

***Psammomoya* (Celastraceae), a taxonomic review**

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Abstract

Keighery, G.J., *Psammomoya* (Celastraceae), a taxonomic review. *Nuytsia* 14(3): 385–392 (2002). The south-western Australian genus *Psammomoya* Diels & Loes. is reviewed and shown to consist of four species, two of them previously named as *P. choretroides* (F. Muell.) Diels & Loes. and *P. ephedroides* Diels & Loes. Two new species, *Psammomoya grandiflora* Keighery and *P. implexa* Keighery, are described. All species are illustrated and a key is provided.

Introduction

Psammomoya is the sole genus of the Celastraceae occurring in temperate Western Australia and is endemic to this region. The genus is closely related to *Apatophyllum* McGillivray (McGillivray 1971), one species of which occurs in the arid zone of Western Australia (Cranfield & Lander 1992). *Apatophyllum* can be distinguished in having leafy stems, the leaves spirally arranged and well developed (opposite-decussate and reduced to cataphylls in *Psammomoya*), bracteoles triangular (ovate in *Psammomoya*), and the floral disc erect and free (broad and fused in *Psammomoya*).

Only two species of *Psammomoya* were recognised when the genus was treated by Jessup (1984) in the "Flora of Australia". The current study was commenced after sorting the contents of a folder for unnamed *Macarthuria* Huegel ex Endl. (Molluginaceae) collections showed that several of them were *Psammomoya* specimens that did not easily fit the accepted taxonomy of the genus. Additional collections of the new taxa recognised here were found among the specimens determined as *Psammomoya choretroides* and *P. ephedroides*.

Methods

All herbarium collections of *Psammomoya* at PERTH, MEL, SYD, and AD have been examined for this study. Populations of three of the four taxa have been examined in the wild.

Taxonomy

Psammomoya Diels & Loes. in L. Diels & E. Pritzel, *Bot. Jahrb. Syst.* 35 : 339 (1904). *Type:* *Psammomoya choretroides* (F. Muell.) Diels & Loes.

Shrubs usually from a corky-barked woody rootstock. *Leaves* opposite-decussate, reduced to dark brown cataphylls. *Inflorescence* of solitary flowers or 2–4-flowered fascicles in axils of cataphylls. *Flowers* hermaphrodite, actinomorphic, on a short pedicel with persistent scarious bracteoles at base. *Sepals* 5, imbricate, broadly ovate to deltate; apex thickened, acute, brown or black. *Petals* 5, imbricate, white, apex acute. *Stamens* 5, opposite sepals and inserted on or below the rim of the disc. *Anthers* cordate, longitudinally dehiscent, introrse, yellow. *Disc* flat, pentagonal. *Ovary* scarcely or partially immersed in disc, 2- or 3-locular, each locule with 2 basal anatropous ovules. *Fruit* a loculicidal capsule, erect or decurved. *Seeds* 1–3, usually 1, erect, ellipsoid or narrowly ellipsoid, with a white fleshy aril at base; seed coat ribbed, crustaceous, brown or black; endosperm copious.

A genus of four species endemic in the south-west of Western Australia.

Key to *Psammomoya* species

1. Ovary 2-locular. Pedicels 0.5–1.2 mm long.
 2. Branchlets 4-angled and 4-sulcate, usually viscid; apex obtuse, hidden by numerous bracts **1. *P. choretroides***
 2. Branchlets 6-ribbed, not viscid; apex pungent, exposed **2. *P. implexa***
1. Ovary 3-locular. Pedicels 1.5–5 mm long.
 3. Branchlets with a pungent apex. Flowers small, the petals 2.5–3.5 mm long **3. *P. ephedroides***
 3. Branchlets with a soft acute apex. Flowers large, the petals 6–7 mm long **4. *P. grandiflora***

1. *Psammomoya choretroides* (F. Muell.) Diels & Loes., in L. Diels & E. Pritzel, *Bot. Jahrb. Syst.* 35: 340, fig. 1 (1904). – *Logania choretroides* F. Muell., *Victorian Naturalist* 6: 118 (1889). *Type*: eastern sources of the Swan River, Western Australia, *Mrs Heal* (*holo*: MEL 100676; *iso*: MEL 100675).

Illustrations. Diels & Pritzel (1904: fig. 41A–H); Morley & Toelken (1983: fig. 132D–F); Jessup (1984: fig. 42G,H); McGillivray (1971: 404, fig. 3).

Rigid erect *shrub*, to 45 cm tall, with 2–5 erect branches from a corky rootstock. *Branchlets* erect, many, 4-angled and 4-sulcate, usually viscid along the angles; apex short, obtuse, black, covered by cataphylls. *Cataphylls* 1–3 mm long, dark brown or black, the pairs of cataphylls separated by 7–11 mm internodes on main branches below branchlets. *Flowers* single or in fascicles of 2–4, often appearing sessile, the pedicel 0.5–1.2 mm long. *Sepals* deltate, 0.9–1.6 mm long. *Petals* ovate-deltate, 2.0–2.4 mm long. *Stamens* inserted below margin of disc; filament 0.4–0.7 mm long; anther *c.* 0.5 mm long. *Disc* fleshy, 1.5–2.0 mm diam. *Ovary* half-immersed in disc, 2-locular. *Style* *c.* 0.2 mm long; stigma obscurely 2-lobed. *Capsule* 2-lobed, broadest above middle, 2-valved, 5–9 mm long, 5–8 mm wide, 1- or 2-seeded. *Seeds* narrowly ellipsoid, 3.8–4.3 mm long; aril 3–4 mm long. (Figure 1A–C)

Selected specimens examined (57 examined). WESTERN AUSTRALIA: Boorabbin, *T.E.H. Aplin* 1936 (PERTH); Dowering, *C.A. Gardner* 667 (PERTH); Lake King, *A.S. George* 329 (PERTH); 13 miles [21 km] E of Lake Grace, 27 Sep. 1975, *J.W. Green* 4445 (PERTH); Quairading, *G.J. Keighery* 2260 (PERTH); Mt Glasse, Bremer Range, *K.R. Newbey* 5593 (PERTH).

Distribution. Endemic to Western Australia, from Galena south-east to the Bremer Range and south to Lake King. (Figure 2A)

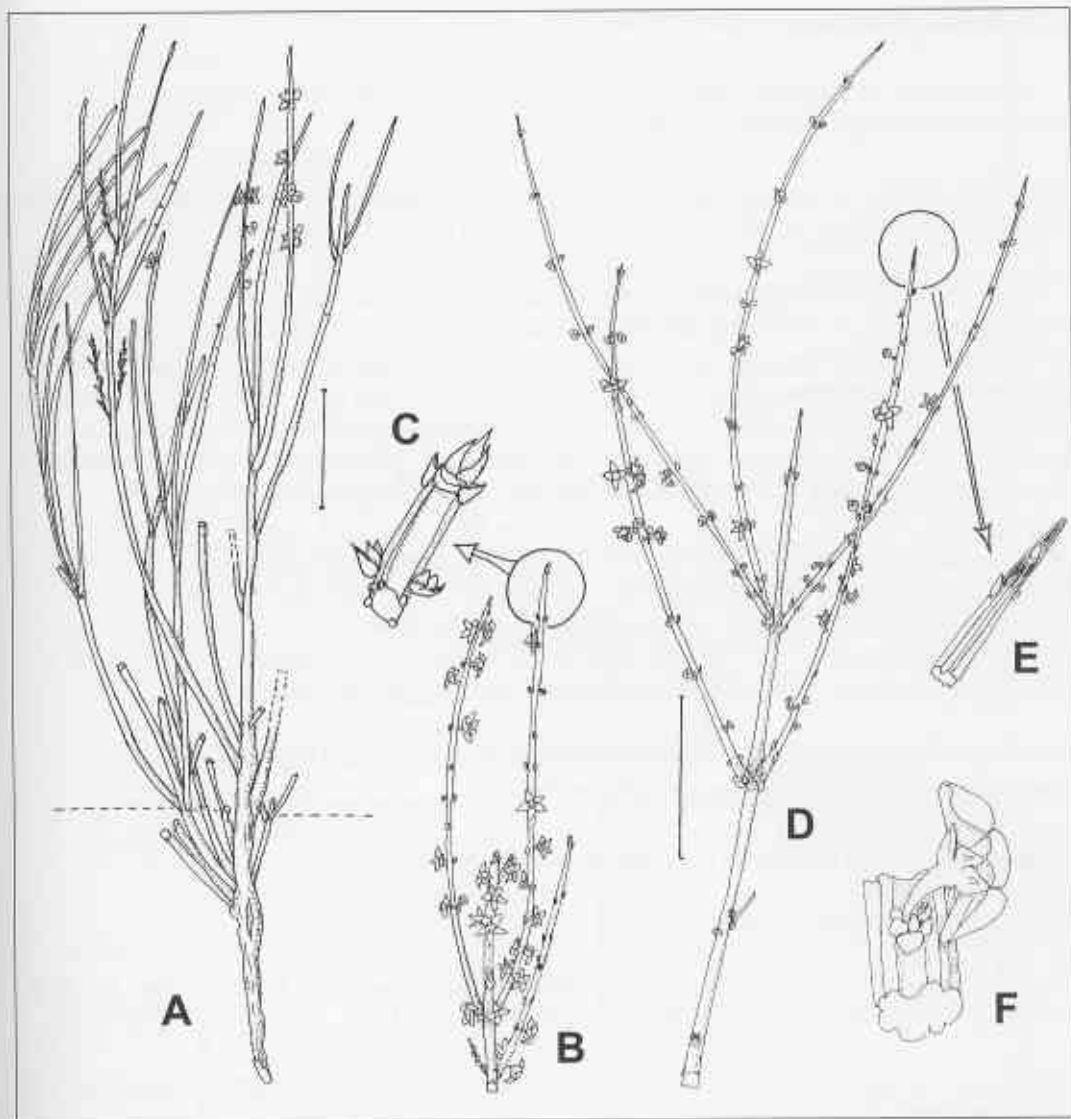


Figure 1. A–C. *Psammomoya choretroides*. A – whole plant (scale bar = 20 mm), B – flowering branch, C – apex of branchlet. D–F. *Psammomoya implexa*. D – flowering branch (scale bar = 25 mm), E – apex of branchlet, F – flower. Drawn from *J.W. Green* 4445 (A–C) and *C.A. Gardner* 12031 (D–F).

Habitat. Known from various vegetation types including *Eucalyptus salmonophloia* woodland, *Allocasuarina* spp. shrubland, heath with emergent mallees or low heath. Soils where this species grows include grey sand, yellow sandy clay, lateritic sand or brown clayey sand.

Flowering time. August to October.

Conservation status. Widespread and well conserved.

Notes. *Psammomoya choretroides* is closely related to *P. implexa*. See notes under the latter species.

2. *Psammomoya implexa* Keighery, *sp. nov.*

Frutex usque ad 1 m altus, ramis principalibus intricate ramosis, 6-costatis, non viscidis; apex atrobrunneus vel niger, pungens, 5–7 mm longus.

Typus: near Wilroy, Western Australia, 29 August 1945, C.A. Gardner 7547 (*holo*: PERTH 02791501; *iso*: PERTH 02792532, 02793415, 02793423, 02793431).

Shrub to 1 m tall, intricately branched; main branches 6-ribbed, not viscid. *Branchlets* 6-ribbed, not viscid; apex pungent, 5–7 mm long, dark brown or black. *Cataphylls* c. 1 mm long, dark brown or black, the pairs of cataphylls separated by 17–22 mm internodes on main branches. *Flowers* single or in fascicles of 2–4, often appearing sessile but on a pedicel 0.5–1.1 mm long. *Sepals* broadly triangular, 0.6–0.9 mm. *Petals* ovate-deltate, 1.8–2.2 mm long. *Stamens* inserted below margin of disc; filament less than 0.6 mm long; anther c. 0.5 mm long. *Disc* fleshy, 1.5–2.0 mm diam. *Ovary* half immersed in disc, 2-locular. *Style* c. 0.2 mm long; stigma obscurely 2-lobed. *Capsule* *n.v.* (Figure 1D–F)

Other specimens examined. WESTERN AUSTRALIA: 36.8 km N of Wubin, 25 Aug. 1998, R. Davis 6480 (PERTH); near Wilroy, 29 Aug. 1945, C.A. Gardner 7547 (PERTH); Ningham to Whitewells, C.A. Gardner 12031 (PERTH); 0.4 km S of Morris Rd on McWhirter Rd, c. 35 km N of Morawa, 27 July 1996, B.J. Lepschi 2738 & T.R. Lally (PERTH); 1 km W of Little's Bore, Gabyon Station, 15 Aug. 1993, S. Van Vreeswyk 3766 (PERTH); Wilroy, J.Z. Weber 5140 (AD, PERTH).

Distribution. Endemic to Western Australia, recorded from Wilroy and Gabyon Station south-east to near Wubin and near Ningham Station. (Figure 2B)

Habitat. This species is recorded as occurring on stony ridges.

Flowering time. August to October.

Conservation status. Conservation Codes for Western Australian Flora: Priority Three. Probably present in Wilroy Nature Reserve and in unallocated Crown land.

Etymology. The epithet is from the Greek word for intricately branched, referring to the much branched habit of the species.

Notes. A poorly known species previously housed at PERTH as *Psammomoya petraea* Keighery ms. Collections of this species in fruit are needed.

Psammomoya implexa was previously confused with *P. choretroides*. However, the two species are disjunct in distribution and there are constant differences in habitat, morphology and habitat preference. *Psammomoya choretroides* is a small compact erect shrub which has 4-angled, usually viscid, stems and erect branchlets with an obtuse apex covered by cataphylls. *Psammomoya implexa* is a large spreading much-branched shrub, which has rigid non-viscid 6-ribbed stems and numerous spreading branchlets ending in a long black pungent point.

3. *Psammomoya ephedroides* Diels & Loes. in L. Diels & E. Pritzel, *Bot. Jahrb. Syst.* 35 : 340 (1904).

Type: ?toward King George Sound, Western Australia, 1892, collector unknown, (*holo*: B *n.v.*, ?destroyed; *iso*: MEL 100678).

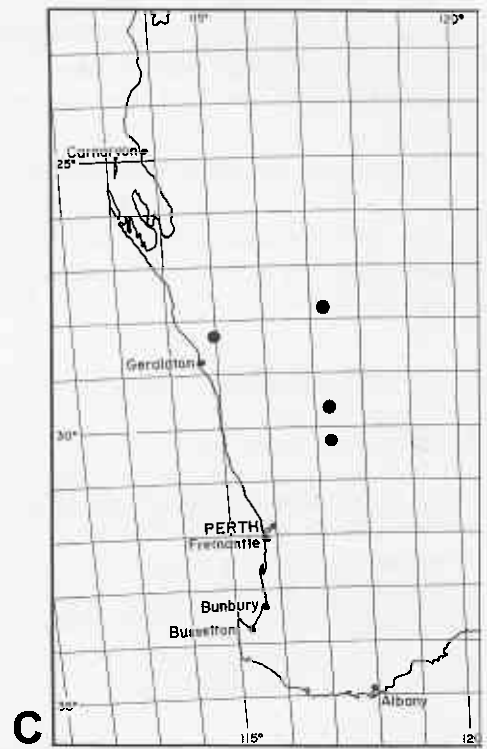
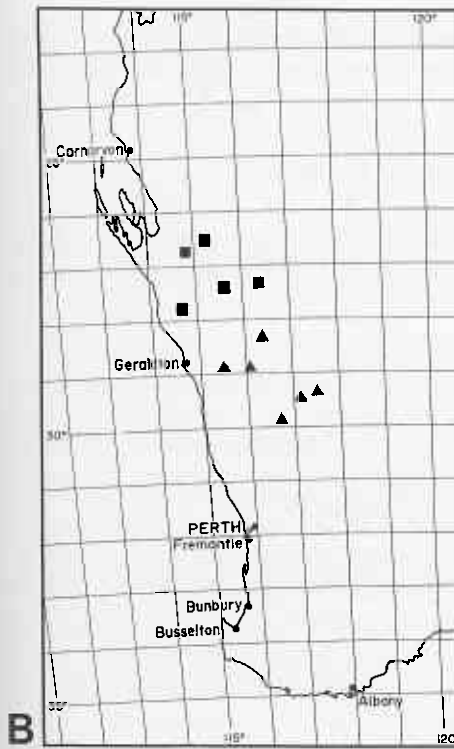
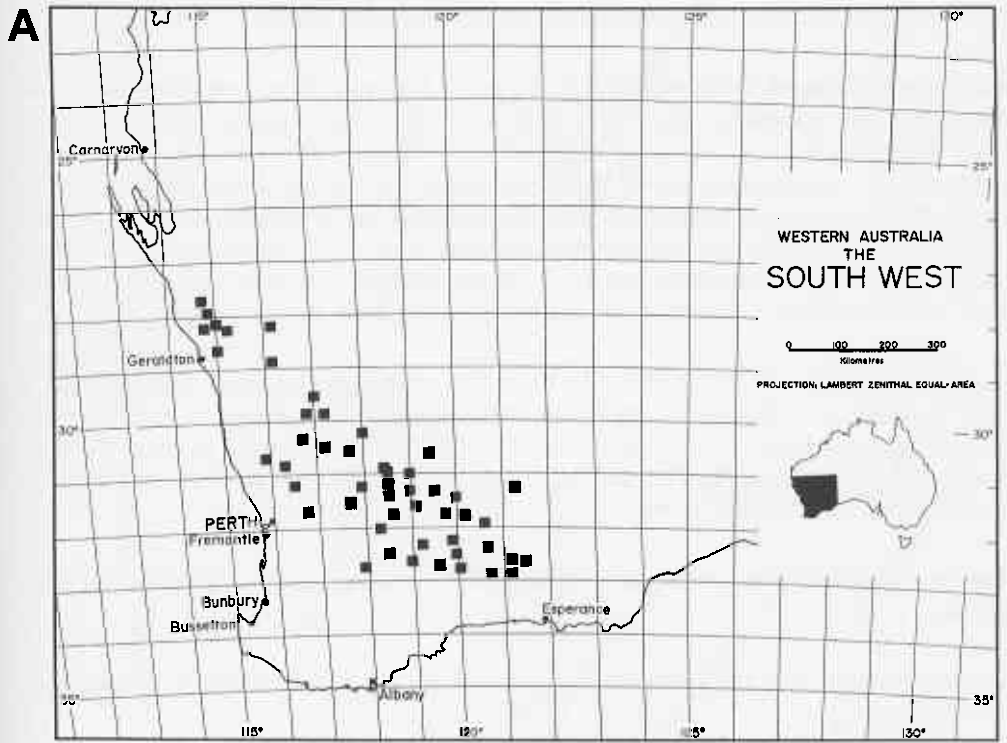


Figure 2. Distribution maps. A - *Psammomya choretroides*; B - *P. ephedroides* ■ and *P. implexa* ▲; C - *P. grandiflora*.

Illustrations. Diels & Pritzel (1904: fig. 41J–L); Jessup (1984: fig. 42H,J).

Much-branched tangled spreading *shrub*, to 1.5 m x 1.5 m; main stems spreading to erect, with numerous short side branchlets. *Branchlets* rigid, 15–35 mm long, 4-angled and 4-sulcate; apex pungent, 2–5 mm long, black. *Cataphylls* linear, 0.5–0.7 mm long, dark brown or black. *Flowers* mostly solitary; pedicel 1.5–2.0 mm long. *Sepals* broadly ovate, 0.8–1.0 mm long. *Petals* ovate-oblong, 2.7–3.5 mm long. *Stamens* inserted on margin of disc; filament *c.* 1.5 mm long; anther *c.* 0.7 mm long. *Disc* thin, 1.0–1.5 mm diam. *Ovary* scarcely immersed, 3-locular. *Style* 1.3–1.5 mm long; stigma obscurely 3-lobed. *Capsule* without persistent corolla, 3-valved, ellipsoid, 5–6 mm long. *Seeds* narrowly ellipsoid, 3.5–4.5 mm long, *c.* 2.5 mm wide, nearly half immersed in the aril. (Figure 3A,B)

Other specimens examined. WESTERN AUSTRALIA: Murgoo Station, *A.M. Ashby* 3298B (AD, PERTH); Toolonga, *A.A. Burbidge* 33 (PERTH); N of Murchison River Bridge, *C.A. Gardner* 2539 (PERTH); Murchison River, *C.A. Gardner* 13199 (PERTH); Murchison River, Aug. 1931, *C.A. Gardner & W.E. Blackall s.n.* (PERTH); Galena, *Gittens* 1579 (PERTH); 35 km N of Murchison River Bridge, *R.V. Smith* 66/307 (PERTH, MEL).

Distribution. Endemic to Western Australia, extending from Toolonga Station east to Murgoo Station. (Figure 2B)

Habitat. *Psammomoya ephedroides* occurs in heaths and shrublands on deep yellow or red sandy loams.

Flowering time. July to September.

Conservation status. Not considered to be at risk. *Psammomoya ephedroides* is present in Kalbarri National Park and Toolonga Nature Reserve. It is also known from several stations and is probably present on unallocated Crown land between these areas.

Notes. Previously confused with *P. grandiflora* (see notes under that species).

The type collection could not have been made close to King George Sound or the Stirling Range as suggested tentatively by Diels and Loesener (*in* Diels & Pritzel 1904), as this species is known only from north of Geraldton.

4. *Psammomoya grandiflora* Keighery, *sp. nov.*

Frutex erectus. Ramuli non spinescentes, apicibus acutis. Cataphylla circa 2 mm longa. Pedicelli 3–5 mm longi. Petala ovato-oblonga ad triangulares, 6–7 mm longa. Filamenta 2.5–3.5 mm longa. Capsula in corolla persistenti circumdata, 3 valvata, 6–8 mm longa.

Typus: Mt Gibson, 29°36' S, 117°11' E, Western Australia, 3 October 1984, *B.H. Smith* 454 (*holo:* PERTH 02791498; *iso:* MEL, CANB, AD, HO, MO).

Illustration. Jessup (1984: fig. 42I).

Spreading erect *shrub* to 80 cm high and 1 m wide; branches erect or spreading, more or less terete. *Branchlets* erect, 4-angled and 4-sulcate; apex very short, soft, acute, covered by cataphylls. *Cataphylls*

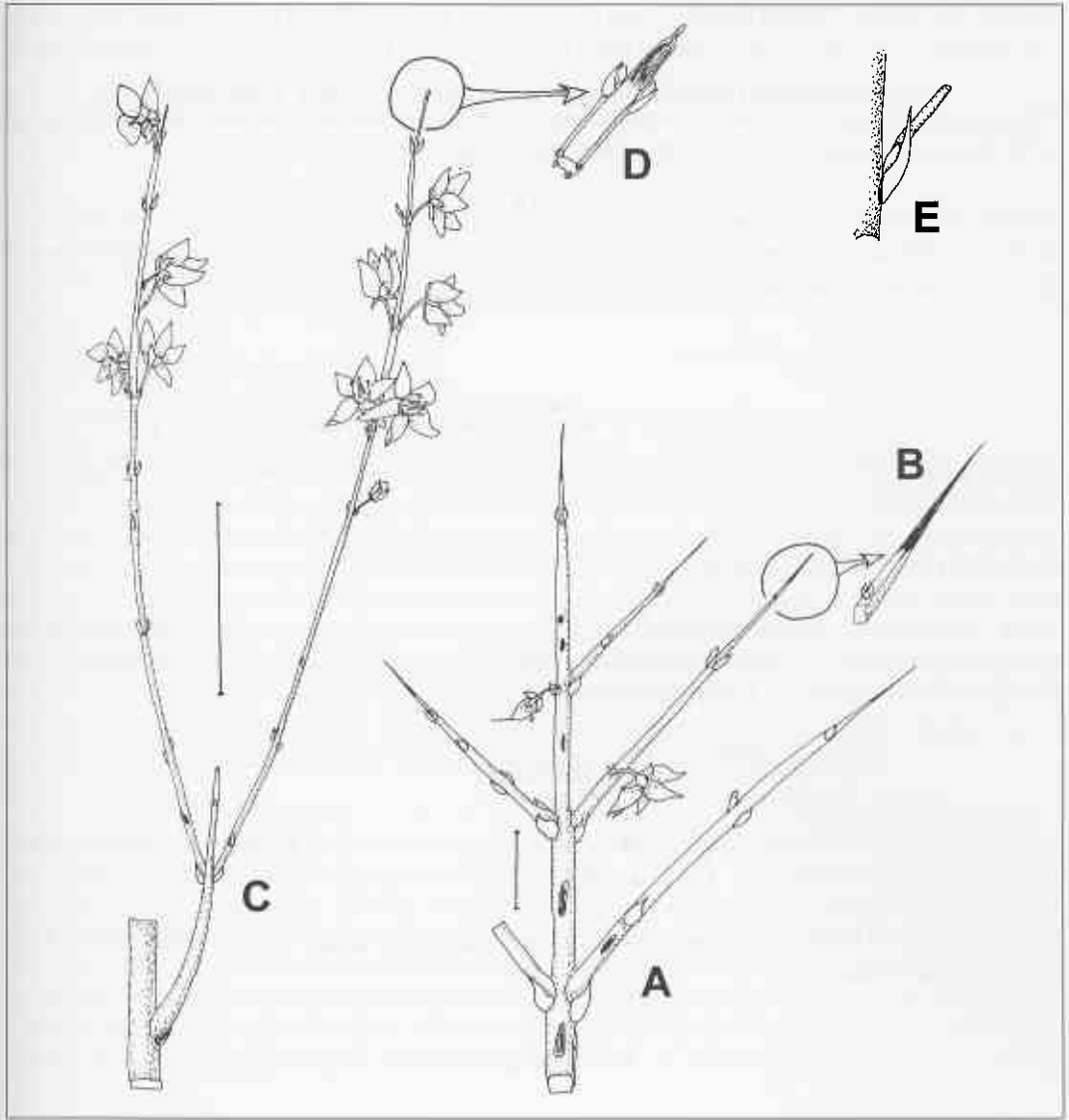


Figure 3. A,B. *Psammomoya ephedroides*. A – flowering branch (scale bar = 5 mm), B – apex of branchlet. C–E. *Psammomoya grandiflora*. C – flowering branch (scale bar = 30 mm), D – apex of branchlet, E – bracts. Drawn from A.M. Ashby 32986 (A,B) and from B.H. Smith 2085 (C–E).

linear-lanceolate, c. 2 mm long, dark brown or black, the pairs of cataphylls separated by 17–24 mm internodes on the main branches. *Flowers* mostly solitary; pedicel 3–5 mm long. *Sepals* broadly ovate, 1.5–2.0 mm long. *Petals* ovate-oblong to triangular, 6–7 mm long, white. *Stamens* inserted below margins of disc; filament 2.5–3.5 mm long; anther c. 0.7 mm long. *Disc* thin, 2.5–3.2 mm diam. *Ovary* scarcely immersed in disc, 3-celled. *Style* c. 2 mm long; stigma obscurely 3-lobed. *Capsule* enclosed by a persistent corolla, 3-valved (or rarely 2-valved by abortion), ellipsoid, 6–8 mm long, 1–3-seeded. *Seeds* ellipsoid, c. 3 mm long, black, half immersed in the aril. (Figure 3C–E)

Other specimens examined. WESTERN AUSTRALIA: between Dalgaranga and Mt Farmer, 27°44' S, 117°13' E, J.S. Beard 7184 (PERTH); East Yuna Reserve, A.C. Burns 1 (PERTH); East Yuna

Reserve, *A.C. Burns* 3 (PERTH); East Yuna Reserve, *A.C. Burns* 22 (PERTH); Mt Gibson, Nov. 1968, *C.A. Gardner s.n.* (PERTH); No. 2 Rabbit Proof Fence, 30°13' S, 117°12' E, *B.H. Smith* 2085 (PERTH).

Distribution. Endemic to Western Australia, known only from scattered localities from East Yuna east to Mt Farmer and south-east to the Mt Gibson area. (Figure 2C)

Habitat. On Mt Gibson *Psammomoya grandiflora* occurs in *Allocasuarina/Grevillea* and *Melaleuca* thicket on red loam over jasperlite. At East Yuna the recorded habitat is "rocky", and near Mt Farmer the species occurs in sandplain with bowgada and spinifex.

Flowering time. August to October.

Conservation status. Not considered to be at risk. *Psammomoya grandiflora*, while poorly known, occurs in nature reserves at East Yuna and Mt Gibson. There is considerable uncleared land between these two locations that could include additional populations.

Etymology. The specific name denotes the large flowers of this species.

Notes. *Psammomoya grandiflora* is related to *P. ephedroides* and was previously included in this species, but differs in having non-pungent branchlets, larger cataphylls, longer pedicels, larger flowers and the capsule enclosed by a persistent corolla.

Discussion

The genus has diversified on the northern and north-eastern margins of the South West Botanical Province of Western Australia. The four species fall into two groups of closely related species, one comprised of *Psammomoya choretroides* and *P. implexa*, and the other of *P. ephedroides* and *P. grandiflora*. In both cases, these groups have one species occurring on deep sandy soils and the second on rocky outcrops.

Acknowledgements

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