: Hartley (1977).

1 *Acradenia frankliniae* Milligan ex Kippist, *Proc. Linn. Soc. Lond.* 2: 201 (1853) *Whitey Wood, Wirewood*

Illustrations: Stones & Curtis, *The Endemic Flora of Tasmania* 5: t. 101, No. 167 (1975); Hartley, *J. Arnold Arboretum* 58: 179, fig. 2 (1977); Whiting *et al.*, *Tasmania's Natural Flora* 297 (2004).

Shrub or tree, to 10 m tall. Shoots glabrous or puberulous. Leaves ternate; petiole 4–7 mm long; leaflets oblong-lanceolate, obtuse, (1.5–)2–7 cm long, 6–19 mm wide, thick, leathery and with prominent glands, margin c. crenulate. Inflorescence terminal, cymose, peduncle short, pedicel equal to or shorter than leaves. Sepals 1.5–2.0 mm long, rounded, fleshy, glandular-tuberculate. Petals white, 5–7(–10) mm long, abaxial surface pubescent. Ovary villous, each carpel terminating in a glabrous gland. Cocci 5–8 mm long, slightly beaked. Flowering Nov.–Feb.; fruiting Jan.–May.

Tas. (KIN?, TWE); endemic. Restricted to western Tasmania where usually found along river banks in wet sclerophyll or rainforest communities. The majority of collections come from the Gordon/Franklin and Pieman River catchments. Isolated collections have been made in the north at Arthur River (KIN?) and to the south at Bathurst Harbour.

2 BORONIA

Boronia Sm., *Tracts Nat. Hist.*, 288 (1798).

Odoriferous shrubs, herbs or rarely small trees; hairs simple or stellate (not in Tas.). Leaves opposite, simple or imparipinnate or bipinnate. Inflorescence terminal and/or axillary or both, cymose or flowers solitary. Flowers 4-merous. Sepals free. Petals free, usually pink or white, sometimes (not in Tas.) blue, green, yellow

or brown, imbricate or valvate (not in Tas.) in bud. Stamens 8 (rarely 4 or 6; see *B. parviflora*), all fertile (in Tas.), shorter than petals; filaments erect, free, glabrous or pilose. Disc entire, not swollen (in Tas.). Carpels lacking sterile apex; styles terminal on ovary (in Tas.); stigma barely differentiated from style (in Tas.). Cocci not transversely ridged, with rounded apices.

An Australian genus of c. 150 species with 11 species (6 endemic) in Tasmania. *Boronia* is classified into 6 sections, 2 of which are found in Tasmania: section *Cyanothamnus* (*B. nana*, *B. anemonifolia*) and section *Boronia*.

Key references: Weston *et al.* (1984); Wilson (1998b); Neish & Duretto (2000); Duretto (2003).

Note for key: *Boronia pilosa* shows striking variation in Tasmania and though all the various forms have been taken into account when the key was produced the user should read each couplet carefully when keying out any pinnate-leaved species.

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| 1. Petal tip an incurved hook; seed rugulose, at magnification tuberculate (section <i>Cyanothamnus</i>) | 2 |
| 1: Petal tip terminal or subterminal abaxially, often apiculate; seed smooth, even at magnification (section <i>Boronia</i>) | 3 |
| 2. Leaves 1 or 3-foliolate, without a strong smell when crushed; weak, scrambling subshrub or herb | 10 <i>B. nana</i> |
| 2: Leaves (3-)5-9-foliolate, with a strong smell of turpentine when crushed; erect (rarely procumbent) woody shrub | 11 <i>B. anemonifolia</i> |
| 3. Leaves simple | 4 |
| 3: Leaves pinnate | 5 |
| 4. Leaves linear to narrow elliptic to elliptic or obovate, at least as twice as long as wide, apex acute | 1 <i>B. parviflora</i> |
| 4: Leaves broad-obovate to almost circular or rarely obovate, less than twice as long as wide, apex obtuse | 2 <i>B. rhomboidea</i> |
| 5. Leaves sessile; petals yellow and brown | <i>B. megastigma</i> + |
| 5: Leaves petiolate; petals pink or white | 6 |
| 6. Stems and sometimes leaves and/or sepals pilose; hairs exceeding 0.3 mm long | 3 <i>B. pilosa</i> |
| 6: Stems, leaves and sepals glabrous to hispidulous; hairs to 0.25 mm long | 7 |
| 7. Weakly ascending to prostrate subshrub, stems not tuberculate; entire leaf in outline 5-11(-15) mm long, 5-18 mm wide, leaflets to 1 mm wide (W Tas.) | 9 <i>B. elisabethiae</i> |
| 7: Erect shrub (if semi erect then leaflets > 1 mm wide or branches tuberculate); entire leaf in outline 6-25 mm long and wide; widest leaflets 1-4 mm wide (if < 1 mm wide then branches tuberculate and/or plant erect) (widespread) | 8 |
| 8. Sepals sparsely to densely hispidulous on abaxial surface | |
| 8: Sepals glabrous or ciliate | 11 |
| 9. Leaves hispidulous; cocci hispidulous | 7 <i>B. hippopala</i> |
| 9: Leaves hispidulous only on petiole, rhachis segments and proximal half of leaflets; cocci glabrous (seen only for <i>B. hemichiton</i>) | 10 |
| 10. Leaflets 1-2 mm wide; sepals 1.75-2 mm long, 1.0-1.25 mm wide (Ben Lomond, Mt Barrow) | 6 <i>B. citriodora</i> |
| 10: Leaflets 0.5-1.0 mm wide; sepals 0.75-1.25 mm long, 0.25-0.5 mm wide (Mt Arthur) | 8 <i>B. hemichiton</i> |
| 11. Sepals narrowly deltate, tips acute to acuminate; petals to 6 mm long (very rarely to 7.5 mm long and then leaflets < 2 mm wide); widest lateral leaflets to 2 mm wide | 3 <i>B. pilosa</i> |
| 11: Sepals deltate or if approaching narrowly deltate then petals 8-10.5 mm long and widest | 12 |

lateral leaflets > 2.5 mm wide; sepal tip acute; widest lateral leaflets 1–4 mm wide

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| 12. Leaflets narrowly oblanceolate; lateral leaflets 5–25 mm long, 0.75–2.5 mm wide, largest 17–25 mm long; glands on leaflets and branchlets usually appearing as shiny discs; petiole 3–6 mm long; sepals c. 1 mm long, 0.75–1 mm wide | 5 <i>B. gunnii</i> |
| 12: Leaflets narrowly obovate to narrowly elliptic or rarely narrowly oblanceolate; lateral leaflets 2–16 mm long, 0.5–4.0 mm wide, glands on leaflets and branchlets not appearing as shiny discs; petiole 0.5–6.0 mm long; sepals (0.75–)1–3.5 mm long, 0.75–2.5 mm wide | 13 |
| 13. Petals 8–10 mm long; petiole 1–3 mm long; leaves congested; stems and leaves not obviously glandular (Schouten Is.) | 4 <i>B. rozefeldsii</i> |
| 13: Petals 3–7 mm long, if 7.0–8.5 mm long then petiole 3–6 mm long and leaves not congested; stems and leaves sometimes slightly glandular tuberculate (western & central regions) | 6 <i>B. citriodora</i> |

+*Boronia megastigma* Nees ex Bartl. (Sweet-Scented Boronia), a native of south-western Western Australia, is grown for the perfume industry and the cut-flower trade. Occasionally, when fields of this species are abandoned and reinvaded by the native vegetation, the original crop-plants can persist for many years and may appear to be naturalized. In Tasmania there is no evidence that the species is successfully reproducing and is not considered to be naturalized.

Boronia section 1 Boronia

Boronia Sm. section *Boronia*.

Leaves simple or pinnate. Inflorescence axillary or terminal. Petals not obviously glandular, deciduous with fruit, sometimes lately so, tip usually subterminal abaxially or apical. Seed black to dark brown, shiny; testa smooth, even at high magnification; raphe fleshy.

Boronia section *Boronia* is confined to southern Australia and contains 57 species. There are two series, both of which are found in Tasmania.

Boronia section 1 Boronia series 1a Pedunculatae

Boronia section *Boronia* series *Pedunculatae* Benth., *Fl. Austral.* 1: [310] 326 (1863).

Synonymy: *Boronia* section *Pedunculatae* (Benth.) De Wild, *Icon. Horti Then.* 2: 67 (1901).

Leaves simple. Inflorescence terminal, sometimes also in upper axils. Sepals valvate in bud, abaxial surface glabrous, usually deciduous in fruit. Seed black; hilum linear along adaxial margin; raphe a cream to brown pulpy mass at base of seed; chalazal opening covered by raphe.

A series of 11 species, 9 of which are confined to south-west Western Australia and two to eastern Australia.

1 Boronia parviflora Sm., *Tracts nat. hist.* 295: t. 6 (1798)

Small Boronia, Tiny Boronia, Swamp Boronia, Small-flowered Boronia

Boronia pilonema Labill., *Nov. Holl. pl.* i. 98, t. 126 (1805). *Boronia colorata* Lehm. ex Bartl. in *Pl. Preiss.* 2: 226 (1848). *Boronia palustris* Maiden & J.Black, *Trans. & Proc. R. Soc. South Australia* 35: 1, pl. 1 (1911).

Illustrations: Duretto, *Fl. Victoria* 4: 163, fig. 29h (1999); Weston & Duretto, *Fl. New South Wales* 2, 2nd edn: 196 (2002); Woolmore *et al.*, *King Island Flora* 71 (2002); Gilfedder *et al.*, *The Nature of the Midlands* 112 (2003); Whiting *et al.*, *Tasmania's Natural Flora* 299 (2004).

Weakly ascending herb or sub-shrub to 50 cm tall, glabrous apart from flowers; branchlets without obvious leaf decurrencies. Leaves simple, sessile, 7–18(–28 outside Tas.) mm long, 0.5–6.0 mm wide, linear to elliptic or obovate, flat. Inflorescence terminal, 1(–3)-flowered; pedicels 2–10 mm long. Sepals green to purple, deltate to ovate, 2–6 mm long, smaller to just longer than petals, abaxial surface glabrous. Petals white to pink, 3–5(–7 outside Tas.) mm long, abaxial surface glabrous. Stamens 8 (also 4 or 6 outside Tas.), filaments glabrous or pilose. Gynoecium glabrous; stigma minute. Flowering & fruiting mainly Aug.–Mar.

Tas. (all regions except TNM, MIS); also SA, Qld, NSW, Vic. Widespread in Tasmania and usually found, though not confined to, in seasonally wet situations. A widespread and variable species (see Duretto 2003 for full discussion). A diminutive form with very narrow leaflets is found in the south-west.

Boronia section **1 Boronia** series **1b Boronia**

Boronia Sm. section *Boronia* series *Boronia*.

Synonymy: *Boronia* section *Octarrhena* F.Muell., *Pl. Vict.* 1: 113 (1862). *Boronia* series *Variabiles* Benth., *Fl. Austral.* 1: 309 (1863). *Boronia* series *Heterandrae* Benth., *Fl. Austral.* 1: 308 (1863); *B.* section *Heterandrae* (Benth.) Engl., *Nat. Pflanzenfam. [Engler & Prantl]* 4 (131-2): 136 (1896). *Boronia* series *Pinnatae* Benth., *Fl. Austral.* 1: 309 (1863); *B.* section *Pinnatae* (Benth.) De Wild, *Icon. Horti Then.* 2: 67 (1901). *Boronia* series *Terminales* Benth., *Fl. Austral.* 1: 310 (1863). *Boronia* series *Ovatae* Paul G.Wilson *Nuytsia* 1: 204 (1971).

Leaves simple or imparipinnate. Inflorescence terminal or axillary, cymose. Sepals imbricate in bud, abaxial surface glabrous or variously hairy, persistent. Seed black or dark brown; hilum sunken, linear to elliptic in centre of adaxial margin; raphe fleshy; hilum and raphe surrounded by labiose raised testa margin; chalazal opening basal.

Boronia series *Boronia* contains 46 species with roughly an equal number of species found in south-west Western Australia and eastern Australia.

2 Boronia rhomboidea Hook., *Icon. Plant.* 8, t. 722 (1845)

Broad-leaved Boronia, Rhomboid Boronia

Illustrations: Kirkpatrick, *Alpine Tasmania* 49, fig. 20e (1997); Weston & Duretto, *Fl. New South Wales* 2, 2nd edn: 198 (2002); Whiting *et al.*, *Tasmania's Natural Flora* 300 (2004).

Erect or prostrate, woody shrub to 1 m tall; branchlets not or slightly glandular tuberculate, leaf decurrencies absent, hispidulous to pilose. Leaves simple, sessile or subsessile; lamina (3-)5-13 mm long, (1-)5-15 mm wide, broad-obovate to almost circular or rarely obovate, glabrous or ciliate, if only at base, concolorous, margins entire. Inflorescence terminal and/or axillary, 1-3-flowered; peduncles 0-2 mm long; pedicels 1.0-3.5 mm long. Sepals elliptic to oblong, 2.5-4.5 mm long, glabrous or sparsely ciliate. Petals white to pink, 5-8 mm long, glabrous. Staminal filaments glabrous. Gynoecium glabrous; stigma minute. Flowering Oct.-Feb. (Mar.); fruiting Jan.-Mar.

Tas. (BEL, TCH, TNS, TSE, TSR); also NSW. Found mainly at higher elevations of the northern part of the Central Highlands, with isolated populations near Mathinna (BEL), Longley (TSE), Vale of Rasselas and Gordon Plains (TSR). Growing in alpine and subalpine heath/sedgeland and *Eucalyptus* woodland on a variety of substrates, often locally dominant. Populations near Longley are under threat.

3 Boronia pilosa Labill., *Nov. Holl. pl.* 1: 97, t. 124 (1805)

Hairy Boronia

Boronia tetrandra var. *pilosa* (Labill.) Hook., *Hook.*, *Hooker's J. Bot. Kew Gard. Misc.* 2: 419 (1840); *B. pinnata* var. *pilosa* F.Muell., *The Native Plants of Victoria* 1: 69 (1879).

Erect, woody shrub to 2(-3 in Vic.) m tall; branchlets not obviously glandular, leaf decurrencies usually present, hispidulous to densely pilose. Leaves pinnate, 3-9-foliolate, 3-22 mm long, 4-34 mm wide, glabrescent to pilose; petiole and rachis segments 0.25-4 mm long; leaflets 1-17 mm long, 0.5-4.0 mm wide, linear or narrowly obovate or narrowly elliptic, semiterete to flat. Inflorescence terminal and/or axillary, 1-10-flowered; peduncles and pedicels 0.5-11 mm long. Sepals narrowly triangular to deltate, 1.0-4.5 mm long, abaxial surface glabrous to pilose. Petals white to pink, 3-8 mm long, abaxial surface glabrous to pubescent. Staminal filaments pilose. Ovary glabrous or rarely hispidulous; style glabrous to pilose; stigma wider than style, sometimes concealing it. Flowering Aug.-Feb.; fruiting Nov.-Feb.

Tas. (BEL, FUR, KIN, TSE, TSR, TWE?); also SA, Vic. The species has had a long and complicated taxonomic history (see Duretto 2003 for review). There are four subspecies, two of which are found in Tasmania. The other subspecies are: subsp. *parvidaemonis* Duretto (Vic.) and subsp. *torquata* Duretto (SA, Vic.).

1. Sepals 1.5–3.5 mm long, glabrous or glabrescent or ciliate or sparsely pilose or rarely pilose or hispidulous; branchlets and leaves hispidulous to pilose; widest leaflets 0.5–2.0 mm wide; style usually pilose (N & E Tas.)

3a subsp. *pilosa*

1: Sepals 2.5–4.5 mm long, pilose; branchlets pilose; leaves glabrescent or ciliate; widest leaflets (1.5–)2–4 mm wide; style glabrous or with few hairs (Tasman & Forestier Pen.'s)

3b subsp. *tasmanensis*

3a *Boronia pilosa* Labill. subsp. *pilosa*

Boronia tetrandra var. *floribunda* Hook., *Hooker's. J. Bot. Kew Gard. Misc.* 2: 419 (1840); *B. pilosa* var. *floribunda* (Hook.) Hook.f., *Bot. Antarct. Voy. Ill. (Fl. Tasman.)* 1: 67 (1855). *Boronia tetrandra* var. *terminiflora* Hook., *op. cit.* 2: 419 (1840). *Boronia tetrandra* var. *laricifolia* Hook., *op. cit.* 2: 419 (1840); *B. pilosa* var. *laricifolia* (Hook.) Hook.f., *op. cit.* 1: 67 (1855).

Illustrations (often as *B. pilosa*): King & Burns, *The Wildflowers of Tasmania* 19 (1969); Collier, *Woodland Wildflowers of Tasmania* 28 (1990); Cameron, *A Guide to Flowers and Plants of Tasmania*, 3rd edn, 63, pl. 141 (2000); Duretto, *Fl. Victoria* 4: 163, fig. 29e (1999), as *B. pilosa* subsp. 1; Corrick & Fruhrer, *Wildflowers of Victoria* 206 (2000); Woolmore et al., *King Island Flora* 71 (2002); Duretto, *Muelleria* 17: 85, fig. 10 J–O (2003); Gilfedder et al., *The Nature of the Midlands* 112 (2003); Simmons et al., *A Guide to Flowers and Plants of Tasmania*, 4th edn, 75 (2008)..

Erect shrub to 3 m tall; branchlets hispidulous to densely pilose, hairs to 1 mm long. Leaves 3–9-foliolate, 3–18 mm long, 4–34 mm wide, glabrescent to pilose; leaflets 1–15 mm long, 0.5–2.5 mm wide, linear to obovate, semiterete to flat; petiole and rachis segments 0.25–3.5 mm long. Inflorescence 1–9-flowered; peduncles 0.5–5.0 mm long; pedicels 1.5–11 mm long. Sepals narrowly triangular to deltate, 1.0–3.5 mm long, abaxial surface glabrescent to pilose. Petals pink, 3–7 mm long. Ovary glabrous or hispidulous; style glabrous to pilose, to 0.6 mm long; stigma slightly wider than style, sometimes concealing it. Flowering Aug.–Feb.; fruiting Nov.–Feb.

Tas. (BEL, FUR, KIN, TSE, TSR, TWE?): also Vic. Found in heath and woodland on sand, sandstones or granites in eastern and northern areas including Cape Barren Island of the Furneaux Group. The taxon is often locally dominant. Woolmore et al. (*l.c.*) indicate that *B. pilosa* is found on King Island and the subspecies has been collected once from the Tasmanian West from Macquarie Heads. *Boronia pilosa* subsp. *pilosa* displays some striking variation over its range and most of this variation concerns the hairiness of various organs and hair length, but leaf and perianth size are also variable (see Duretto 2003). Notable are the large leaved plants on mountain tops and other exposed areas of the Freycinet Peninsula which approach *B. rozefeldsii* in appearance. In addition there are weak plants of heaths on the east coast that often have hispidulous ovaries and very large stigmas. Further research is required to elucidate if this variation warrants taxonomic recognition.

3b *Boronia pilosa* subsp. *tasmanensis* Duretto, *Muelleria* 17: 97, fig. 10t–v (2003)

Erect shrub to 1.5 m tall; branchlets pilose, leaf decurrencies faint or absent, hairs to 1 mm long. Leaves 3–9-foliolate, 7–22 mm long, 10–34 mm wide, glabrous to pilose; leaflets 3–17 mm long, 1–4 mm wide, narrowly elliptic to narrowly obovate or rarely obovate, flat; petiole 0.5–2.5 mm long; rachis segments 0.5–4.0 mm long. Inflorescence 1–10-flowered; peduncles and pedicels 0.5–8.0 mm long. Sepals narrowly triangular, 2.5–5.0 mm long, abaxial surface pilose. Petals white to pink, 4–8 mm long. Ovary glabrous; style glabrous or glabrescent; stigma minute. Flowering Sep.–Jan.; fruiting Nov.–Jan.

Tas. (TSE); endemic. Confined to the Tasman and Forestier Peninsulas, where it is found in dense or open and usually wet heath or bushland. The leaflets of plants from more exposed areas (eg. Cape Hauy, Cape Raoul) are often wider and less hairy than in plants from more sheltered areas.

4 *Boronia rozefeldsii* Duretto, *Muelleria* 17: 101, figs 12a–b (2003)

Schouten Island Boronia

Erect, woody shrub to 50 cm tall; branchlets not obviously glandular, leaf decurrencies faint or absent, pilose to hispidulous. Leaves pinnate, 3–7-foliolate, 10–20 mm long, 22–26 mm wide, hispidulous proximally; petiole and rachis segments 1–3 mm long; leaflets 7–12 mm long, 2–4 mm wide, narrowly obovate to narrowly elliptic. Inflorescence axillary, 3–7-flowered; peduncles 1–2 mm long; pedicels 3–6 mm long. Sepals deltate, c. 2 mm long, ciliate. Petals pink, 8–10 mm long, abaxial surface pubescent along margins. Staminal

filaments pilose. Ovary glabrous; style glabrescent; stigma minute. Flowering material has been collected in Nov.; fruiting material in Feb.

Tas. (TSE); endemic. Confined to Schouten Island where found in sparsely vegetated areas or in cracks on bare granitic outcrops and ridgelines.

5 *Boronia gunnii* Hook.f., *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1: 68, t. 10 (1855)

Gunn's Boronia, Cataract Gorge Boronia

Boronia tetrandra var. *grandiflora* Hook., *Hooker's J. Bot. Kew Gard. Misc.* 2: 419 (1840); *B. pinnata* var. *gunnii* (Hook.f.) Benth., *Fl. Austral.* 1: 319 (1863). *Boronia pilosa* Labill. sensu W.M.Curtis & D.I.Morris, *The Student's Flora of Tasmania* 1: 104 (1975), p.p.

Illustration: Duretto, *Muelleria* 17: 102, fig. 13 C-F (2002).

Erect, woody shrub to 1.2 m tall; branchlets slightly glandular tuberculate, leaf decurrencies faint, hispidulous. Leaves pinnate, 5–9-foliolate, 12–32 mm long, 16–50 mm wide, proximal leaflets sparsely hispidulous, otherwise glabrescent; petiole and rachis segments 1–6 mm long; leaflets 5–25 mm long, 0.75–2.5 mm wide, narrowly oblanceolate, glands usually shiny. Inflorescence axillary, 1–7-flowered; peduncles 1.5–3.0 mm long; pedicels 5–9 mm long. Sepals deltate, c. 1 mm long, glabrous to minutely ciliate. Petals pink, 5–8 mm long, glabrous to sparsely puberulous along margins. Staminal filaments pilose. Ovary glabrous; style glabrescent; stigma minute. Flowering Oct.–Jan; immature fruiting material has been collected in Jan.

Tas. (TNM†, BEL, TSE); endemic. Once common in the Cataract Gorge area near Launceston though probably extinct there now. Locally common in the areas around the Duke and Apsley Rivers. The species is usually found in exposed, rocky riverine areas prone to flooding.

6 *Boronia citriodora* Gunn ex. Hook.f., *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1: 68 (1855)

Lemon Plant, Lemon Boronia

Boronia pinnata var. *citriodora* (Gunn ex Hook.f.) Rodway, *Tasman. Fl.*, 22 (1903).

Prostrate to erect, woody shrub to 3 m tall; branchlets not to slightly glandular tuberculate, leaf decurrencies faint, hispidulous. Leaves pinnate, 1–9-foliolate, 7–25 mm long, 7–30 mm wide, glabrescent to hispidulous; petiole and rachis segments 1.5–6.0 mm long; leaflets 3–16 mm long, 0.5–4.0 mm wide, narrowly elliptic to narrowly oblanceolate, flat to semiterete. Inflorescence axillary and terminal, 1–7-flowered; peduncles 1–8 mm long; pedicels 1.5–15 mm long. Sepals deltate, 0.75–2.5 mm long, ciliate or abaxial surface sparsely hispidulous. Petals white to pink, 3.5–8.5 mm long, glabrous or abaxial surface sparsely pilose. Staminal filaments pilose. Ovary glabrous; style glabrous or glabrescent; stigma minute. Flowering Nov.–Mar.(–May); fruiting Nov.–Apr.

Tas. (BEL, TCH, TNS, TSE, TSR, TWE); endemic. Found in the Central Highlands to near Hobart (subsp. *citriodora*), Ben Lomond and Mt Barrow (subsp. *orientalis*) and in the South-West (subsp. *paulwilsonii*). The species is found in heath, woodland, or rainforest borders on slopes and rocky ridges. Found in high altitude areas of north-east and central Tasmania and to sea level in the west. There are 3 subspecies.

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| 1. Sepals sparsely hispidulous to hispidulous abaxially (NE Tas. – Mt Barrow, Ben Lomond) | 6c subsp. orientalis |
| 1: Sepals glabrous abaxially (W & Central Tas.) | 2 |
| 2. Leaves less than 15(–17 and then leaves mostly trifoliolate) mm long; lateral leaflets to 10 mm long, 1–2 mm wide (to 13 x 2.5, Mt Field); pedicels 1.5–4.5 mm long; sepals 0.75–1.5 mm long (Central Tas.) | 6a subsp. citriodora |
| 2: Largest leaves greater than 15 mm long; largest lateral leaflets greater than 10 mm long, 1.75–4.5 mm wide; pedicels 5–15 mm long; sepals 1.5–2.5 mm long (W Tas.) | 6b subsp. paulwilsonii |

6a *Boronia citriodora* Gunn ex. Hook.f. subsp. *citriodora*

Illustrations (all as *B. citriodora*): Stones & Curtis, *The Endemic Flora of Tasmania* 1: t. 7, No. 9 (1967); Cochrane et al., *Flowers and Plants of Victoria and Tasmania*, 3rd edn, 123, t. 625 (1980); Kirkpatrick, *Alpine*

Tasmania 49: fig. 20e (1997); Cameron, *A Guide to Flowers and Plants of Tasmania*, 3rd edn, 23, pl. 11 (2000); Simmons *et al.*, *A Guide to Flowers and Plants of Tasmania*, 4th edn, 20 (2008).

Erect to prostrate shrub to 60 cm tall. Leaves 1–7-foliolate, 7–15(–17) mm long, 7–22 mm wide; leaflets 4–10(–13) mm long, 0.5–2.5 mm wide, flat to semiterete; petiole and rachis segments 1.5–4.5 mm long. Inflorescence 1–3-flowered; peduncles and pedicels 1.5–5.0 mm long. Sepals 0.75–1.5 mm long, minutely ciliate. Petals 3.5–7.0 mm long.

Tas. (TCH, TNS, TSE, TSR, TWE); endemic. Found mainly in the Central Highlands of Tasmania above 900 m, with outlying populations found to the south, eg. at Mt Field and near Hobart. The taxon is found in peaty and/or rocky soils in alpine and subalpine moors, fjeldmark, alpine meadows, heath and woodland. Some plants from Mt Field, and particularly Wombat Moor, have leaves to 17 mm long (like subsp. *paulwilsonii*) while other plants from this area key out easily to the type subspecies.

6b *Boronia citriodora* subsp. *paulwilsonii* Duretto, *Muelleria* 17: 81, fig. 6h-i (2003)

Erect shrub to 3 m tall. Leaves 3–9-foliolate, 15–25 mm long, 10–30 mm wide; leaflets 5–17 mm long, 1.5–4.0 mm wide, flat; petiole and rachis segments 2–6 mm long. Inflorescence 1–7-flowered; peduncles 1.5–8.0 mm long; pedicels 5–15 mm long. Sepals 1.5–2.5 mm long, minutely ciliate. Petals 6.0–8.5 mm long.

Tas. (TSR, TWE); endemic. Confined to south-west Tasmania, south from Macquarie Harbour and west from Mt Shea and found in a variety of usually wet habitats including, *Eucalyptus/Nothofagus* woodland, rain-forest borders, tall closed or open heath, shrubland on rocky outcrops, heath dominated by rushes and sedges on slopes, ridge tops or near creeks and rivers.

6c *Boronia citriodora* subsp. *orientalis* Duretto, *Muelleria* 17: 83, fig. 6j-l (2003)

Erect shrub to 1.2 m tall. Leaves 3–7-foliolate, 7–14 mm long, 7–22 mm wide; leaflets 3.5–11 mm long, 1–2 mm wide, flat to semiterete; petiole and rachis segments 1–3 mm long. Flowers solitary; peduncles 1–2 mm long; pedicels 2–3 mm long. Sepals 1.75–2 mm long, abaxial surface sparsely hispidulous. Petals 5.5–6.0 mm long. Flowering & fruiting Dec.–Feb.

Tas. (BEL); endemic. Confined to Mt Barrow and Ben Lomond, where it is found in alpine heath.

7 *Boronia hippopala* Duretto, *Muelleria* 17: 84, fig. 10a-c (2003)

Erect, woody, shrub to 1.8 m tall; branchlets slightly to obviously glandular tuberculate, leaf decurrencies present, hispidulous, hairs evenly distributed around stem. Leaves pinnate, 3–7-foliolate, 6–10 mm long, 6–14 mm wide, densely hispidulous all over or sometimes mainly in the proximal portion; petiole and rachis segments 1–3 mm long; leaflets 1–8 mm long, 0.75–1.75 mm wide, linear to narrowly elliptic to narrowly obovate. Inflorescence axillary, 1–3-flowered; peduncles and pedicels to 2 mm long. Sepals narrowly triangular to deltate, 1–2 mm long, abaxial surface variously hispidulous. Petals white to pink, 3.5–6.0 mm long, abaxial surface sparsely hispidulous. Staminal filaments pilose. Ovary glabrescent; style hispidulous or glabrous; stigma minute. Flowering Oct.–Jan; fruiting Dec.–Jan.

Tas. (BEL, TSE); endemic. Restricted to small areas around the Horseshoe and Dukes Marshes, Rawlina Hill and upper Elizabeth River area in or near Eucalypt woodland on stony ground. Closely related to *B. hemichiton* from which it can be, at times, hard to distinguish.

8 *Boronia hemichiton* Duretto, *Muelleria* 17: 87, fig. 10d-f (2003)

Woody shrub to 30 cm tall; branchlets slightly glandular tuberculate, leaf decurrencies faint, hispidulous. Leaves pinnate, 3–7-foliolate, 9–12 mm long, 12–16 mm wide, hispidulous on proximal areas becoming glabrescent distally; petiole and rachis segments 1.5–2.5 mm long; leaflets 2–9 mm long, 0.5–1.0 mm wide, linear to narrowly elliptic to narrowly obovate. Inflorescence axillary, 1–5-flowered; peduncles 1–2 mm long; pedicels 2–4 mm long. Sepals narrowly triangular, 0.75–1.5 mm long, abaxial surface glabrescent to sparsely

hispidulous. Petals white to pink, 4.5–5.5 mm long, abaxial surface hispidulous. Staminal filaments pilose. Gynoecium glabrous; stigma minute. Flowering & fruiting Sep.-Dec.

Tas. (BEL); endemic. Found only in the Mt Arthur area in heath and on forest edges. Closely related to *B. hippopala*.

9 *Boronia elisabethiae* Duretto, *Muelleria* 17: 88, fig. 10g-i (2003)

Semi-erect to weakly spreading, woody sub-shrub to 50 cm long; branchlets not obviously glandular, leaf decurrencies absent, hispidulous. Leaves pinnate, 3–9-foliolate, 5–15 mm long, 5–18 mm wide, glabrescent to hispidulous; petiole and rachis segments 1–3 mm long; leaflets 2–11 mm long, 0.5–1.0 mm wide, narrowly elliptic to linear, flat to semiterete. Inflorescence terminal or axillary, 1–3-flowered; peduncles and pedicels 1–4 mm long. Sepals deltate, 1.5–3.0 mm long, abaxial surface hispidulous or glabrous. Petals white to pink, 3.5–6.0 mm long, abaxial surface hispidulous. Staminal filaments pilose. Gynoecium glabrous; stigma minute. Flowering Nov.-Mar.; fruiting Jan.-Mar.

Tas. (TCH, TSR, TWE); endemic. Found in western Tasmania from sea level to 960 m usually in exposed areas with poor and rocky or peaty soils. It is found in wet and dry conditions in button grass and sedge moorland, closed or open heath, and in mats of other species such as *Donatia novae-zelandiae* Hook.f. and *Oreobolus pumilio* R.Br.

Boronia section 2 *Cyanothamnus*

Boronia section *Cyanothamnus* (Lindl.) F.Muell., *Fragm.* 9: 113 (1875).

Synonymy: *Cyanothamnus* Lindl., *Sketch Veg. Swan R.* 18 (1 Dec. 1839). *Boronia* series *Cyaneae* Benth., *Fl. Austral.* 1: 309 (1863); *B.* section *Cyaneae* (Benth.) De Wild., *Icon. Horti Then.* 2: 67 (1901), *nom. illeg.*

Leaves simple, pinnate or bipinnate. Inflorescence axillary. Petals often with large pellucid oil glands, persistent or deciduous, tip with a small but distinct incurved hook. Seed black or grey, shiny or dull; testa rugulose, at magnification tuberculate, with or without wax platelets between tuberculae; raphe minute.

Boronia section *Cyanothamnus* is confined to southern and eastern Australia and contains 23 species, 2 of which extend to Tasmania.

10 *Boronia nana* Hook., *Icon. Pl.* 3, t. 270 (1840)

Dwarf Boronia, *Small Boronia*

Boronia polygalifolia sensu G.Bentham, *Fl. Austral.* 1: 320 (1863); L.Rodway, *Tasman. Fl.* 22 (1903), *non* Sm. (1798).

Weakly erect or spreading, sub-shrub to 1 m long, glabrous or pubescent (SA, Vic.); branchlets not obviously glandular, leaf decurrencies present. Leaves simple or pinnate, 1–5-foliolate; petiole 0.5–5.0 mm long; leaflets and simple leaves 2–25 mm long, 0.5–4.0 mm wide, linear to elliptic, ovate or obovate. Inflorescence 1–7-flowered; peduncles 1–7 mm; pedicels 2–16 mm long. Sepals deltate to narrow-deltate, 1–2(–3.5 outside Tas.) mm long, 0.5–1.5 mm wide. Petals white to pink, 2.5–6.0 mm long, not obviously glandular. Staminal filaments pilose. Ovary glabrous; style pilose; stigma minute. Flowering Sep.-Feb.; fruiting Nov.-Apr.

Tas. (BEL, FUR, KIN, TNM, TNS, TSE, TSR, TWE?); also SA, NSW, Vic. Scattered populations are found throughout northern Tasmania in woodland or heath. *Boronia nana* is one of the most widespread species of *Boronia* and has a complicated taxonomic history (see Duretto 2003 for details). There are 3 varieties, 2 of which are found in Tasmania. The third, var. *pubescens* (Benth.) J.H.Willis, is found in South Australia and Victoria. The species requires detailed field research to determine if the current classification is warranted and to produce an accurate conservation assessment.

1. Leaves trifoliolate

10a var. *nana*

1: Leaves simple

10b var. *hyssoifolia*

10a *Boronia nana* Hook. var. *nana*

Boronia polygalifolia var. *trifoliolata* Benth., *Fl. Austral.* 1: 321 (1863).

Illustrations: Melville & Summerville, *Kew Bull.* 9: 462, figs 1.5–1.8 (1954); Duretto, *Fl. Victoria* 4, 160, fig. 28f (1999).

Leaves pinnate or very rarely bipinnate, 3(–5)-foliolate.

Tas. (KIN, TNS); also SA, Vic. In Tasmania the variety is rare and has been found in the Table Cape, Rocky Cape, Deloraine and Beaconfield areas in the north-west. It is found in heath and open woodland usually on sandy or rocky substrates.

10b *Boronia nana* var. *hyssopifolia* Melville, *Kew Bull.* 9: 463, fig. 1, 1-4 (1954)

Boronia hyssopifolia Sieb. ex Hook., *J. Bot. (Hooker)* 1: 255 (1834), p.p., *nom inval.* *Boronia polygalifolia* sensu G.Bentham *Fl. Austral.* 1: 321 (1863), p.p., non. Sm. (1798).

Illustrations: Cochrane *et al.*, *Flowers and Plants of Victoria and Tasmania* 23, t. 38 (1980, 3rd ed.), as *B. nana*; Duretto, *Fl. Victoria* 4, 160, fig. 28f (1999); Cameron, *A Guide to Flowers and Plants of Tasmania*, 3rd edn, 117, pl. 295 (2000), as *B. nana*; Weston & Duretto, *Fl. New South Wales* 2, 2nd ed., 189 (2002); Gilfedder *et al.*, *The Nature of the Midlands* 112 (2003), as *B. nana*; Simmons *et al.*, *A Guide to Flowers and Plants of Tasmania*, 4th edn, 145 (2008).

Leaves simple.

Tas. (BEL, FUR, KIN, TNM, TNS, TSE, TSR, TWE?); also NSW, Vic. Occurs in eastern and northern Tasmania with historical collections from Zeehan and around Hobart. Found in heath, woodland and forest on a variety of substrates.

11 *Boronia anemonifolia* A.Cunn. in B.Field, *Geographical Memoirs of New South Wales* 330 (1825) subsp.

variabilis (Hook.) P.G.Neish, *Muelleria* 14: 11 (2000)

Sticky Boronia, Stinking Boronia

Boronia variabilis Hook., *J. Bot. (Hooker)* 1: 255 (1834); *B. anemonifolia* var. *variabilis* (Hook.) Benth., *Fl. Austral.* 1: 321 (1863); *B. anemonifolia* var. *variabilis* (Hook.) Rodway, *Tasman. Fl.* 22 (1903), *nom. illeg., non* Benth. (1863). *Boronia dentigeroides* Cheel, *J. Roy. Soc. N.S. Wales* 62: 301 (1929). *Boronia anemonifolia* sensu L.Rodway, *Tasman. Fl.* 23 (1903); W.M.Curtis & D.I.Morris, *The Student's Flora of Tasmania* 1, 2nd edn: 105 (1975). *Boronia anemonifolia* var. *dentigera* sensu G.Bentham, *Fl. Austral.* 1: 321 (1863); L.Rodway, *Tasman. Fl.* 23 (1903), *non* (F.Muell.) Benth. (1863).

Illustrations (usually as *B. anemonifolia*): Curtis & Morris, *The Student's Flora of Tasmania* 1: 105, fig. 29 (1975); Cameron, *Guide to Flowers and Plants of Tasmania* 110 (1981); Duretto, *Fl. Victoria* 4: 160, fig. 29e (1999), as *B. anemonifolia* subsp. 3; Neish & Duretto, *Muelleria* 17: 5, figs 1g-i (2000); Cameron, *A Guide to Flowers and Plants of Tasmania*, 3rd edn, 111, pl. 276 (2000); Harris *et al.*, *One Hundred Islands: the Flora of the Outer Furneaux* 118 (2001); Weston & Duretto, *Fl. New South Wales* 2, 2nd edn: 269 (2002); Woolmore *et al.*, *King Island Flora* 70 (2002); Whiting *et al.*, *Tasmania's Natural Flora* 298 (2004); Simmons *et al.*, *A Guide to Flowers and Plants of Tasmania*, 4th edn, 143 (2008).

Erect, woody shrub to 2.5 m tall; branches glandular tuberculate, leaf decurrencies present, glabrous to pubescent. Leaves pinnate or bipinnate (or simple, outside Tas.), 3–7(–9)-foliolate, 13–35 mm long, 9–30 mm wide, with strong turpentine smell; petiole 2–16 mm long; rachis segments 3–7 mm long; leaflets narrow-cuneate to cuneate or narrow-elliptic to elliptic or ovate or obovate, strongly conduplicate or flat, 3–13 mm long, 1–4 mm wide, tip often divided into three lobes. Inflorescence axillary, (1–)3–6(–9+)-flowered; peduncle 2–10 mm long; pedicel 1.5–6.0 mm long. Sepals broad ovate, 1–2 mm long, glabrous. Petals 3–5 mm long, abaxial surface glabrous or glabrescent. Staminal filaments pilose. Ovary glabrous or glabrescent; style pilose; stigma minute. Flowering & fruiting mainly Aug.–Feb.

Tas. (KIN, BL, FUR, TNM, TNS, TSE, TWE); also Qld, NSW, Vic. Widespread on the islands of Bass Strait and throughout northern and eastern Tasmania. It is mainly found growing on and around sandstone and granite outcrops in eucalypt woodland or forest, where it can be the dominant component of the shrubby understorey, or heath or shrubland in exposed areas.

Specimens of subsp. *variabilis* from St Paul's Dome resemble subsp. *anemonifolia* in some respects. The long prophylls, long sepals, and persistent petals are characteristic of subsp. *anemonifolia*, but the glabrous, wider leaves and numerous flowers resemble that of subsp. *variabilis*. These specimens are here treated to be subsp. *variabilis*.

The complex taxonomic history of the *B. anemonifolia* is given in detail by Niesh and Duretto (2000). There are 4 subspecies, the others being: subsp. *anemonifolia* (NSW, Vic.), subsp. *aurifodina* P.G.Neish (Vic.) and subsp. *wadbilligensis* P.G.Neish (NSW).

3 ZIERIA

Zieria Sm., *Trans. Linn. Soc. London* 4: 216 (1798).

Synonymy: *Boronia* section *Zieria* F.Muell., *Trans. Philos. Soc. Victoria*. 2: 65 (1857).

Odoriferous subshrubs to small trees; hairs simple and/or stellate. Leaves opposite, rarely whorled, palmately trifoliolate, or unifoliolate. Inflorescence axillary, cymose. Flowers 4-merous. Sepals basally fused. Petals free, valvate or imbricate in bed. Stamens 4, free, opposite sepals, shorter than petals, all fertile, erect. Disc 4-lobed, lobes distinct, gland-like, opposite stamens. Carpels 4, more or less free, lacking sterile apex; style terminal on ovary; stigma capitate. Cocci not transversely ridged, with rounded apices.

A genus of about 60 species, all but one of which is confined to eastern Australia, the other is endemic to New Caledonia.

Key references: Armstrong (2002); Duretto & Forster (2007).

1. Leaves simple 1 *Z. veronicea*
 1: Leaves ternate 2

2. Leaflets densely tomentose, 0.2–1.8 cm long 2 *Z. littoralis*
 2: Leaflets glabrous, glabrescent or with a sparse indumentum, 3–10 cm long 3 *Z. arborescens*

1 *Zieria veronicea* (F.Muell.) Benth., *Fl. Austral.* 1: 305 (1863) subsp. ***veronicea*** *Pink Zieria*

Boronia veronicea F.Muell., *Trans. Phil. Soc. Victoria* 1: 11 (1854).

Illustrations: Duretto, *Fl. Victoria* 4: 167, fig. 30d, after p. 532, plate 5a (1999), as *Z. veronicea*; Armstrong, *Austral. Syst. Bot.* 15: 451, fig. 134 (2002); Whiting *et al.*, *Tasmania's Natural Flora* 307 (2004).

Shrub to 60 cm high, lemon-scented, densely stellate-velvety indumented throughout. Leaves simple, subsessile or with petiole to 0.7 mm long; lamina lanceolate to oblong, 5–18 mm long, 1–4 mm wide, adaxial surface light green, abaxial surface grey-green, margins entire, recurved to revolute, apex obtuse. Inflorescence 1–3-flowered, generally not exceeding leaves. Sepals narrowly lanceolate, 2.0–5.5 mm long, acute, densely stellate-hairy, smooth. Petals pink or occasionally white, 2–7 mm long. Ovary stellate-pubescent. Cocci 3.5–5.0 mm long, velutinous with a dense stellate indumentum, small terminal appendage present. Seeds mottled black, rugulose to striated. Flowering Aug.-Nov.; fruiting Oct.-Nov.

Tas. (FUR, TSE); also SA, Vic. A rare taxon in Tasmania where known from the Mt William, George Bay, Scamander and Coles Bay areas. Found in Eucalypt woodland and heath. The other subspecies, *Z. veronicea* subsp. *insularis* J.A.Armstr., is confined to Kangaroo Island (SA).

2 *Zieria littoralis* J.A.Armstr., *Austral. Syst. Bot.* 15: 389 (2002)

Zieria cytisoides sensu L.Rodway, *Tasman. Fl.* 21 (1903); W.M.Curtis & D.I.Morris, *The Student's Flora of Tasmania* 1: 103 (1975), *non* Sims (1818).

Illustrations: Duretto, *Fl. Victoria* 4: 167, fig. 30h (1999), as *Z. sp.* 3; Armstrong & Harden, *Fl. New South Wales* 2, 2nd edn: 286 (2002); Armstrong, *Austral. Syst. Bot.* 15: 390, fig. 78 (2002); Whiting *et al.*, *Tasmania's Natural Flora* p. 307 (2004).

Spreading shrub to c. 1(–1.8) m high, densely stellate-velvety throughout. Leaves trifoliolate; petiole 0.5–4.0 mm long; leaflets obovate to broad-elliptic, (2.5–)4–18 mm long, (1.5–)2.5–7.0 mm wide, usually glandular tuberculate, adaxial surface dark green, abaxial surface grey-green, margins entire and recurved to revolute, apex rounded. Inflorescence 3–9-flowered, usually not exceeding leaves, congested. Sepals deltate, 1.5–2.5 mm long, tomentose, smooth. Petals white or white-pink, 2–3 mm long. Ovary glabrous. Cocci 2.5–5.0 mm long, stellate-pubescent, lacking an appendage. Seed black to red-brown, striated. Flowering Jun.-Feb.; fruiting Oct.-Feb.

Tas. (FUR?, TSE); also NSW, Vic. Known from the Bicheno and Cape Tourval/The Hazards areas where it grows in shallow soil and cracks on granitic rock, sometimes in heath. An isolated collection from Scamander (FUR) requires confirmation.

3 *Zieria arborescens* Sims, *Bot. Mag.* t. 1395 (1811) subsp. *arborescens* *Stinkwood, Forest Zieria*

Zieria macrophylla Bonpl., *Desc. Pl. Malmaison* 64 (1816); *Z. smithii* Andrews var. *macrophylla* (Bonpl.) Benth., *Fl. Austral.* 1: 307 (1863). *Boronia arborescens* (Sims) F.Muell., *Fragm.* 1: 100 (1859). *Zieria lanceolata* sensu J.D.Hooker, *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1: 65 (1855), non Sims (1818). *Zieria smithii* sensu L.Rodway, *Tasman. Fl.* 21 (1903), non Andrews (1810).

Illustrations (mostly as *Z. arborescens*): Duretto, *Fl. Victoria* 4: 167, fig. 30a (1999); Cameron, *A Guide to Flowers and Plants of Tasmania*, 3rd edn, 47, pl. 87 (2000); Armstrong & Harden, *Fl. New South Wales* 2, 2nd edn: 281 (2002); Armstrong, *Austral. Syst. Bot.* 15: 308, fig. 9 (2002); Woolmore et al., *King Island Flora* 71 (2002); Gilfedder et al., *The Nature of the Midlands* 119 (2003); Whiting et al., *Tasmania's Natural Flora* 306 (2004); Simmons et al., *A Guide to Flowers and Plants of Tasmania*, 4th edn, 69 (2008).

Shrub or small tree to 5(–8) m high. Leaves trifoliolate; petiole 8–48 mm long; leaflets variable, narrow-elliptic, oblong or lanceolate, (15–)30–128 mm long, (3–)6–29 mm wide, discolorous, adaxial surface glabrous or glabrescent, abaxial surface glabrescent to stellate-tomentose, margins entire, usually recurved, apex acute. Inflorescence usually shorter than leaves, open, many-flowered. Sepals deltoid, 1.0–2.5 mm long, tomentose. Petals 3.5–8.0 mm long, white, pubescent. Ovary glabrous. Cocci glabrous, with small terminal appendage, not warty. Seed red-brown to black, striated. Flowering (May–)Aug.-Jan.; fruiting Nov.–Mar.

Tas. (all regions except MIS); also Qld, NSW, Vic. Common throughout the main island and on some Bass Strait Islands from sea level to c. 1100 m. Found in wet habitats including wet sclerophyll forest or woodland, rainforest (especially along the edge), heath and along waterways. A narrow-leafed form has been collected from the Cape Pillar Track (Tasman Pen.). *Zieria arborescens* has two other subspecies, both with restricted distributions: subsp. *glabrifolia* J.A.Armstr. (Qld, NSW) and subsp. *decurrens* J.A.Armstr. (NSW).

4 CORREA

Correa Andrews, *Bot. Repos.* 1: t. 18 (1798).

Synonymy: *Mazeutoxeron* Labill., *Voy. Rech. Perouse* 2: 12 (1800), Atlas t. 17 (1800). *Antomarchia* Colla, *Hortus Ripul.* App. 31: 345 (1826). *Didimeria* Lindl., *Three Exped. Australia (Mitchell)* 2: 197 (1838).

Shrubs to small trees; hairs stellate. Leaves opposite, simple. Inflorescence terminal or axillary, cymose. Flowers 4-merous. Sepals fused into an unlobed or 4 (8-)lobed cup. Petals green, yellow, red or white, valvate, fused for most of their length or sometimes separating (*C. alba*). Stamens 8, free, all fertile, erect, shorter or longer than petals. Disc 8-lobed. Carpels lacking sterile apex, style arising from c. middle of the carpels. Cocci not transversely ridged.

A genus of 11 species that is restricted to south-eastern Australia. Hybrids occur frequently between sympatric species. Many species and cultivars are becoming increasingly important in the horticulture and some taxa are used in site rehabilitation.

Key references: Wilson (1961, 1998a); Choi & Duretto (2008).

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| 1. Petals free at or immediately after anthesis, white or rarely with a pink tinge | 1 <i>C. alba</i> |
| 1: Petals remaining fused into a tube, cream, yellow, green, red or white | 2 |
| 2. Staminal filaments linear throughout | 4 <i>C. lawrenceana</i> |
| 2: Staminal filaments, at least the antepetalous ones, widened at base | 3 |
| 3. Leaves broadly elliptic to ovate, adaxial surface of leaves smooth and glabrous or nearly so, margin entire, flat | 2 <i>C. backhouseana</i> |
| 3: Leaves narrow oblong to cordate, adaxial surface of leaves pubescent or scabrous, margin entire to crenulate, flat to recurved | 3 <i>C. reflexa</i> |

1 *Correa alba* Andrews, *Bot. Repos.* 1: t. 18 (1798)*White Correa*

Erect to spreading shrub to 3 high and 4 m wide. Leaves: petioles 2–8 mm long; lamina elliptic to orbicular, 7–46 mm long, 4.5–28.5 mm wide, obtuse, adaxial surface tomentose to glabrous, abaxial surface densely tomentose. Inflorescence 1–5-flowered, terminal on short branchlets; bracteoles basal, linear to spatulate, 1–5 mm long, deciduous; pedicels 0.75–6.5 mm long, tomentose. Flowers not pendent. Calyx hemispherical, 2–6 mm long, truncate to 4-dentate or broadly lobed, fawn-tomentose. Petals white (rarely pink), c. campanulate, 8–17 mm long, petals soon free and spreading, abaxial surface tomentose. Stamens included, filaments broadened at base. Flowering mainly Mar.–Dec.; fruiting mainly Sep.–Apr.

Tas. (FUR, KIN, TNS, TSE, TWE?); also SA, NSW, Vic. A common species in coastal areas in the Furneaux Group, and along the northern and eastern coasts of the island of Tasmania. It is found in closed heath and woodland on sand as well as in rocky areas. Hybrids between *C. alba* and other *Correa* species are sometimes encountered where two or more species co-occur.

Correa alba contains three varieties, two of which are in Tasmania (see Choi & Duretto (2008) for detailed discussion). The other, var. *pannosa* Paul G. Wilson, is found in south-western Victoria and south-eastern South Australia.

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| 1. Stellate hairs on abaxial surface of leaves not stalked or occasionally stalked; stalks, when present, to 0.05 mm long (N of Triabunna) | 1a var. <i>alba</i> |
| 1: Stellate hairs on abaxial surface of leaves stalked; stalks to 2 mm long (S from Dunalley) | 1b var. <i>rotundifolia</i> |

1a *Correa alba* Andrews var. *alba*

Illustrations: Duretto, *Fl. Victoria* 4: 172, fig. 31a (1999); Cameron, *A Guide to Flowers and Plants of Tasmania*, 3rd edn, 101, pl. 245 (2000), as *C. alba*; Harris *et al.*, *One Hundred Islands: the Flora of the Outer Furneaux* 138 (2001), as *C. alba*; Weston & Harden, *Fl. New South Wales* 2, 2nd edn: 289 (2002); Simmons *et al.*, *A Guide to Flowers and Plants of Tasmania*, 4th edn, 145 (2008); Choi & Duretto, *Muelleria* 26: 48, fig. 1a-d [leaf hairs] (2008).

Stems and leaves stellate tomentose, indumentum smooth in appearance; stellate hairs usually white, sometimes red-brown, mostly sessile, stalks to 0.05 mm long, rays 0.1–0.25(–0.5) mm long. Leaves: lamina 7–46 mm long, 4.5–28.5 mm wide. Sepals 3.25–7 mm long. Petals 8.5–17 mm long.

Tas. (FUR, KIN, TNS, TSE, TWE?); also NSW, Vic. Common on the islands of eastern Bass Strait and across the north of the island of Tasmania though apparently absent from King Island. On the east coast it is found as far south as Triabunna.

1b *Correa alba* var. *rotundifolia* DC., *Prod.* 1: 719 (1824)

Mazeutoxeron rufum Labill., *Voy. Rech. Perouse* 2: 12 (1800), Atlas t. 17 (1800); *Correa rufa* (Labill.) Vent., *Jard. Malm.* 1: sub. t. 13 (1803).

Illustrations: Choi & Duretto, *Muelleria* 26: 48, fig. 1i-l [leaf hairs]; 51: fig. 3 (2008).

Stems and leaves stellate tomentose, rough and uneven in appearance; most hairs red-brown, stellate hairs mostly stalked, stalks 0.1–0.5 mm, rays 0.2–0.5(–0.75) mm long. Leaves: lamina 5–28 mm long, 2.5–27 mm wide. Sepals 3–6 mm long. Petals 8–14 mm long.

Tas. (TSE); endemic. Restricted to south-eastern Tasmania where it is found on the Tasman and Forestier Peninsulas, the South Arm area (east of Hobart) and Bruny Island, and surrounding minor islands.

2 *Correa backhouseana* Hook., *J. Bot. (Hooker)* 1: 253 (1834) [as *C. Backhousiana*] var. **backhouseana**

Correa speciosa race *backhousiana* (Hook.) Benth., *Fl. Austral.* 1: 355 (1863) [as *C. speciosa* b. *Backhousiana*], *p.p.*; *C. speciosa* var. *backhousiana* (Hook.) Rodway, *Tasman. Fl.* 21 (1903).

Illustrations (all as *C. backhouseana*): Stones & Curtis, *The Endemic Flora of Tasmania* 6: t. 156, No. 252 (1978); Duretto, *Fl. Victoria* 4: 172, fig. 31c (1999); Cameron, *A Guide to Flowers and Plants of Tasmania*, 3rd edn, 101, pl. 246 (2000); Woolmore et al., *King Island Flora* 71 (2002); Whiting et al., *Tasmania's Natural Flora* 301 (2004); Simmons et al., *A Guide to Flowers and Plants of Tasmania*, 4th edn, 147 (2008).

Rounded shrub to 2 m high; branches smooth. Leaves with petioles 2–7 mm long; lamina coriaceous, broadly elliptic to ovate, 10–50 mm long, 6–25 mm wide, adaxial surface smooth and glabrous, abaxial surface densely tomentose, apex obtuse to acute, base obtuse to subcordate. Inflorescence 1–3-flowered, terminating short branches; pedicels 3–10 mm long, tomentose; bracteoles submedial to basal, linear, deciduous. Flowers usually pendent. Calyx hemispherical, 3–8 mm long, truncate to gently or deeply undulate and then with recurved margin, densely fawn-tomentose. Petals cream, fused, broadly cylindrical, 2–8 cm long. Stamens just exerted, filaments widening at base. Flowering Jul.-Jan. (Apr.); fruiting Nov.-Feb.

Tas. (FUR?, KIN, TNS, TWE, TSR); also Vic. Widespread in western and north-western coastal areas of the island of Tasmania, and nearby islands, and King Island. Collections from the Furneaux Group and Port Sorrell (Midlands) require confirmation. The taxon is rare in Victoria where it is known only from coastline shrubland on dunes and cliffs near Cape Otway. The species hybridises with *C. alba*. *Correa backhouseana* has 3 varieties including var. *coriacea* (Paul G.Wilson) Paul G.Wilson (WA, SA) and var. *orbicularis* Paul G.Wilson (SA).

3 *Correa reflexa* (Labill.) Vent., *Jard. Malmaison* 1: footnote to t. 13 (1803) *Common Correa, Native Fuchsia*

Mazeutoxeron reflexum Labill., *Voy. Rech. Perouse* 2: 66 (1800); *Correa speciosa* var. *virens* Hook.f., *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1: 62 (1855). *Correa speciosa* sensu J.D.Hooker, *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1: 62 (1855); G.Bentham, *Fl. Austral.* 1: 354 (1863), *p.p.*; L.Rodway, *Tasman. Fl.* 20 (1903), non Donn. ex Andrews (1811), *p.p.* *Correa speciosa* race *normalis* Benth., *Fl. Austral.* 1: 355 (1863) [as *Correa speciosa* α *normalis*], *p.p.*, *nom. illeg.* *Correa speciosa* race *backhousea* Benth., *Fl. Austral.* 1: 355 (1863) [as *Correa speciosa* α *normalis*], *p.p.*, *nom. illeg.* *Correa speciosa* race *backhousiana* (Hook.) Benth., *Fl. Austral.* 1: 355 (1863) [as *C. speciosa* b. *Backhousiana*], *p.p.*

Erect, spreading, or semi-prostrate shrubs to 2(–3) m high; branches densely tomentose to loosely floccose. Leaves with petiole 2–5 mm long; lamina papery or coriaceous, oblong to broadly ovate or orbicular, 12–47 mm long, 5–47 mm wide, adaxial surface smooth to scabridulous, glabrous or pubescent, abaxial surface glabrescent to tomentose, apex rounded to obtuse or acute, base rounded to cordate with rounded lobes. Inflorescence 1(–3)-flowered, terminal on lateral branchlets, terminal leaf pair sometimes appearing as leaf-like bracts; pedicel 1–2 mm long. Flower erect or pendent. Calyx hemispherical, 3–5 mm long, truncate or slightly undulate, 4-dentate, sometimes with 4 interlobes, cream- to rusty-tomentose. Corolla green, yellowish-green, cream, red, or red with green tips, fused, cylindrical to trumpet-shaped (not in Tas.), 2–4 cm long. Stamens exerted, filaments widening at base. Flowering Aug.-Dec.(-May); fruiting Oct.-Mar.

Tas. (BEL, FUR, TNM, TNS, TSE, TSR); also SA, Qld, NSW, Vic. There are 7 varieties; 2 are found in Tasmania.

1. Flowers pendant, clasped between two reflexed foliaceous bracts; petals red or green-yellow

3a var. *reflexa*

1: Flowers erect or pendant, not obviously clasped by two reflexed foliaceous bracts; petals green to yellow

3b var. *nummularifolia*

3a *Correa reflexa* Labill. var. *reflexa*

Illustrations (often as *C. reflexa*): Curtis & Morris, *The Student's Flora of Tasmania* 1: 110, fig. 30 (1975); Duretto, *Fl. Victoria* 4: 172, fig. 31f (1999); Cameron, *A Guide to Flowers and Plants of Tasmania*, 3rd edn, 59, pl's 129, 130 (2000); Weston & Harden, *Fl. New South Wales* 2, 2nd edn: 289 (2002); Gilfedder *et al.*, *The Nature of the Midlands* 1133 (2003); Whiting *et al.*, *Tasmania's Natural Flora* 302 (2004); Simmons *et al.*, *A Guide to Flowers and Plants of Tasmania*, 4th edn, 75 (2008).

Shrub to 2(-3) m high. Leaves with petiole 3-5 mm long; lamina papery, broadly ovate, 17-47 mm long, 5-37 mm wide, adaxial surface sparsely stellate to slightly scabrous, abaxial surface sparsely to densely stellate-hairy, apex obtuse, base shallowly to deeply cordate or rounded. Flowers mostly pendent, clasped by subtending leaves; pedicel 1-2 mm long. Calyx hemispherical, truncate to undulate or rarely shortly 4-lobed, fawn to rusty tomentose, 3-5 mm long. Corolla narrowly cylindrical, (2-)2.5-4.0 cm long, usually green, yellow-green or green but also cream with yellow tips or red with green tips. Flowering Aug.-Dec.(-May); fruiting Oct.-Mar.

Tas. (BEL, FUR, TNM, TNS, TSE, TSR); also SA, Qld, NSW, Vic. The most widespread and variable variety of *C. reflexa*, occurring in a wide range of habitats from sandy heath to dry, rocky sites in open forest. On the north-east coast of Tasmania there is a variety with small leaves that are glabrescent abaxially. This variety appears to readily form hybrid swarms with *C. alba*.

3b *Correa reflexa* var. *nummulariifolia* (Hook.f.) Paul G.Wilson, *Trans. R. Soc. S. Austral.* 85: 30 (1961)

Correa speciosa var. *nummulariifolia* Hook.f., *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1: 62 (1855).

Low, spreading shrub. Leaves with petiole 2-3 mm long; lamina broadly ovate to semiorbicular or orbicular, 12-26 mm long, 6-15 mm wide, adaxial surface scabridulous or sparsely hairy, abaxial surface densely stellate-hairy, apex acute, base rounded. Flowers 1-3 at the ends of short branches of 1-3 internodes; peduncle and bracts not differentiated. Calyx truncate, 3-4 mm long, rusty-tomentose. Corolla yellow-green, cylindrical, 15-25 mm long. Flowering material collected in Aug.; fruiting material collected in Dec.

Tas. (FUR); endemic. Apparently confined to the Furneaux Group, Bass Strait. This taxon appears to hybridise readily with other *correas* and the material available is very variable. Wilson (1998a) postulated that this form may merely be a member of a hybrid complex as a similar plant is seen on the east coast of Tasmania where hybridisation is apparent.

4 *Correa lawrenceana* Hook., *J. Bot. (Hooker)* 1: 254 (1834-35) [as *C. Lawrenceana*] var. *lawrenceana*

Correa ferruginea Backh. in J.Ross, *Hobart Town Alm. & Van Dieman Land Ann.* 80 (1835). *Correa ferruginea* Gunn ex Hook., *Comp. Bot. Mag.* 1:276 (1836), *nom. illeg.*, non Backh. (1835); *C. lawrenceana* var. *ferruginea* (Gunn ex Hook.) Hook.f., *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1: 62 (1855). *Correa lawrenceana* var. *glabra* (Lindl.) Hook.f., *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1: 62 (1855), p.p. *Correa lawrenceana* var. *glabra* Benth., *Fl. Austral.* 1:355 (1863), *nom. illeg.*, non (Lindl.), Hook.f. (1855).

Illustration: Whiting *et al.*, *Tasmania's Natural Flora* 302 (2004).

Shrub to 3 m high (or small tree to 16 m outside Tas.); stems rusty-floccose. Leaves with petiole to 16 mm long; lamina papery or coriaceous, narrow- to broad-elliptic or ovate, (1-)1.3-9.5 cm long, 0.3-3.3 cm wide, adaxial surface glabrous or glabrescent and smooth, abaxial surface glabrous to densely stellate-hairy, margin entire, apex acute to rounded, base cuneate to cordate. Inflorescence axillary, or rarely terminal, 1-3(-7)-flowered; peduncle c. 0.5-5.0 cm long; pedicel 5-10 mm long; bracts normally deciduous. Flowers pendent. Calyx hemispherical, 2.5-10 mm, lobes triangular to broad-obtuse or rarely acuminate, green and glabrescent or densely rusty- or fawn-tomentose. Corolla yellow to green (also pink to red outside Tas.), fused, cylindrical, 11-26 mm long, indumentum scale-like to velvety. Stamens exerted to about half the length of the corolla, filaments narrow linear throughout. Flowering Jan.-Jul.(-Oct.); fruiting Dec.-Jan.

Tas. (all regions except MIS); endemic. Widespread in Tasmania were found in wetter areas in *Eucalyptus* communities and/or rocky areas. There are two readily identifiable forms of the variety: one, the typical

form, with glabrous or glabrescent leaves which is found mainly in the eastern areas; and the second with leaves that are densely tomentose on the abaxial surface which is mainly confined to western and southern areas. *Correa lawrenceana* has 7 other varieties (Qld, NSW, Vic.). The species is unusual in the genus in that it does not readily hybridise with other species.

5 PHILOTHECA

Philotheca Rudge, *Trans. Linn. Soc. London* 11: 298 (1816).

Shrubs or small trees; glabrous or with an indumentum of simple or (not in Tas.) stellate hairs. Leaves alternate, simple. Inflorescence axillary or terminal, cymose. Flowers 4–5-merous. Sepals free. Petals free, rarely united (not in Tas.), white, pink, or sometimes (not in Tas.) red or blue, imbricate or rarely valvate in bud. Stamens 10, free or fused (not in Tas.), erect or pyramidally arranged and incurved over the ovary; filaments usually pilose, becoming recurved at the apex at anthesis. Disc prominent, entire. Carpels with sterile apex; ovary glabrous. Cocci not transversely ridged, mostly beaked at apex.

An Australian genus of 53 species classified into 4 sections. The 3 Tasmanian species are placed in *Philotheca* section *Erionema* (F.Muell.) Paul G.Wilson. Most species of *Eriostemon* were transferred to *Philotheca* by Wilson (1998c). *Eriostemon* now consists of 2 species in Queensland and New South Wales.

Key references: Wilson (1971, 1998c); Rozefelds (2001).

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|--|---------------------|
| 1. Flowers mostly 4-merous; leaves mucronate | 1 <i>P. virgata</i> |
| 1: Flowers 5-merous; leaves not mucronate | 2 |

- | | |
|---|-----------------------|
| 2. Leaves narrowly obovate to obcordate, < 5 mm wide | 2 <i>P. verrucosa</i> |
| 2: Leaves broadly obovate to obcordate, some leaves > 8 mm wide | 3 <i>P. freyciana</i> |

1 *Philotheca virgata* (Hook.f.) Paul G.Wilson, *Nuytsia* 12(2): 260 (1998) *Tasmanian Wax-flower*

Eriostemon virgatus Hook.f., *J. Bot. (Hooker)* 2: 417 (1840); *E. virgatum* Hook.f., *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1: 64 (1855).

Illustrations (sometimes as *E. virgatus*): Stones & Curtis, *The Endemic Flora of Tasmania* 1: t. 7, No. 10 (1967); Bayly, *Fl. Victoria* 4: 180, fig. 33f (1999); Weston & Harden, *Fl. New South Wales* 2, 2nd edn: 298 (2002); Whiting *et al.*, *Tasmania's Natural Flora* 306 (2004).

Slender shrub to 2.5(–4 outside Tas.) m high; branchlets glabrous, glandular tuberculate. Leaves obcuneate to elliptic or obovate, sometimes narrowly, 6–30 mm long, 2.0–5.5(–8) mm wide, thin-textured, slightly discolorous, dotted with many small oil glands, margins slightly recurved and glandular-crenate, shortly mucronate. Inflorescences 1–3-flowered, axillary, without an obvious peduncle; pedicels solitary. Flowers 4(5)-merous. Sepals c. orbicular, c. 1 mm long. Petals white or pale pink, broad-elliptic, 4–6 mm long, glabrous. Cocci shortly beaked, c. 5 mm long. Flowering Apr.–Dec.(–Feb.); fruiting Jan.–Apr.

Tas. (KIN, FUR, TSE, TSR, TWE); also NSW, Vic. A common species in western Tasmania with isolated occurrences on the east coast between St Helens and Scamander, Freycinet Peninsula, and in the area between the Huon River and d'Entrancasteaux Channel. Found in a variety of habitats, often on well drained rocky substrates, including heath, *Eucalyptus* woodland and rainforest margins. The species is localized in both Victoria and New South Wales. In Victoria it is known from Mt Kaye and near Buldah, and in New South Wales, from Mt Imlay, near Eden.

2 *Philotheca verrucosa* (A.Rich.) Paul G.Wilson, *Nuytsia* 12(2): 260 (1998) *Fairy Wax-flower, Wax-flower*

Eriostemon verrucosus A.Rich., *Voy. Astrolabe Bot.* 2: 74, t. 26 (1834) [as *E. verrucosum*]; *E. verrucosum* sensu J.D.Hooker, *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1: 64 (1855). *Eriostemon obcordatus* A.Cunn. ex Hook., *J. Bot. (Hooker)* 1: 254 (1834) [as *E. obcordatum*]. *Eriostemon obovalis* sensu G.Bentham, *Fl. Austral.* 1: 334 (1863); L.Rodway, *Tasman. Fl.* 24 (1903), non. A.Cunn. (1825).

Illustrations: Kirkpatrick et al., *City Parks & Cemeteries: Tasmania's Remnant Grasslands & Grassy Woodlands* 104, pl. 14-4 (1988), as *E. verrucosus*; Bayly, *Fl. Victoria* 4: 180, fig. 33g (1999), as *E. verrucosus*; Cameron, *A Guide to Flowers and Plants of Tasmania*, 3rd edn, 95, pl. 229 (2000); Gilfedder et al., *The Nature of the Midlands* 111 (2003); Whiting et al., *Tasmania's Natural Flora* 305 (2004); Simmons et al., *A Guide to Flowers and Plants of Tasmania*, 4th edn, 119 (2008).

Shrub or subshrub to 1 m high; branchlets glabrous, prominently glandular tuberculate. Leaves narrowly to broadly obcordate, 3–15 mm long, 4–6 mm wide, leathery, more or less concolorous, adaxial surface smooth, abaxial surface prominently glandular-verrucose or rarely relatively smooth, margins thick, apex obtuse to retuse. Inflorescences axillary, 1–3 flowered; pedicels borne on a common peduncle. Flowers 5-merous. Sepals suborbicular, c. 1 mm long. Petals white (pink in bud), elliptic, 4–8 mm long, glabrous. Cocci prominently beaked, 5–6 mm long. Flowering mostly Jul.–Nov.; fruiting material collected in Feb.

Tas. (BEL, TNM, TSE, TSR); also SA, Vic. Found in the eastern part of the state mainly in rocky or sandy areas in heath or *Eucalyptus* forest. The distinction between this species and the following is not clear cut (see notes under *P. freyciana*).

3 *Philotheca freyciana* Rozefelds, *Muelleria* 15: 23, fig. 4 (2001)

Shrub or subshrub to c. 80 cm high; branchlets glabrous, prominently glandular tuberculate. Leaves broadly obcordate, 7–17 mm long, 3–11 mm wide, leathery, more or less concolorous, adaxial surface smooth, abaxial surface prominently glandular-verrucose, margins thick, apex obtuse to retuse. Inflorescences axillary, 1–3 flowered; pedicels borne on a common peduncle. Flowers 5-merous. Sepals suborbicular, c. 1.5 mm long, glabrous. Petals white (pink in bud), elliptic, c. 8 mm long, glabrous. Cocci prominently beaked, c. 5 mm long. Flowering & fruiting material collected in Jan.

Tas. (TSE); endemic. Restricted to the Hazards and Cape Tourville of Freycinet Peninsula where found growing in crevices and on thin soils in woodland and heath on granite. The taxon is closely related to both *P. verrucosa* and *P. myoporoides* (DC.) Bayly (Qld, NSW, Vic.) and indeed quite difficult to distinguish from *P. myoporoides* subsp. *petraeus* Rozefelds (Vic.). Research is required on the varied and widespread *P. myoporoides* species complex, which includes both *P. freyciana* and *P. verrucosa*, to determine the validity and status of the currently accepted names.

6 LEIONEMA

Leionema (F.Muell.) Paul G.Wilson, *Nuytsia* 12: 270 (1998).

Synonymy: *Eriostemon* section *Leionema* F.Muell., *Pl. Vict.* 1: 125 (1862); *Phebalium* section *Leionema* (F.Muell.) Benth., *Fl. Austral.* 1: 337 (1863); *Crowea* section *Leionema* (F.Muell.) Kuntze, *Lex. Gen Phan.* 150 (1903). *Eriostemon* section *Chorilaenopsis* F.Muell., *Pl. Vict.* 1: 131 (1862).

Shrubs; hairs simple or stellate (not in Tas.). Leaves alternate, simple, margins entire or toothed. Inflorescences axillary or terminal, cymose or flowers solitary. Flowers 5-merous. Sepals free. Petals white, free or united (not in Tas.), valvate in bud. Stamens 10, free, all fertile, divergent, glabrous, subequal to or longer than petals. Disc entire. Carpels usually with sterile beak; styles fused, arising from c. middle of ovary; stigma minutely lobed. Cocci not transversely ridged, apices rounded or beaked.

A genus of 24 species: 23 confined to eastern Australia and 1 to the North Island of New Zealand.

Key references: Wilson (1971, 1998d); Mole et al. (2004); Duretto et al. (2006).

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|---|------------------------|
| 1. Leaves terete, but becoming grooved along adaxial surface when dry | 1 <i>L. montanum</i> |
| 1: Leaves flat, or margins slightly recurved | 2 |
| 2. Leaves flat, margins serrate, apex truncate or bilobed | 2 <i>L. bilobum</i> |
| 2: Leaves flat or margins recurved, margins entire to slightly crenulate, apex blunt or truncate or c. retuse | 3 <i>L. oldfieldii</i> |

1 *Leionema montanum* (Hook.) Paul G.Wilson, *Nuytsia* 12(2): 275 (1998)

Phebalium montanum Hook., *J. Bot. (Hooker)* 1: 255 (1834); *Eriostemon montanus* (Hook.) F.Muell., *Pl. Indig. Col. Victoria* 1: 129 (1862).

Illustrations (sometimes as *P. montanum*): Stones & Curtis, *The Endemic Flora of Tasmania* 1: t. 7, No. 11 (1967); ditto 6: t. 151, No. 248 (1978); Kirkpatrick, *Alpine Tasmania* 49, fig. 20c (1997); Cameron, *A Guide to Flowers and Plants of Tasmania*, 3rd edn, 27, pl. 19 (2000); Whiting et al., *Tasmania's Natural Flora* 303 (2004); Simmons et al., *A Guide to Flowers and Plants of Tasmania*, 4th edn, 27 (2008).

A much-branched shrub to 50 cm high, decumbent or prostrate; branches pubescent between the decurrent leaf-bases, the lower parts with conspicuous leaf scars. Leaves crowded, very shortly stalked, 5–12 mm long, 1.0–1.5 mm wide, terete, becoming channelled along upper surface on drying, apex blunt to acute, often with conspicuous glandular dots. Flowers solitary in the axils of upper leaves; pedicels to 2 mm long. Sepals broadly triangular, 0.5–1.0 mm long, glabrous. Petals white or pinkish often crimson tipped, elliptical or narrow obovate, 3.5–5.0 mm long. Stamens longer than petals, glabrous, anthers crimson before dehiscence. Gynoecium glabrous. Cocci c. 3 mm long. Flowering Nov.–Mar.; fruiting Jan.–Mar.

Tas. (BEL, TCH); endemic. Confined to mountain tops and higher elevation areas of the Western Tiers and surrounds and in the north-east at Mt Arthur, Mt Barrow and Ben Lomond. Found in alpine heath in rocky areas.

2 *Leionema bilobum* (Lindl.) Paul G.Wilson, *Nuytsia* 12(2): 271 (1998) subsp. *truncatum* (Hook.f.) Duretto & K.L.Durham, *Muelleria* 23: 12 (2006) *Notched Phebalium*

Phebalium truncatum Hook.f., *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1: 64, t. 9 (1855). *Phebalium bilobum* Lindl. sensu G.Bentham, *Fl. Austral.* 1: 340 (1863); W.M.Curtis & D.I.Morris, *The Student's Flora of Tasmania* 1: 108 (1975). *Eriostemon hillebrandii* sensu L.Rodway, *Tasman. Fl.* 24 (1903), non. F.Muell. (1845).

Illustrations: Whiting et al., *Tasmania's Natural Flora* 303 (2004), as *L. bilobum*; Duretto et al., *Muelleria* 23: 10, fig. 1e-f (2006).

Shrub to 3 m high; branchlets slender, terete or slightly angular when young, minutely or coarsely stellate-hairy. Leaves shortly petiolate, petiole to 1 mm long; lamina 4–25 mm long, 3–11 mm wide, chartaceous, shortly ovate-oblong or sometimes narrow ovate, minutely glandular punctate, sparsely stellate-hairy to glabrous, margins strongly to slightly serrate, tapered at base, apex truncate. Inflorescence a terminal cyme, 5–7-flowered; pedicels minutely stellate-hairy, 2.5–6.0 mm long, green or red. Calyx lobes deltate, c. 0.5 mm long, with a dense tuft of hairs at tip. Petals white, red towards apex, narrowly elliptic, 3–4 mm long, glabrous. Stamens subequal to petals, anther pale yellow; disc short-cylindric, red or green; carpels 2–3(–4), glabrous. Cocci c. 5 mm long. Flowering (Jul.) Sep.–Nov.; fruiting Oct.–Jan.

Tas. (BEL, FUR, TCH, TNS, TSE); endemic. Found in the north and east of the state including some of the islands of the Furneaux Group. Usually occurring in heath or woodlands on well drained soils such as those derived from granite. Plants from the south-east portion of the species' range tend to have narrower leaves. The three other subspecies of *L. bilobum* are endemic to Victoria (Duretto et al. 2006).

3 *Leionema oldfieldii* (F.Muell.) Paul G.Wilson, *Nuytsia* 12(2): 276 (1998)

Eriostemon oldfieldii F.Muell., *Fragm.* 1: 3 (1855); *Phebalium oldfieldii* (F.Muell.) F.Muell. ex Benth., *Fl. Austral.* 1: 340 (1863).

Illustrations: Stones & Curtis, *The Endemic Flora of Tasmania* 5: t. 101, No. 168 (1975); Kirkpatrick, *Alpine Tasmania* 50, fig. 21d (1997), as *P. oldfieldii*; Whiting et al., *Tasmania's Natural Flora* p. 304 (2004).

A much branched shrub, 30–90 cm high, glabrous or the young branches pubescent. Leaves crowded, 3–13 mm long, 2.5–4.0 mm wide; base narrowed into a short stalk to 2 mm long; lamina leathery, narrow-oblong or ±cuneate, adaxial surface shining; abaxial surface pale with glandular dots, margin entire to slightly crenulate near apex, often slightly recurved, apex blunt, sometimes truncate or slightly indented on each

side of the midrib. Flowers solitary, in axils of upper leaves, sometimes so crowded as to appear umbellate; pedicels to 3 mm long. Sepals ovate, 0.5–1.0 mm long, thick. Petals white or pinkish, narrow-lanceolate, 4–5 mm long. Stamens c. as long as petals, filaments glabrous. Gynoecium glabrous. Cocci 3.5–4.5 mm long. Flowering Dec.–Jan.; fruiting Dec.–Mar.

Tas. (TCH, TSR, TWE); endemic. Localised to mountains to the west and south. Found in heath often in exposed situations.

7 NEMATOLEPIS

Nematolepis Turcz., *Bull. Soc. Imp. Naturalistes Moscou* 25(2): 158 (1852).

Synonymy: *Phebalium* section *Eriostemoides* Endl., *Gen. Pl. [Endlicher]* 1156 (1840). *Symphypetalon* J.Drumm. ex Harv., *Hooker's J. Bot. Kew Gard. Misc.* 7: 54 (1855).

Shrubs or small trees, with lepidote scales. Leaves alternate, simple. Inflorescences axillary, cymose or flowers solitary. Flowers 5-merous. Sepals free. Petals white, free or rarely united (not in Tas.), imbricate in bud. Stamens 10, free, all fertile, divergent, c. equal to the petals. Disc prominent. Carpels with sterile apex; styles fused, arising from c. middle of ovary; stigma capitate; ovules 2 per locule. Cocci not transversely ridged, apices rounded or beaked.

An Australian genus of 7 species.

Key references: Wilson (1971, 1998d); Mole et al. (2004).

1 *Nematolepis squamea* (Labill.) Paul G.Wilson, *Nuytsia* 12: 279 (1998)

Lancewood, Satinwood

Eriostemon squameus Labill., *Nov. Holl. Pl.* 1: 111, t. 141 (1806); *Phebalium billardieri* A.Juss., *Mem. Soc. Hist. Nat. Paris* 2: 134 (1825), *nom. Illeg.*; *P. squameum* (Labill.) Engl., *Nat. Pflanzenfam.* III, 4: 141 (1896).

Erect shrub or tree to 12 m high; branchlets angular or terete, smooth to glandular-verrucose, silvery to rusty-lepidote. Leaves coriaceous to chartaceous, 4–90 mm long, 4–22 mm wide; petiole to 9 mm long; lamina lanceolate to narrow-oblong elliptic, with translucent glandular dots, smelling strongly when crushed, margin entire, adaxial surface smooth to slightly glandular-verrucose, glabrous, abaxial surface densely silvery (or rusty)-lepidote, apex acuminate to obtuse, rounded or retuse. Inflorescence an axillary, compact or loose cyme, up to half as long as leaves, usually (1–)3–20-flowered, lepidote; pedicel 1–9 mm long. Sepals free, deltate, c. 1 mm long, glandular, glabrous. Petals white to cream, elliptic, 3–5 mm long, glabrous, gland-dotted. Stamens ± as long as petals, filaments widened towards base, glabrous or hirsute at base; anthers yellow. Disc prominent. Ovary glabrous. Cocci slightly spreading, 2.5–3.5 mm long. Flowering Aug.–Feb.; fruiting Nov.–Mar.

Tas. (all regions except MIS); also Qld, NSW, Vic. Found mainly in wet forests and heath throughout Tasmania though absent from the islands of eastern Bass Strait. The species contains 3 subspecies, with 2 in Tasmania, 1 of which is endemic. *Nematolepis squamea* subsp. *coriacea* (Paul G.Wilson) Paul G.Wilson is confined to alpine areas of Victoria. The three subspecies are at times difficult to segregate. In Tasmania plants from the Central Highlands and the southern parts of the East Coast Region often have small leaves (to 4 cm long) and do not have glandular-verrucose stems. These can be assigned to a subspecies on the basis of the leaf tip but not always confidently. Detailed work is required on this species over its full range (see also discussion under subsp. *retusa*). When collecting this species it is important that the full range of leaf size and shape is collected.

1. Tall shrubs or trees (to 12 m), branches not glandular-verrucose; leaves 28–90 mm long, at least some leaves > 40 mm long; leaf tip obtuse to acute, sometimes minutely mucronate

1a subsp. *squamea*

1: Shrubs (to 4 m); branches usually glandular-verrucose, sometimes faintly so; leaves 4–30(–40) mm long; leaf tip retuse or obtuse, rarely mucronate

1b subsp. *retusa*

1a *Nematolepis squamea* (Labill.) Paul G.Wilson subsp. *squamea*

Illustrations (often as *N. squamea*): Duretto, *Fl. Victoria* 4: 192, fig. 35c (1999), as *P. squameum* subsp. *squameum*; Cameron, *A Guide to Flowers and Plants of Tasmania*, 3rd edn, 47, pl. 86 (2000); Weston & Harden, *Fl. New South Wales* 2, 2nd edn: 305 (2002); Woolmore et al., *King Island Flora* 71 (2002); Gilfedder et al., *The Nature of the Midlands* 119 (2003); Simmons et al., *A Guide to Flowers and Plants of Tasmania*, 4th edn, 57 (2008).

Shrub or tree to 12 m high; branchlets angular, not obviously glandular. Leaves with petiole 3–9 mm long; lamina lanceolate to elliptic, 2.8–9.0 cm long (usually at least some leaves > 4 cm long), 1.7–2.2 cm wide, apex obtuse to acute, sometimes minutely mucronate. Inflorescence (3–)5–20-flowered; pedicel 2.5–13 mm long. Petals 3.5–5.0 mm long. Staminal filaments glabrous or sparsely hirsute in lower half. Flowering Aug.–Feb.; fruiting Dec.–Mar.

Tas. (all regions except MIS); also Qld, NSW, Vic. Found mainly in the western half of Tasmania with few collections from the eastern half. Common in damp *Eucalyptus* forests and woodlands, rainforest, tall and low heath. Has been used for telegraph poles.

1b *Nematolepis squamea* subsp. *retusa* (Hook.) Paul G.Wilson, *Nuytsia* 12: 279 (1998)

Phebalium retusum Hook., *J. Bot. (Hooker)* 1: 254 (1834); *P. billardieri* var. *retusum* (Hook.) Hook.f., *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1: 63 (1855); *P. squameum* subsp. *retusum* (Hook.) Paul G.Wilson, *Nuytsia* 1: 94 (1970).

A small to tall shrub, 0.1–4.0 m tall; branches slightly to strongly glandular-verrucose, sometimes smooth. Leaves with petioles 1–3 mm long; lamina 4–30(–40) mm long, 4–9 mm wide, apex rounded to retuse. Flowers solitary or in 2–5-flowered cymes; pedicel 1–3 mm long. Petals 3.0–3.5 mm long. Staminal filaments glabrous or with a few hairs at base. Flowering Sept.–Jan.; fruiting Nov.–Feb.

Tas. (BEL, FUR, TCH, TNS, TSE, TSR); endemic. Largely confined to north-eastern Tasmania and the Central Plateau where it is found in *Eucalyptus* forest, riverine areas and on often exposed, rocky slopes and ridges.

There is some variation in the size and density of the glandular tubercles on the stems and adaxial surface of the leaves, and leaf size and shape. Throughout the range of *N. squamea* subsp. *retusa* plants can possess stems that are distinctly and densely glandular-verrucose or be virtually smooth. The adaxial surface of the leaves can be slightly glandular-verrucose to smooth. Plants from the Central Highlands, the Launceston area, Mt Barrow, and the Dukes River area tend to have narrow-lanceolate to lanceolate leaves (c. 20–25 mm long, 4–7 mm wide) with a slightly retuse to obtuse [often slightly mucronate in the Launceston area] apex. These plants are usually found in forest or woodland and can reach 4 m in height. A few collections from the Central Highland are prominently glandular-verrucose and have smaller, more rigid leaves. Plants from the Douglas-Apsley to near Swansea tend to have broad-lanceolate to small, elliptic leaves (c. 12–22 mm long, 6–9 mm wide) with an obtuse to slightly retuse apex. These plants are usually found in exposed, rocky areas and rarely exceed 1 m in height. Few collections have larger leaves (to 40 mm long) but these invariably have prominently glandular-verrucose stems.

Nematolepis squamea subsp. *retusa* is very similar in appearance to *N. squamea* subsp. *coriacea* (Vic.). Not all specimens of *N. squamea* subsp. *retusa* have glandular-verrucose stems and leaves with retuse apices, and some specimens of *N. squamea* subsp. *coriacea* have leaves with retuse apices. Both taxa have small leaves when compared to the typical subspecies. The presence of glandular-verrucose stems and leaves with retuse apices are critical features in the key to subspecies presented by Wilson (1971). The subspecies do differ in that the staminal filaments are glabrous in the Victorian taxon and usually have a few hairs in the Tasmanian taxon though in some specimens they are glabrous.

8 PHEBALIUM

Phebalium Vent., *Jard. Malmaison* 2: 102, t. 102 (1804).

Synonymy: *Eriostemon* section *Phebalium* (Vent.) F.Muell., *Pl. Vict.* 1: 129 (1862); *Phebalium* section *Euphebalium* Benth., *Fl. Austral.* 1: 337 (1862), *nom. illeg.*; *Crowea* section *Phebalium* (Vent.) Baill., *Dict. Bot.* 2: 277 (1881).

Shrubs; hairs lepidote. Leaves alternate, simple. Inflorescences terminal, umbellate. Flowers 5(–8 outside Tas.)-merous. Sepals fused at base. Petals white or yellow, also can be pink (outside Tas.), free, imbricate in bud. Stamens 10, free, all fertile, divergent, longer than petals; filaments glabrous. Disc not apparent. Carpels usually with sterile beak; styles fused, arising from c. middle of ovary; stigma scarcely differentiated from style or capitate. Cocci not transversely ridged, apices rounded or beaked.

An Australian genus of 29 species with 1 endemic to Tasmania.

Key references: Wilson (1971, 1998d); Mole *et al.* (2004).

1 *Phebalium daviesii* Hook.f., *Bot. Antarct. Voy. III. (Fl. Tasman.)* 2: 358 (1859)

Phebalium glandulosum var. *daviesii* (Hook.f.) Benth., *Fl. Austral.* 1: 342 (1863) [as *P. glandulosum* var. (?) *Daviesi*]; *Eriostemon daviesii* (Hook.f.) F.Muell., *Proc. Roy. Soc. Tasm.* 1879: 6 (1880).

Illustration: Whiting *et al.*, *Tasmania's Natural Flora* 305 (2004).

Slender shrub to 1.5 m tall. Branches with scurfy scales when young. Leaves linear-cuneate, 8–30 mm long, 1–3 mm wide, adaxial surface with a row of raised glands along each side, midrib impressed, abaxial surface silvery to silvery/rusty lepidote, margins recurved to revolute, apex emarginate or 2-lobed. Inflorescence terminal, umbellate, 6–8-flowered; pedicels 2–7 mm long, lepidote. Calyx minute, obscurely 5-lobed, abaxial surface lepidote. Petals white or yellow, ovate-oblong, c. 2.5 mm long, abaxial surface lepidote. Stamens c. twice as long as petals; filaments slender with scattered glands; anthers yellow. Flowering Sept.-Jan.; fruiting Dec.-Jan.

Tas. (FUR); endemic. A critically endangered species confined to north-eastern Tasmania. The species is closely related to *P. glandulosum* Hook. (Qld, NSW, SA, Vic.) and *P. squamulosum* Vent. (Qld, NSW, Vic.).

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NOTE: Web addresses can and do change: a list of current web addresses is maintained in the web version of this treatment on the *Flora of Tasmania Online* website at <https://flora.tmag.tas.gov.au/>

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