

NEW GENERA FROM AUSTRALIAN *OLEARIA* (ASTERACEAE: ASTEREAE)

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ABSTRACT

Ten new genera, including 29 species, are recognized from among species previously identified within Australian *Olearia*.

Landerolaria Nesom, **gen. nov.** — **L. arckaringensis** (P.J. Lang) Nesom, comb. nov., **L. eremaea** (Lander) Nesom, comb. nov., **L. gordonii** (Lander) Nesom, comb. nov., **L. humilis** (Lander) Nesom, comb. nov., **L. laciniifolia** (Lander) Nesom, comb. nov., **L. macdonnellensis** (D.A. Cooke) Nesom, comb. nov., **L. newbeyi** (Lander) Nesom, comb. nov., **L. orientalis** (A.R. Bean & Jobson) Nesom, comb. nov., **L. stuartii** (F. Muell.) Nesom, comb. nov., **L. xerophila** (F. Muell.) Nesom, comb. nov.

Neolaria Nesom, **gen. nov.** — **N. bella** (A.R. Bean & Jobson) Nesom, comb. nov., **N. ferresii** (F. Muell.) Nesom, comb. nov., **N. mucronata** (Lander) Nesom, comb. nov.

Phaseolaria Nesom, **gen. nov.** — **P. elliptica** (DC.) Nesom, comb. nov., **P. fulgens** (A.R. Bean) Nesom, comb. nov., **P. praetermissa** (P.S. Green) Nesom, comb. nov.

Walsholaria Nesom, **gen. nov.** — **W. calcarea** (F. Muell. ex Benth.) Nesom, comb. nov., **W. cuneifolia** (Bean & Mathieson) Nesom, comb. nov., **W. magniflora** (F. Muell.) Nesom, comb. nov., **W. muelleri** (Sond.) Nesom, comb. nov.

Muellerolaria Nesom, **gen. nov.** — **M. rudis** (Benth.) Nesom, comb. nov., **M. picridifolia** (F. Muell.) Nesom, comb. nov.

Vicinia Nesom, **gen. nov.** — **V. ciliata** (Benth.) Nesom, comb. nov., **V. squamifolia** (F. Muell.) Nesom, comb. nov.

Wollemiaster Nesom, **gen. nov.** — **W. cordatus** (Lander) Nesom, comb. nov.

Eoglandula Nesom, **gen. nov.** — **E. glandulosa** (Labill.) Nesom, comb. nov., **E. suffruticosa** (D.A. Cooke) Nesom, comb. nov.

Linealia Nesom, **gen. nov.** — **L. floctoniae** (Maiden & Betche) Nesom, comb. nov.

Ephedrides Nesom, **gen. nov.** — **E. trifurcata** (Lander) Nesom, comb. nov.

A description for each genus is provided and the species are illustrated. Formal typification is provided for each species. Lectotypes are designated for *Aster huegelii* var. *squamifolius*, *Eurybia ciliata*, *Olearia picridifolia*, and *O. rudis*.

Cross et al. (2002) showed that Australasian *Olearia* is polyphyletic, based on ITS sequence data. *Olearia* species from New Zealand, New Guinea, and some from Tasmania, Lord Howe Island, and mainland Australia are distantly related to most of the Australian ones, including the generic type *O. tomentosa* (Cross et al. 2002; Wagstaff et al. 2011; Saldivia et al. 2020) and are placed in a different subtribe (subtr. *Celmisiinae*; Saldivia in Nesom 2020).

Many of the Australian species placed by Bentham (1867) in sect. *Adenotriche* (glabrous vestiture) are positioned by molecular data (Cross et al. 2002; Brouillet et al. 2009) among other accepted Australian genera, while others (*O. hookeri*, *O. imbricata*, *O. passerinoides*, *O. teretifolia*) are related or closely similar in morphology to sect. *Eriotriche*, which in turn is directly related to *Olearia* in a stricter sense (see below).

Species of sects. *Eriotriche*, *Asterotriche*, and sect. *Dicerotriche* sensu stricto (*Olearia tomentosa*) form a strongly supported clade ("clade A" of Cross et al.). Australian sect. *Asterotriche* is monophyletic (Messina et al. 2013, 2014); the status of *O. tomentosa* is unsettled (see Saldivia et al.

2020 and comments under subtribe *Celmisiinae* by Saldivia in Nesom 2020). Sect. *Eriotriche* is not monophyletic, if by definition it includes all species with 'wool-producing hairs' (see Lander 1990 for illustrations), but these species as a group still are evolutionarily distinct from the sect. *Asterotriche* / *O. tomentosa* clade. The newly segregated *Landerolaria*, *Vicinia*, and *Wollemiaster* produce "Eriotriche" hairs — if these latter genera are accepted, segregation of sect. *Eriotriche* species at generic rank also is justified. Admixtures of glandular and eglandular hairs have made characterization of sect. *Merismotriche* problematic, and some species of the sect. *Eriotriche* alliance appear to have completely lost hairs, becoming glabrous.

Subgroups can be discerned within "clade A" *Eriotriche*. The morphological consistency of these groups needs to be confirmed and it remains to be seen whether they are evolutionarily discrete — this whole "clade A" *Eriotriche* aggregate might be treated as a single genus or segregates might be recognized.

- * the *O. ramulosa* group: *O. adpressa?*, *O. algida*, *O. ericoides*, *O. ramosissima*, *O. ramulosa*. *Olearia ramosissima* and *O. ramulosa* are included as molecular samples within "clade A" sect. *Eriotriche* of Cross et al. (2002).
- * the *O. exiguifolia* group: *O. exiguifolia*. Not included in molecular analyses.
- * the *O. microphylla* group: *O. brachyphylla*, *O. lanuginosa*, *O. lepidophylla*, *O. microphylla*. *Olearia microphylla* is included as a molecular sample within sect. *Eriotriche* of clade A of Cross et al. (2002).
- * the *O. axillaris* group: *O. arida*, *O. axillaris*, *O. revoluta*. None included in molecular analyses.
- * the *O. glutinosa* group: *O. cassiniae*, *O. decurrens*, *O. glutinosa*, *O. microdisca*, *O. plucheacea*, *O. racemosa*, *O. subspicata*, *O. tubuliflora*. *Olearia decurrens* and *O. plucheacea* are unusual in producing toothed leaves and perhaps are sister species. The ebracteate peduncles of *O. plucheacea* are unusual. None included in molecular analyses.
- * the *O. pimeleoides* group: *O. burgessii*, *O. fluvialis*, *O. incana*, *O. incondita*, *O. iodochroa*, *O. minor*, *O. occidentissima*, *O. pimeleoides*, *O. propinqua*. *Olearia pimeleoides* is included as a molecular sample within sect. *Eriotriche* of clade A of Cross et al. (2002).
- * the *O. tenuifolia* group: *O. adenolasia**, *O. adenophora**, *O. ballii*, *O. curticomma*, *O. elaeophila*, *O. floribunda*?, *O. homolepis**, *O. hookeri*, *O. imbricata*, *O. lehmanniana*, *O. muricata**, *O. passerinoides*, *O. paucidentata**, *O. stricta**, *O. strigosa*, *O. tenuifolia**, and *O. teretifolia* Western Australia endemics *O. elaeophila*, *O. lehmanniana*, *O. muricata*, *O. paucidentata*, and *O. strigosa* were studied as a group by Lander (2008a). Species with an asterisk are hirsute to hispid. Walsh (2014) regarded *O. adenophora* as a synonym of variable *O. tenuifolia*. *Olearia ballii*, *O. floribunda*, and *O. passerinoides* are included as molecular samples within sect. *Eriotriche* of clade A of Cross et al. (2002).

Some species of Bentham's sect. *Merismotriche* are segregated here as distinct genera (*Landerolaria*, *Neolaria*, *Muellerolaria*, *Vicinia*). Others (*O. adenophora*, *O. floribunda*, *O. homolepis*, *O. muricata*, *O. paucidentata*, *O. stricta*, *O. strigosa*, *O. tenuifolia*) are placed here in the *O. tenuifolia* group of "clade A Eriotriche."

In any case, little is gained by continuing to identify species as *Olearia* when they are outside the bounds, morphologically and molecularly, of *Olearia* (sensu clade A of Cross et al.) and more closely related to other accepted genera of *Brachyscominae*. Some of the species moved here to new genera have not been included in molecular sampling but are considered in context of their morphology.

Placement of *Olearia arguta* Benth. as closely related to *Camptacra* (Lowrey et al. 2001; Cross et al. 2002) has resulted from confusion regarding its identity — the Cross et al. molecular sample (from Queensland) apparently is identified by Bean (2020) as *Camptacra robusta* Bean. The type of *O. arguta* (*R. Brown* 2253, probable holotype: BM image; probable isotypes: MEL image, P image; not included in Bean's revision) belongs with *Camptacra* — based on its geography, it presumably would be identified by Bean as *C. gracilis*, but its morphology seems out of place in that species.

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LANDEROLARIA Nesom, **gen. nov.** **TYPE:** *Landerolaria stuartii* (F. Muell.) Nesom

Aromatic shrubs usually with a mixture of biseriate glandular hairs and two types of uniseriate, eglandular hairs; leaves oblong to narrowly lanceolate or elliptic, epetiolate, margins regularly toothed; heads solitary or in loose terminal clusters on few-bracteate peduncles; achenes densely sericeous. For Australian botanist Nicholas S. Lander.

Shrubs, often aromatic, taprooted (as described for *Olearia arckaringensis*). **Stems** to 0.3–2 m, with stipitate-glandular hairs or a mixture of biseriate glandular hairs and uniseriate, eglandular hairs. or eglandular, often resinous. **Leaves** alternate, narrowly oblong to narrowly lanceolate, obovate, or elliptic, attenuate-epetiolate (petiolate in *L. macdonnellensis* and *L. xerophila*), 0.2–0.3 (in *L. humilis*) or 1–11.5 cm long, margins serrate to crenate with 2–8(–15 in *L. laciniifolia*) pairs of teeth, with sessile glands to minutely stipitate-glandular, glabrescent, often resinous. **Heads** 1 or few in loose clusters; peduncles minutely bracteate, 1–8 cm long; receptacles shallowly convex, weakly alveolate. **Involucres** broadly campanulate; phyllaries 3–5-seriate, graduate in length, linear-elliptic, longest 3.5–4.5 mm long, sessile glandular or eglandular. **Ray flowers** 8–64, ligules 5–15 mm long, white to blue, purple, or mauve, coiling at maturity. **Disc flowers** bisexual, fertile, corollas narrowly cylindric, 4–9 mm long, the tube barely expanded into the limb. **Achenes** narrowly obovoid, 1.8–4 mm long, compressed, numerous-nerved, sparsely strigose (*L. orientalis*) to densely sericeous, sometimes also glandular; pappus 1- or 2-seriate, bristles 20–55, 4–8 mm long.

In the molecular-phylogenetic analysis of Cross et al. (2002), a strict consensus tree places *Olearia stuartii* in an unresolved position among taxa of Brachyscominae. Another consensus tree (their Fig. 3, with reduction of taxa in Celmisiinae) places it with *O. ferresii* as a weakly supported pair within the Brachyscominae as sister to *Tetramolopium vagans*, outside the bounds of a more strictly defined *Olearia*. *Tetramolopium vagans* (Pedley 1993) seems morphologically in place within *Tetramolopium*, although the epithet is meant to reflect its geographic displacement from close related congeners and molecular data (Lowrey et al. 2001) indicate that it is not closely related to the rest of the genus. *Olearia ferresii* is distinct in morphology from the *Landerolaria* species and treated here as a member of the genus *Neolaria*.

Lander (1989) noted that *Olearia gordonii*, *O. humilis*, *O. stuartii*, and *O. xerophila* comprise a "natural group with no other close relatives." Species newly described since then (*O. arckaringensis*, *O. eremaea*, *O. laciniifolia*, *O. newbeyi*, and *O. orientalis*) appear to belong with the first four, as does *O. macdonnellensis* (described in 1986). The additions considerably increase the morphological diversity of the group, and it would not be surprising to find that more than a single clade is represented.

As alluded to by Lander (1990), *Olearia laciniifolia* is similar to *O. rudis* (see the genus *Muellerolaria*, this publication) in its hirsute vestiture of long, uniseriate, multicellular hairs—but *O. xerophila* (of *Landerolaria*) also is hirsute. *Olearia laciniifolia* differs from *O. rudis* in its fully shrubby habit, abundant glandular hairs, 4–5-seriate phyllaries graduate in length, and strigose-sericeous achenes. *Olearia arckaringensis* is unusual in *Landerolaria* in the density of its lanate vestiture.

Olearia tridens (Cooke 1986), from Northern Territory, is at least superficially similar to *O. stuartii* and the two were compared in the protologue of the latter, but Lander (1987) transferred *O. tridens* to *Minuria*.

- 1. Heads in loose corymbs.
 - 2. Leaves 2–12 mm long **Landerolaria newbeyi**
 - 2. Leaves 10–75 mm long.
 - 3. Leaves broadly elliptic-obovate **Landerolaria macdonnellensis**
 - 3. Leaves linear to narrowly oblong **Landerolaria gordonii**
- 1. Heads solitary on bracteate peduncles
 - 4. Heads terminal and on axillary branches in a diffuse (paniculate) array **Landerolaria humilis**
 - 4. Heads on bracteate peduncles, solitary or loosely clustered above the leaves.
 - 5. Stems and leaves hirsute-villous **Landerolaria laciniifolia**
 - 5. Stems and leaves lanate or minutely pubescent to glabrescent or subglabrous.
 - 6. Leaves oblong to oblanceolate or linear-oblanceolate **Landerolaria stuartii**
 - 6. Leaves elliptic to elliptic-obovate.
 - 7. Stems closely white-lanate, vestiture obscuring the stem surface .. **Landerolaria arckaringensis**
 - 7. Stems glandular and hairy, vestiture not obscuring the stem surface.
 - 8. Peduncles mostly obscured by closely spaced, ascending leaves **Landerolaria eremaea**
 - 8. Peduncles visible above distal leaves
 - 9. Leaves hirsute and glandular, margins serrate with 7–9 pairs of sharp teeth
..... **Landerolaria xerophila**
 - 9. Leaves resinous but glabrous, margins crenate-dentate with 1–3 pairs of low teeth
..... **Landerolaria orientalis**

1. *Landerolaria gordonii* (Lander) Nesom, **comb. nov.** *Olearia gordonii* Lander, Nuytsia 7: 32. 1989. **TYPE: Queensland.** On the very dry slopes of the Bendee ridges between Glenmorgan and Surat, and on the Thomby Range, with *Acacia catenulata*, no date, *D.M. Gordon 80* (holotype: BRI; isotype: PERTH, Fig. 1).

Queensland. Flowering (May)June–September(–October).

2. *Landerolaria newbeyi* (Lander) Nesom, **comb. nov.** *Olearia newbeyi* Lander, Nuytsia 18: 100. 2008. **Type: Western Australia.** 17 km NNE of Peak Charles, ca. 78 km SE of Norseman, scattered in patches in *Thryptomene australis* High Shrubland (disturbed roadside), 21 Jan 1985, *K.R. Newbey 10897* (holotype: PERTH 06105424 image; isotypes: PERTH-2 sheets images, Fig. 2).

Western Australia. Flowering August–January.

3. *Landerolaria humilis* (Lander) Nesom, **comb. nov.** *Olearia humilis* Lander, Nuytsia 7: 26. 1989. **TYPE: Western Australia.** Sandstone to Yuinmery Road, 3 km S of turnoff to Atley Homestead [on Sandstone-Paynes Find road], 28° 15 S, 119° 05' E, compact sandy loam, tall open shrubland with *Acacia* dominant, 25 Aug 1986, *P.S. Short 2563* - voucher for chrom. no. det. of n = 9 (holotype: PERTH image; isotypes: K-2 sheets images, MEL-2 sheets images, Fig. 3).

Western Australia. Flowering (June–)July–October.

4. *Landerolaria stuartii* (F. Muell.) Nesom, **comb. nov.** *Eurybia stuartii* F. Muell., *Fragm. Phyt. Aust.* 1: 202. 1859. *Aster stuartii* (F. Muell.) F. Muell., *Fragm. Phyt. Aust.* 5: 76. 1865. *Olearia stuartii* (F. Muell.) Benth., *Fl. Austral.* 3: 481. 1867. **TYPE: South Australia.** NW interior of

South Australia, [1859], *J.M. Stuart s.n.* (holotype: MEL image; isotype: K image). Protologue: "In regionibus interioribus boreali-occidentalibus coloniae South Australia."

Aster megalodontus F. Muell., *Fragm. Phyt. Aust.* 8: 244. 1874. **TYPE: Northern Territory.** Protologue: "In monte Olga; E. Giles." Not seen; as synonym of *Olearia stuartii* fide Electronic Flora of South Australia database.

Northern Territory, South Australia, Western Australia. Flowering June–September.

- 5. *Landerolaria laciniifolia*** (Lander) Nesom, **comb. nov.** *Olearia laciniifolia* Lander, *Nuytsia* 72: 149. 1990. **TYPE: Western Australia.** Newdegate-Lake Grace road, 22 Sep 1964, *A.R. Fairall 1623* (holotype: PERTH image, Figs. 10, 11; isotype: KPBG).

Western Australia. Flowering June–November.

- 6. *Landerolaria eremaea*** (Lander) Nesom, **comb. nov.** *Olearia eremaea* Lander, *Nuytsia* 72: 141. 1990. **TYPE: Western Australia.** Beegul [Rockhole], 93 mi NE of Cosmo Newberry, above breakaway, 25 Aug 1961, *A.S. George 2881* (holotype: PERTH image, Fig. 7).

Western Australia. Flowering July–August.

- 7. *Landerolaria arckaringensis*** (P.J. Lang) Nesom, **comb. nov.** *Olearia arckaringensis* P.J. Lang, *J. Adelaide Bot. Gard.* 22: 57. 2008. **TYPE: South Australia.** Region 2: Lake Eyre, Arckaringa Station, breakaway slopes facing Arckaringa Creek, on the scree slopes, below the crest, well out of the creek bed proper, with *Senna*, *Stackhousia*, *Ptilotus*, *Lotus*, *Goodenia*, *Acacia*, *Gunniopsis*, *Aristida*, *Scaevola*, 28 Jun 2000, *D.E. Symon 16109* (holotype: AD image; isotypes: AD image, K-2 sheets images Fig. 8, NT image, PERTH image).

South Australia. Flowering (March–)May–September.

- 8. *Landerolaria xerophylla*** (F. Muell.) Nesom, **comb. nov.** *Eurybia xerophylla* F. Muell., *Fragm. Phyt. Aust.* 1(3): 51. 1858. *Aster xerophyllus* (F. Muell) F. Muell., *Fragm. Phyt. Aust.* 5(35): 76. 1865. *Olearia xerophylla* (F. Muell.) Benth., *Fl. Austr.* 3: 486. 1867. **LECTOTYPE** (designated here): **Queensland.** Barren ridges, upper Burdekin, no date, *F. Mueller s.n.* (K 838941 image, lower row of stems). Protologue: "In collibus sterilioribus ad fluvium Burdekin." MEL 1547184 image (lower left stem) is a possible isolectotype, but the label has "Range between the Flinders and Burdekin R."

Aster heynei F. Muell., *Fragm. Phyt. Aust.* 5(35): 86. 1865. **LECTOTYPE** (designated here): **Queensland.** Cape River, no date, *E.M. Bowman 221* (MEL 1547108 image-upper 2 plants; possible isolectotype: K 838941 image, upper plant). Protologue: "Ad flumen Cape's River. Bowman."

Queensland, Western Australia. Flowering mostly May–September but continuing sporadically all year. Lander (1989) noted that the wide disjunction suggests that the species once had a wider distribution. Figure 6.

- 9. *Landerolaria macdonnellensis*** (D.A. Cooke) Nesom, **comb. nov.** *Olearia macdonnellensis* D.A. Cooke, *Muelleria* 6: 181. 1986. **TYPE: Northern Territory.** 1 km W of Ellery Creek Big Hole, 23° 47' S, 133° 03' E, 17 Jul 1983, *P.K. Latz 9636* (holotype: NT not seen; isotypes: CANB-2 sheets images, DNA image-Fig. 4, NT).

Northern Territory. Flowering August–September.

- 10. *Landerolaria orientalis*** (A.R. Bean & Jobson) Nesom, **comb. nov.** *Olearia orientalis* A.R. Bean & Jobson, *Austrobaileya* 10: 106. 2017. **TYPE: Queensland.** Port Curtis District, 3 km E of Glenavon homestead, Five Mile Creek headwaters, 1 Mar 1994, *P.I. Forster PIF15039* (holotype: BRI [2 sheets]; isotypes: AD, CANB, DNA, K, L, MEL, NSW, PE). No types seen.

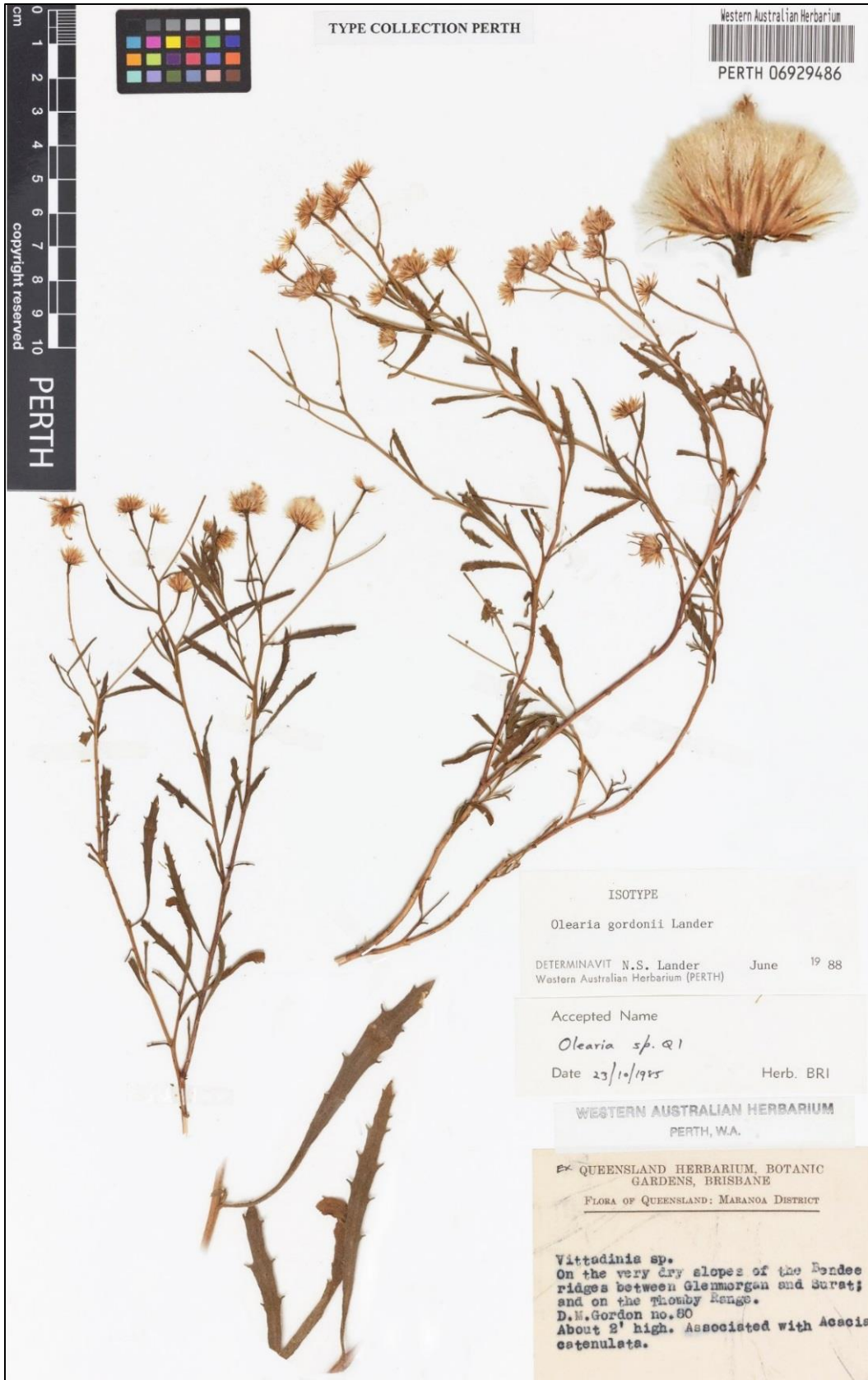


Figure 1. *Landerolaria gordonii*. Queensland. Isotype (PERTH).



Figure 2. *Landerolaria newbeyi*. Western Australia. Isotype (PERTH).



Figure 3. *Landerolaria humilis*. Isotype (MEL).



Figure 4. *Landerolaria macdonnellensis*. Isotype (DNA).

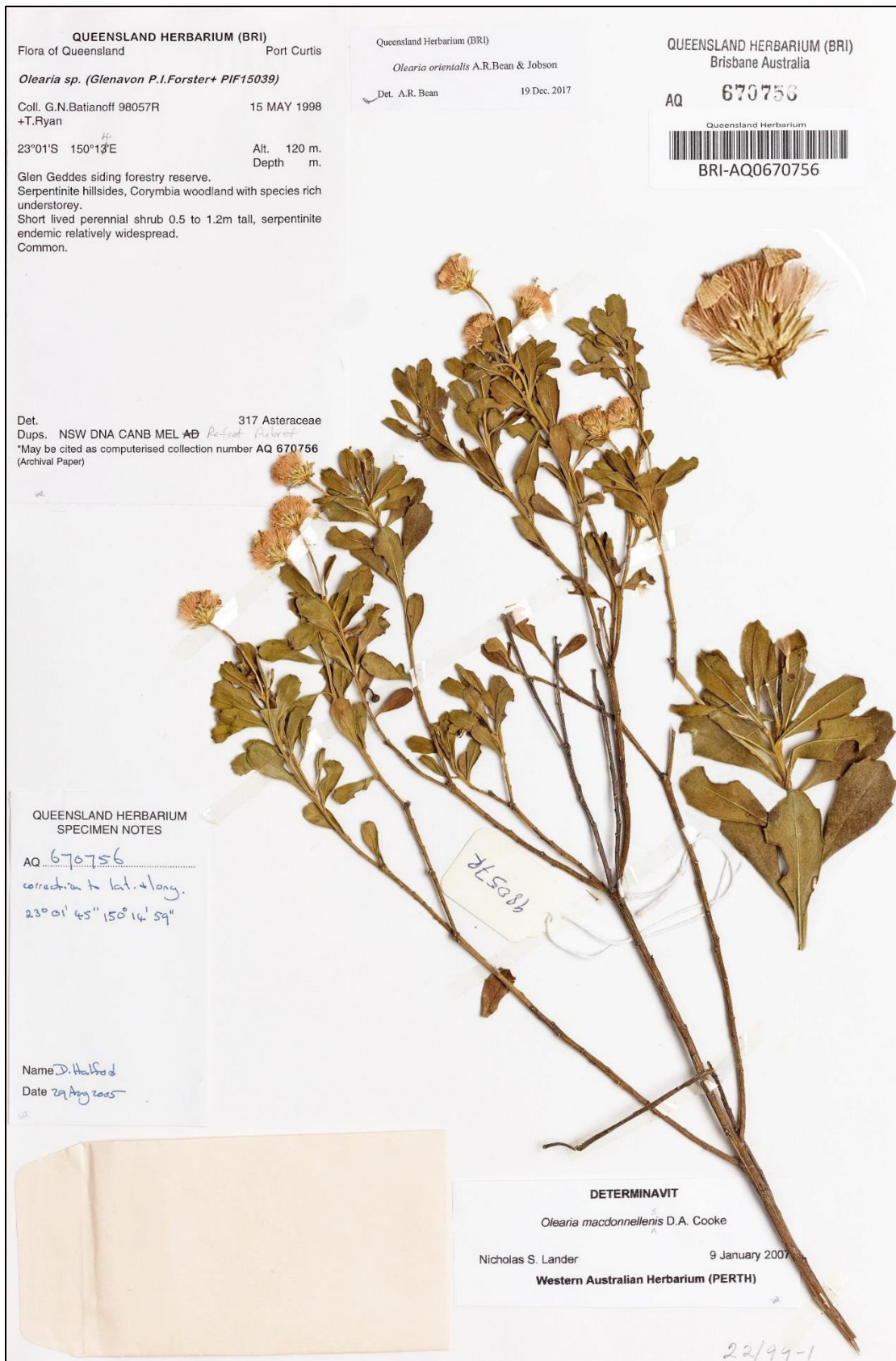


Figure 5. *Landerolaria orientalis*. Queensland. Batianoff 98057R (BRI).

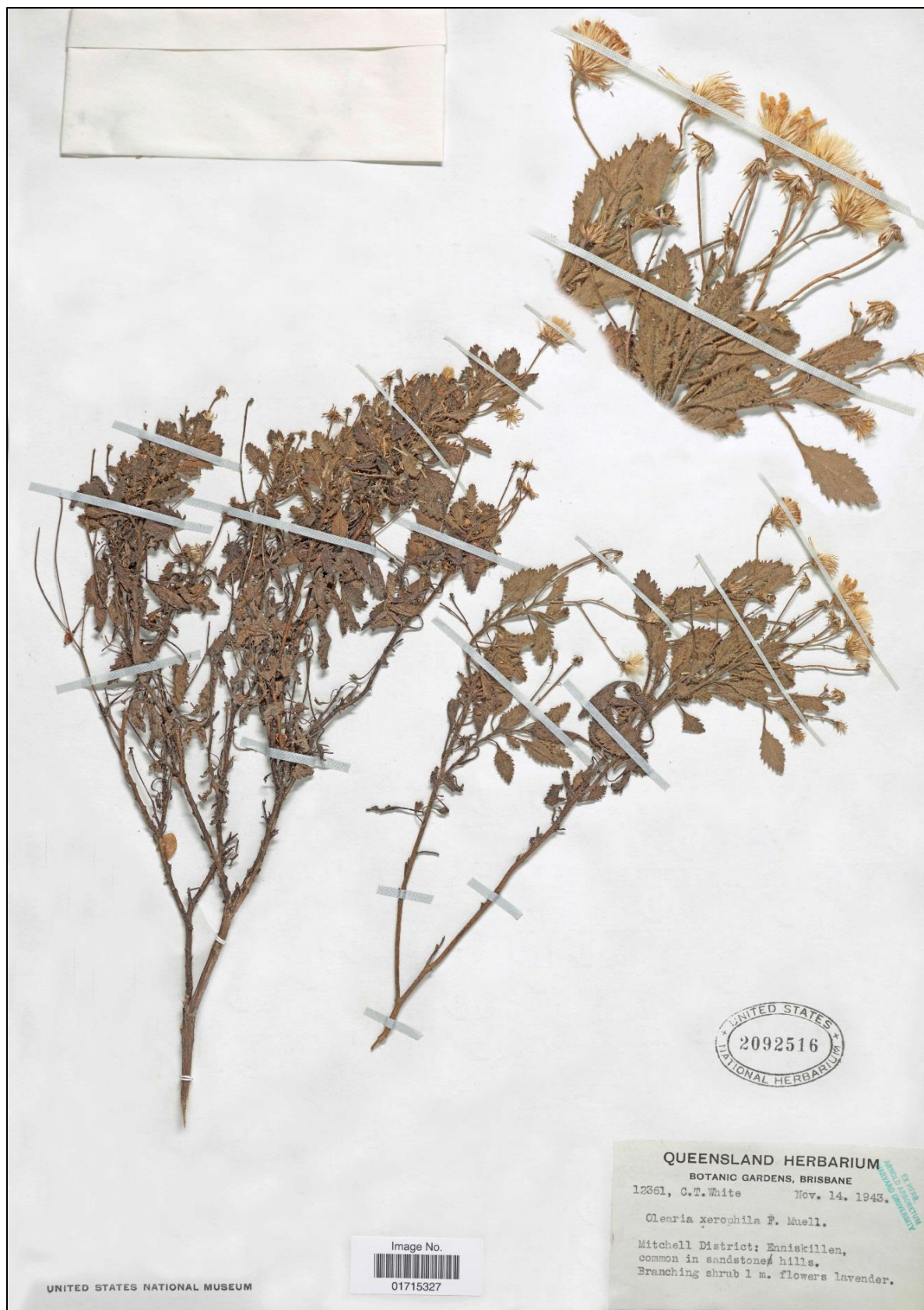


Figure 6. *Landerolaria xerophila*. Queensland. White 123361 (US).



Figure 7. *Landerolaria eremaea*. Western Australia. Holotype of *Olearia eremaea* (PERTH).



Figure 8. *Landerolaria arckaringensis*. South Australia. Isotype (K).



Figure 9. *Landerolaria sturtii*. Northern Territory. Lazarides 5950 (US).



Figure 10. *Landerolaria laciniifolia*. Western Australia. Holotype of *Olearia laciniifolia* (PERTH).



Figure 11. *Landerolaria laciniifolia*. Details from holotype.

NEOLARIA Nesom, **gen. nov.** **TYPE:** *Neolaria ferresii* (F. Muell.) Nesom

Distinct in its elongate, thickened, epetiolate leaves with entire to mucronulate or serrulate margins, linear-bracteate peduncles, heads terminal and from distal nodes in a loosely corymboid cluster, and densely sericeous achenes.

Shrubs, aromatic. **Stems** 50–150 cm, spreading eglandular hairs (multicellular, uniseriate) and sparsely stipitate-glandular (multicellular, biseriate) to glabrescent or glabrous; oil glands sometimes present on ribs. **Leaves** alternate, linear to lanceolate to oblong-lanceolate, epetiolate, 1.5–11.5 cm long, thickened, margins entire to mucronulate, denticulate, or serrulate, teeth sometimes mostly distal, minutely hirsute, sessile- or minutely stipitate-glandular. **Heads** terminal and from distal nodes, appearing as a loose corymboid cluster; peduncles 1–7 cm long, with linear to linear-lanceolate bracts. **Involucres** campanulate; phyllaries 4–5-seriate, graduate in length, longest 5–11 mm, linear to linear-lanceolate, sessile-glandular; receptacles alveolate. **Ray flowers** 8–18, ligules 9–16 mm long, white to mauve or purple, coiling at maturity. **Disc flowers** bisexual, fertile, corollas yellow, 7–9 mm long, lobes triangular, reflexing. **Achenes** narrowly obovoid, compressed, 3–4 mm long, 3-ribbed, densely sericeous, eglandular; pappus 1- or 2-seriate, bristles 24–40, 7–9 mm long, apically expanded, sometimes with a shorter outer series.

In the molecular-phylogenetic analysis of Cross et al. (2002), a strict consensus tree places *Olearia ferresii* in an unresolved position among taxa of Brachyscominae. Another consensus tree (their Fig. 3, with reduction of taxa in Celmisiinae) places it with *O. stuartii* as a weakly supported pair within the Brachyscominae. The three species segregated here as *Neolaria* appear distinct as a group and disconnected from *O. stuartii* and its relatives (see *Landerolaria*).

Lander (1990) noted that ray corollas of *Landerolaria ferresii* and *L. mucronata* produce druse crystals not seen elsewhere in *Olearia* sensu lato except in *O. incana* (of the *O. pimeleoides* group of "clade A" sect. *Eriotriche*).

1. Leaves linear-lanceolate, 1–5 mm wide, margins entire to mucronulate with a few teeth **Neolaria mucronata**
1. Leaves mostly lanceolate to oblong-lanceolate, 6–22 mm wide, margins shallowly serrate to serrate-mucronate or denticulate with 15–20 pairs of evenly and closely spaced teeth.
2. Stems and leaves with mostly glandular hairs, rarely with minute eglandular hairs; oil glands present on stems and leaves; veins of decurrent leaf base not forming stem ribs; rays 8–10, ligules cream to white **Neolaria ferresii**
2. Stems and leaves densely and evenly hirsutulous, with only eglandular hairs; oil glands absent from stems and leaves; veins of decurrent leaf base continuing onto the stem and forming ribs; rays 14–18, ligules mauve to purple **Neolaria bella**

1. Neolaria ferresii (F. Muell.) Nesom, **comb. nov.** *Eurybia ferresii* F. Muell., *Fragm. Phyt. Aust.* 3: 18, t. 18. 1862. *Aster ferresii* (F. Muell.) F. Muell., *Fragm. Phyt. Aust.* 5: 75. 1865. *Olearia ferresii* F. Muell. ex Benth., *Fl. Aust.* 3: 487. 1867. **TYPE: Northern Territory.** Brinkley's Bluff, Macdonnell Ranges, [1859], *J.M. Stuart s.n.* (holotype: MEL image, Fig. 4).

Northern Territory, South Australia, Western Australia. Flowering May–October.

2. Neolaria bella (A.R. Bean & Jobson) Nesom, **comb. nov.** *Olearia bella* A.R. Bean & Jobson, *Austrobaileya* 10: 102. 2017. **TYPE: Queensland.** Warrego District: ca. 15 km S of Quilpie, towards Eulo, S-facing slope of mesa, with *Acacia* open woodland, gravelly, eroded Ferricrete duricrust, locally occasional shrub 1.25 m high, 4 Sep 1990, *P.G. Wilson 513* (holotype: BRI, Fig. 2; isotypes: NSW, PERTH, not seen).

Queensland. Flowering June–September.

3. *Neolaria mucronata* (Lander) Nesom, **comb. nov.** *Olearia mucronata* Lander, *Nuytsia* 72: 151. 1990. **TYPE: Western Australia.** Wittenoom, Jan 1972, *McGuire 18* (holotype: PERTH image, Fig. 1).

Western Australia. Flowering July–November(–January).



Figure 1. *Landerolaria mucronata*. Western Australia. Holotype of *Olearia mucronata* (PERTH). Arrow points to leaf with mucronate margins.

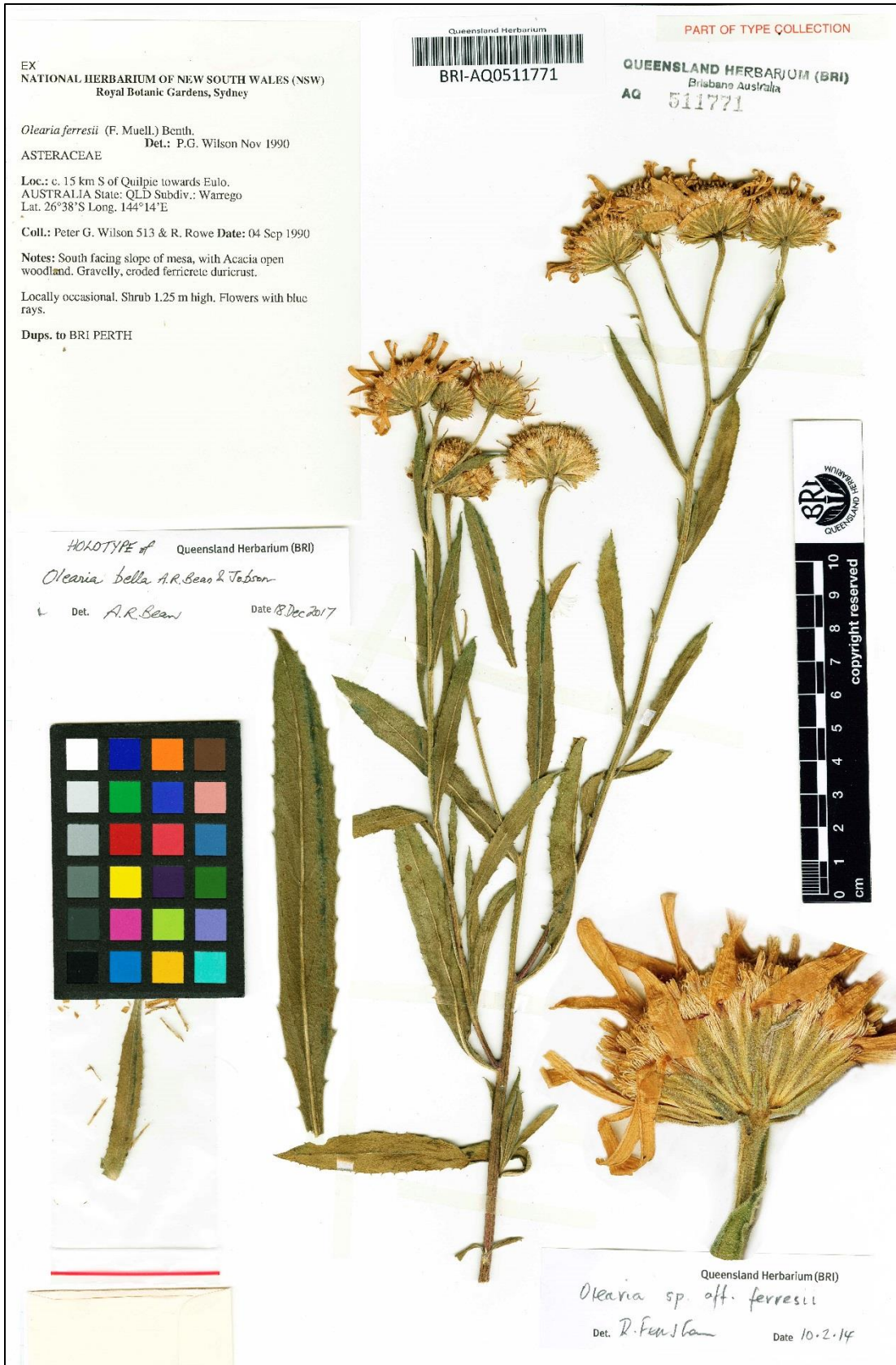


Figure 3. *Landerolaria bella*. Holotype (BRI).



Figure 3. *Landerolaria ferresii*. Northern Territory. Lazarides 6158 (US).



Figure 4. *Landerolaria ferresii*. Holotype (MEL).



Figure 5. *Landerolaria ferresii*. South Australia. Seeds of South Australia, Conservation Center.



Figure 6. *Landerolaria ferresii*. South Australia. Seeds of South Australia, Conservation Center.



Figure 7. *Landerolaria ferresii*. Northern Territory. Photo by Mark Marathon, Wikimedia Commons.

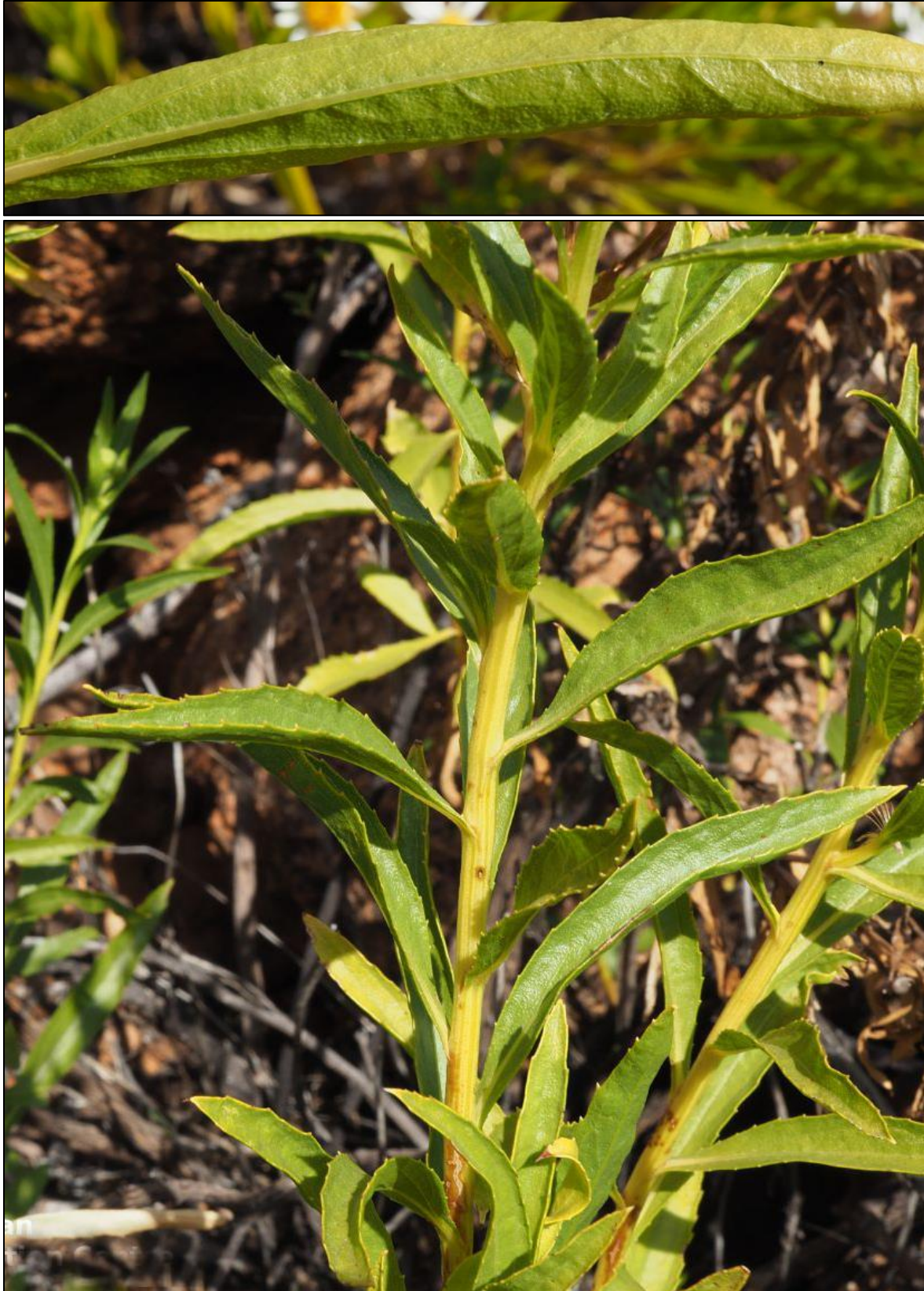


Figure 8. *Landerolaria ferresii*. South Australia. Seeds of South Australia, Conservation Center. Leaves of lower photo show the evenly toothed leaf margins characteristic of the genus.

PHASEOLARIA Nesom, **gen. nov.** TYPE: *Phaseolaria elliptica* (DC.) Nesom

Shrubs with large, alternate, petiolate leaves with glabrous, gland-dotted and viscid-resinous surfaces and small heads in corymbs. For Australian botanist Anthony R. Bean.

Shrubs; stem, leaves, and involucre glabrous, glandular, viscid to resinous. **Stems** 0.3–2.5 mm, viscid-glandular. **Leaves** alternate, petiolate, blades narrowly elliptic to lanceolate, oblanceolate, obovate, or ovate, 2.5–11 cm long, petioles 4–17 mm long, not decurrent, venation brochidodromous, margins entire. **Heads** in terminal, corymbose clusters, ultimate peduncles (2–)5–23 mm long, bracteate. **Involucre** short-cylindric, 4.5–6 mm wide (pressed); phyllaries in (2–)3–4 series strongly graduate in length, narrowly elliptic-lanceolate, longest 3–3.5 mm, scarious with a green midregion, glabrous or sparsely hairy distally; receptacles flat to convex, shallowly alveolate. **Ray flowers** fertile, 6–20, ligules white to lilac, 2.2–9 mm long. **Disc flowers** bisexual, fertile, corollas yellow, 3.5–4.5 mm long. **Achenes** subcylindric, slightly compressed, 1.6–3.2 mm long, 4–5-ribbed, sparsely strigose, eglandular; pappus uniseriate, of 15–30 bristles 2.3–5 mm long, or in *P. praetermissa* also with an outer series 0.4–0.5 mm long.

In the molecular-phylogenetic analysis of Cross et al. (2002, Figs. 1 and 3), *Olearia elliptica* and *O. elliptica* "var." *praetermissa* cluster (with low support) in an unresolved position among taxa of Brachyscominae, outside of a more strictly defined *Olearia*. The Lord Howe Island plants ("praetermissa") and a previously undescribed entity ("fulgens") were recognized at specific rank by Bean (2020a), who presented his study as a taxonomic revision of group.

1. Leaves obovate to oblanceolate; ray ligules 2.2–2.6 mm long; achenes 1.6–1.8 mm long; pappus biseriate **Phaseolaria praetermissa**

1. Leaves elliptical to ovate; ray ligules 4.5–9 mm long; achenes 2.1–3.2 mm long; pappus usually 1-seriate.

2. Leaves 3.6–5.5 times longer than wide; petioles 5–10 mm long; phyllaries glabrous; disc corolla lobes with tiny hairs **Phaseolaria fulgens**

2. Leaves 2.5–3.5 times longer than wide; petioles 10–17 mm long; phyllaries sparsely hairy at distal end; disc corolla lobes glabrous **Phaseolaria elliptica**

1. **Phaseolaria elliptica** (DC.) Nesom, **comb. nov.** *Olearia elliptica* DC., Prodr. 5: 271. 1836. *Aster ellipticus* DC., Prodr. 5: 271. 1836 [nom. inval., pro syn.]. **LECTOTYPE** (Bean 2020): **New South Wales**. Illawarra, [Oct–Nov 1818], A. *Cunningham* 27 (G-DC image, Fig. 1; isolectotype: K).

Eurybia illita F. Muell., Fragm. 1: 16. 1858. *Aster illitus* (F. Muell.) F. Muell., Fragm. 5: 76. 1865. *Olearia illita* F. Muell., Fragm. 5: 76. 1865 [nom. inval., pro syn.]. **TYPE: Queensland**. Moreton District, Mt. Lindesay, no date, W. *Hill* s.n. (holotype: MEL image; isotypes: K-2 collections on one sheet).

2. **Phaseolaria fulgens** (A.R. Bean) Nesom, **comb. nov.** *Olearia fulgens* A.R. Bean, *Austrobaileya* 10: 658. 2020. **TYPE: Queensland**. Darling Downs District, State Forest 595, Talgai, Mount Gammie North, 9 Jan 1993, D. *Halford* Q1630 (holotype: BRI; isotypes: MEL, NSW). Types as cited, not seen; line drawing! in protologue.

3. **Phaseolaria praetermissa** (P.S. Green) Nesom, **comb. nov.** *Olearia praetermissa* (P.S. Green) A.R. Bean, *Austrobaileya* 10: 660. 2020. *Oleolaria elliptica* subsp. *praetermissa* P.S. Green, *Kew Bull.* 48: 311. 1993. **TYPE: New South Wales**. Lord Howe Island, 25 Mar 1971, A.N. *Rodd* 1771 (holotype: K image, Fig. 3; isotype: NSW image).



Figure 1. *Phaseolaria elliptica*. Holotype (G-DC).



Figure 2. *Phaseolaria elliptica*. Queensland. Forster PIF40536 (US).



Figure 3. *Phaseolaria praetermissa*. Holotype (K).

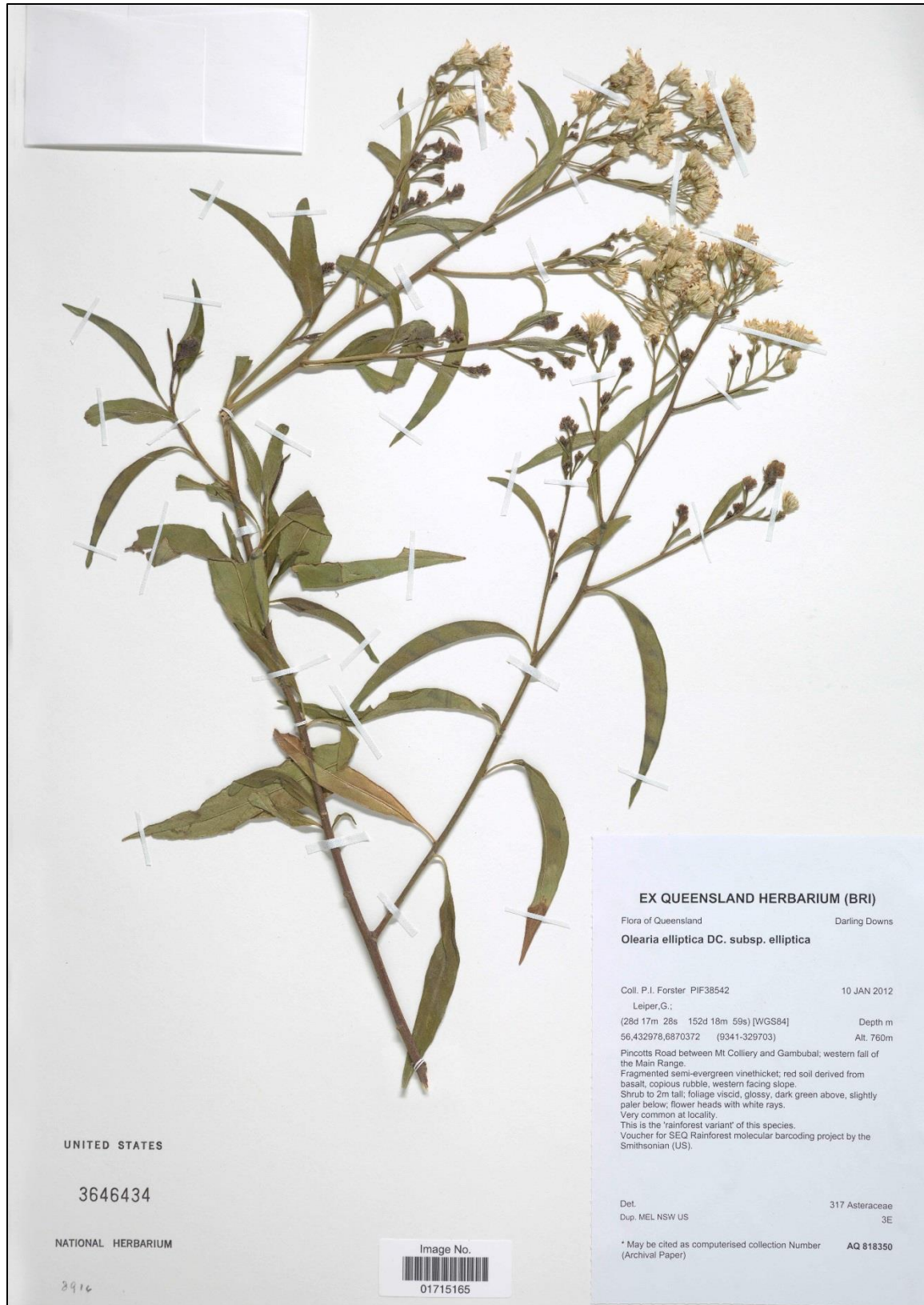


Figure 4. *Phaseolaria fulgens*. Queensland. Forster PIF38542 (US), cited by Bean (2020).



Figure 5. *Phaseolaria fulgens*. Queensland. Pedley 5591 (US), cited by Bean (2020).



Figure 6. *Phaseolaria elliptica*. Photo by 'plant.nerd,' Flickr.



Figure 7. *Phaseolaria fulgens*. DiversityNativeSeeds.com.au.



Figure 8. Top: *Phaseolaria fulgens*. Photo by Sebastian Tesoriero, Plantthis.com. Bottom: *Phaseolaria elliptica*. New South Wales. Photo by "Brian G," Blue Mountains Native Plants.



Figure 9. *Phaseolaria praetermissa*. Lord Howe Island. Photo by John Game, Wikipedia.

WALSHOLARIA Nesom, **gen. nov.** **TYPE:** *Walsholaria magniflora* (F. Muell.) Nesom

Distinct in its glabrous, resinous stems, leaves, and involucre, small, thickened, obovate or cuneate leaves with distally few-toothed margins, solitary, terminal heads on short, leafy branches, involucre with multiseriate, elliptic, tightly appressed phyllaries, and oblong, 4-6 ribbed achenes with apically acute pappus bristles. For Australian botanist Neville G. Walsh.

Shrubs; stems, leaves, and involucre glabrous, resinous. **Stems** 0.8–1.5 m. **Leaves** alternate, spatulate to obovate or cuneate, 5–25 mm long, narrowed to a petiolar region, thickened, margins flat, entire to crenate or dentate with a few shallow teeth. **Heads** solitary, terminal on short, leafy branches. **Involucre** cylindrical to narrowly ovoid or urceolate, 6–18 mm long; phyllaries linear-lanceolate to elliptic-lanceolate, thickened, in 4–8 tightly appressed series strongly graduate in length; receptacles foveolate. **Ray flowers** 7–24, ligules white to pale purple or mauve, tightly coiling at maturity. **Disc flowers** bisexual, fertile, corollas yellow to cream or (in *W. cuneifolia*) white, narrowly cylindrical, 5–10 mm long, lobes triangular, spreading-reflexing. **Achenes** oblong, compressed, 4–6-ribbed, 4–8 mm long, glabrous or loosely strigose-sericeous to sericeous; pappus bristles 1- or 2-seriate (without a short outer series), apically acute, 5–15 mm long, of roughly equal length, slightly longer than the disc corollas.

In the molecular-phylogenetic analysis of Cross et al. (2002), consensus trees indicate that *Walsholaria* is a strongly supported clade phylogenetically distinct from *Olearia*. Figure 1 places it as sister to *Olearia cordata* and *Minuria integerrima*, within subtribe Brachyscominae. Figure 2 (with reduced taxa in *Olearia* sensu stricto) places it as sister to *Olearia* sensu stricto. Figure 3 (with reduced taxa in Celmisiinae) places *Walsholaria* as sister to *Grangea* (Grangeinae) and *Talamancaster panamensis* (Baccharidinae), the whole group as sister to Brachyscominae.

1. Leaves obtriangular; involucre 13–18 mm long; rays 12–24.
 2. Ray ligules 13–22 mm long achenes glabrous; pappus bristles 12–15 mm long
..... **Walsholaria magniflora**
 2. Ray ligules 6–7 mm long; achenes sericeous; pappus bristles 7.5–8 mm long . **Walsholaria cuneifolia**
1. Leaves obovate to obdeltate; involucre 6–12 mm long; rays 7–13, ligules 4–12 or 18–25 mm long; pappus bristles 5–10 mm long.
 3. Ligules 18–25 mm long; achenes 5–6 mm long; pappus bristles 8–10 mm long
..... **Walsholaria calcarea**
 3. Ligules 4–12 mm long; achenes 2.5–4 mm long; pappus bristles 5–8 mm long **Walsholaria muelleri**

1. Walsholaria calcarea (F. Muell. ex Benth.) Nesom, **comb. nov.** *Olearia calcarea* F. Muell. ex Benth., Fl. Austral. 3: 481. 1867. **TYPE MATERIAL:** New South Wales. Three collections by F. Mueller (MEL 1547084 image, Fig. 1; MEL 1543370; MEL 1543373). Protologue: "Towards Cudnaka and banks of the Murray near Moorundi, F. Mueller, (Herb. F. Mueller)." New South Wales, South Australia, Victoria, West Australia. Flowering July–September.

"In many respects (leaf size and shape, capitulum size, colour of ray florets) intermediate between *O. muelleri* and *O. magniflora* and perhaps a hybrid between those species, both certainly being present at several sites from which *O. calcarea* has been recorded in Victoria" (Walsh & Lander 1999). It is not convincingly clear, even, that available type material of *O. calcarea* and *O. muelleri* represents different species (pers. observ.). Photos in Figs. 2-5 are identified as on the websites from which they were taken.

2. Walsholaria muelleri (Sond.) Nesom, **comb. nov.** *Eurybia muelleri* Sond., Linnaea 25: 459. 1853. *Olearia muelleri* (Sond.) Benth., Fl. Austral. 3: 481. 1867. *Aster muelleri* (Sond.) F. Muell., Syst. Census Austral. Pl., 78. 1882. **TYPE MATERIAL:** MEL 681594 and 5 collections mounted on a single K sheet. Protologue: "Ad Murray, (Dr. Behr.) In planitie juxta montes Flinders-range et in rupibus ad Cudnaka. Oct." New South Wales, South Australia, Victoria, West Australia. Flowering August–October.

3. Walsholaria magniflora (F. Muell.) Nesom, **comb. nov.** *Aster magniflorus* F. Muell., Fragm. 5(35): 80. 1865 [*Olearia magniflora* cited in synonymy]. *Olearia magniflora* (F. Muell.) Benth., Fl. Austral. 3: 480. 1867. **TYPE MATERIAL:** 1 sheet at K (with 2 collections on the same sheet) and 5 collections at MEL. Protologue: "In planitiebus colibusque desertorum praesertim calcariis secundum flumina Murrumbidgee, Murray's et Darling's River, F.M.; flumen Lachlan's River versus, Burkitt; prope lacum Yanga, Beckler." New South Wales, South Australia, Victoria, West Australia. Flowering (March–)August–October.

4. Walsholaria cuneifolia (Bean & Mathieson) Nesom, **comb. nov.** *Olearia cuneifolia* Bean & Mathieson, Austrobaileya 9: 404. 2015. **TYPE:** Queensland. Naipa Downs, ca. 35 km NW of Mitchell, *Eucalyptus thozetiana* woodland on slope rocky mesa, 26 Mar 2015, M.T. Mathieson MTM1999 (holotype: BRI image; isotypes: CANB, K, MEL image-Fig. 2, NSW, US image). New South Wales, Queensland, South Australia, Victoria. Flowering August–October.



Figure 1. *Walsholaria calcarea*. Lectotype of *Olearia calcarea* (MEL).



Figure 2. *Walsholaria muelleri*. South Australia. Seeds of South Australia website.



Figure 3. *Walsholaria muelleri*. South Australia. Seeds of South Australia website.



Figure 4. *Walsholaria muelleri*. South Australia. Photo by Ron Taylor, Seeds of South Australia website.



Figure 5. *Walsholaria muelleri*. South Australia. Photo by William Archer, Esperance Wildflowers website.



Figure 6. *Walsholaria magniflora*. South Australia. Seeds of South Australia website.



Figure 7. *Walsholaria cuneifolia*. Isotype of *Olearia cuneifolia* (MEL).

MUELLEROLARIA Nesom, **gen. nov.** TYPE: *Muellerolaria rudis* (Benth.) Nesom

Distinct in its subshrubby habit, vestiture of long, stiff, uniseriate, multicellular, eglandular hairs, sessile leaves, large heads on long, ebracteate peduncles, phyllaries in 2–3 series of equal length, alveolate receptacles, and narrowly cylindrical, 6–10-ribbed, glabrous achenes. For Australian botanist Ferdinand von Mueller (1825-1896).

Subshrubs, sometimes aromatic. **Stems** 0.2–1.5 m, woody at base. **Leaves** alternate, sessile to subsessile, subclasping in *M. rudis*, hirsute to strigose-hirsute with uniseriate, multicellular hairs. **Heads** solitary or few on ebracteate or paucibracteate peduncles from distal axils, on peduncles mostly 2–12 cm long and above the level of the leaves. **Involucres** broadly cylindrical, 2–4 cm wide (pressed); phyllaries in 2–3 series of equal length, linear-oblong with acute apex, the outer evenly green, sparsely hirsute; receptacles alveolate. **Ray flowers** 20–75, ligules 10–15 mm long; blue to purplish or white, coiling at maturity. **Disc flowers** bisexual, fertile, corollas yellow, 4–5 mm long. **Achenes** narrowly oblong, compressed, 2–3.5 mm long, 6–10-ribbed, glabrous, eglandular; pappus bristles in 2 series, barbellate with acute apices, outer about as long as the disc corollas, inner much shorter.

Olearia picridifolia and *O. rudis* were considered by both Bentham (1867) and Mueller (1865) to be morphologically close, and molecular data (Cross et al. 2002) show strong support for their sister relationship. A strict consensus tree (Fig. 3 of Cross et al.) places *Muellerolaria* as sister to *O. cordata*/*O. ciliata*/*Olearia* sensu stricto (clade A); their consensus tree of Fig. 1 places it in an unresolved position among other taxa of Brachyscominae. The two species are distinct in habit and vestiture but the broadly cylindrical involucres with linear, equal-length phyllaries mark them as evolutionary sisters.

1. Leaves 6–40 mm wide, sparsely hirsute to glabrate, margins often coarsely serrate

..... **Muellerolaria rudis**

1. Leaves 2–9 mm wide, sparsely to densely hirsute to strigose-hirsute, margins entire

..... **Muellerolaria picridifolia**

1. **Muellerolaria rudis** (Benth.) Nesom, **comb. nov.** *Eurybia rudis* Benth., Enum. Pl. [Endlicher] 58. 1837. *Shawia rudis* (Benth.) Sch.-Bip., Jahresber. Pollichia 18-19: 174. 1861. *Olearia rudis* (Benth.) F. Muell. ex Benth., Fl. Austral. 3: 487. 1867. **LECTOYPE** (designated here): **Western Australia**. Swan River, *Hügel s.n.* (K 838939 image; isoelectotype: W image). Protologue: "*Swan-River*. (Hügel.) β) *King Georges Sound*. (Ferd. Bauer.)"

Eurybia scabra Benth., Enum. Pl. [Endlicher] 58. 1837. *Shawia scabra* (Benth.) Sch.-Bip., Jahresber. Pollichia 18-19: 174. 1861. *Olearia rudis* var. *scabra* (Benth.) Benth., Fl. Austral. 3: 487. 1867. **POSSIBLE TYPE: Tasmania**. Terra van Diemen, *F. Bauer 27* (W image). Protologue: "*s. Nov. Holl.* (Ferd. Bauer.)"

Aster exsul Lindl., Sketch Veg. Swan River 2: 24. 1839. **TYPE**: (not cited, not seen). As synonym of *Olearia rudis*, fide APNI. Mueller (1865, p. 75) cited this as the locality for *Aster "exul"*: "In collibus nemorosis aridioribus et in planitiebus arenoso-argillaceis dumosis passim a fluvio cygnorum usque ad flumina Darling's River et Wimmera et sinum Rivoli Bay."

Olearia rudis var. *glabriuscula* Benth., Fl. Austral. 3: 487. 1867. **TYPE MATERIAL**: MEL, presumably K). Protologue: "Wimmera, Dallachy; Gawler Town, Rivoli Bay, etc., in S. Australia, F. Mueller."

Roger Fryer has photographed Kangaroo Island plants of *Muellerolaria rudis* with large, sessile glands along the leaf margins (Fig. 10). These almost certainly deserve to be formally recognized.

2. **Muellerolaria picridifolia** (F. Muell.) Nesom, **comb. nov.** *Eurybia picridifolia* F. Muell., Linnaea 25: 397. 1853. *Olearia picridifolia* (F. Muell.) Benth., Fl. Austral. 3: 487. 1867. **LECTOYPE** (designated here): **South Australia**. Arkaba, 1 Oct 1851, *F. Mueller s.n.* (MEL 1547075 image; isoelectotypes: MEL). Protologue: "In fruticetis collium steriliorum inter Rocky-creek et Crystal-brook, nec non in vallibus petraeis prope Arkaba."



Figure 1. *Muellerolaria rudis*. New South Wales. Crisp 5722 (US).



Figure 2. *Muellerolaria rudis*. Victoria. Muir 1118 (US).



Figure 3. *Muellerolaria rudis*. Western Australia. Pritzel 651 (US).



Figure 4. *Muellerolaria picridifolia*. South Australia. Blaylock 806 (US).



Figure 5. *Muellerolaria rudis*. South Australia. South Australia Seeds website.



Figure 6. *Muellerolaria rudis*. South Australia. South Australia Seeds website.



Figure 7. *Muellerolaria rudis*. Western Australia. Photo by Russell Cumming, Flickrriver.



Figure 8. *Muellerolaria rudis*. Western Australia. Photo by Russell Cumming, Flickrriver.



Figure 9. *Muellerolaria rudis*. South Australia. South Australia Seeds website.



Figure 10. Kangaroo Island variant of *Muellerolaria rudis*. Photos by Roger Fryer, 28 Dec 2010, North Queensland Plants website.



Figure 11. *Muellerolaria picridifolia*. South Australia. Seeds of South Australia website.

VICINIA Nesom, **gen. nov.** **TYPE:** *Vicinia ciliata* (Benth.) Nesom

Distinct in its densely arranged, narrow, hirsute to hispid-hirsute, eglandular leaves and solitary heads on long, ebracteate peduncles.

Shrubs or **subshrubs**, taprooted. **Stems** 15–50(–80) cm high, stems and leaves hirsute to hispid-hirsute, eglandular, not viscid, peduncles sparsely cobwebby. **Leaves** densely arranged, often fasciculate, linear to linear-triangular (*V. ciliata*) or spatulate to obovate, elliptic, or oblong-elliptic (*V. squamifolia*), epetiolate, 2–30 mm long, 1–3 mm wide, apex acute or rarely 3-lobed, midvein impressed (sulcate) adaxially, raised abaxially, scabrous to subglabrous above and "rarely with sparse cobwebby hairs" (Flora of Victoria), hairy below, margins entire, narrowly revolute, ciliate. **Heads** solitary, terminal or less commonly terminal and axillary on ebracteate peduncles 5–25(–30) cm long; involucre hemispheric; phyllaries 3(–4)-seriate, linear-lanceolate, graduate in length, green-herbaceous, sometimes purple-tipped, apices acute, hirsute to glabrous, eglandular; receptacles shallowly convex, alveolate. **Ray flowers** 15–35, ligules 10–17 mm long, lilac to blue or violet, coiling at maturity. **Disc flowers** bisexual, fertile, corollas yellow. **Achenes** oblong, compressed, 1.6–3 mm long, 6–10-ribbed, eglandular, variable (see Flora of Victoria website) from glabrous to strigose; pappus of 25–35 barbellate bristles 2.5–4 mm long, subequal, with an outer series of shorter bristles.

In the molecular-phylogenetic analysis by Cross et al. (2002) two consensus trees place *Olearia ciliata* as sister to *Olearia* sensu stricto (clade A of their Figs. 1 and 2). Bentham (1867) placed *Olearia ciliata* in sect. *Merismotriche*, characterized by rigid, uniseriate, multicellular hairs (illustrations in Lander 1990), but the plants are similar in habit to species of *Olearia* sect. *Eriotriche* ("clade A") in their densely arranged, often fasciculate, linear leaves and it produces the "woolly" hairs characteristic of sect. *Eriotriche*. Rigid, eglandular hairs occur in *O. adenophora* and *O. homolepis* of the *O. tenuifolia* group, but the fasciculate leaves and solitary, long-pedunculate heads with narrow phyllaries of *Vicinia* are not found there

1. Leaves mostly 10–30 mm long; involucre 11–14 mm wide (pressed); rays 21–35 .. **Vicinia ciliata**
1. Leaves mostly 2–5 mm long; involucre 7–8 mm wide (pressed); rays 15–26 . **Vicinia squamifolia**

1. **Vicinia ciliata** (Benth.) Nesom, **comb. nov.** *Eurybia ciliata* Benth., Enum. Pl. [Endlicher] 58. 1837. *Shawia ciliata* (Benth.) Sch.-Bip., Jahresb. Pollichia 18/19: 174. 1861. *Aster huegelii* F. Muell., Fragm. 5(35): 79. 1865. *Olearia ciliata* (Benth.) F. Muell. ex Benth., Fl. Austral. 3: 488. 1867. **LECTOTYPE** (designated here): **Australia**. Nova Hollandia, *F. Bauer* "20 & 28" (W 46602 image, fragment MEL image). **SYNTYPE**: King George's Sound, C.A.A. *Hugel s.n.* (W 46603).

Mueller did not cite a type for *Aster huegelii*. He cited *Eurybia ciliata* Benth. a synonym, thus it seems that he intended *Aster huegelii* as a replacement name in *Aster* for *Eurybia ciliata* (not *Aster ciliatus* Walt. 1788, Willd. 1803, or Nutt. 1840).

Olearia ciliata var. *hispida* Benth., Fl. Austral. 3: 488. 1867. **TYPE: South Australia**. In fruticitis apud Hake's Place, 21 Sep 1848, *F. Mueller s.n.* (holotype: MEL image).

Eurybia ciliata var. *glabrata* Sond., Linnaea 25: 458. 1853. Protologue (localities from South Australia and Tasmania): "β. glabrata, foliis glaberrimis vel ima basi ciliolatis achaenniisque glabris. Pine forest ad Gawler et prope Pfeiffer's Station, Januar. Dr. (Behr.) North-rhine September. Ad fluv. Onkaparinga. Van Diemensland (Stuart.) β ad Port Lincoln." Not seen.

South Australia, Tasmania, Victoria, Western Australia. Flowering August–November (December).

2. **Vicinia squamifolia** (F. Muell.) Nesom, **comb. nov.** *Aster huegelii* var. *squamifolius* F. Muell., Fragm. 5(35): 79. 1865. *Olearia ciliata* var. *squamifolia* (F. Muell.) Benth., Fl. Austral. 3: 488. 1867. **LECTOTYPE** (designated here): **South Australia**. Kangaroo Island, Cygnet Bay, no date, *Fr. Waterhouse s.n.* (MEL 1543684; isoelectotype: K). Mueller' protologue cited the locality as

"ex insula halmaturorum;" Bentham cited "Kangaroo Island, Waterhouse." There are two labels and apparently two Waterhouse collections on the MEL sheet — it is not clear which collection goes with which label. The second label has "[Kangaroo Island], Scrub near Wallans Hut, no date, *F. Waterhouse s.n.*" As an extension of the lectotypification, the two taller stems on the right are associated here with the Cygnet Bay label.

Endemic to Kangaroo Island. Flowering September-December.



South Australian
Seed Conservation Centre

Figure 1. *Vicinia ciliata*. Top: Victoria. Flora of Victoria website. Bottom: South Australia. Seeds of South Australia website.



Figure 2. *Vicinia ciliata*.



Figure 3. *Vicinia ciliata*. Victoria. Photos by Geoff Carle (top), Annabel Carle (bottom). Flora of Victoria website.



Figure 4. *Vicinia ciliata*. Victoria. Photo by Lorraine Jansen, Flora of Victoria website. "Eriotriche" hairs on the peduncle.



Figure 5. *Vicinia ciliata*. Top: Seeds of South Australia website. Bottom: South Australia. Photo by Reiner Richter, iNaturalist.



Figure 6. *Vicinia ciliata*. South Australia. Detail from holotype of *Olearia ciliata* var. *hispida* (MEL).



Figure 7. *Vicinia ciliata*. Left, old terminal heads overtopped by heads from new growth. Right, details of leaves from the same plant. "S.W. Australia." Mueller 136 (PH).



Figure 8. *Vicinia ciliata*. Victoria. Photo by Loraine Jansen, Flora of Victoria website.



Figure 9. *Vicinia ciliata*. Western Australia. Cowan A527 (US).



Figure 10. *Vicinia ciliata*. Victoria. Muir 935 (US).



Figure 11. *Vicinia squamifolia*. Seeds of South Australia website.



Figure 12. *Vicinia squamifolia*. Seeds of South Australia website.



Figure 13. *Vicinia squamifolia*. Kangaroo Island. Syntype of *Aster huegelii* var. *squamifolius* (MEL 1543685).

WOLLEMIASTER Nesom, **gen. nov.** **TYPE:** *Wollemiaster cordatus* (Lander) Nesom

Distinct in its shrubby habit, densely stipitate-glandular vestiture, epetiolate, narrowly oblong leaves with an ampliate base, and few, solitary heads terminal and axillary on leafy branches.

Shrubs, aromatic; stems, peduncles, and leaf surfaces densely stipitate-glandular with biseriate hairs, with less conspicuous uniseriate, erect, eglandular hairs and appressed uniseriate hairs with a long, flexuous apical cell. **Stems** 1–2 m. **Leaves** alternate, linear-oblong to lanceolate-oblong, epetiolate, 2.5–4 cm long, 4–8 mm wide, base ampliate and subclasping, midvein impressed (sulcate) adaxially, raised abaxially, margins entire, revolute. **Heads** solitary and few, terminal and axillary on leafy branches. **Involucres** campanulate, 8–9 mm wide (pressed); phyllaries 3–4-seriate, graduate in length, lanceolate, longest 4.5–5.5 mm, scarious with a green midregion, stipitate-glandular, apex acuminate. **Ray flowers** 12–18, ligules white to pale blue or violet, ca. 12 mm long, coiling at maturity. **Disc flowers** bisexual, fertile, corollas 4–5 mm long, yellow. **Achenes** oblong, compressed, ca. 2.5 mm long, 6-ribbed, strigose, eglandular; pappus uniseriate, of 35–40 barbellate bristles 1–3.5 mm long, about 3/4 as long as the disc corolla tube and limb.

1. **Wollemiaster cordatus** (Lander) Nesom, **comb. nov.** *Olearia cordata* Lander, *Telopea* 1: 84. 1975.

TYPE: New South Wales. 0.5 mi above Wisemans Ferry on road to Maroota, near road notice "Trucks use low gear," Mar 1973, P. Matthew NSW128087 (holotype: NSW not seen; isotype: K image, Fig. 1).

New South Wales. "Most known populations occur within conservation reserves (Wollemi National Park, Yengo National Park, and Wisemans Ferry Historic Site)" (New South Wales Office of Environment & Heritage). Flowering mostly February-June, less commonly throughout the year.

Wollemiaster cordatus has "Eriotriche hairs" and the general habit of linear-leaved species of sect. *Eriotriche*, where it is most similar in habit to the *O. tenuifolia* group, but the dense, stipitate-glandular vestiture is not known among those species or elsewhere. In the molecular analysis of Cross et al. (2002), a strict consensus tree (their Fig. 1) shows *Olearia cordata* as sister to *Minuria integerrima*. In a consensus tree with a reduced number of Celmsiinae species (their Fig. 3), *O. cordata* is sister to *O. ciliata* and "clade A."



Figure 1. *Wollemiaster cordatus*. Detail from K isotype (Fig. 2).



Figure 2. *Wollemiaster cordatus*. New South Wales. K isotype.



Figure 3. *Wollemiaster cordatus*. New South Wales. Earth.com, no attribution of photographer,

EOGLANDULA Nesom, **gen. nov.** **TYPE:** *Eoglandula glandulosa* (Labill.) Nesom

Distinct in its slender, glabrous, sessile-glandular stems, linear leaves with nodular-glandular swellings along the margins, and small heads in corymbs or panicles.

Shrubs (short-lived?) or **subshrubs**. **Stems** 1–2.5 or 0.4–0.7 m, sessile-glandular; internodes 2–5 mm long; in *E. glandulosa*—axillary buds apparently absent, leaf axils (lower half of stem) producing cluster of small leaves or (upper half) branches bearing an inflorescence. **Leaves** alternate (spiral), blades linear, epetiolate, 5–55 mm long, 1–2 mm wide, glabrous, resinous, venation indistinct, apex acute, margins with prominent nodular-glandular swellings. **Heads** in terminal corymbs, ultimate peduncles 3–15(–20) mm long. **Involucres** shallowly campanulate-cylindric, 3–4 mm wide (pressed); phyllaries lanceolate-elliptic to elliptic-lanceolate, thick-herbaceous, (2–)3–4 seriate, graduate in length, longest 1.8–2.4 mm long; receptacles shallowly convex, alveolate. **Ray flowers** fertile, 8–25, ligules 4–9 mm long, white or pale blue, tightly coiling at maturity. **Disc flowers** bisexual, fertile, corollas yellow, 2.5–2.8 mm long, tube gradually broadening into the limb, lobes narrowly triangular, recurving-coiling. **Achenes** elliptic to oblanceolate-elliptic, 1.2–1.8 mm long, slightly to strongly compressed, 3–5-ribbed, sparsely short-strigose with Zwillingshaare (paired cells divergent at the apex in *E. glandulosa*?) or densely strigose-sericeous, eglandular; pappus 1-seriate, of 35–54 barbellate bristles 2–2.5 mm long, apices clavate (*E. glandulosa*) or acute (*E. suffruticosa*).

In the molecular analysis of Cross et al. (2002), a strict consensus tree (their Fig. 1) places *Olearia glandulosa* in an unresolved position among taxa of Brachyscominae. Another consensus tree (their Fig. 3, after reduction of taxa of Celmisiinae) places it as basal to subtr. Brachyscominae. *Olearia suffruticosa* is remarkably different from *O. glandulosa* in growth form, but even the habit of *O. glandulosa* is unusual, with its long, slender, proximally unbranched stems. An unambiguous characterization of the above-ground duration of the latter has not been published. The glandularity of the two species is so distinct, however, otherwise unknown in Brachyscominae, that a sister relationship is highly probable.

1. Shrubs; stems 1–2.5 m tall; leaves 5–55 mm long; heads in distinct corymbs, on bracteate peduncles; achenes sparsely strigose **Eoglandula glandulosa**

1. Subshrubs; stems 0.4–0.7 m tall; leaves mostly 1.5–6(–14) mm long; heads in panicles, on leafy, peduncular branches; achenes densely strigose-sericeous **Eoglandula suffruticosa**

1. Eoglandula glandulosa (Labill.) Nesom, **comb. nov.** *Aster glandulosus* Labill., Nov. Holl. Pl. 2: 50, t. 197. 1806. *Galatella glandulosa* (Labill.) Nees, Gen. Sp. Ast., 174. 1832. *Eurybia glandulosa* (Labill.) DC., Prodr. 5: 269. 1836. *Shawia glandulosa* (Labill.) Sch.Bip., Jahresb. Pollichia 18/19: 173. 1861. *Olearia glandulosa* (Labill.) Benth., Fl. Austral. 3: 454. 1867. **TYPE: Tasmania.** **Protologue:** "In capite Van-Diemen," *J.J.H. Labillardière s.n.* (holotype: FI 6203 image; isotypes: FI image, G-2 sheets-images, P image).

Australian Capital Territory, New South Wales, South Australia, Tasmania, Victoria. Flowering October–April.

2. Eoglandula suffruticosa (D.A. Cooke) Nesom, **comb. nov.** *Olearia suffruticosa* D.A. Cooke, J. Adelaide Bot. Gard. 7: 279. 1985. **TYPE: South Australia.** Bool Lagoon, Hundred of Robertson, ca. 25 km S of Naracoorte, 7 Apr 1963, *D. Hunt 1545* (holotype: AD image, Fig. 9). Southeastern South Australia, southwestern Victoria. Flowering March–May.

Cooke (1985, p. 279) noted that "This species is closely related to *Olearia glandulosa* but is readily distinguished by the subshrubby habit, loose leafy inflorescence, and larger capitula. The two species are sympatric and occur in similar habitats, but no transitional specimens have been seen and they have distinct flowering periods"



Figure 1. *Eoglandula glandulosa*. Victoria, Macedon Ranges. Photo by Russell Best, Atlas of Living Australia website <ala.org.au/species>.



Figure 2. *Eoglandula glandulosa*. New South Wales. Wilson 561 (US).



Figure 3. *Eoglandula glandulosa*. Photo by David Francis, Wikimedia Commons.



Figure 4. *Eoglandula glandulosa*. Details from FI isotype.



Figure 5. *Eoglandula glandulosa*. Australian Capital Territory, Namadgi National Park. Canberra Nature Map website. <<https://canberra.naturemapr.org/>>



Figure 6. *Eoglandula glandulosa*. Details from FI isotype.



Figure 7. *Eoglandula glandulosa*. New South Wales. Photo by Andrew Ome, New South Wales Flora Online-PlantNET.



Figure 8. *Eoglandula glandulosa*. South Australia. Seeds of South Australia, South Australian Seed Conservation Centre, Botanic Gardens of South Australia.

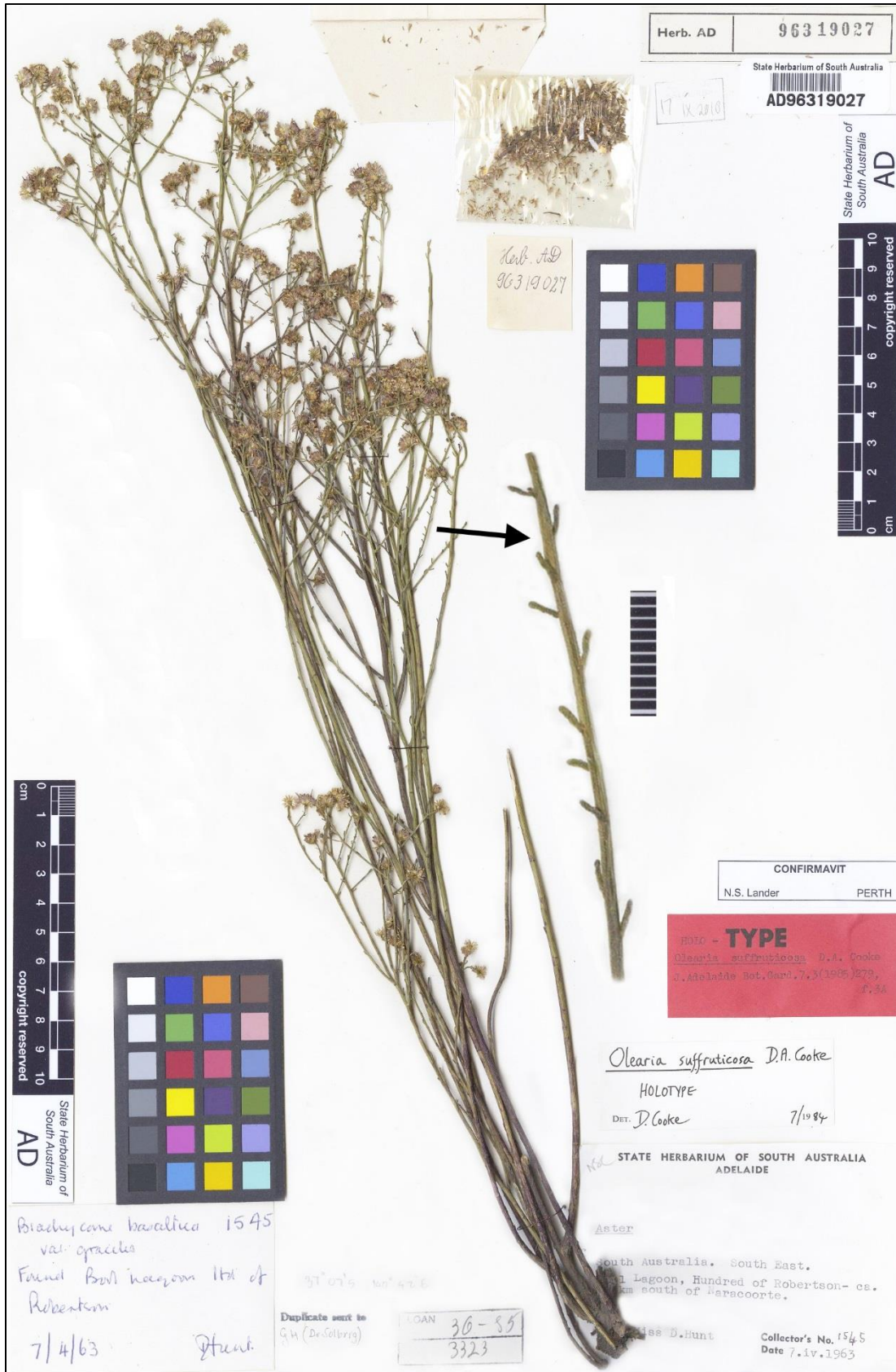


Figure 9. *Olearia suffruticosa*. Holotype (AD).



Figure 10. *Eoglandula suffruticosa*. Details from the holotype.



Figure 11. *Eoglandula suffruticosa*. South Australia. Seeds of South Australia website.



Figure 12. *Eoglandula suffruticosa*. South Australia. Seeds of South Australia website.



Figure 13. *Eoglandula suffruticosa*. South Australia. Seeds of South Australia website.



Figure 14. *Eoglandula suffruticosa*. Royal Botanic Gardens Melbourne. Photo by Melburnian, Wikipedia.



Figure 15. *Eoglandula suffruticosa*. South Australia. Seeds of South Australia website.

LINEALIA Nesom, **gen. nov.** TYPE: *Linealia flocktoniae* (Maiden & Betche) Nesom

Distinctive in its tall habit with stems mostly unbranched up to near the inflorescence, short duration and lack of secondary growth, eglandular vestiture, linear leaves on short internodes with dense axillary clusters of slightly smaller ones, heads in terminal corymbs, and relatively small achenes.

Short-lived perennial herbs, evergreen, living up to 4-5 years, probably taprooted (see below). **Stems** 1–2.5 m high, green, without secondary growth or axillary buds, single or much-branched from the base, mostly unbranched up to the inflorescence, internodes 2–15 mm long, sparsely and minutely puberulent with crisped, eglandular hairs, eglandular. **Leaves** linear, epetiolate, crowded, alternate (spiral) and with clusters of leaves from axils, 2–9 cm long, 1–5 mm wide, apex acute, margins strongly revolute, entire, abaxial venation pinnate, surfaces sparsely and finely pubescent, glabrescent, eglandular. **Heads** in terminal corymbs; ultimate peduncles 15–40(–50) mm long. **Involucres** short-cylindric, 4–5 mm high, 7–8.5 mm wide (pressed); phyllaries green-herbaceous, thickened, linear-lanceolate, apices acute-acuminate, in 2–3 series, inner of ca. equal length, outer about about half the length of the inner; receptacles shallowly convex, shallowly foveolate. **Ray flowers** 30–48 in 1(–2) series, ligules ca. 6–8 mm long, white to light violet, coiling at maturity. **Disc flowers** bisexual, fertile, corollas yellow, 4.5–5 mm long, tube nearly filiform, ca. half the length of the corolla, abruptly broadening into the cylindric limb, 5-lobed, lobes triangular, spreading. **Achenes** elliptic-oblong, 1.8–2 mm long, compressed, ca. 6–8-nerved, strigose-sericeous, eglandular; pappus 1-seriate, of 36–50 persistent, apically acute barbellate bristles equalling the disc corolla length.

Linealia flocktoniae (Maiden & Betche) Nesom, **comb. nov.** *Olearia flocktoniae* Maiden & Betche, Proc. Linn. Soc. NSW 34: 361. 1909. TYPE: AUSTRALIA. New South Wales. Dorrigo, Mar 1909, J.L. Boorman s.n. (holotype: NSW 179624; isotypes: MEL image, NSW-2 sheets, PERTH). Holotype fide Australasian Virtual Herbarium.

In the molecular-phylogenetic analysis of Cross et al. (2002), a consensus tree (their Fig. 1) places *Olearia flocktoniae* in an unresolved position among taxa of subtr. Brachyscominae. A second consensus tree (their Fig. 3, with reduction of species in Celmisiinae) places it as most closely related to *Kippistia suaedifolia*, *Minuria cunninghamii*, and *Minuria* sp., this group in turn as sister to *Tetramolopium alinae*, *Peripleura bicolor*, and *Vittadinia*. *Linealia* resembles *Eoglandula* and some species of "clade A" sect. *Eriotriche* in its linear, congested leaves and corymboid inflorescence.

These plants have been characterized as "shrubs," "short-lived shrubs," "non-woody shrubs," and "short-lived, semi-herbaceous shrubs" — their habit is difficult to categorize. Maiden and Betche (1909) noted in the protologue that "The collector asserts that it is an annual," the rationale unstated but presumably because (at least in part) of the green stems and apparent lack of secondary growth. The plants are evergreen but without secondary growth and plants have not been observed to live more than four or five years. They reach reproductive maturity in the second year, growing taller and flowering more abundantly with addition of inflorescence branches in the 3rd and 4th years (Gross & Mackay 2014).

Below-ground parts of *Linealia* apparently have not been characterized, but *Kippistia suaedifolia* (subshrubs) and *Minuria cunninghamia* (perennial herbs) are taprooted and it is plausible that *Linealia* is also.

Linealia plants grow adjacent to wet sclerophyll forest and warm-temperate rainforest, but even so the flowering period apparently is constrained to the five months from January to May, perhaps reflecting ancestry from a less equable climate (NSW DEC 2004). They grow only in disturbed sites (roadsides, openings, clearings) and competition with other species hastens their demise.



Figure 1. *Linealia flocktoniae*. New South Wales. Photo by Shane Ruming, New South Wales Office of Environment & Heritage, Threatened Species.

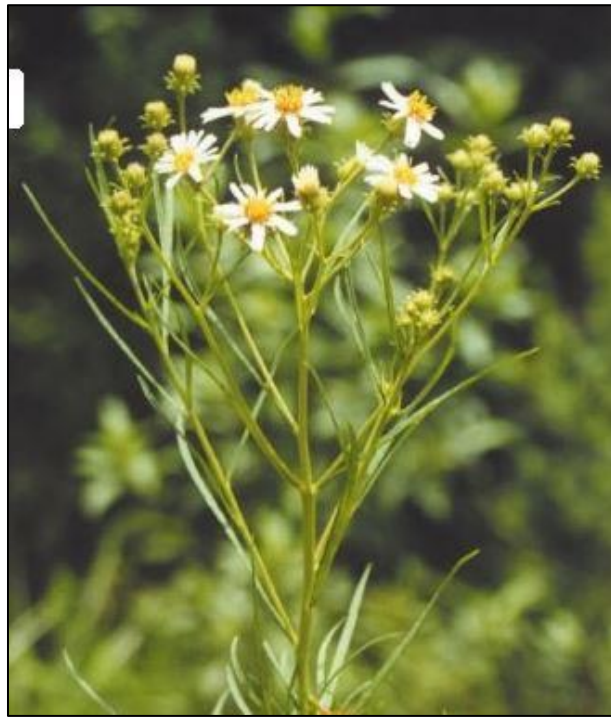


Figure 2. *Linealia flocktoniae*. New South Wales. New South Wales Office of Environment & Heritage, Threatened Species. Top: Photo by Shane Ruming. Bottom: Photo by Peter Richards.



National Herbarium of Victoria (MEL)
 ISOTYPE
Linealia flocktoniae Maiden & Betche (as 'Flocktonae') MELISR
 Determinavit: A. Messina 7. III. 2017



SYNTYPE
MELISR
Linealia flocktoniae Maiden & E. Betche (as 'Flocktonae')
 Proceedings of the Linnean Society of New South Wales
 34: 363 (Sept. 1909)
 Det. N.S. Lander, 21 November 2014
 Western Australian Herbarium (PERTH)

TYPE
 NATIONAL HERBARIUM OF VICTORIA (MEL), AUSTRALIA

MEL 624832

NATIONAL HERBARIUM OF NEW SOUTH WALES,
 BOTANIC GARDENS, SYDNEY.
Linealia Flocktonae Maiden & Betche.
 Loc. *Sorriso* N.S.W.
 Coll. *J. de Boorman* Date *3. 1909.*

I am rather uneasy about this species. It has the habit of an American Aster, but the collector assures us that the locality he found it in excludes the idea of an introduced species, and we could not identify it with any native species.
E. Betche



Figure 4. *Linealia flocktoniae*. Detail from isotype (MEL).



Figure 5. *Linealia flocktoniae*. Details from isotype (MEL).



Figure 6. *Linealia flocktoniae*. Details of stems, leaves, and nodes from isotype (MEL).

EPHEDRIDES Nesom, **gen. nov.** TYPE: *Ephedrides trifurcata* (Lander) Nesom

Distinct in its low, subshrubby habit with spreading woody rhizomes or underground caudex branches, glabrous-viscid vestiture, opposite branching, bracteate leaves, and solitary, few-flowered heads.

Subshrubs, tussock-like or in patches, from woody rhizomes or underground caudex branches; vegetative surfaces pustulate and viscid but otherwise glabrous. **Stems** mostly 20–30 cm, branches opposite, rarely with secondary branches, without secondary growth. **Leaves** opposite, all cauline, bracteate, indurate and brownish, deltate to triangular or oblong-triangular, 1–5.5(–8, fide protologue) mm long, margins entire. **Heads** solitary, terminal. **Involucres** narrowly ovoid, 2.5–3.8 mm wide (pressed); phyllaries ca. 3-seriate, elliptic-ovate to elliptic, graduate in length, longest 5–6 mm, indurate-stramineous with a darker, slightly keeled midline, margins membranous; receptacle shallowly convex. **Ray florets** 2–4, ligules 4.5–5 mm long, white. **Disc florets** bisexual, fertile, 3, corollas 5–5.7 mm long, white to cream, lobes narrowly triangular, reflexing. **Achenes** obovoid, 1.7–2.3 mm long, sericeous with duplex hairs; pappus uniseriate, of 40–52 barbellate bristles more or less equal in length to the disc corollas.

Ephedrides trifurcata (Lander) Nesom, **comb. nov.** *Olearia trifurcata* Lander, Nuytsia 18: 101. 2009.

TYPE: Western Australia. Ca. 1 km SE of Kau Rock, ca. 60 km NE of Esperance, 33° 24' 35", 122° 19' 53", margin of playa lake, *Stipa* sp. zone with *Eucalyptus* sp. and *Melaleuca* spp., occupies ca. 4–5 hectares, 3 Jan 1990, W.R. Archer *s.n.* (holotype: PERTH image, Fig. 1; isotypes: AD, CHR, K, MEL).

South-central Western Australia, mostly at margins of playa lakes and saline drainages. Flowering November–March.

These plants are highly unusual in growth habit and morphology. Small, white-flowered heads apparently have evolved independently in several olearioid lineages. The species has not been included in molecular sampling.



Figure 1. *Ephedrides trifurcata*. Photos by W.R Archer, FloraBase, the Western Australia Flora.



Figure 2. *Ephedrides trifurcata*. Western Australia. Holotype (PERTH).