

## *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)

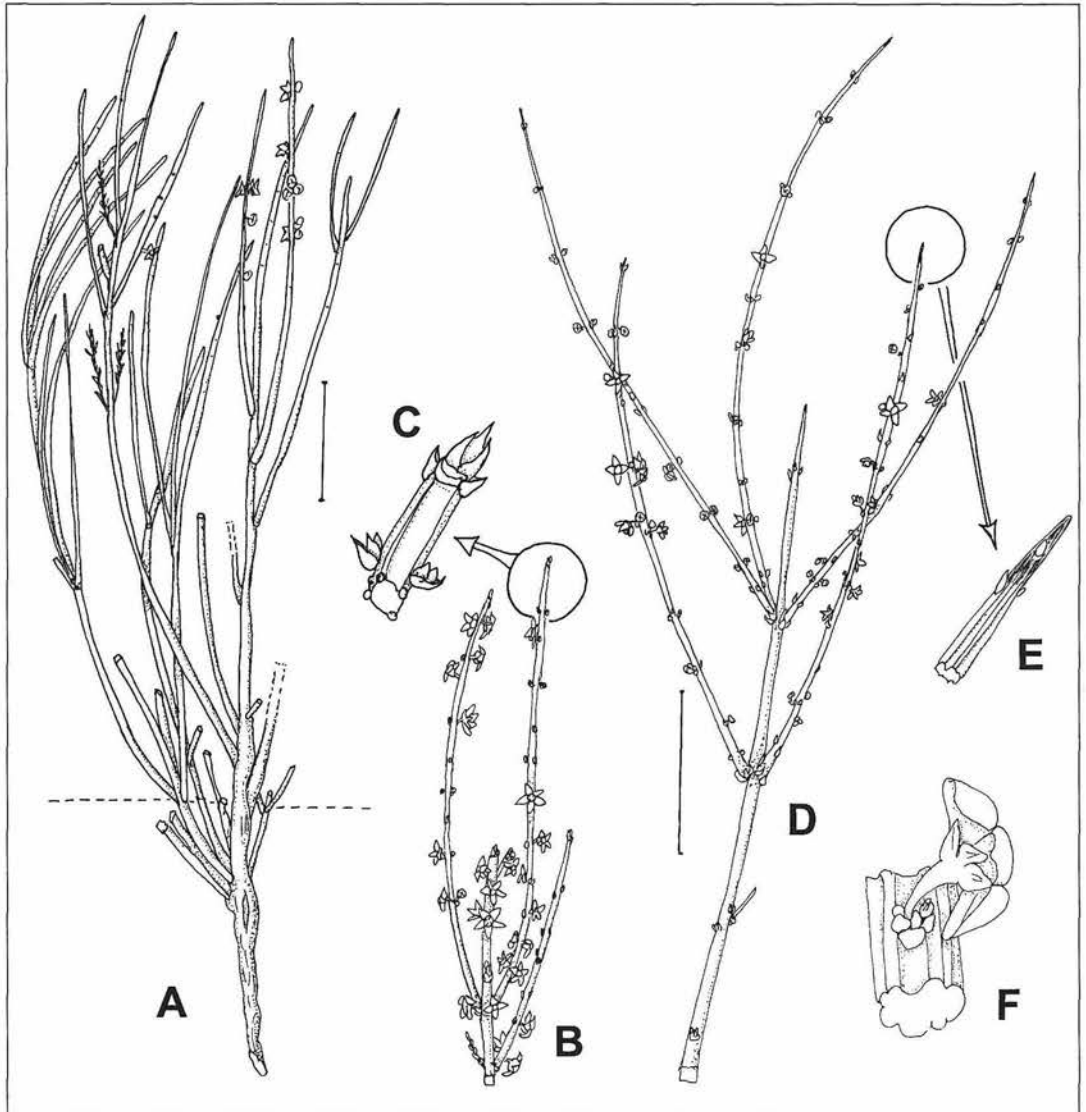


Figure 1. A–C. *Psammomoya choretroides*. A – whole plant (scale bar = 20 mm), B – flowering branch, C – apex of branchlet. D–F. *Psammomoya implexa*. D – flowering branch (scale bar = 25 mm), E – apex of branchlet, F – flower. Drawn from *J.W. Green* 4445 (A–C) and *C.A. Gardner* 12031 (D–F).

*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).

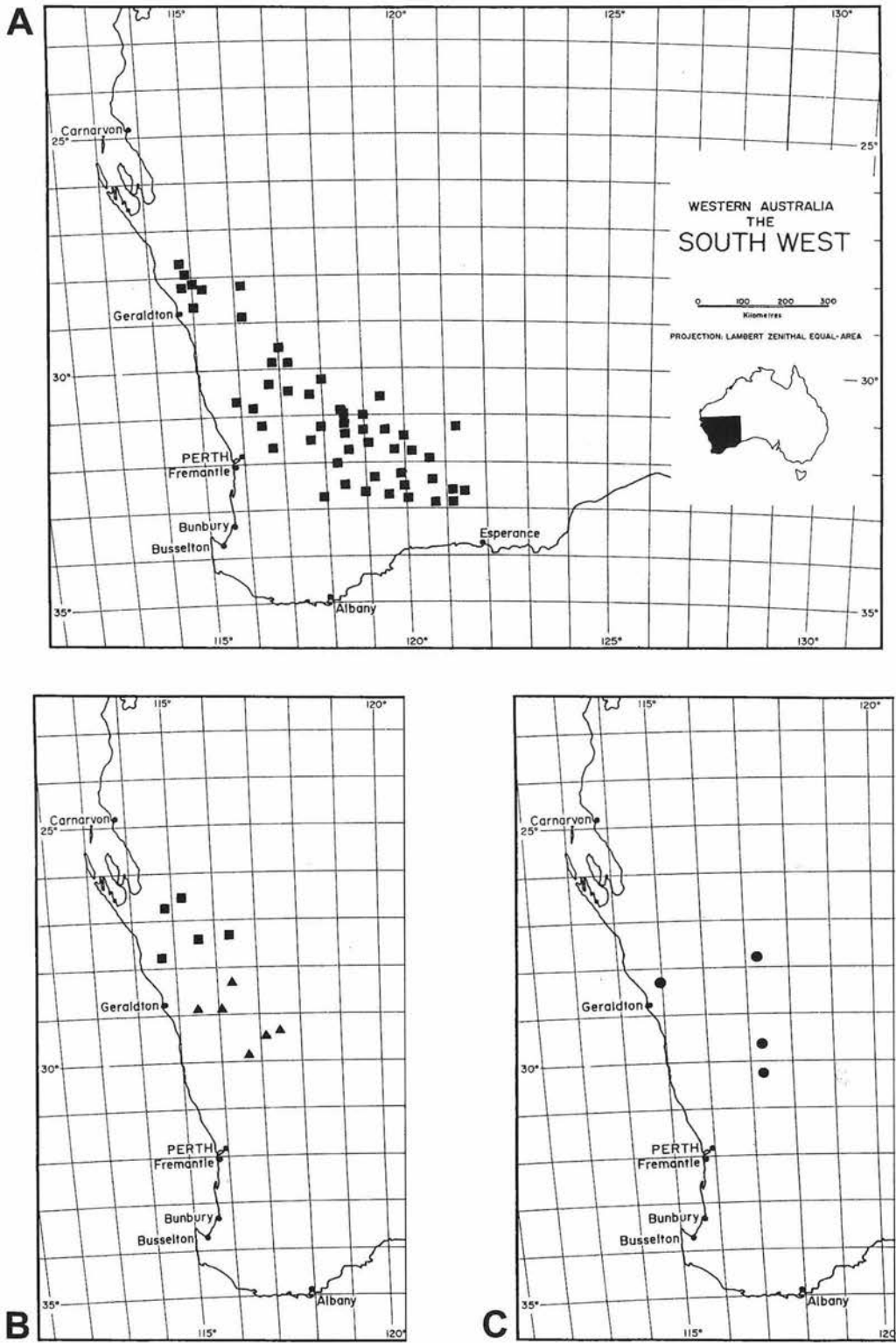


Figure 2. Distribution maps. A – *Psammomoya choretroides*; B – *P. ephedroides* ■ and *P. implexa* ▲; C – *P. grandiflora*.

*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*

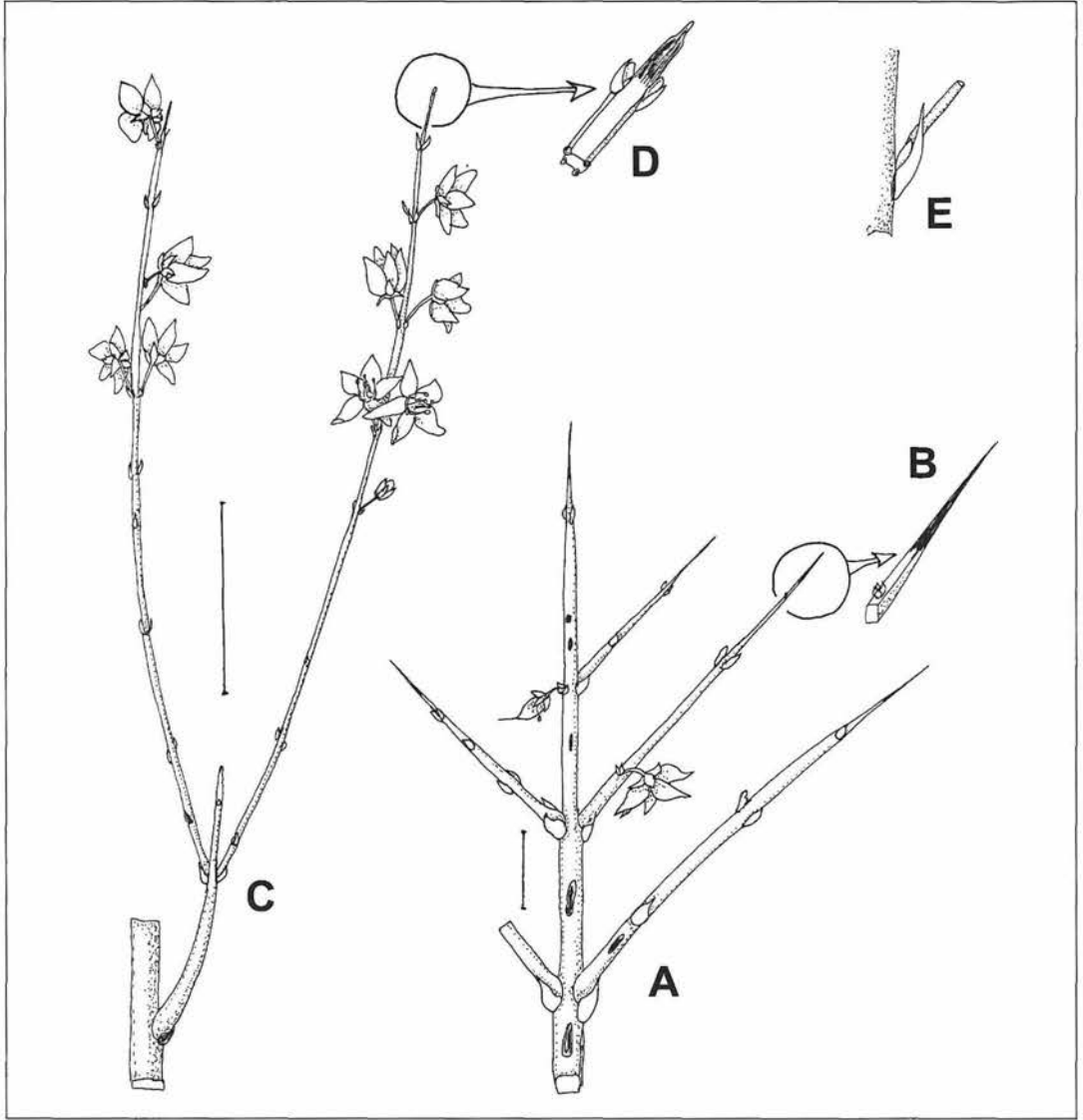


Figure 3. A,B. *Psammomoya ephedroides*. A – flowering branch (scale bar = 5 mm), B – apex of branchlet. C–E. *Psammomoya grandiflora*. C – flowering branch (scale bar = 30 mm), D – apex of branchlet, E – bracts. Drawn from *A.M. Ashby* 32986 (A,B) and from *B.H. Smith* 2085 (C–E).

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 Dalgarranga 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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### References

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