

## NEW GENERA AND SPECIES OF AUSTRALIAN INULEAE (ASTERACEAE)

by

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### ABSTRACT

Short, P. S. New genera and species of Australian Inuleae (Asteraceae). *Muelleria* 7(1): 103–116 (1989). — Five new genera, *Dielitzia* Short, *Feldstonia* Short, *Fitzwillia* Short, *Lemooria* Short and *Sondottia* Short are described. All but *Sondottia* are monotypic. A new species of *Dithyrostegia* A. Gray is described. New species and new combinations are: *Dielitzia tysonii* Short, *Dithyrostegia gracilis* Short, *Feldstonia nitens* Short, *Fitzwillia axilliflora* (W.V. Fitzg. ex Ewart & J. White) Short, *Lemooria burkittii* (Benth.) Short, *Sondottia connata* (W.V. Fitzg.) Short and *S. glabrata* Short.

### INTRODUCTION

In a revision of *Angianthus* Wendl. (*sensu* Bentham 1867) I (Short 1983) excluded three species from *Angianthus s. str.*, viz. *A. axilliflorus* W.V. Fitzg. ex Ewart & J. White, *A. connatus* W.V. Fitzg. and *A. burkittii* (Benth.) J.M. Black. At the time I suggested that they may represent monotypic genera or have affinities with other genera which had not been examined. Subsequent investigations have failed to reveal such affinities. Thus, in this paper, each is formally referred to a new genus. Several further taxa, of which I have known for some years, are also described.

Collections from all major Australian herbaria have been examined.

### TAXONOMY

#### *Dielitzia* Short, gen. nov.

*Herba annua*, caespitosa, glomerulis foliis circumcinctis; glomeruli sessiles vel in axibus brevibus, tomentosus majores. *Folia* sessilia, integra, infima opposita, superne alterna, sublinearia, tomentosa. *Glomeruli* late ellipsoidei usque oblatis; bracteae glomerulos subtendentes involucrium conspicuum glomerulis aequilongum facientes, cartilagineae; receptaculum cupulatum, nudum. *Capitula* c. 4–15. *Bracteae intra capitulum* biseritatae; bracteae exteriores 1–4, setaceae, longo-plumosae; bracteae interiores (2)3–4, hyalinae, marmoratae, apicibus pilis rectis subrigidis praeditis. *Flosculi* 1 in quoque capitulo, tubulare, hermaphroditi. *Corolla* 4 vel 5-lobata. *Styli* rami truncati, apicibus papillatis. *Stamina* 4 vel 5; antherae ad basim caudatae, ad apicem appendicibus sterilibus. *Cypselae* subobovoidae, papillatae; carpodium absens. *Pappus* setaceus.

*Typus*: *D. tysonii* Short

*Annual herb*, tufted, of 1–20 compound heads surrounded by leaves, the compound heads sessile or terminating short, tomentose major axes. *Leaves* sessile, entire,  $\pm$  linear, at least the lowermost opposite, the upper alternate, tomentose. *Compound heads* broadly ellipsoid to obloid; bracts subtending the compound heads forming a conspicuous involucre the length of the head, the bracts mainly cartilaginous. *General receptacle* cup-like, naked. *Capitula* c. 4–15 per compound head. *Capitular* bracts in 2 rows; outer bracts 1–4, bristle-like, long-plumose; inner bracts (2)3–4,  $\pm$  hyaline, with brown or blackish marbling, apices with straight,  $\pm$  rigid hairs  $\frac{2}{5}$ – $\frac{1}{2}$  the total length of the bracts. *Florets* 1 per capitulum, bisexual. *Corolla* 4 or 5 lobed. *Style* branches truncate; apices papillate. *Stamens* 4 or 5; anthers caudate, each with a sterile apical appendage; filament collar straight in outline and not thicker than the filament. *Cypselas*  $\pm$  obovoid, minutely papillate; carpodium absent. *Pappus* setaceus.

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## DISTRIBUTION (Fig. 1):

Monotypic. Restricted to inland Western Australia between latitudes *c.* 24° S. and 29° S. and longitudes *c.* 115° E. and 123° E.

## ETYMOLOGY:

The generic name is an anagram derived from the surnames and commemorating botanists F. L. E. Diels (1874–1945) and E. G. Pritzel (1875–1946).

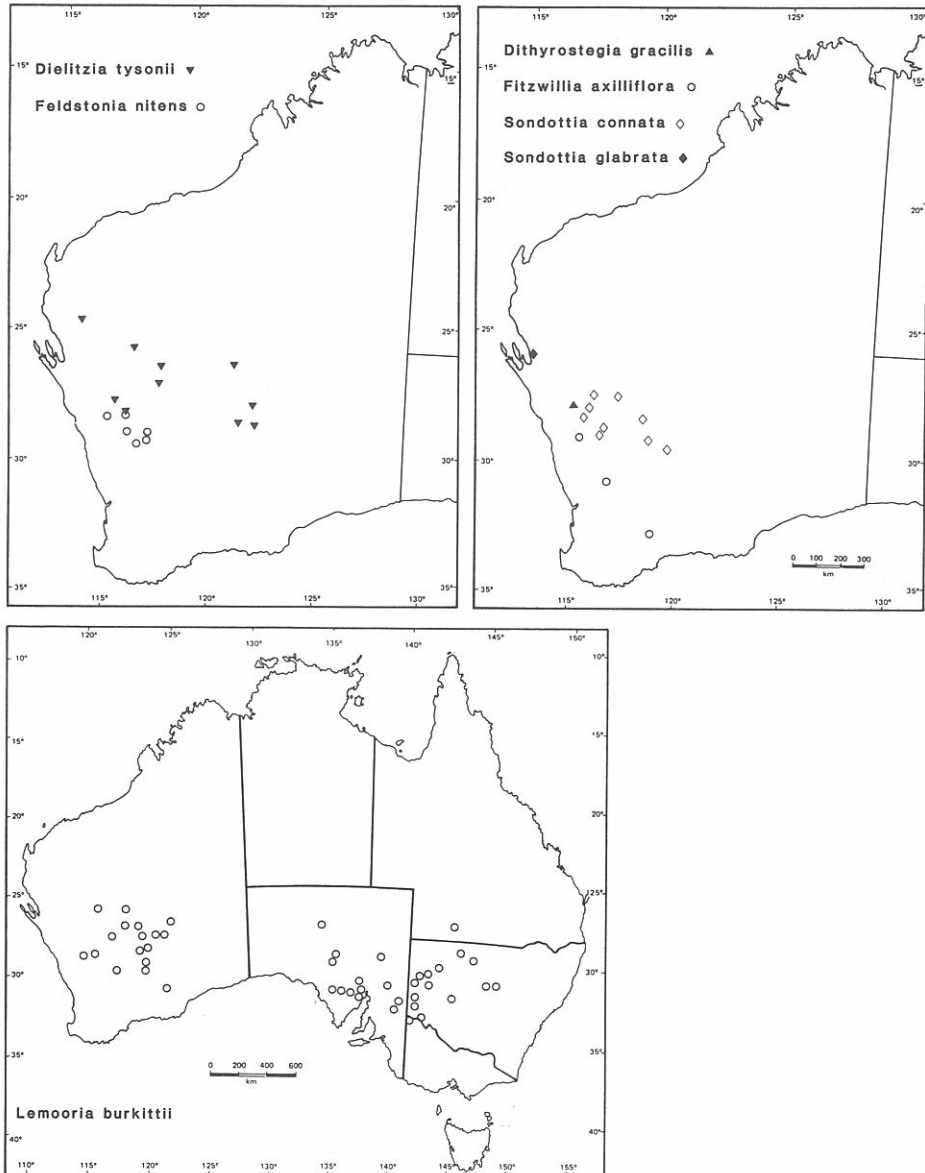


Fig. 1. Distribution of *Dielitzia tysonii*, *Feldstonia nitens*, *Dithyrostegia gracilis*, *Fitzwillia axilliflora*, *Sondottia connata*, *S. glabrata* and *Lemooria burkittii*.

## NOTES:

With the exception of *Isoetopsis* the habit alone readily distinguishes this taxon from all other Australian Asteraceae. The cartilaginous bracts of the general involucre, the cup-like general receptacle and the structure of the capitular bracts (particularly the marbled, inner bracts) are features unique to the genus.

Although the general receptacle is described as being glabrous the bristle-like bracts deemed to be the outer capitular bracts could possibly be interpreted as receptacular bracts.

The marbling of the inner bracts is best observed in spirit collections. In herbarium specimens bracts may appear to be more or less uniform in colour.

***Dielitzia tysonii* Short, sp. nov.**

*Herba annua*, caespitosa, glomerulis 1–20, ab foliis circumcinctis, sessilibus vel in axibus majoribus usque ad 1.5 cm longibus. *Folia* sublinearia, c. 1–8 cm longa, 0.08–0.15 cm lata, ad basim dilatatae, submucronatae, semisucculentae, tomentosae. *Glomeruli* late ellipsoidei usque obloidei, 4–6 mm longi, 3–7 mm diametro; bractae glomerulos subtendentes c. 8–12, praecipue cartilagineae sed apicibus hyalinis. *Capitula* c. 4–15. *Bracteae intra capitulum* longitudine c.  $\frac{2}{3}$ – $\frac{3}{4}$  flosculi aequanti. *Flosculi* 1 in quoque capitulo. *Stamina* 4 vel 5; antherae 0.53–0.64 mm longae; microsporangia 0.35–0.48 mm longa; appendices apicales 0.35–0.48 mm longae; pollinis grana in quaque anthera 28–88. *Cypselae* subobovoidea, 1–1.3 mm longae, 0.5–0.6 mm diametro. *Setae pappi* c. 10, barbellatae, ad bases conjunctae, longitudine c.  $\frac{1}{3}$ – $\frac{1}{2}$  corollae aequanti. (Fig. 2).

**HOLOTYPE:** Western Australia, 17.2 km NE. of Nallan on Yarrabubba road, 23.viii.1986, *Lander 1389, Fuhrer & Short* (MEL 1556923). **ISOTYPE:** AD, CANB, K, PERTH, S.

*Annual herb*, tufted, of 1–20 compound heads surrounded by leaves, the compound heads  $\pm$  sessile or on major axes to 1.5 cm long. *Leaves*  $\pm$  linear, c. 1–8 cm long, 0.08–0.15 cm wide, expanded at the base,  $\pm$  mucronate, semisucculent, tomentose. *Compound heads* broadly ellipsoid to obloid, 4–6 mm long, 3–7 mm diam.; bracts subtending compound heads c. 8–12, mainly cartilaginous but with hyaline apices. *Capitula* c. 4–15 per compound head. *Capitular bracts* c.  $\frac{2}{3}$ – $\frac{3}{4}$  the length of the florets. *Florets* 1 per capitulum. *Stamens* 4 or 5; anthers 0.53–0.64 mm long; microsporangia 0.35–0.48 mm long; apical appendages 0.16–0.25 mm long; pollen grains 28–88 per anther. *Cypselas*  $\pm$  obovoid, 1–1.3 mm long, 0.5–0.6 mm diam. *Pappus* bristles c. 10, barbellate, of unequal length, fused at the base, c.  $\frac{1}{3}$ – $\frac{1}{2}$  the length of the corolla.

**DISTRIBUTION** (Fig. 1):

See generic treatment.

**ECOLOGY & REPRODUCTIVE BIOLOGY:**

Habitat notes suggest a preference for sandy loam to clay soil. Collectors' notes include: 'Growing in open *Acacia* shrubland. Brown sandy loam with gravel. With an array of ephemeral composites including *Gnephosis burkittii*, *Podolepis*, *Cephalopterum drummondii*, *Isoetopsis graminifolia*, *Brachyscome* & *Calotis*', 'Open *Acacia/Cassia* scrub. Sandy loam covered with ironstone gravel' and 'Growing on saline clay flat'.

Pollen: ovule ratios were determined for 15 plants from *Short 1519*. The values obtained (range = 204–408;  $\bar{x}$  = 329.7; S.D. = 56.7; S.E. $\bar{x}$  = 14.64) indicate a high degree of self-pollination (Short 1981).

**ETYMOLOGY:**

The specific epithet commemorates Isaac Tyson, a pastoralist who collected the plant in 1893.

## NOTES:

*Dielitzia tysonii* has a marked resemblance in habit to *Isoetopsis graminifolia* Turcz. It is readily distinguished in the field from the latter by its hairy, not glabrous, leaves.

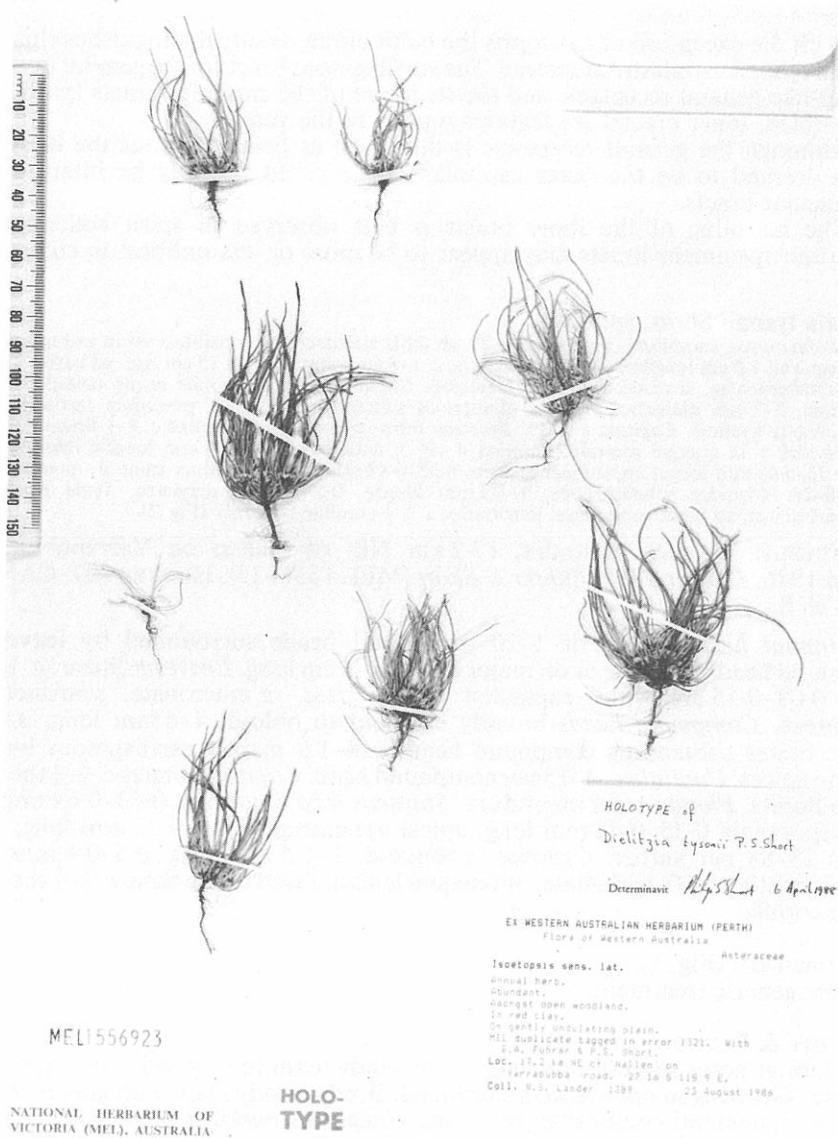


Fig. 2. Holotype sheet of *Dielitzia tysonii*.

**SELECTED SPECIMENS EXAMINED (Total 10):**

*Western Australia* — Kennedy Range, 21.viii.1986, *Lander 1368* (MEL, PERTH); c. 39 km from Leonora along road to Laverton, 20.viii.1982, *Short 1519* (MEL); Mt Gould, 22.viii.1986, *Short 2552* (MEL, PERTH); 16 km E. of Yalgoo, 15.ix.1973, *Wilson 4149* (PERTH).

***Dithyrostegia* A. Gray**

For a description of this now ditypic genus see Short (1983, p. 201).

***Dithyrostegia gracilis* Short, sp. nov.**

*Herba annua. Axes majores erecti, glabri, ramificatione dichotoma. Folia sessilia, sublinearia vel lanceolata, 2–9 mm longa, 0.4–2 mm lata, amplexicaules; paginae exteriores glabrae, interiores sparsim glandulosae. Gomeruli 3.5–4.5 mm longi, 2.5–3.5 mm diametro; bractee glomerulosae.*

subtendentes 2, in dimidio inferiore connatae, glabra. *Capitula* 6–20. *Bractae intra capitulum* 1, hyalinae, integrae. *Florsculi* 1 in quoque capitulo. *Corolla* 5-lobata. *Stamina* 5; antherae 1.3–1.5 mm longae; microsporangia 0.96–1.1 mm longa; appendices apicales 0.34–0.38 longae. *Cypselae* subovoideae, c. 1.3–1.5 mm longae, c. 0.6 mm diametro; carpodium absens. *Setae pappi* laeves, ad basim conjunctae, longitudine c.  $\frac{1}{2}$  corollae tubi aequanti. (Fig. 3).

**HOLOTYPUS:** Western Australia, Yuin Station, 2.ix.1975, *Evans s.n.* (PERTH).

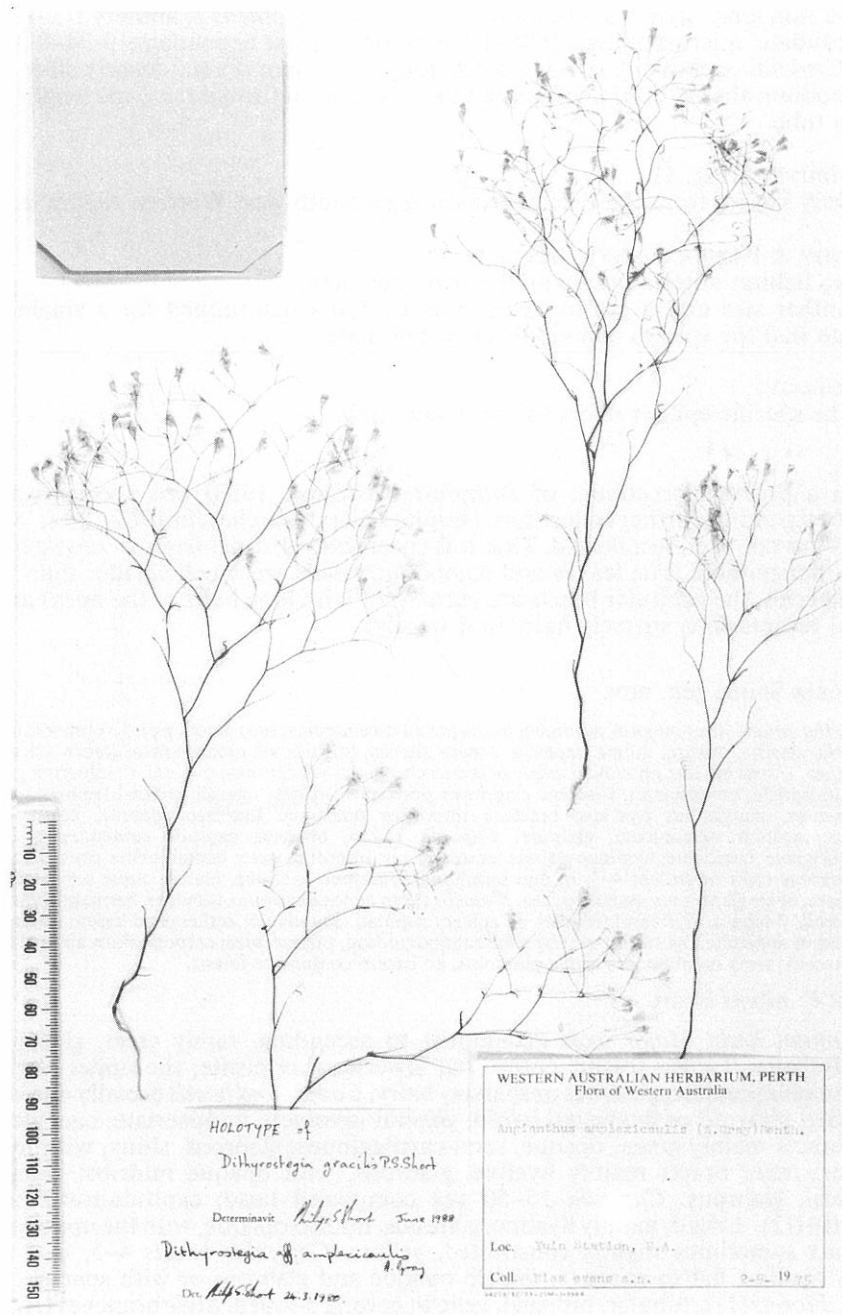


Fig. 3. Holotype sheet of *Dithyrostegia gracilis*.

*Annual herb*, to c. 25 cm high. *Major axes* erect, glabrous; branching dichotomous. *Leaves* sessile,  $\pm$  linear or lanceolate, 2–9 mm long, 0.4–2 mm wide, stem-clasping, outer surfaces glabrous, inner surfaces sparsely glandular. *Compound heads* 3.5–4.5 mm long, 2.5–3.5 mm diam.; bracts subtending compound heads 2, connate in c. the lower  $\frac{1}{2}$ , glabrous; general receptacle beset with long hairs. *Capitula* 6–20 per compound head. *Capitular bracts* 1, hyaline, enveloping the fruit and the lower  $\frac{1}{2}$  of the corolla tube, entire. *Florets* 1 per capitulum; corolla 5-lobed, corolla tube c. 1.5–2 mm long. *Style* branches truncate, papillate. *Stamens* 5; anthers 1.3–1.5 mm long, caudate; microsporangia 0.96–1.1 mm long; apical appendages 0.34–0.38 mm long. *Cypselas*  $\pm$  obovoid, c. 1.3–1.5 mm long, c. 0.6 mm diam., densely silky hairy, carpodium absent. *Pappus* of smooth bristles fused at the base, c.  $\frac{1}{6}$  the length of the corolla tube.

#### DISTRIBUTION (Fig. 1):

Only known from the type collection from south-west Western Australia.

#### ECOLOGY & REPRODUCTIVE BIOLOGY:

No habitat notes accompany the type specimen.

Anther size and a pollen:ovule ratio of 5,464 determined for a single floret indicate that the species commonly cross-pollinates.

#### ETYMOLOGY:

The specific epithet refers to the slender habit.

#### NOTES:

In a previous treatment of *Dithyrostegia* (Short 1983) this species was not described pending further collections. Despite several searches (in 1982, '83 & '86) the species has not been recollected. That it is specifically distinct from *D. amplexicaulis* seems indisputable. The leaves and compound heads are much smaller than in the latter species, the capitular bracts are entire (not with long hairs at the apex) and the general receptacle is sparsely hairy (not woolly).

#### Feldstonia Short, gen. nov.

*Herba annua. Axes majores* decumbentes usque ad ascendentes, raro erecti, glabri vel sparsim pilosi. *Folia* sessilia, integra, infima opposita, supera alterna, linearia vel oblanceolata, glabra vel sparsim pilosa. *Glomeruli* late obovoidei usque depresso obovoidei; involucre generale multiseriale, conspicuum; bractee exteriores praecipue virides, opacae, subcartilagineae, glabrae, nitentes, marginibus hyalinis; bractee interiores praecipue hyalinae, glabrae, costis opacis; receptaculum subconicum, glabrum. *Capitula* 15–50; bractee capitula subtendentes (0)1(2), subrigidae, praecipue, hyalinae glabrae, costis opacis, interdum parte distali leviter constricta, lutea. *Bractee intra capitulum* 4–5, in duo serialibus, praecipue hyalinae, planae usque concavae, costa opaca, apice glabra vel sparsim pilosa. *Flosculi* (1)2 in quoque capitulo, tubulare, hermaphroditici, lutei. *Corolla* 5-lobata. *Styli* rami truncati, ad apicem papillati. *Stamina* 5; antherae ad basem caudatae, ad apicem appendicibus sterilibus. *Cypselae* subobovoideae, pubescentes; carpodium absens. *Pappus* setaceus, setas subplumosas usque plumosas, ad basem conjunctae ferens.

#### TYPUS: *F. nitens* Short

*Annual herb. Major axes* decumbent to ascending, rarely erect, glabrous or sparsely hairy. *Leaves* sessile, entire, the lowermost opposite, the upper alternate, linear or oblanceolate, glabrous or sparsely hairy. *Compound heads* broadly obovoid to depressed obovoid or depressed ovoid; general involucre multiseriate, conspicuous; outer bracts mainly green, opaque, semi-cartilaginous, glabrous, shiny, with hyaline margins; inner bracts mainly hyaline, glabrous, with opaque midribs; receptacle  $\pm$  conical, glabrous. *Capitula* 15–50 per compound head; capitulum-subtending bracts (0)1(2),  $\pm$  rigid, mainly hyaline, glabrous, midrib opaque, with the upper part of the bract sometimes slightly constricted, yellow. *Capitular bracts* 4–5, in 2 rows, mainly hyaline, flat to concave, midrib opaque and glabrous or with sparsely hairy apices. *Florets* (1)2, tubular, bisexual, yellow; corolla 5-lobed. *Style* branches truncate, apices papillate. *Stamens* 5; anthers caudate, each with a sterile apical appendage;

filament collar straight in outline and not thicker than the filament. *Cypselas*  $\pm$  obovoid, pubescent, carpopodium absent. *Pappus* setaceous, the bristles subplumose to plumose, united at the base.

**DISTRIBUTION** (Fig. 1):

Monotypic. Restricted to Western Australia between latitudes *c.* 28° S. and 30° S. and longitudes *c.* 116° E. and 118° E.

**ETYMOLOGY:**

The name *Feldstonia* is an anagram derived from the surname and commemorates Danish botanist C. E. H. Ostenfeld (1873–1931) who published several papers on Western Australian botany. Although an anagram it is regarded as a personal generic name and following Recommendation 20A of the ICBN is given the feminine gender.

**NOTES:**

A number of attributes, including the semicartilaginous bracts of the general involucre and the combination of features of the fruit, pappus and capitular bracts readily distinguish the genus from others of the Inuleae.

***Feldstonia nitens* Short, sp. nov.**

*Herba annua. Axes majores* 6–30 cm longi. *Folia* linearia vel suboblanceolata, interdum suprema ovata, 3–40 mm longa, 0.5–2.5 mm lata, submucronata, glabra vel sparsim pilosa. *Glomeruli* late obovoidei usque depresso obovoidei vel depresso ovoidei, 5–8 mm longi, 4–14 mm diametro. *Capitula* 15–50; bracteae capitula subtendentes ovatae usque lanceolatae, 3.4–4.8 mm longae, 1.2–1.5 mm latae. *Bractee intra capitulum* 3.8–4.1 mm longae, 1.1–1.4 mm latae. *Flosculi* (1)2. *Stamina* 5; antherae 1.6–1.9 mm longae, microsporangia 1.2–1.5 mm longa, appendices apicales 0.38–0.45 mm longae. *Cypselae* subobovoideae, 1.4–1.9 mm longae, 0.6–0.9 mm diametro. *Pappi* setae *c.* 10–15, subplumosae usque plumosae, ad basem conjunctae, longitudine *c.*  $\frac{1}{3}$  corollae tubi aequanti. (Fig. 4).

**HOLOTYPE:** Western Australia, 19.3 km from Yalgoo along the road to Paynes Find. *Acacia* scrub. Growing with an array of annuals including *Cephalopterum drummondii*, *Pogonolepis*, *Gnephosis* and *Myriocephalus*, 2.ix.1982, *Short 1615* (MEL 621021). **ISOTYP:** AD, BRI, CANB, E, GH, HO, K, NSW, PERTH, S.

*Annual herb. Major axes* 6–30 cm long. *Leaves* linear or  $\pm$  oblanceolate, the uppermost sometimes ovate, 3–40 mm long, 0.5–2.5 mm wide, mucronate, glabrous or sparsely hairy. *Compound heads* broadly obovoid to depressed obovoid or depressed ovoid, 5–8 mm long, 4–14 mm diam. *Capitula* 15–50 per compound head; capitulum-subtending bracts ovate to lanceolate, 3.4–4.8 mm long, 1.2–1.5 mm wide. *Capitular bracts* 3.8–4.1 mm long, 1.1–1.4 mm wide. *Florets* (1)2; corolla tube 2–2.7 mm long. *Stamens* 5; anthers 1.6–1.9 mm long; microsporangia 1.2–1.5 mm long; apical appendages 0.38–0.45 mm long. *Cypselas*  $\pm$  obovoid, 1.4–1.9 mm long, 0.6–0.9 mm diam. *Pappus* bristles *c.* 10–15, subplumose to plumose, bases united, *c.*  $\frac{1}{3}$  the length of the corolla tube.

**DISTRIBUTION** (Fig. 1):

See generic treatment.

**ECOLOGY & REPRODUCTIVE BIOLOGY:**

Collectors' habitat notes include: '*Acacia* scrub. Red-brown loam' and 'Mallee scrub (*Acacia* common). Reddish sandy loam'.

A pollen:ovule ratio of 4,460, determined from a single floret, indicates that the species commonly cross-pollinates.

**ETYMOLOGY:**

The specific epithet refers to the shiny bracts of the general involucre.

**SELECTED SPECIMENS EXAMINED (Total 14):**

*Western Australia* — 9 miles N. of Paynes Find, 23.x.1973, *Demarz 4674* (KP, PERTH); 20 km from



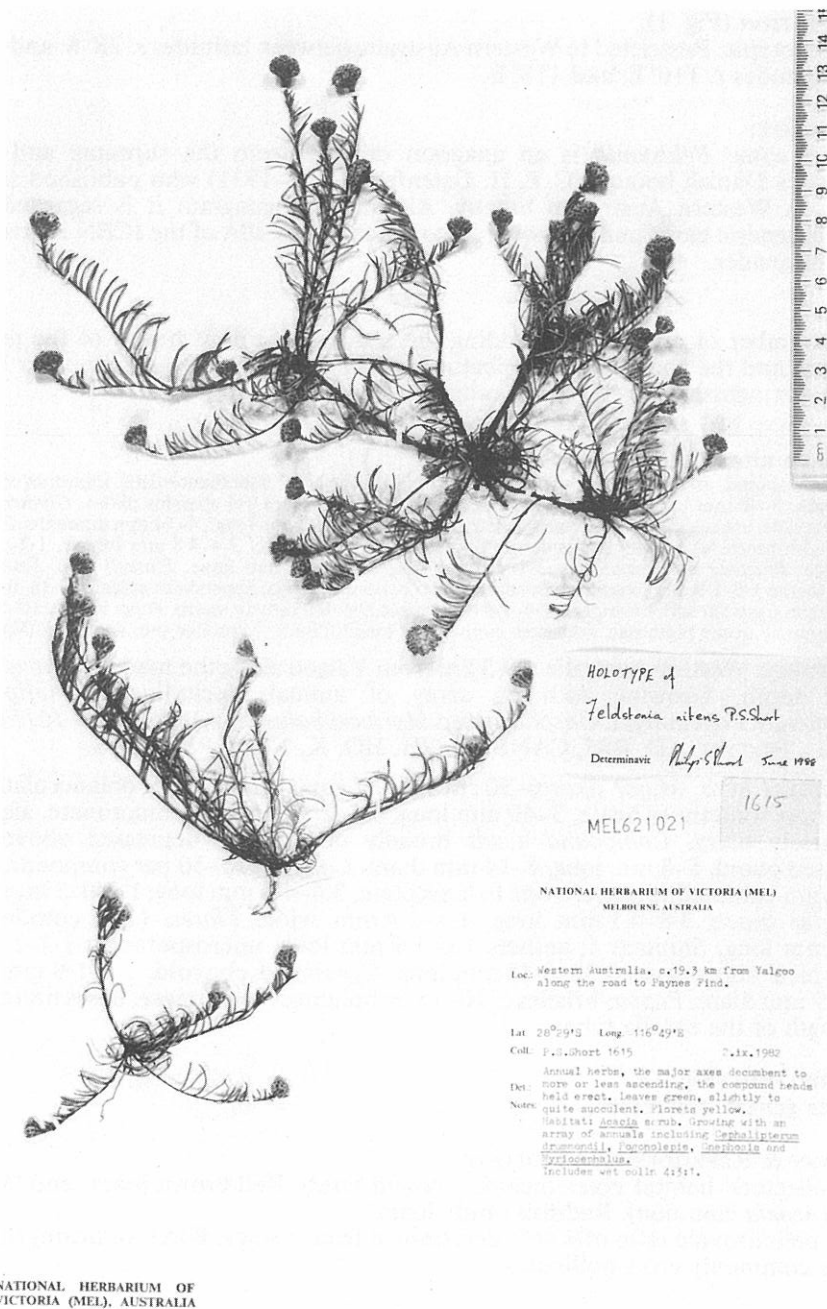


Fig. 4. Holotype sheet of *Feldstonia nitens*.



Yalgoo on Paynes Find road, 21.x.1983, *Short 2155* (MEL); 86 km NE. of Wubin, 29.ix.1986, *Wilson 12350* (MEL, PERTH).

**Fitzwillia Short, gen. nov.**

*Herba annua. Axes majores* ascendentes usque erecti, glabri, alis hyalinis; caulis simplex vel e nodis basalibus superioribusque ramificans. *Folia* opposita, sessilia, integra, semisucculenta, glabra, mucronata. *Glomeruli* perdepressa obovoidei usque obovoidei; involucre generale absens; receptaculum subintegrum. *Capitula* 5–10; bracteae intra capitulum 4(6), integrae, hyalinae, planae usque conduplicatae. *Flosculi* 1 vel 2 in quoque capitulo, tubulares, hermaphroditi, albi. *Corolla* 5-lobata. *Styli* rami truncati, ad apicem papillati. *Stamina* 5; antherae ad basem caudatae, ad apicem appendicibus sterilibus. *Cypselae* subobconicae, villosae; pericarpium ad apicem sclerenchymatum, fascibus vascularibus 2; testa sine fascibus vascularibus; carpopodium absens. *Pappus* subcylindricus, ciliatus.

TYPUS: *F. axilliflora*

*Annual herb. Major axes* ascending to erect, glabrous, with hyaline wings; stem simple or forming major branches at basal and upper nodes. *Leaves* sessile, entire, opposite, erect, glabrous, semisucculent, mucronate. *Compound heads* broadly depressed obovoid to obovoid; general involucre absent; receptacle  $\pm$  entire. *Capitula* 5–10 per compound head; capitulum-subtending bracts leaf-like, glabrous. *Capitular bracts* 4(6), entire, hyaline, flat to conduplicate. *Florets* 1 or 2 per capitulum, tubular, bisexual, white; corolla 5-lobed. *Style* branches truncate, apices papillate. *Stamens* 5; anthers caudate, each with a sterile apical appendage; filament collar straight in outline and not thicker than the filament. *Cypselas*  $\pm$  obconic, villous; pericarp in mid-transverse section lacking sclerenchyma but the fruit apex with a capping of sclerenchyma, with two, medial/oblique vascular bundles; testa thin, lacking vascular bundles in mid-transverse section; carpopodium absent. *Pappus* cup-like, ciliate.

DISTRIBUTION (Fig. 1):

Monotypic. Restricted to south-west Western Australia. Collections have only been gathered near Cowcowing, Newdegate and Morawa.

ETYMOLOGY:

The name *Fitzwillia* is an anagram derived from the names and commemorating the botanist William V. Fitzgerald (1867–1929). Although an anagram it is regarded as a personal generic name and following Recommendation 20A of the ICBN is given the feminine gender.

NOTES:

The fruit provide the most distinctive feature of this genus although a sclerified capping also occurs in cypselas of *Epitriche demissus* (A. Gray) Short (Short 1989). The leaf-like capitulum-subtending bracts and the arrangement of the capitular bracts are characters unique to the genus. The pale white florets have not been observed in other Australian inuloid species.

***Fitzwillia axilliflora* (W.V. Fitzg. ex Ewart & J. White) Short, comb. nov.**

BASIONYM: *Angianthus axilliflorus* W.V. Fitzg. ex Ewart & J. White, Proc. Roy. Soc. Vict. 22: 315, pl. 56, figs 1–3 (1910), ('*axiliflorus*'); W.V. Fitzg., J. Bot. 50: 21 (1912); Grieve & Blackall, W. Aust. Wildfls 812 (1975); Short, Muellera 5: 209 (1983). LECTOTYPE (*vide* Short 1983): Cowcowing, Oct. 1904, *Koch 1196* (MEL 541217). ISOLECTOTYPES AND PROBABLE ISOLECTOTYPES: AD, BM (same no. but dated Aug. 1904), MEL 541218, MEL 541219, NSW (2 sheets), PERTH.

*Annual herbs*, 3–13.5 cm high. *Major axes* ascending to erect, with 2–4 hyaline wings; stem simple or forming shorter major axes at basal and upper nodes, all axes glabrous. *Leaves* lanceolate or  $\pm$  linear, c. 4–7 mm long, 0.7–1.3 mm wide,  $\pm$  concave, semisucculent, mucronate, glabrous. *Compound heads* broadly depressed obovoid to obovoid, 4.5–7 mm long, 2.5–8 mm diam.; general involucre absent but several leaf-like bracts present. *Capitula* 5–10 per compound head; capitulum-subtending

bracts  $\pm$ trullate to narrowly trullate or ovate to lanceolate, 4–4.5 mm long, 1.3–2.2 mm wide. *Capitular bracts* 4(5,6), 3.7–4.3 mm long, *c.* the length of the floret. *Florets* 1 or 2, pale white. *Stamens* 5; anthers 1.3–1.6 mm long; microsporangia 1–1.2 mm long; apical appendages 0.33–0.44 mm long. *Cypselas*  $\pm$ obconic, 1.1–1.4 mm long, 0.6–0.78 mm diam., villous. *Pappus* cup-like, with ciliate margins, *c.* 0.3–0.5 mm long.

**DISTRIBUTION (Fig. 1):**

See generic treatment.

**ECOLOGY & REPRODUCTIVE BIOLOGY:**

The species is apparently confined to the margins of salt lakes where it grows amongst samphire in sand or sometimes clay loam.

A pollen:ovule ratio of 7,398, determined from a single floret, indicates that the species commonly cross-pollinates.

**SPECIMENS EXAMINED:**

*Western Australia* — Newdegate, 1931, *Blackall 1276* (PERTH); 5 km S. of Morawa, 23.x.1983, *Short 2188* (MEL); 5 km S. of Morawa, 16.ix.1986, *Short 2959* (AD, CANB, MEL, PERTH).

**Lemooria Short, gen. nov.**

*Herba* annua. *Axes majores* prostrati, sparsim lanati, pilis glandiferis. *Folia* ad basem opposita, superiora alterna, sessilia, integra, glabra vel pilis glandiferis. *Glomeruli* depresso ovoidei; involucre generale conspicuum; bracteae 12–18, marginibus hyalinis, dense lanatae; receptaculum ramosum. *Capitula c.* 10–20, sine bracteis subtendentibus. *Bracteae intra capitulum* (4)5–6(8), in  $\pm$  2 serialibus, ovatae usque lanceolatae vel ellipticae, planae usque concavae, praecipue hyalinae sed costa viridi, lanatae, marginibus superibus laciniatis. *Flosculi* 1 vel 2, tubulare, hermaphroditi, lutei. *Corolla* 5-lobata. *Styli* rami truncati, ad apicem papillati. *Stamina* 5; antherae ad basem caudatae, ad apicem appendicibus sterilibus. *Cypselae* subobovoideae, fuscae, sparsim papillatae, plerumque apicibus pilos intertextos ferentibus; pericarpium sine sclerenchyma; carpopodium absens. *Pappus* setaceus; setae 8–12, subplumosae, ad basem conjunctae, longitudine *c.*  $\frac{1}{2}$  corollae tubi aequanti.

**TYPUS:** *L. burkittii* (Benth.) Short

*Annual herb.* *Major axes* prostrate, sparsely woolly, some glandular hairs present. *Leaves* opposite at the base, the upper alternate, sessile, entire, glabrous or with glandular hairs. *Compound heads* depressed ovoid; general involucre conspicuous, about equal to or longer than the head, bracts 12–18, midribs leaf-like and longer than the wing-like hyaline margins, densely lanate; receptacle branched. *Capitula c.* 10–20; capitulum-subtending bracts absent. *Capitular bracts* (4)5–6(8), in  $\pm$  2 rows, ovate to lanceolate or elliptic, flat to concave, mainly hyaline but with green midrib, lanate, the upper margins lacinate. *Florets* 1 or 2, tubular, bisexual, yellow; corolla 5-lobed. *Style* branches truncate, apices papillate. *Stamens* 5; anthers caudate and with sterile apical appendages. *Cypselas*  $\pm$ obovoid, brown, sparsely papillate, usually with apices with intertwined hairs; pericarp lacking sclerenchyma, vascular bundles two; carpopodium absent. *Pappus* setaceus; bristles 8–12, subplumose and united at the base, *c.*  $\frac{1}{2}$  the length of the corolla tube.

**DISTRIBUTION (Fig. 1):**

Monotypic. Widely spread in semi-arid and arid regions of the Australian mainland south of *c.* 26°S.

**ETYMOLOGY:**

The name *Lemooria* is an anagram commemorating the botanist Spencer Le Marchant Moore (1850–1931). It is of the feminine gender (see note under *Fitzwillia*).

**NOTES:**

A unique combination of features, i.e. the capitular bracts and bracts of the general involucre, the pappus and fruit, distinguishes *Lemooria* from other inuloid genera. It is one of the most distinctive Australian composites and the species is readily

identified in the field by its reddish, prostrate, somewhat wiry branches terminating in woolly compound heads.

**Lemooria burkittii** (Benth.) Short, comb. nov.

BASIONYM: *Gnephosis burkittii* Benth., Fl. Austr. 3: 570 (1867); Short, Muelleria 5: 210 (1983). — *Angianthus burkittii* (Benth.) J.M. Black, Fl. S. Aust. 1st ed. 645, pl. 53 (1929), 2nd ed. 925, fig. 1227 (1957). LECTOTYPE (*vide* Short 1983): Lake Gillies, s. dat., *Burkitt s.n.* (MEL 541211). ISOLECTOTYPE: K.

*Annual herb. Major axes* prostrate, 1.5–10 cm long, reddish, sparsely woolly, some glandular hairs present. *Leaves* linear, 0.5–2 cm long, c. 0.03–0.05 cm wide, glabrous or with glandular hairs. *Compound heads* depressed ovoid, 0.6–1.2 cm diam.; bracts subtending the heads c. 12–18. *Capitula* c. 10–20 per compound head. *Capitular bracts* (4)5–6(8), ovate to lanceolate or elliptic, 2.8–3.4 mm long, 0.6–1.3 mm wide. *Florets* 1 or 2 per capitulum; corolla tube 1.8–2.5 mm long. *Stamens* 5; anthers 0.19–0.21 mm long; microsporangia 0.39–0.46 mm long; apical appendages 0.19–0.21 mm long. *Cypselas* ± obovoid, 0.7–1.2 mm long, 0.5–0.85 mm diam. *Pappus* of 8–12 subplumose bristles united at the base.

DISTRIBUTION (Fig. 1):

See generic treatment.

ECOLOGY & REPRODUCTIVE BIOLOGY:

A common species in both low and tall shrubland formations. Collectors' notes include: 'On desert loam, on bare eroded patches in community of *Atriplex vesicaria*, with some *Bassia* [*Selerolaena*] species'. 'In open *Acacia* shrubland. Brown sandy loam with gravel . . . with an array of ephemeral composites', 'Tall *Acacia* open shrubland. Clay loam' and 'In red-brown loam in *Dodonaea/Ptilotus* shrubland'.

Pollen: ovule ratios determined for *Short 756* and *Short 1520* range from 446 to 696, values indicative of a high degree of self-pollination (Short 1981).

SELECTED SPECIMENS EXAMINED (Total c. 120):

*Western Australia* — 39 km from Leonora along Laverton road, 20.viii.1982, *Short 1520* (MEL); E. edge of Fraser Range, 19.ix.1982, *Short 1761* (MEL).

*South Australia* — 5 km W. of Nonning Hmsd, 30.viii.1968, *Copley 2035* (AD); Koonamore, 7.viii.1971, *Crisp 283* (AD, CBG).

*Victoria* — Parish of Olney, 30.viii.1948, *Willis s.n.* (MEL 84577).

*New South Wales* — Terrananya Stn, 26.vii.1955, *Constable s.n.* (NSW 35571, NT 19057); Fowlers Gap Stn, 30.viii.1973, *Cunningham & Milthorpe 1349* (NSW).

*Queensland* — 65 km N. of Hungerford, s. dat., *Hocking s.n.* (BRI 192446).

**Sondottia** Short, gen. nov.

*Herba annua. Axes majores* ascendentes usque erecti, glabri usque lanati; caulis simplex vel e nodis basalibus superioribusque ramificans. *Folia* opposita, connata, sessilia, integra, glabra vel lanata, submucronata, interdum semisucculenta. *Glomeruli* late ellipsoidei usque obloidei; bractee glomerulos subtendentes carentes, vel 2 vel 4, marginibus hyalinis. *Capitula* 5–13; bractee capitula subtendentes virides, praecipue cartilagineae, apicibus hyalinis et interdum marginibus hyalinis, glabrae usque dense lanatae. *Bractee intra capitulum* 4–6, hyalinae costa opaca, subplanae, glabrae vel sparsim lanatae. *Flosculi* 1 in quoque capitula, tubulare, hermaphroditi, lutei. *Corolla* 5-lobata. *Styli* rami truncati, ad apicem papillati. *Stamina* 5; antherae ad basem caudatae, ad apicem appendicibus sterilibus. *Cypselae* subobovoidae, praecipue glabrae sed apicibus longe pilosis, sine carpopodium. *Pappus* subcyathiformis, laciniatus.

LECTOTYPUS (here chosen): *S. connata* (W.V. Fitzg.) Short

*Annual herbs. Major axes* ascending to erect, glabrous to lanate; stem simple or forming major branches at basal and upper nodes. *Leaves* opposite, connate, sessile, entire, glabrous or lanate, ± mucronate, sometimes semisucculent. *Compound heads* broadly ellipsoid to obloid; bracts subtending compound heads 0, 2 or 4, with hyaline margins (sometimes several leaf-like bracts present); general receptacle a shortly branched axis. *Capitula* 5–13 per compound head; capitulum-subtending bracts

green, mainly cartilaginous but with hyaline apices and sometimes with very narrow hyaline margins, glabrous to densely lanate, each bract subtending 1–3 capitula. *Capitular* bracts 4–6, hyaline, with opaque midribs,  $\pm$  flat, glabrous or sparsely lanate. *Florets* 1 per capitulum, tubular, bisexual, yellow; corolla 5-lobed. *Style* branches truncate, apices papillate. *Stamens* 5; anthers caudate, each with a sterile apical appendage; filament collar straight in outline and not thicker than the filament. *Cypselas*  $\pm$  obovoid, mainly glabrous but with long, intertwined hairs at the apex; carpodium annular. *Pappus* cup-like, laciniate.

DISTRIBUTION (Fig. 1):

A ditypic genus restricted to Western Australia.

ETYMOLOGY:

The name *Sondottia* is of feminine gender and is an anagram derived from the names and commemorating the botanist Otto Wilhelm Sonder (1812–1881).

NOTES:

The cartilaginous capitulum-subtending bracts are apparently unique to this genus and readily separate it from any other genera with single flowered capitula. Other distinguishing features include the opposite, connate leaves and the intertwined long hairs at the apex of the fruit.

KEY TO SPECIES OF SONDOTTIA

1. General involucre absent or several leaf-like bracts at base of head; upper axes lanate ..... 1. *S. connata*
1. General involucre of 2 or 4 bracts with broad, hyaline margins; upper axes  $\pm$  glabrous ..... 2. *S. glabrata*

*Sondottia connata* (W.V. Fitzg.) Short, comb. nov.

BASIONYM: *Angianthus connatus* W.V. Fitzg. J. West Aust. Nat. Hist. Soc. 2: 24 (1905); Grieve & Blackall, W. Aust. Wildfls 816 (1975); Short, Muelleria 5: 209 (1983). LECTOTYPE (*vide* Short 1983); Mingenew, Sept. 1903, *Fitzgerald s.n.* (NSW 138682). ISOLECTOTYPES: NSW 138683, PERTH.

*Annual herb*, c. 3–12 cm high. *Major axes* ascending to erect, mainly glabrous but the upper part lanate; stem simple or forming branches at basal and upper nodes. *Leaves* linear, c. 5–13 mm long, 0.5–1.4 mm wide, often semisucculent, mucronate, usually glabrous but the uppermost leaves sometimes lanate. *Compound heads* obovoid, c. 6.5–10 mm long, 3.5–5 mm diam.; general involucre absent but one or several leaf-like, lanate bracts with small, hyaline apices may be present at the base of the head. *Capitula* c. 5–13 per compound head; capitulum-subtending bracts  $\pm$  elliptic to narrowly elliptic or obovate, 3.6–5.2 mm long, 0.55–1.9 mm wide; mainly cartilaginous and green but with hyaline apices and sometimes very narrow (<0.1 mm) hyaline margins, sparsely to densely lanate, each bract subtending 1–3 capitula. *Capitular bracts* 5–6, narrowly elliptic or linear, 3–3.8 mm long, 0.3–0.5 mm wide, c. the length of the florets, usually mainly hyaline but sometimes the opaque midrib more prominent, glabrous or sparsely lanate. *Florets* 1 per capitulum; corolla tube 2.2–2.6 mm long. *Stamens* 5; anthers 1.4–1.5 mm long; microsporangia 0.95–1 mm long; apical appendages 0.43–0.48 mm long. *Cypselas*  $\pm$  obovoid, 1.6–1.85 mm long, 0.5–0.7 mm diam. *Pappus* cup-like, laciniate, c. 0.2 mm long.

DISTRIBUTION (Fig. 1):

Restricted to Western Australia between latitudes c. 27° S. and 30° S. and 116° E. and 121° E.

In the revision of *Angianthus s. lat.* (Short 1983) it was erroneously recorded that the species was only known from the type locality. It is moderately common.

### ECOLOGY & REPRODUCTIVE BIOLOGY:

The species occurs in an array of arid habitats but seems to be most common in saline environments. Collectors' notes include: 'Sandy loam with ironstone gravel, with scattered *Atriplex* shrubs', 'In sand and very sandy loam amongst *Acacia*, *Eremophila* shrubs' and 'Beneath *Acacia* shrubs amongst samphire. Loam.'

Pollen: ovule ratios have not been obtained for this species but from anther size it is evident that several thousand pollen grains occur in each floret, suggesting that cross-pollination commonly occurs (Short 1983).

### SELECTED SPECIMENS EXAMINED (Total 15):

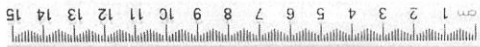
Western Australia — Hospital Rocks, 8.x.1983, *Short 1998* (AD, MEL, PERTH); 26 km S. of Cue, 14.ix.1986, *Short 2921* (MEL, PERTH); 6 km S. of Warriedar, 26.ix.1986, *Wilson 12293* (MEL, PERTH); Lake Austin, c. 15 km S. of Cue, 28.ix.1986, *Wilson 12326* (MEL, PERTH).

### *Sondottia glabrata* Short, sp. nov.

*Herba annua*, usque ad 40 cm alta. *Axes majores* erecti, glabrati. *Folia* praecipue linearia, usque ad c. 10 mm longa et c. 1 mm lata, glabra, summa subovata usque lanceolata basibus hyalinis. *Glomeruli* subovoidei vel ellipsoidei, 6–7 mm longi, 3–4 mm diametro; bractee glomerulos subtendentes 2 vel 4, subovatae vel ellipticae, 4.5–5 mm longae, 2.5–3.3 mm latae, subglabrae usque lanatae, marginibus hyalinis 0.7–1.33 mm latis. *Capitula* 4–8; bractee capitula subtendentes anguste ellipticae vel oblanceolatae, 3.7–4.3 mm longae, 0.7–1.3 mm latae, sparsim usque dense lanatae. *Bractee intra capitulum* 4–5, anguste ellipticae vel lanceolatae, 2.8–3.7 mm longae, 0.2–0.5 mm latae, sparsim lanatae. *Flosculi* 1 in quoque capitulo. *Corollae* tubus 2.4–2.7 mm longus. *Stamina* 5; antherae 1.6–1.9 mm longae; microsporangia 1.3–1.6 mm longa; appendices apicales 0.3–0.34 mm longae. *Cypselae* subovoideoae, 1.4–1.6 mm longae, 0.45–0.6 mm diametro. *Pappus* subcyanthiformis, laciniatus, 0.2–0.5 mm longus. (Fig. 5).

**HOLOTYPE:** Western Australia, c. 6 km S. of Wooramel River along the north-west coastal highway. Chenopod/*Acacia* shrubland. Compact sandy loam, 16.x.1983, *Short 2088* (MEL 1523448). **ISOTYPUS:** PERTH.

*Annual herb*, to c. 10 cm high. *Major axes* erect,  $\pm$  glabrous; stem forming branches at basal and upper nodes. *Leaves* mainly linear, to c. 10 mm long, c. 1 mm



NATIONAL HERBARIUM OF  
VICTORIA (MEL), AUSTRALIA

HOLOTYPE of  
*Sondottia glabrata* P.S. Short

Determinavit: P.S. Short June 1988

MEL1523448

NATIONAL HERBARIUM OF VICTORIA (MEL)  
MELBOURNE, AUSTRALIA  
*Angianthus connatus* W.V. Fitzg.

Loc.: WESTERN AUSTRALIA - c. 6 km. S. of  
Wooramel River along the North West  
Coastal Highway.

Lat. c. 25°47'S Long. 114°19'E

Coll.: P.S. Short no. 2088 16.x.1983.

Det.:

Notes: Chenopod/*Acacia* shrubland. Compact sandy  
loam.

Dupl.

Fig. 5. Holotype sheet of *Sondottia glabrata*.

wide, glabrous, the uppermost  $\pm$ ovate to lanceolate and with hyaline bases. *Compound heads*  $\pm$ obovoid to ellipsoid, 6–7 mm long, 3–4 mm diam.; bracts subtending compound heads 2 or 4, *c.* the length of the head,  $\pm$ ovate or elliptic, 4.5–5 mm long, 2.5–3.6 mm wide,  $\pm$ glabrous to lanate, with hyaline margins 0.7–1.33 mm wide. *Capitula* 4–8 per compound head; capitulum-subtending bracts narrowly elliptic or oblanceolate, 3.7–4.3 mm long, 0.7–1.3 mm wide, mainly cartilaginous and green but with hyaline apices and sometimes with narrow ( $<0.1$  mm) hyaline margins, sparsely to densely lanate, each bract subtending 1 capitulum. *Capitular bracts* 4–5, narrowly elliptic or lanceolate, 2.8–3.7 mm long, 0.2–0.5 mm wide, to *c.*  $\frac{3}{4}$  the length of the florets, mainly hyaline but with an opaque midrib, sparsely lanate. *Florets* 1 per capitulum; corolla tubes 2.4–2.7 mm long. *Stamens* 5; anthers 1.6–1.9 mm long; microsporangia 1.3–1.6 mm long; apical appendage 0.3–0.34 mm long. *Cypselas*  $\pm$ obovoid, 1.4–1.6 mm long, 0.45–0.6 mm diam. *Pappus* cup-like, lacinate, 0.2–0.5 mm long.

#### DISTRIBUTION (Fig. 1):

Only known from the vicinity of the Wooramel River, Western Australia.

#### ECOLOGY & REPRODUCTIVE BIOLOGY:

Habitat notes indicate that the species occurs in chenopod (mainly *Atriplex*)/*Acacia* shrubland.

As with *S. connata* this species, as indicated by anther size, probably has a pollen:ovule ratio of several thousand. Therefore cross-pollination is likely to be common (Short 1983).

#### SPECIMENS EXAMINED: (2, including type)

*Western Australia* — *c.* 28 km S. of Wooramel River along the north-west coastal highway, 16.x.1983, Short 2094 (MEL).

#### ACKNOWLEDGEMENTS

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