The genus *Anthotium* (Goodeniaceae)

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Abstract

Morrison, D.A. The genus *Anthotium* (Goodeniaceae). Nuytsia 7(1): 49-58 (1989). Three species are recognised in the genus, which is endemic to the southwest of Western Australia. *A. humile* R. Br. var. *junciforme* (Vriese) E. Pritzel is raised to specific status as *A. junciforme* (Vriese) D.A. Morrison. A total of five names are lectotypified, the species are described, and a key, illustrations and distribution maps are provided.

Introduction

The first satisfactory complete treatment of *Anthotium* was that of Bentham (1868), and the only full generic treatment since then is that of Krause (1912). More recently, there have been considerable advances in the understanding of the morphology and anatomy not only of this genus, but also of related genera (e.g. Carolin 1959, 1960, 1966, 1967a, 1970). At the same time, there has been much collecting of material of the species referred to *Anthotium*, and also redefinition of species limits in the other genera in the family Goodeniaceae (e.g. Carolin 1967b, 1967c, 1974, 1979, Morrison 1986). As a consequence, it is now desirable to revise *Anthotium* in order to bring the formal taxonomy of the genus up to date.

Generic Relationships

Anthotium is a very coherent group within the Goodeniaceae. The most distinctive feature of the genus is that the fruit is a true dehiscent capsule, rather than the more complex pseudocapsule of *Lechenaultia* (Morrison 1988) or the indehiscent fruits of the rest of the closely related genera of the family (Carolin 1966).

The genus is most closely related to *Lechenaultia* R. Br., with which it shares a number of synapomorphies (Carolin 1977). In particular, the ovary is inferior and extremely elongated with numerous ovules, as it is in *Lechenaultia*, and the upper part of the ovary remains unilocular.

However, in contrast to *Lechenaultia*, the ovules are in four vertical rows rather than in two, the leaves are radical rather than cauline, the indusium is cup-shaped rather than two-lipped, the inside of the corolla lacks an indumentum, and the pollen grains are free rather than united in tetrads.

In general, the facies of the genus are most similar to those of *Lechenaultia filiformis* R. Br. and *L. ovata* D. Morrison, which are in many ways the most distinctive members of that genus (Morrison 1986, 1988). Indeed, Sprengel (1824) considered that *Lechenaultia* and *Anthotium* should be combined, although he gave no reasons for this decision. No-one has followed this lead.

Carolin (1977) unites *Anthotium*, *Lechenaultia* and *Dampiera* as one of the two distinct groups within the Goodeniaceae, characterised by anthers that are connate around the style, the lack of stellate hairs, and a base chromosome number of nine. This seems to be the most satisfactory arrangement.

Methods and Terminology

This revision is intended to deal with most of the collections made to date, and material from the following herbaria was examined and annotated (abbreviations follow Holmgren et al. 1981): MEL, PERTH, NSW, and SYD. The specimens at BRI were also examined, and types were obtained from LD. All of the specimens cited have been personally examined unless otherwise noted.

Terminology, in general, follows Carolin (1959, 1960, 1966, 1967a), but some comments on the inflorescence and corolla seem warranted.

Carolin (1967) applied the descriptive terminology of Troll to the Goodeniaceae, and this interpretation has been followed here. All inflorescences in *Anthotium* terminate in a flower and are thus cymose, each being a monochasium of about three flowers. Each flower is subtended by a bracteole, and each monochasium by a bract. The monochasia are grouped into a higher-order inflorescence which itself terminates in a flower, each higher-order group (referred to as a head) having about five monochasia. Several of these heads appear on each flowering shoot, which is axillary.

Recent taxonomic works on the Goodeniaceae (Carolin 1967b, 1967c, 1974, 1979, Morrison 1986, 1988) have adopted the terminology of Krause (1912) for the corolla, and I have followed suit. In particular, the abaxial and adaxial sides of the flower are referred to as inferior and superior respectively. Carolin (1967b) illustrates the series of measurements relating to the parts of the corolla. In *Anthotium*, all five of the petals are fused near the base into a short tube, with the three inferior lobes further fused beyond this tube. All five of the petals are free along their winged part.

Systematic Treatment

Anthotium R. Br., Prodr. 1: 582 (1810); Roemer & Schultes, Linn. Syst. Veg. edn 16, 5: 35 (1820); Don, Gen. Hist. 3: 727 (1834); Endl., Gen. Pl. 508 (1838); DC., Prodr. 7: 520 (1839); Benth., Fl. Austral. 4: 44 (1868); Benth. & J.D. Hook., Gen. Pl. 2: 537 (1876); Baillon, Hist. Pl. 8: 370 (1885); F. Muell., Syst. Census Austral. Pl. edn 2, 147 (1889); Schonl., Nat. Pflanzenfam. IV. 5: 76 (1889); K. Krause, Pflanzenr. IV. 54: 109 (1912); C. Gardner, Enum. Pl. Austral. Occ. 125 (1930); N. Burb., Dict. Austral. Pl. Gen. 20 (1963); Beard, Descr. Cat. Western Austral. Pl. edn 2, 101 (1970); Grieve & Blackall, How to Know Western Austral. Wildfl. edn 2, 4: 679 (1975); J. Green, Census Vasc. Pl. Western Australia edn 2, 156 & 183 (1985); J. Wheeler, Fl. Perth Region 627 (1987). *Type: A. humile* R. Br.

Perennial herbs, entirely glabrous except for the indusium of one species. Stems ascending to erect, one to many from a common woody rootstock, sparsely branched, terete, up to 2 mm diam., often striate. *Leaves* radical, simple, somewhat fleshy, linear-terete to lanceolate or spathulate, entire to serrulate, usually rugose. *Inflorescences* axillary, compound, 1-5 heads (and a terminal flower) on each leafless terete flowering shoot, each head formed from 1-5 monochasial cymes of 1-3 flowers (and a terminal flower), each cyme in the axil of a bract and each flower in the axil of a bracteole; bracts and bracteoles paired but pairs displaced. *Flowers* bisexual, zygomorphic, sessile. *Sepals* 5, adnate to the ovary for most of their length but apparently not connate, lobes linear to linear-lanceolate, usually all equal. *Petals* 5 with 2 superior (adaxial) and 3 inferior (abaxial), either purple to light blue or cream or else various shades of bright red; all petals connate into a short tube at the base, the superior two otherwise free, the inferior three connate beyond the tube; the inferior lobes lanceolate, acute, with rounded wings on the free parts; the superior lobes falcate, acute, with the wings on the adjacent margins hemispherical auriculate thickened and infolded to enclose the indusium, the wings on the opposite margins rounded. *Stamens* 5, epigynous, exposed; filaments narrow linear, thin, free; anthers linear or oblong, 2-celled, connate around the style, dehiscing in bud through 2 longitudinal slits; pollen grains free. *Ovary* inferior, narrowly cylindrical, erect, 2-locular, ribbed; ovules axile, basifixed, up to 15 pairs per locule; style 1, usually straight, moderately robust; indusium cupular, glabrous or bearded outside, the stigmatic surface inside the cup. *Fruit* a true capsule, very similar in appearance to the ovary, surmounted by persistent sepal lobes and often also the style, dehiscing through 4 longitudinal valves. *Seeds* small, epidermis thickened and hardened; embryo terete, the same size as the albumen.

Anthotium is endemic to Western Australia, with all three species restricted to the South-West Botanical Province.

The generic name comes from the Greek *anthos* for flower and *otos* for ear, referring to the auriculate inner wings of the superior corolla lobes.

Key to the Species

1. Leaves lanceolate or spathulate, > 2 mm wide; flowers red ..... 2. *A. rubriflorum*

1. Leaves linear or terete, <1 mm wide; flowers pale blue to pink or cream

2. Flowering stems 2-7 cm long ..... 1. *A. humile*

2. Flowering stems 12-40 cm long ..... 3. *A. junciforme*

1. **Anthotium humile** R. Br., Prodr. 1: 582 (1810); Roemer & Schultes, Linn. Syst. Veg. edn 16, 5: 35 (1820); Don, Gen. Hist. 3: 727 (1834); DC., Prodr. 7: 520 (1839); Vriese, Natuurk. Verh. Holl. Maatsh. Wetensch. Haarlem ser. 2, 10: 188 (1854); Benth., Fl. Austral. 4: 44 (1868); F. Muell., Syst. Census Austral. Pl. edn 2, 147 (1889); E. Pritzel, Bot. Jahrb. Syst. 35: 554 (1905); K. Krause, Pflanzenr. IV. 54: 110 & t. 21A (1912); C. Gardner, Enum. Pl. Austral. Occ. 125 (1930); Beard, Descr. Cat. Western Austral. Pl. edn 2, 101 (1970); Grieve & Blackall, How to Know Western Austral. Wildfl. edn 2, 4: 679 (1975); J. Green, Census Vasc. Pl. Western Australia edn 2, 156 & 183 (1985). — *Anthotium glabrum* Poiret, Dict. Sci. Nat. 2: Suppl. 80 (1816). — *Lechenaultia humilis* (R. Br.) Sprengel, Linn. Syst. Veg. edn 17, 1: 720 (1824). *Lectotype* (here designated): Bay I ora occidentis Nova Holl vel oric a Portu GRIII^{tii}, *R. Brown* (Britten sheet No. 2542) (lecto: BM n.v., photo SYD; isolecto: BM n.v., photo SYD).

Goodenia pygmaea Vriese in Lehm., Pl. Preiss. 1: 413 (1845). *Lectotype* (here designated): In depressis arenosis prope urbiculam 'Perth', *L. Preiss* 1492, s. dat. (lecto: LD; isolecto: G n.v., photo SYD).

Tufted herb, almost clonal with up to 5 separate tufts connected underground to a central rootstock, to 10(-20) cm high and 10 cm diam. *Leaves* somewhat fleshy, usually linear to terete or rarely narrow lanceolate to narrow spathulate, if narrow lanceolate or narrow spathulate then 30-65 mm long and 1.5-3 mm wide, or if linear to terete then 45-110 mm long and 0.5-1 mm wide, entire, acute or with a callous tip, thickened, rugose. *Flowering stalks* rugose, (1.5-)2.5-7 cm long, usually shorter than the leaves; heads compact, each of up to 3 crowded cymes; bracts linear to terete but often flattened near the base, (5-)7-10(-13) mm long, 0.6-1.3 mm wide, obtuse to acute; bracteoles linear to triangular, 3-5 mm long, 0.71-(-1.2) mm wide, acute. *Calyx lobes* 2.7-3.2 mm long, 0.6-0.8 mm wide, acute to acuminate. *Corolla* from light blue through mauve or pink to cream; tube 1.5 mm long, inferior petals fused for a further 1.3-2.5 mm; inferior lobes 2.1-3.3 mm long and 0.8-1.2 mm wide, wings 1.9-3 mm long and 0.5-0.7 mm wide; superior lobes 3.5-4.3 mm long and 0.7-1 mm wide, wings 1.2-1.5 mm long and 0.9-1.2 mm wide on adjacent margins and 0.2-0.3 mm wide on opposite margins. *Staminal filaments* 1-1.5 mm long; anthers 1.1-1.2 mm long. *Ovary* 2.5-3.8 mm long, ribbed, with 6-8 pairs of ovules per locule; style straight or sometimes bent, 2.5-5 mm long; indusium glabrous. *Fruit* not seen. Figure 1a.

Specimens examined. WESTERN AUSTRALIA: between West Mt Barren and Cape Anne, *T.E.H. Aplin* 5696 (PERTH); near Torbay, Dec. 1927, *W.E. Blackall* s.n. (PERTH); Lake Wagin, 1890, *M. Cronin* s.n. (MEL); Chester Pass Rd, c. 2 miles [3 km] from Porongorup turnoff, *E.J. Croxford* 163 (PERTH); s. loc., *J. Drummond* 181 (MEL, NSW82004); Young River, Jan. 1935, *E. & C.A. Gardner* s.n. (PERTH); 13 miles [21 km] S of Elverdton Mine, *A.S. George* 1989 (PERTH); 51.5 miles [83 km] E of Ravensthorpe, *A.S. George* 2251 (PERTH); Tuttanning Reserve, *A.S. George* 10517 (PERTH); 11 km S of Dumberning Siding, *G.J. Keighery* 7861 (PERTH); Broke Inlet, *K.F. Kenneally* 6570 (PERTH); K.G.S., s. dat., *G. Maxwell* s.n. (MEL); Plantagenet and Stirling Range, s. dat., [*G. Maxwell*] s.n. (MEL); s. loc., s. dat., *F. von Mueller* s.n. (NSW82009); Lake Muir, s. dat., *Muir* s.n. (MEL); 7 miles [11 km] E of Gnowangerup, *K.R. Newbey* 1206 (PERTH); 1 mile [2 km] E of Pabelup Lake, *K.R. Newbey* 1218 (PERTH); 13 miles [21 km] N of Albany, *K.R. Newbey* 1226 (PERTH); District South West Plantagenet, *E. Pritzel* 255 (NSW82005); Thistle Cove, *H.M. Wilson* 61 (PERTH); 60 miles [97 km] E of Lake King, *E. Wittwer* 1498 (PERTH); 8 km E of Lake Muir, *E. Wittwer* 2288 (PERTH).

Distribution. South Western Australia: Avon, Eyre, Darling and Roe Districts. Scattered throughout the inland and coastal areas from Pemberton and Narrogin to Cape le Grande (Map 1).

Habitat. Recorded from sand, sandy loam, sandy clay, and silt. It usually occurs in heath or eucalypt woodland, but it also occurs around the edges of winter-wet depressions and swamps.

Flowering period. Usually from early December to late January, but flowers have also been collected in March.

Typification. In his protologue, Robert Brown noted that he had seen two "varieties" of *A. humile*, one of which was twice as large in all of its parts as the other. The herbarium sheets of his material at BM are labelled as being collected from King George Sound on 27 December 1801 and at Lucky Bay (Bay I) in January 1802; and this dual collecting presumably reflects the two varieties referred to. The Britten sheet has 3 specimens of the larger variety and 5 specimens of the smaller variety, while the public collection sheet has 2 of the former and 1 of the latter. I have chosen the third specimen from the left on the Britten sheet at BM (a specimen of the large variety) as the lectotype. It should be noted here that the two "varieties" of Brown's material are both *L. humile* s. str., and cannot be confused with *L. junciforme*.

The sheet of *Preiss* 1492 at LD (the preferred reference collection for Preiss material (Crisp 1983)) has only two small scraps of a flowering specimen. The flower measurements are those of *A. humile* rather than *A. junciforme*, but this seems to contradict the reported collecting locality, as there are no other known collections of *A. humile* from this area.

Figure 1. *Anthotium humile*. A — habit (from *George* 1989, PERTH). *Anthotium junciforme*. B — habit (from *Keighery* 3844, PERTH). *Anthotium rubriflorum*. C habit (from *Morrison* 199, SYD). Scale bar: 2 cm.

Notes. Poiret attributes the name *A. glabrum* to Robert Brown, noting that it is the only species in the genus. Brown's provisional name for the species (as noted on the type specimens) was "*fasciculatum*", so it is unclear where Poiret obtained this epithet.

Conservation status. Widespread and common.

2. **Anthotium rubriflorum** F. Muell. ex Benth., Fl. Austral. 4: 45 (1868); F. Muell., Syst. Census Austral. Pl. edn 2, 147 (1889); E. Pritzel, Bot. Jahrb. Syst. 35: 554 (1905); K. Krause, Pflanzenr. IV. 54: 110 & t. 21CH (1912); C. Gardner, Enum. Pl. Austral. Occ. 125 (1930); Beard, Descr. Cat. Western Austral. Pl. edn 2, 101 (1970); Grieve & Blackall, How to Know Western Austral. Wildfl. edn 2, 4: 680 (1975); J. Green, Census Vasc. Pl. Western Australia edn 2, 156 & 183 (1985). [*Anthotium humile* auct. non R. Br. (1810): Vriese, Natuurk. Verh. Holl. Maatsh. Wetensch. Haarlem ser. 2, 10: 188 (1854), p.p. (as to *Drummond* 180 only)]. *Type citation*: "Drummond, n. 180, Maxwell." *Lectotype* (here designated): S.W. Australia, *Maxwell*, s. dat. (lecto: K n.v., photo SYD; isolecto: MEL). *Lectoparatype*: S.W. Australia, *Drummond* 180, 1848 [5th Coll.] (K n.v., photo SYD, MEL).

Tufted herb, almost clonal with up to 5 separate tufts connected underground to a central rootstock, to 15(-20) cm high and 10(-20) cm diam. *Leaves* fleshy, lanceolate to spathulate, (35-)45-80(-95) mm long, (2-)3-6(-7.5) mm wide, entire to serrulate, acute, often thickened or recurved, rugulose. *Flowering stalks* rugulose, (7-)9-16 cm long, usually twice as long as the leaves; heads compact, each of up to 2 crowded cymes; bracts linear to terete, (8-)10-17(-21) mm long, 0.6-1.5(-2) mm wide, obtuse; bracteoles lanceolate but usually flattened near the base, 5-8 mm long, 1.5-2(-3) mm wide, acute. *Calyx lobes* 3.5-4.2 mm long, 0.7-1 mm wide, acuminate. *Corolla* usually bright scarlet, but sometimes a deeper or paler red; tube 1 mm long, inferior petals fused for a further 1.8-3 mm; inferior lobes 3.5-4(-4.5) mm long and 0.8-1.2 mm wide, wings 3-3.5(-4.5) mm long and 0.4-0.7 mm wide; superior lobes 3.5-4.5 mm long and 1.1-1.3(-1.5) mm wide, wings 1.5-1.8 mm long and 1.1-1.3(-1.7) mm wide on the adjacent margins and 0.2-0.4 mm wide on the opposite margins. *Staminal filaments* 1-1.4 mm long; anthers 1-1.2 mm long. *Ovary* 4-5(-7) mm long, strongly ribbed, with 7-9(-12) pairs of ovules per locule; style straight, 2.8-3.5 mm long; indusium bearded on the upper side. *Fruit* 7-9 mm long. *Seeds* cylindrical or ovoid, 0.8 mm long, black, pitted. Figure 1c.

Specimens examined. WESTERN AUSTRALIA: s. loc., s. dat., *C. Andrews* s.n. (PERTH); W of Ravensthorpe, *J.C. Anway* 584 (MEL, NSW100867, PERTH); 40 miles [64 km] E of Hyden, *J.S. Beard* 3918 (PERTH); near Bruce Rock, Sept. 1929, *W.E. Blackall* s.n. (PERTH); 11 km ENE of Conjinup Hill, *M.A. Burgman* 2882 (PERTH); 2 km NW of boundary of Fitzgerald River National Park on Hammersley Drive, *M.G. Corrick* 8817 (MEL105738); Coolgardie, 1893, *E. Cronin* s.n. (MEL); Coolgardie, 1894, *Cronin* s.n. (MEL); 11 miles [18 km] E of Newdegate, *H. Demarz* 3610 (PERTH); Swan River, s. dat., *J. Drummond* s.n. (NSW81993); E sources of Swan River, 1890, *A. Eaton* s.n. (MEL); Youndegin, 1890, *A. Eaton* s.n. (MEL); Uberin Hill, Jan. 1918, *C.A. Fontleroy* s.n. (BRI377089); c. 65 km N of South Coast Highway on Old Ravensthorpe Road, *D.B. Foreman* 1191 (MEL1546036); Bungulla, *C.A. Gardner* 461 (PERTH); Bendering, *C.A. Gardner* 1331 (PERTH); 10 km E of Bendering, *C.A. Gardner* 13619 (PERTH); near Rabbit-proof fence E of Hyden, *C.A. Gardner* 14994 (PERTH); c. 60 km E of Hyden, *C.A. Gardner* 15947 (PERTH); eastward from Newdegate, Nov. 1935, *C.A. Gardner* s.n. (PERTH); Fitzgerald townsite, *G.J. Keighery* 335 (PERTH); N of Bendering, *F. Lullfitz* 1754 (PERTH); 7 miles [11 km] E of Hyden, *F. Lullfitz* 3823 (PERTH); Ag. Dept. Plot, E of R.P. Fence, Forrestania, *F. Lullfitz* 4028 (PERTH); 5 miles [8 km] NW of Calingiri, Nov. 1955, *A.R. Main* s.n. (PERTH); 6 km N of Mt Madden towards Lake King, *B.R. Maslin* 4064 (PERTH); 33 km W of Lake King towards Newdegate, *D. Morrison* 199 (SYD); 22 miles [35 km] E of Hyden, *K. Newbey* 1106 (PERTH); 27 km W of Lake Cronin, *K. Newbey* 6285 (PERTH); Cookernup, Sept. 1946, *W.H. Nicholls* s.n. (MEL644160); Tammin, *C.H. Ostenfeld* 960 (PERTH); District Avon, *E. Pritzel* 891 (NSW81995); Calingiri, *R.D. Royce* 5649 (PERTH); Minnivale, *R.D. Royce* 7998 (PERTH); 15 miles [24 km] S of Tammin, *R.D. Royce* 9435 (PERTH); Frank Hann National Park, *R.D. Royce* 10250 (PERTH); E sources of Swan River, 1890,

G. Sewell s.n. (MEL); 16-19 km from Lake King along road to Lake Grace, *A. Strid* 21082 (PERTH); 10 km E of Rabbit Proof Fence on Hyden-Norseman road, *P. Weston* 332 (SYD).

Distribution. South Western Australia: Avon, Eyre and Roe Districts. Found in the inland areas from New Norcia to Ravensthorpe (Map 1).

Habitat. Recorded from sand, or occasionally sandy clay, sandy loam or gravel. It is usually found in heath or scrub, but it also occurs in woodland and mallee.

Flowering period. Usually from early November to mid December, but flowers have also been collected in October.

Typification. Bentham lists two specimens in the protologue, and so a lectotype must be chosen. The Maxwell and Drummond collections are mounted on the same sheet at K, the Maxwell specimen (in the upper left-hand corner) being chosen because it appears to be more complete.

Conservation status. Widespread and common.

3. **Anthotium junciforme** (Vriese) D.A. Morrison, comb. nov. — *Goodenia junciformis* Vriese in Lehm., Pl. Preiss. 1: 413 (1845). — *Anthotium humile* R. Br. var. *junciforme* (Vriese) E. Pritzel, Bot. Jahrb. Syst. 35: 554 (1905); K. Krause, Pflanzenr. IV. 54: 110 & t. 21B (1912); Grieve & Blackall, How to Know Western Austral. Wildfl. edn 2, 4: 679 (1975); J. Wheeler, Fl. Perth Region 627 (1987). [*Anthotium humile* auct. non R. Br.: Vriese, Natuurk. Verh. Holl. Maatsh. Wetensch. Haarlem ser. 2, 10: 188 & t. 37, p.p.; Benth., Fl. Austral. 4: 44 (1868), p.p. (both as to *Preiss* 1522 only)]. *Lectotype* (here designated): In planitie arenosa; hieme aqua salsa inundata ad fl. Cygn. prope urbiculam 'Perth', *L. Preiss* 1522, 12.ii.1840 (lecto: LD n.v., photo SYD; isolecto: G n.v., photo SYD, K n.v., photo SYD, L903.311-189 n.v., 903.311-183 n.v., & 909.62-74 n.v., photo SYD, MEL 2 sheets, P n.v., W n.v.).

Goodenia geniculata Vriese in Lehm., Pl. Preiss. 1: 413 (1845) nom. illeg. non R. Br. (1810). — *Goodenia genuflexa* Vriese in Lehm., Pl. Preiss. 2: 244 (1848). [*Anthotium humile* auct. non R. Br.: Vriese, Natuurk. Verh. Holl. Maatsh. Wetensch. Haarlem ser. 2, 10: 188 (1854), p.p.; Benth., Fl. Austral. 4: 44 (1868), p.p. (both as to *Preiss* 1456 only)]. *Lectotype* (here designated): In planitie sublimosa hieme inundata prope 'Toby's-Inlet' (Sussex), *L. Preiss* 1456, 27.xii.1839 (lecto: LD n.v., photo SYD; isolecto: G n.v., photo SYD, L903.311-185 n.v. & 903.311-186 n.v., photo SYD, MEL 2 sheets, W n.v.).

Junciform herb, with solitary clumps from a single rootstock, to 40-(50) cm high and 20 cm diam. *Leaves* somewhat fleshy, linear to terete, 90-145 mm long, 0.6-0.9 mm wide, entire, acute or often with a callous tip, thickened, rugose. *Flowering stalks* rugulose, (12-)18-40 cm long, usually twice as long as the leaves; heads loose, each of up to 5 scattered cymes; bracts linear to terete and sometimes flattened near the base, (5-)9-19 mm long, 0.4-0.9 mm wide, acute or with a callous tip; bracteoles triangular, 2-4(-6) mm long, 0.5-0.8 mm wide, acute. *Calyx lobes* 3.2-4.5 mm long, with the superior lobe 0.5-1 mm longer than the others, 0.4-0.5 mm wide, acute to acuminate. *Corolla* purple to light blue; tube 2 mm long, inferior petals fused for a further 1-1.5 mm; inferior lobes 3-4.5 mm long and 0.9-1.1 mm wide, wings 2.5-4.5 mm long and 0.7-0.8 mm wide; superior lobes 4.5-6 mm long and 1-1.2 mm wide, wings 1.2-1.6 mm long and 1-1.5 mm wide on the adjacent margins and 0.2-0.3 mm wide on the opposite margins. *Staminal filaments* 1.3-1.5 mm long; anthers 1-1.5 mm long. *Ovary* 3.5-6.5(-9) mm long, ribbed, with 11-15 pairs of ovules per locule; style straight, 4-5 mm long; indusium glabrous. *Fruit* 8-12 mm long. *Seeds* cylindrical or laterally compressed and ovoid, 0.7 mm long, pale brown, tuberculate. Figure 1b.

Specimens examined. WESTERN AUSTRALIA: Yallingup, Dec. 1930, *W.E. Blackall* s.n. (PERTH); S.W. Australia, s. dat., *Clarke* s.n. (MEL); Keysbrook-Mandurah road, *H. Demarz* 6634

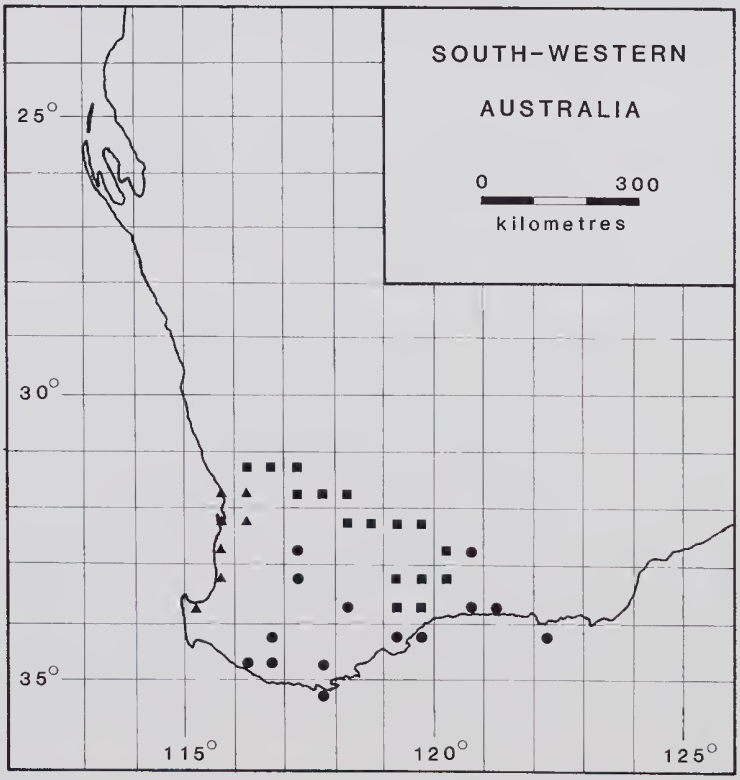
(PERTH); s. loc., [*J. Drummond*] 416 (MEL); Midland Junction, Dec. 1899, *W.V. Fitzgerald* s.n. (NSW82007, PERTH); Wattle Grove, *A.S. George* 627 (PERTH); lower Canning River, Jan. 1898, *R. Helms* s.n. (PERTH); Waterloo, *G.J. Keighery* 3844 (PERTH); 1 km N of Serpentine, *G.J. Keighery* 7183 (PERTH); Bayswater, *A. Morrison* 9314 (NSW81996); Midland Junction, *A. Morrison* 9334 (NSW81999); Cannington, *A. Morrison* 10263 (NSW81998); Kelmscott, *A. Morrison* 10264 (NSW82001); Kelmscott, *A. Morrison* 10266 (NSW82000); Cannington, *A. Morrison* 12260 (NSW82003); Kelmscott, *A. Morrison* 12262 (NSW82002); Bayswater, *A. Morrison* 18031 (BRI079201, NSW81997); Kelmscott, Dec. 1900, *A. Morrison* s.n. (BRI079200); Harvey's River, Dec. 1877, *F. von Mueller* s.n. (MEL); Maida Vale, *J. Peacock* 60827.1 (SYD); Busselton, s. dat., *A. & E. Pries* s.n. (MEL); District Murray, *E. Pritzel* 134 (NSW82006); Busselton, s. dat., *T.C. Rosselloty* s.n. (MEL); upper Swan River, 1885, *J. Sewell* s.n. (MEL).

Distribution. South Western Australia: Darling District. Found along the coast from Perth to Yallingup (Map 1).

Habitat. Occurs in eucalypt woodland, especially in winter-wet depressions.

Flowering period. Usually from early December to late February, but flowers have also been collected in late March.

Typification. De Vriese published the names *G. junciformis* and *G. geniculata* simultaneously in "Plantae Preissianae" in 1845. However, *G. geniculata* Vriese is a later homonym of *G. geniculata* R. Br. (Prodr. 1: 577 (1810)), and so in the corrigenda to the "Plantae Preissianae" de Vriese provided *G. genuflexa* as a replacement name for *G. geniculata* Vriese. *G. junciformis* Vriese thus has priority in combination with *Anthotium.*



Map 1. Distribution of *Anthotium humile* (●), *Anthotium rubriflorum* (■), and *Anthotium* junciforme (▲).

Relationships. This taxon has traditionally been treated at the varietal level, although Wheeler (1987) has noted that with more study it might be elevated to specific status. In many ways this taxon is less similar to *A. humile* than is *A. rubriflorum.* In particular, the non-clonal growth habit, the extremely elongated flowering stems, the larger leaves, the unequal calyx lobes, the larger corolla, and the larger ovary with more numerous ovules make this taxon distinctive within the genus. In contrast, the only similarities with *A. humile* are the narrow leaves, the pale blue corolla, and the glabrous indusium. So, this taxon must be given equal status with the other two. It is completely allopatric with respect to *A. humile.*

Conservation status. 3R. This species has been collected only very rarely since the turn of the century (about 6 times), and the known distribution extends through some of the most closely-settled parts of the state. It is not known from conservation reserves.

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