

## A revision of the genus *Pericalymma* (Myrtaceae)

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### Abstract

Cranfield, R.J. A revision of the genus *Pericalymma* (Myrtaceae). *Nuytsia* 13 (1): 7–22(1999). The genus *Pericalymma* (Endl.) Endl. (Myrtaceae) is revised and two new species from south-west Western Australia, *P. megaphyllum* Cranfield and *P. spongiocaula* Cranfield, are described. *Pericalymma crassipes* (Lehm.) Schauer is reinstated and the new combination *P. ellipticum* var. *floridum* (Schauer) Cranfield is made. A key to the species of *Pericalymma* is provided as well as distribution maps and illustrations.

### Introduction

This paper presents a revision of *Pericalymma* (Myrtaceae), a genus of four species endemic to the south-west of Western Australia. Originally given sectional status in *Leptospermum* by Endlicher (1837), *Pericalymma* was raised to generic rank by Endlicher (1840). Later, Bentham (1867) relegated *Pericalymma* to *Leptospermum* sect. *Pericalymma*. Finally Thompson (1983) reinstated *Pericalymma* to generic rank as part of her revisionary studies of *Leptospermum*, as a monotypic genus based on *Pericalymma ellipticum*. Rye (1987) retained *Pericalymma* as a monotypic genus in the "Flora of the Perth Region".

Critical examination of herbarium material of *Pericalymma* and extensive field work have been undertaken to reassess the status of *Pericalymma crassipes* and *P. floribundum*, both of which were placed in synonymy by Thompson (1983), as well as to determine the status of two new taxa. This investigation included statistical analysis of morphological data and anatomical studies of stem tissues.

Chapman (1991) lists two further species names under *Pericalymma*, *P. roseum* Turcz. and *P. teretifolium* Turcz., both described in 1852. Type photographs for both species were located at the Western Australian Herbarium (PERTH) and upon examination were considered to be species of *Kunzea*. Subsequently Toelken (1996) cited *Kunzea roseum* as a putative hybrid of *Kunzea jucunda* Diels x *Kunzea preissiana* Schauer and *Kunzea teretifolia* a synonym of *Kunzea pauciflora* Schauer.

## Methods

Measurements were taken from dried material, detergent-softened where possible. All taxa have been studied in the field to record habit and habitat data, as well as flower colour. Voucher specimens have been lodged at PERTH.

Stem tissues were examined microscopically using prepared stained cross-sections. The number of large open vessels was compared with the number of thick-walled fibre tracheids present for each sample.

Selected populations of *Pericalymma*, including those showing the extremes of variation in the characters being recorded, were investigated using Analysis of Variance (ANOVA), a statistical method to establish differences between populations and within (species) populations. This study was based primarily on the analysis of the mean lengths of the bracteoles, although others characters were tested (Cranfield unpublished).

Material housed in PERTH was examined, including a photograph of the type of *Pericalymma floridum*. The type material of *Pericalymma ellipticum* was borrowed from W and a photographic record retained at PERTH. The type of *Pericalymma crassipes* was located but not seen, and assumptions have been made based on the type description.

Localities recorded on all available herbarium collections were used to produce distribution maps, but vague and general localities have not been mapped. The conservation status of all species and infraspecific taxa has been assessed and coded where appropriate, according to the Department of Conservation and Land Management's Conservation Codes for Western Australian Flora.

## Morphology

*Habit.* All species are shrubs less than 3 m tall. The original descriptions indicate that *Pericalymma ellipticum* grows to 3 m. This study found that throughout the species range the maximum height attained was usually under 2.5 m. Two species appear to attain a height less than 0.45 m and have inflated erect or gnarled stems. All species have dichotomous spreading branchlets with various leaf densities and clustering.

*Stems.* Several species have inflated or swollen stems with soft brittle tissue and are usually single-stemmed. One species has non-inflated stems with harder tissue that is structurally stronger. This is usually multi-stemmed at ground level.

*Leaves.* The leaves are simple and sessile. The lamina is from 1 to 12 mm long and is flat or conduplicate. The considerable range of size and shape of the larger leaves is depicted in Figure 1. All leaves are drawn at the same magnification. The leaf shapes are generally narrowly obovate with the exception of one sample which has large obovate leaves and corresponds to the new species *Pericalymma megaphyllum*. The midrib is obvious mainly in specimens that represent *Pericalymma ellipticum* and is not visible in *Pericalymma crassipes* although varying degrees of ribbing can be seen in the other two species.

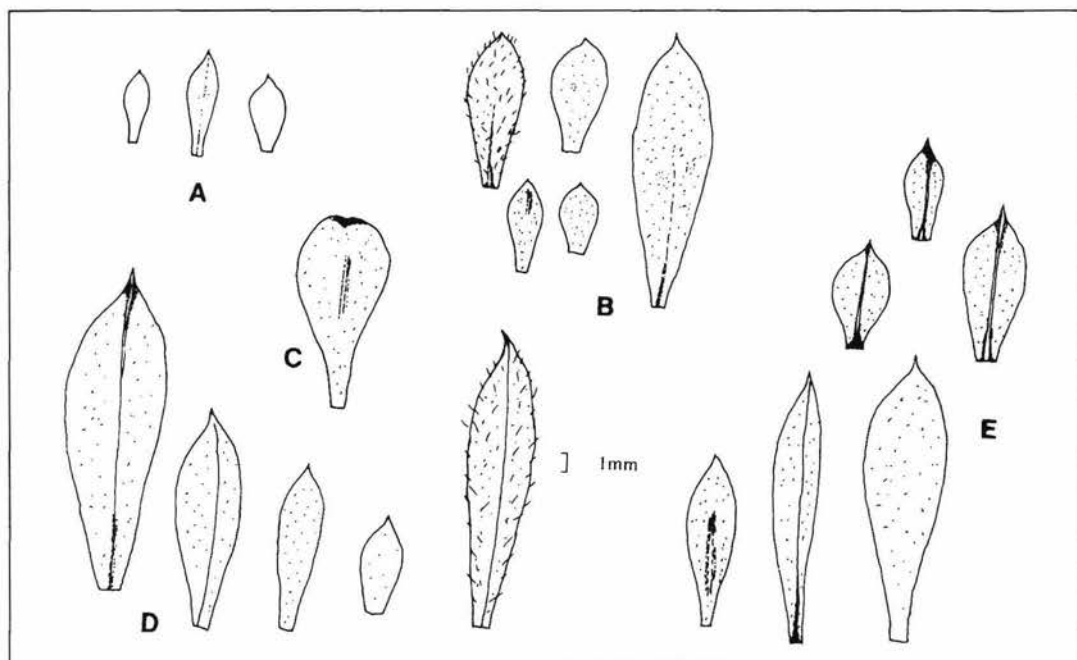


Figure 1. Leaf morphology. A – *Pericalymma crassipes*, B – *P. spongiocaula*, C – *P. megaphyllum*, D – *P. ellipticum* var. *floridum*, E – *P. ellipticum* var. *ellipticum*.

**Floral leaves.** The 3–5 floral leaves per flower vary in shape and are sessile. They may be absent in *P. megaphyllum*. The floral leaves are usually paired and decussate. The base of the floral leaf is winged; the size of this wing depends upon the position of the floral leaf in relation to the bracteoles.

The lower floral leaves in some instances can be mistaken for vegetative leaves and the upper floral leaves tend to merge into the bracteoles. This transitional development from vegetative to floral leaves to bracteoles accounts for the irregular number of floral leaves in the species descriptions.

**Bracteoles.** The bracteoles are ovate, membranous, decussate, 1–5 mm long, with varying degrees of hairiness. The lower bracts tend to be confused with the upper floral leaves and in some instances may have photosynthetic tissue present. The persistence of the bracts on old fruits can be used as an aid in determining the identity of vegetative samples of *Pericalymma*.

Figure 2 represents all species, showing the developmental trend of the vegetative leaves through floral leaves to bracteoles indicating that an adaptation of vegetative structures is initiated for floral development. This adaptation is a result of flower bud initiation in which the leaf development is slowed and the leaves modified to protect the developing flowers.

**Flowers.** There are usually one or two sessile flowers on the apex of the branchlets. When in pairs, the flowers open successively. The petals show great variation in presentation and size, ranging from 1 to 6 mm long. *Pericalymma crassipes* has petals which are small and tend to be inrolled slightly, and are greenish white in colour. Other species of *Pericalymma* have pink or white petals which tend to be large and presented at 90 degrees to the hypanthium. *Pericalymma ellipticum* var. *floridum* has the largest flowers and it is this feature that characterizes this variety.

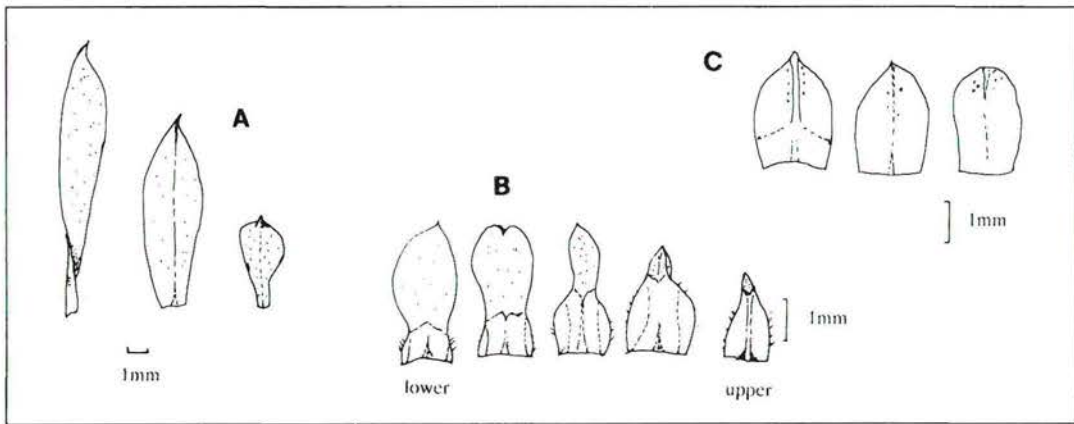


Figure 2. Morphology of A - vegetative leaves, B - floral leaves, C - bracteoles.

### Geographical distribution and habitats

The distribution of the genus *Pericalymma*, as shown in Figure 3, extends from Catby in the north to Bremer Bay in the south-east. Within this area the species are restricted to habitats associated with various wetland types or drainage channels.

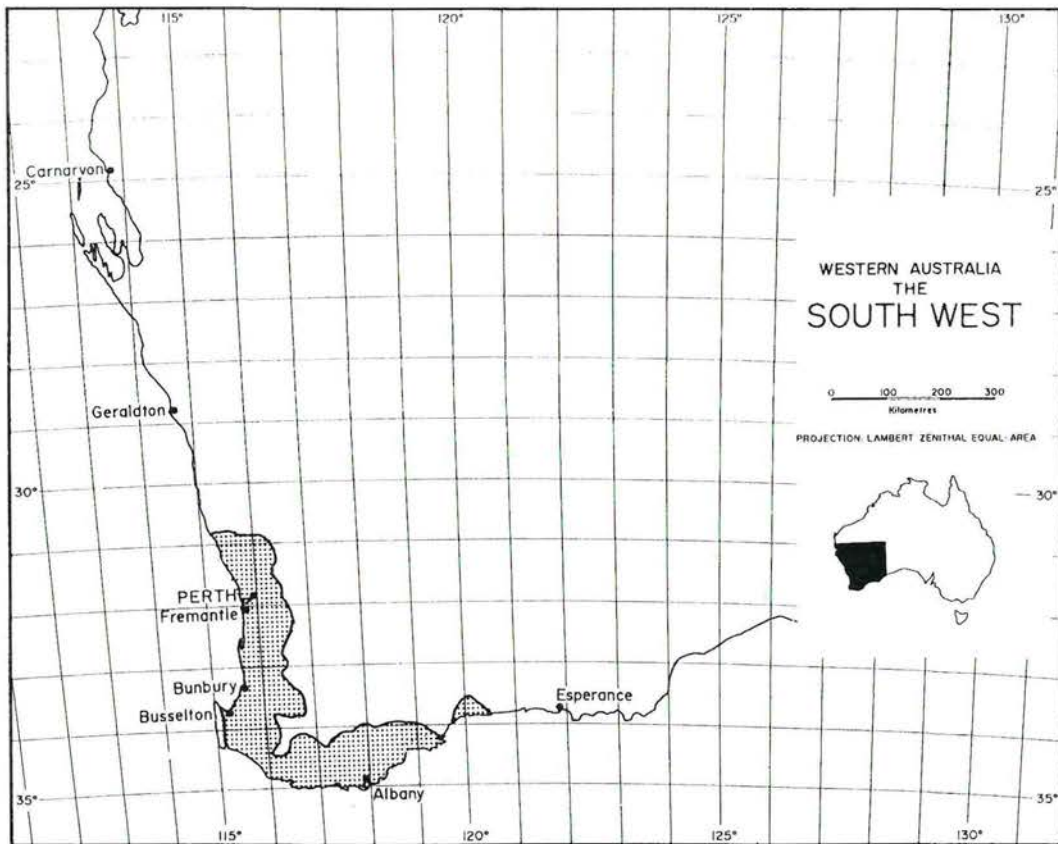


Figure 3. Distribution of *Pericalymma*.

*Pericalymma* species occur in various micro and macro habitats of which there are three basic types. Figure 4 depicts these three types of habitats which are described below. Evolutionary development of the species may have followed from one ecological type to the others, although the direction of this development is unknown.

*Type 1 habitat.* Fringing permanent or semi-permanent water bodies with associated inundation areas. Soils are usually leached sands with thin peaty surfaces.

*Type 2 habitat.* Low-lying poorly drained areas or swampy interdunes to plains with successive swampy flats, subjected to seasonal inundation with fresh water. Soils are leached sands with a peaty surface and a low pH. These are associated with fringing lateritic gravel soils.

*Type 3 habitat.* This is an elevated habitat, mostly occurring in hilly areas on seasonally swampy platforms or foot slopes with drainage channels. Soils are mainly leached sand with some clayey sands associated with lateritic soils.

Populations restricted by physical habitat barriers tended to be uniform, i.e. of a single species, while those from habitats with no obvious barriers tended to have a mixture of species, sometimes with hybrids present.

All species appear to be fire-sensitive. Species with inflated stems appear to become easily stressed and may die during prolonged droughts or following disturbance of their habitat.

### Stem anatomy and statistical analysis

Baas (1977) published a paper investigating the swollen stem anatomy of *Pericalymma crassipes* [as *Leptospermum crassipes*], and indicated that some unique features were apparent when compared with other species of *Leptospermum*. Anatomical investigations conducted in 1994 (reported in Cranfield, unpub. thesis) of a range of *Pericalymma* stems indicated that distinct tissue types could be recognized superficially. These observed tissues correlated with two basic stem types, the soft inflated and the harder non-inflated stems, which correspond to one of the proposed species divisions. The brittle open porous tissue type corresponds to the inflated stem of *Pericalymma crassipes* and allied species, while the denser harder tissue type represents the non-inflated stems of *Pericalymma ellipticum*. This observation provided a useful character that could be used in a key.

Excluding *P. ellipticum*, statistical analysis of length of bracteoles indicated that several populations (corresponding with the species *P. crassipes*) were significantly different from the remainder. These populations also showed the most extreme form of stem inflation; this supported recognition of more than one species. Separation of the remaining two species (the two new species described in this paper), required another approach in which all five characters were scored (average lengths of leaves, floral leaves, bracteoles, sepals and petals). Polygon graphing of these five characters was carried out to illustrate how useful each character was for separation of the taxa.

Elimination of all the species with inflated stems from the *Pericalymma ellipticum* herbarium folders left specimens that showed some variability in flower size but insufficient differences to be separated into more than one species. Previously two species had been recognized among the hard-stemmed specimens, *P. ellipticum* and *P. floridum*.

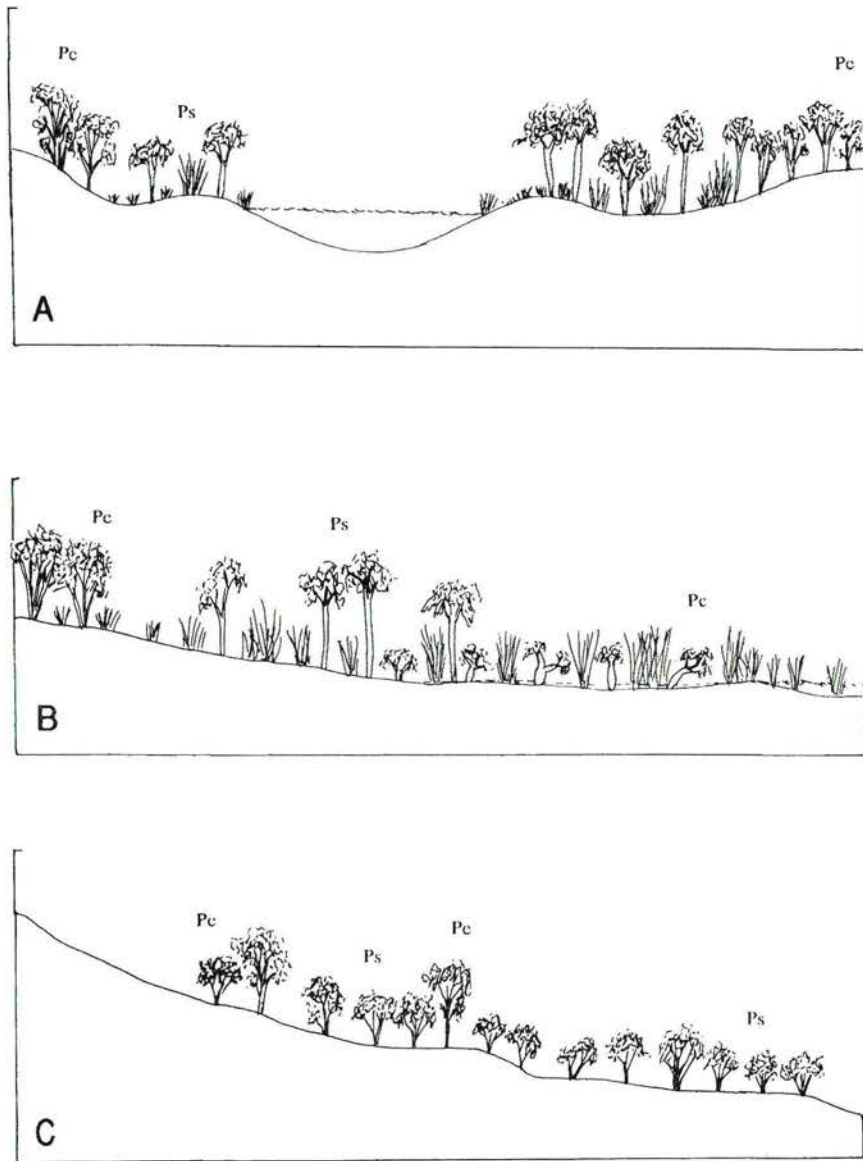


Figure 4. Schematic *Pericalymma* habitats. Pc = *P. crassipes*, Pc = *P. ellipticum* and Ps = *P. spongiocaula*. A – Type 1 habitat, fringing permanent water bodies. B – Type 2 habitat, seasonally flooded low plains. C – Type 3 habitat, elevated seasonally flooded areas.

### Taxonomy

**Pericalymma** (Endl.) Endl. (Endlicher 1840: 1230). – *Leptospermum* sect. *Pericalymma* Endl. (Endlicher 1837: 51). *Type*: *Leptospermum ellipticum* Endl. [= *Pericalymma ellipticum* (Endl.) Schauer].

Dwarf to tall *shrubs*, branchlets dichotomous, flexuose. *Leaves* alternate, sessile, entire, coriaceous. *Flowers* terminating short branchlets, 1 or 2 per branchlet; bracteoles usually 4, opposite

and decussate, sessile, intergrading with floral leaves, which in turn intergrade with vegetative leaves below. *Hypanthium* cup-shaped. *Sepals* 5, alternating with petals on hypanthium rim. *Petals* 5, spreading, ovate to obovate, longer than sepals, with a row of short hairs at the base, margin crisped, apex obtuse. *Stamens* indefinite in a single ring, free, shorter than the petals, erect, inflexed; each with a filiform filament. *Anthers* versatile; cells parallel, longitudinally dehiscent. *Ovary* 3-celled; ovules 3–5 per cell, peltate, hemitropous. *Style* inserted in a deep depression in the summit of the ovary; stigma peltate. *Fruit* a woody capsule, 3-valved. *Seeds* a maximum of 1 per cell, developed from the lowest ovule, testa with a close papillose texture.

### Key to the species of *Pericalymma*

1. Main stems not obviously swollen, stem tissue firm. (Shrub to 3 m high.) ..... **P. ellipticum**
1. Main stems swollen, stem tissue soft and porous
  2. Petals 1.3–2 mm long, white to greenish white, margins inrolled slightly; stems gnarled. (Shrub to 0.45 m high.) ..... **P. crassipes**
  2. Petals 2.1–5 mm long, white to pink, not inrolled; stems erect
    3. Bracteoles 1.7–2.8 mm long; stamen filaments 0.4–0.5 mm long, leaves obovate, 4–12 x 2.1–5.0 mm. (Shrub to 0.35 m high.) ..... **P. megaphyllum**
    3. Bracteoles 2.1–3.7 mm long; stamen filaments 1.1–1.6 mm long, leaves narrowly obovate, 1.8–7.0 x 0.7–2.7 mm. (Shrub to 1.6 m high.) ..... **P. spongiocaulum**

***Pericalymma crassipes*** (Lehm.) Schauer (Schauer 1844: 120). – *Leptospermum crassipes* Lehm. (Lehmann 1842: 5). *Type*: Albany [Western Australia], October 1840, *Preiss.* No. 155 (*holo*: LD n.v.).

Dwarf *shrub* to 0.45 m high. *Stems* gnarled, inflated and soft. *Leaves* clustered near ends of branchlets; lamina narrowly obovate, 2.8–4.5 x 0.6–1.4 mm, glabrous, folded, venation indistinct, apex acute sometimes recurved. *Floral leaves* 3–5, sessile, obovate, 2.3–3.7 x 0.3–1.0 mm, with membranous basal wings, apex acute. *Bracteoles* 4, 2 upper and 2 lower, ovate, 1.1–2.2 x 0.5–1.8 mm, green to light brown, margin ciliate to glabrous, adaxial surface hirsute with simple hairs to glabrous, apex acute to obtuse. *Hypanthium* 2.5–2.6 x 2.0–2.5 mm, glabrous to sparsely hirsute. *Sepals* very broadly triangular, 0.9–1.6 x 0.9–1.2 mm, hirsute, margin ciliate, apex obtuse and slightly hooded. *Petals* white to greenish white, ovate, sometimes inrolled, 1.3–2.0 x 1.0–1.8 mm, apex obtuse. *Stamen filaments* c. 1.0 x 0.2–0.25 mm. *Anthers* ovate, topped with a gland, 0.3–0.35 x c. 0.3 mm. *Ovules* 0.25–0.3 x 0.1–0.15 mm. *Style* 1–2 x c. 0.3 mm. *Fruit* 2.5–3.5 x c. 2.5 mm glabrous to hirsute. *Seeds* obovoid, 1.35–1.50 x 0.5–0.6 mm, testa brown to black.

*Selected specimens examined.* WESTERN AUSTRALIA: Scott River National Park, 4 Nov. 1993, R.J. Cranfield & D. Kabay 8993; 11.9 km S of Mount Barker, 12 Nov. 1993, R.J. Cranfield & D. Kabay 9085; Albany, Feb. 1901, *Diels & Pritzel s.n.*; King George Sound, Oct. 1898, *Goaby s.n.*; William Bay National Park, 17 Oct. 1992, *B.G. Hammersley*; Irwin Inlet, Dec. 1912, *S.W. Jackson s.n.*; Bullsbrook, N of Midland Junction, 8 Aug. 1962, *N.G. Marchant s.n.*

*Distribution.* *Pericalymma crassipes* occurs in coastal south-west Western Australia from the Scott River plain near Augusta to Betty's Beach near Albany. (Figure 5A)

*Habitat.* Occurring mainly on coastal fresh water swamps (Type 2 habitat) with sandy soils with high peat content which are acidic and seasonally flooded. These habitats are usually dominated by tall sedges under which *Pericalymma crassipes* can be found.

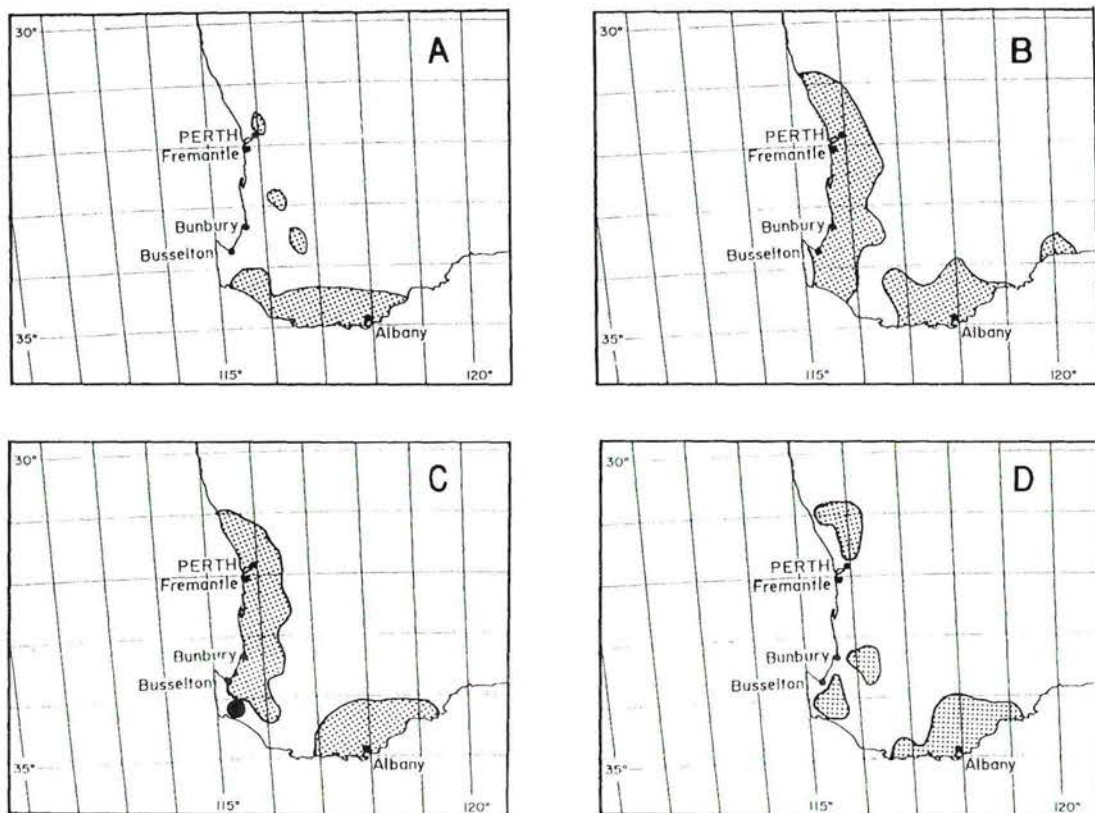


Figure 5. Distribution of *Pericalymma* species and varieties. A – *P. crassipes*, B – *P. ellipticum* var. *ellipticum*, C – *P. ellipticum* var. *floridum* (stippled) and *P. megaphylla* ●, D – *P. spongiocaule*.

*Flowering period.* October to November.

*Conservation status.* Not considered rare or endangered although occurring in restricted habitats.

*Notes.* The flowers of this species are small and hidden among the sedges indicating that a specialized pollinator is involved or that selfing occurs.

***Pericalymma ellipticum*** (Endl.) Schauer (Schauer 1844: 120). – *Leptospermum ellipticum* Endl. (Endlicher 1837: 51). *Type:* King George Sound, [Western Australia], 1837, Huegel (*holo:* W).

*Shrub* to 3 m high. *Stems* erect, multi-stemmed, not obviously inflated and hard to firm. *Leaves* scattered to dense on branchlets; lamina oblanceolate to narrowly obovate, 3.5–11.3 x 0.6–4.6 mm, glabrous to sparsely hairy, flat to shallowly folded, venation obscure, apex acute and sometimes reflexed. *Floral leaves* 4, sessile, oblanceolate to ovate, 2.0–6.6 x 0.2–1.5 mm, glabrous with basal membranous wings, apex acute to obtuse. *Bracteoles* 4, 2 lower and 2 upper, ovate, 2.0–4.6 x 1.2–4.0 mm, greenish brown to light brown, glabrous to sparsely hirsute, margin glabrous to sparsely ciliate, apex acute to obtuse. *Hypanthium* 1.5–4.0 x 1.75–3.0 mm, glabrous to sparsely hirsute. *Sepals*

very broadly triangular, 1.2–2.6 x 1.0–2.5 mm, glabrous to hirsute with simple white hairs, margin ciliate and sometimes inrolled, apex acute to obtuse and hooded. *Petals* white to pink, broadly ovate, 2.3–6.0 x 2.0–5.5 mm, glabrous, margin crisped, apex obtuse. *Stamen filaments* 1.0–2.1 x 0.1–0.3 mm. *Anthers* ovate, 0.2–0.5 x 0.2–0.3 mm. *Ovules* 0.2–0.3 x 0.18–0.5 mm. *Style* 1.5–3.5 x 0.2–0.5 mm. *Fruit* 2.0–5.0 x 2.0–3.5 mm, glabrous. *Seeds* obovoid to ovoid, 1.3–2.0 x 0.5–1.5 mm; testa papillose, black.

*Habitat.* Both varieties occur mainly on Type 3 habitat and also the elevated edges of Types 1 & 2 habitats, mainly on drier leached lateritic sands with fine layer of peat or other organic matter.

*Flowering period.* October to January for both varieties.

*Notes.* The two varieties recognized here frequently grow together in the same general habitat. In the past they have been treated as distinct species, but the only character that has been used to distinguish them is petal size, which does not give a complete separation of herbarium specimens. The absence of any other clear differences between the two taxa has led to the adoption here of varietal rank. However, the status of var. *floridum* needs further investigation, in particular to determine whether there are any microhabitat differences between the two taxa.

#### Key to the varieties of *Pericalymma ellipticum*

1. Petals 2–3.5 mm long ..... var. **ellipticum**
1. Petals 3.5–6 mm long ..... var. **floridum**

#### ***Pericalymma ellipticum* (Endl.) Schauer var. *ellipticum***

*Petals* 2.0–3.5 x 2.5–3 mm. (Figure 6)

*Selected specimens examined.* WESTERN AUSTRALIA: Guildford, Apr. 1901, *C. Andrews s.n.*; S of Jandakot, Oct. 1961, *T.E.H. Aplin s.n.*; 10 miles [16 km] W of Yarloop, 13 Apr. 1978, *R.J. Cranfield* 112; 18 km SW of Busselton along Vasse Highway, 28 Sep. 1992, *R.J. Cranfield* 8339a; Hardy Rd, Forrestfield, 23 Oct. 1993, *R.J. Cranfield* 8945; 11 km W of Donnybrook on Capel road, 26 Sep. 1992, *R.J. Cranfield & P. Spencer* 8320; Red Gully Rd, E of Fynes Rd, W of Mogumber, 17 Dec. 1992, *E.A. Griffin* 8516.

*Distribution.* *Pericalymma ellipticum* var. *ellipticum* occurs from Jurien in the north to east of Albany in the south. (Figure 5B)

*Conservation status.* Not considered rare or endangered.

#### ***Pericalymma ellipticum* var. *floridum* (Schauer) Cranfield, *stat. et comb. nov.***

*Pericalymma floridum* Schauer (Schauer 1844: 121). – *Leptospermum floridum* (Schauer) Benth. (Bentham 1867: 110). *Type:* near Guildford, Western Australia, 1839, *Preiss.* No 131 (LD *n.v.*, photograph at PERTH).

*Petals* 3.5–6.0 x 2.7–5.5 mm. (Figure 7)

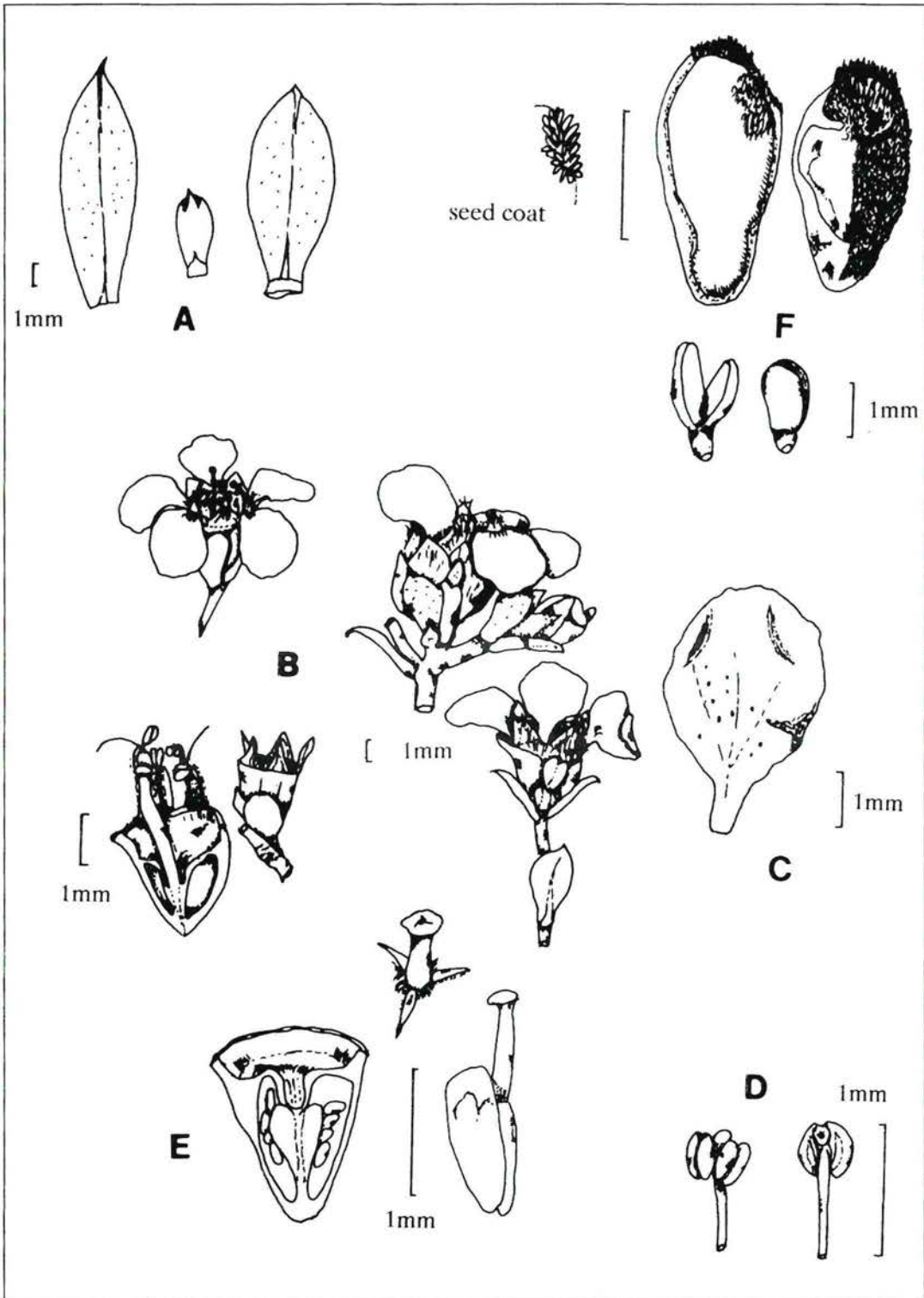


Figure 6. *Pericalymma ellipticum* var. *ellipticum*. A – leaves; B – flowering branchlets, young and old flowers and TS of flower; C – petal; D – two views of stamen; E – two views of style and its insertion point and TS of ovary; F – seeds and embryos.

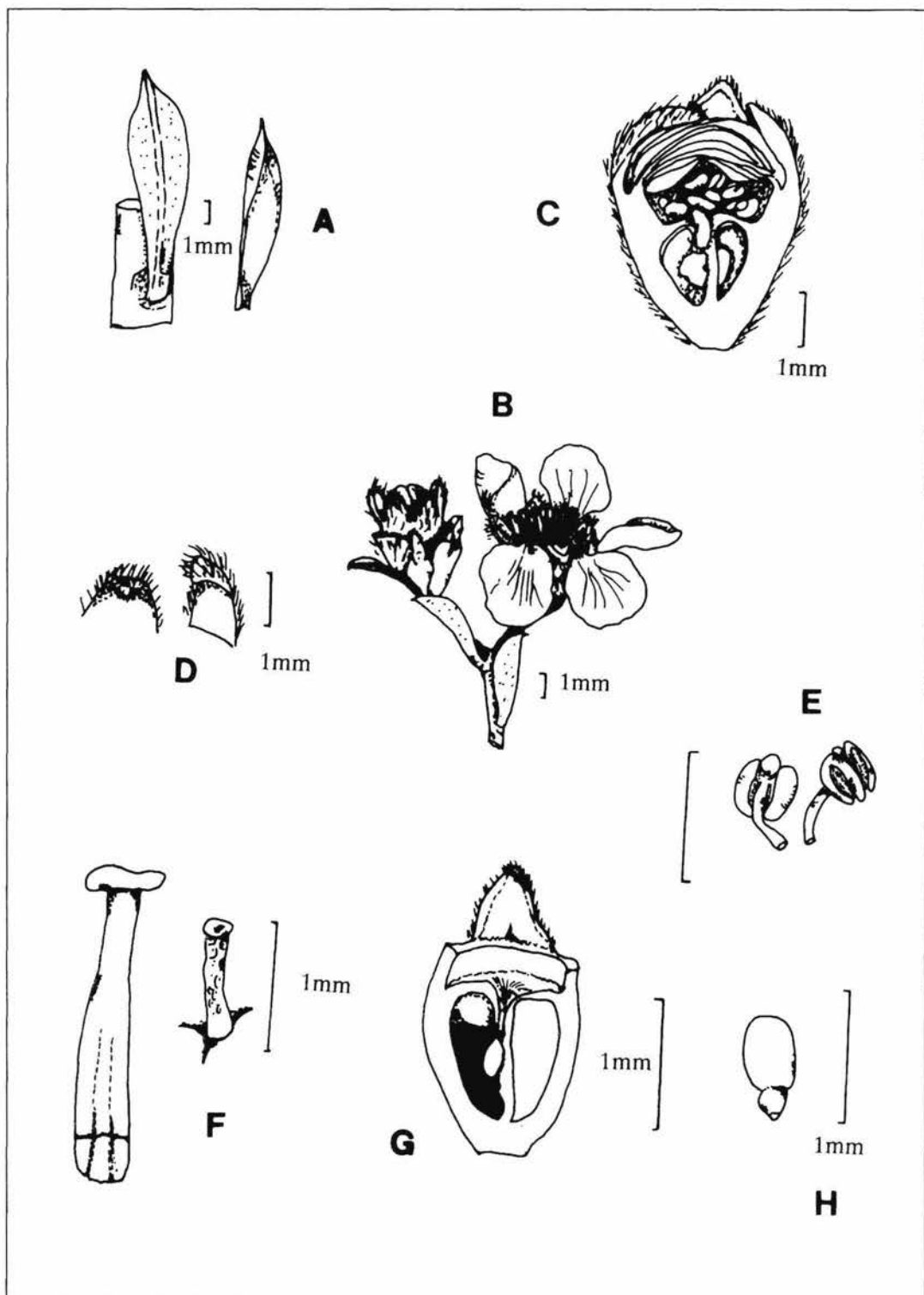


Figure 7. *Pericalymma ellipticum* var. *floridum*. A – leaves; B – flowering branchlet; C – TS of flower bud; D – two views of sepal apex; E – two views of stamen; F – style with insertion point and enlargement of style; G – seed in TS of fruit; H – seed embryo.

*Selected specimens examined.* WESTERN AUSTRALIA: intersection of Vahland Ave and South St, Canning Vale, 16 Oct. 1993, R.J. Cranfield s.n.; 1.3 km W of Wolka Rd off Cooljarloo Rd, W of Brand Highway, 27 Oct. 1993, R.J. Cranfield & D. Kabay 8974; 25 km E of Brookton Highway, 2 Dec. 1993, R.J. Cranfield & D. Kabay 9108; NW corner of Twin Swamps Nature Reserve, S of Muchea, 24 Sep. 1992, E.A. Griffin 6810; SE corner Moore River National Park, NW of Gingin, 17 Oct. 1992, E.A. Griffin 7286; Kelmscott, 11 Sep. 1897, R. Helms s.n.

*Distribution.* *Pericalymma ellipticum* var. *floridum* appears to occur in two main areas, one north of Perth and the other around the Busselton area, with a scattering of populations between these areas. It also occurs around Albany. (Figure 5C)

*Conservation status.* Not considered rare or endangered.

***Pericalymma megaphyllum* Cranfield, sp. nov.**

*Pericalymma crassipes* et *Pericalymma spongiocaula* affinis sed foliis majoribus late obovatus differt.

*Typus:* Scott River, Western Australia, 4 November 1993, R.J. Cranfield 8996 (*holo:* PERTH 03715442; *iso:* AD, BRI, CANB, Curtin University, HO, K, MEL, US).

*Shrub* to 0.35 m high. *Stems* erect, inflated and soft. *Leaves* alternate, scattered along branchlets; lamina obovate, 4.0–11.8 x 2.1–5.0 mm, glabrous, flat, midrib visible adaxially, venation obscure, margin slightly undulate, apex obtuse to acuminate. *Floral leaves* 4 or absent, sessile, narrowly ovate, 2.1–3.3 x 0.2–0.7 mm, with membranous basal wings, apex acute and reflexed. *Bracteoles* 4, 2 lower and 2 upper, ovate, 1.7–2.8 x 0.6–1.4 mm, light brown, glabrous, margins ciliate, apex acute. *Hypanthium* 1.5–2.0 x 1.7–2.5 mm, glabrous to sparsely hirsute. *Sepals* depressed-triangular, 1.0–1.4 x 1.1–1.6 mm, glabrous to sparsely hirsute, margin sparsely ciliate, apex acute and hooded. *Petals* white or pink, broadly ovate, 2.1–3.8 x 2.0–3.8 mm, margins crisped, apex obtuse. *Stamens filaments* 0.4–0.5 x 0.15–0.16 mm. *Anthers* ovate, 0.4–0.5 x 0.4–0.45 mm. *Ovules* 0.4–0.6 x 0.15–0.2 mm. *Style* 1.0–2.0 x 0.25 mm. *Fruit* 3.0–3.5 x 2.0–2.5 mm, glabrous. *Seeds* obovoid, not seen at maturity. (Figure 8)

*Distribution.* Known only from type location. (Figure 5C)

*Habitat.* Only known to occur on a Type 3 habitat in an elevated washed area with red brown, lateritic, clayey sand.

*Flowering period.* November.

*Conservation status.* CALM Conservation Code for Western Australian Flora: Priority One.

*Etymology.* Named from the Greek *mega* – large and *phyllum* – leaf, in reference to the relatively large broad leaves.

*Note.* Further surveys and studies of this species are required to establish its relationships to other species and to determine its ranking.

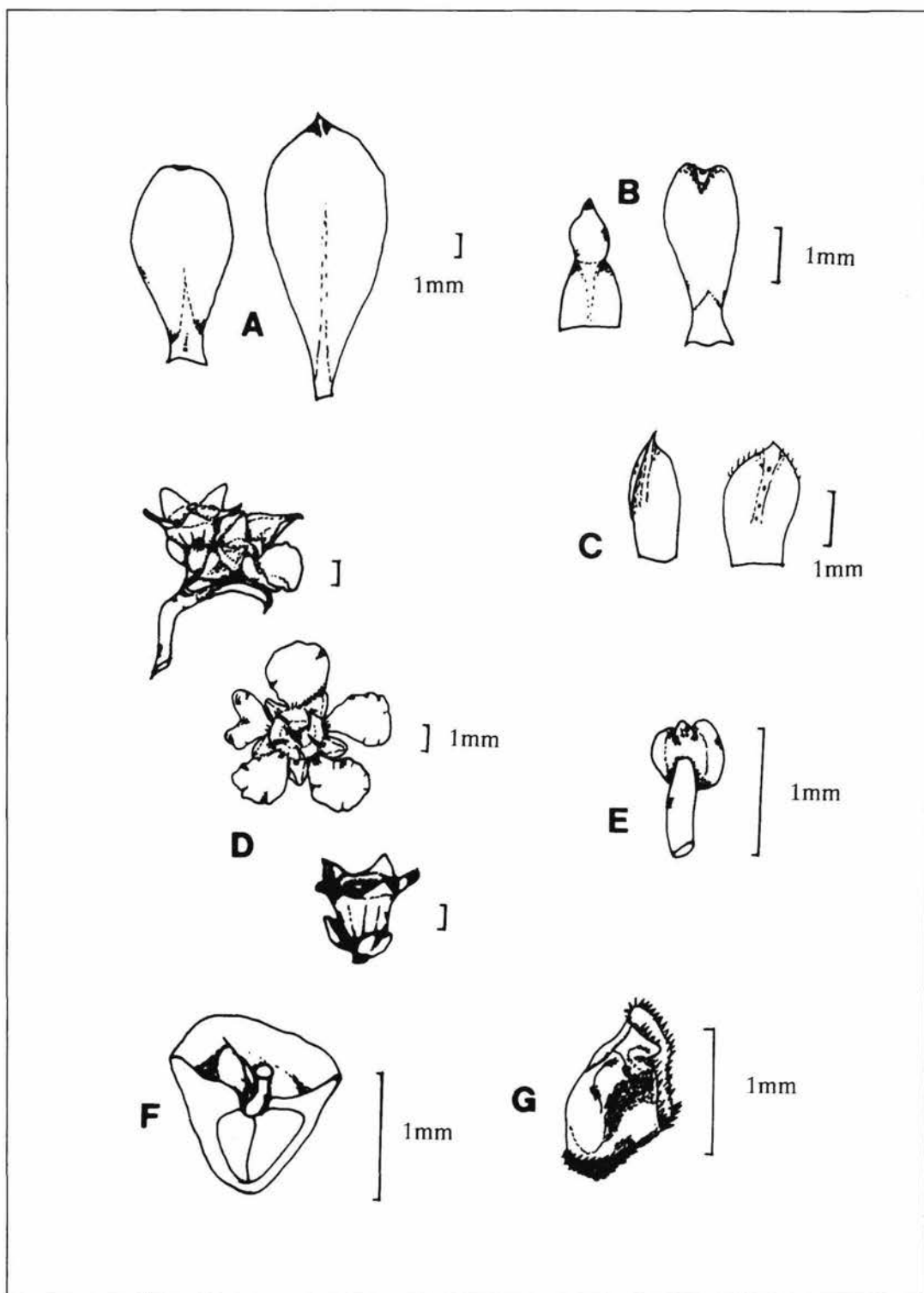


Figure 8. *Pericalymma megaphylla*. A - leaves; B - floral leaves; C - bracteoles; D - inflorescence, young and old flowers; E - stamen; F - TS of hypanthium and gynoecium; G - seed (immature).

**Pericalymma spongiocaula** Cranfield, *sp. nov.*

*Pericalymma crassipes* affinis sed planta elatiore floribus majoribus petalis margine crispatis altiter appianatis differt.

*Typus:* Mount Barker, Western Australia, 12 November 1993, *R.J. Cranfield* 9085 (*holo:* PERTH 03755673; *iso:* AD, BRI, CANB, Curtin University, HO, K, MEL).

*Shrub* to 1.6 m high. *Stems* straight, erect, inflated and soft. *Leaves* scattered or clustered near ends of branchlets; lamina narrowly obovate, 1.8–7.0 x 0.7–2.7 mm, glabrous, partially folded, venation obscured, oil glands obvious, apex acute reflexed to straight. *Floral leaves* 4, sessile, obovate, 1.0–4.5 x 0.1–1.5 mm, with membranous basal wings, apex acute. *Bracteoles* 3 or 4, 1 or 2 lower and 2 upper, opposite and decussate, sessile, ovate, 2.1–3.7 x 1.1–3 mm, light brown, hirsute to glabrous, margin hirsute, apex acute to obtuse. *Hypanthium* 3–4 x 2–3.5 mm, hirsute. *Sepals* broadly triangular, 1.1–2.4 x 0.9–1.8 mm, hirsute, margin ciliate, apex acute and hooded. *Petals* white or pink, obovate to ovate, 2.5–5 x 1.8–3.8 mm. *Stamen filaments* 1.1–1.6 x 0.1–0.2 mm. *Anthers* ovate, 0.45–0.5 x 0.3–0.45 mm. *Ovules* 0.35–0.70 x 0.15–0.35 mm. *Style* 1–2.25 x 0.25–0.35 mm. *Fruit* 3.0–5.5 x 2–3 mm, glabrous or hirsute. *Seeds* obovoid, 1.2–2. x 0.6–1.0 mm; testa black to dark brown. (Figure 9)

*Selected specimens examined.* WESTERN AUSTRALIA: Scott River National Park, 4 Nov. 1993, *R.J. Cranfield* & *D. Kabay* 8995; 6 km N of Wellstead, 7 Dec. 1993, *R.J. Cranfield* & *D. Kabay* 9163; 17 km NW of Cheynes Beach, 8 Dec. 1993, *R.J. Cranfield* & *D. Kabay* 9189; 1.5 km W of Betty's Beach, 8 Dec. 1993, *R.J. Cranfield* & *D. Kabay* 9199a; 3 km E of Blackwood River Crossing on Brockman Highway, Augusta to Nannup, 3 Nov. 1978, *G.J. Keighery* 1878; Scott River, E of Augusta, 21 Sept. 1973, *E.C. Nelson* ANU17302; Blue Waters, Collie, 31 Oct. 1979, *R.A. Saffrey* 1750; Stuart Rd, 11 miles [17.6 km] from junction with Pemberton–Nannup road, 15 Oct. 1968, *J.W. Wrigley s.n.*

*Distribution.* *Pericalymma spongiocaula* occurs from Cataby near Jurien to Wellstead east of Albany. (Figure 5D)

*Habitat.* Occurring in Type 1 and Type 2 habitats with sandy peaty soils containing some lateritic gravel.

*Flowering period.* October to January.

*Conservation status.* Widespread, not considered rare or endangered.

*Etymology.* Named from the Latin *spongiosus* – porous and *caule* – stem, in reference to the soft, swollen stems.

*Notes.* In both of its habitats *Pericalymma spongiocaula* overtops most associated species displaying its larger and showier flowers above the surrounding plants. This suggests that this species is insect-pollinated with little selfing occurring, possibly creating considerable genetic variation within and between populations.

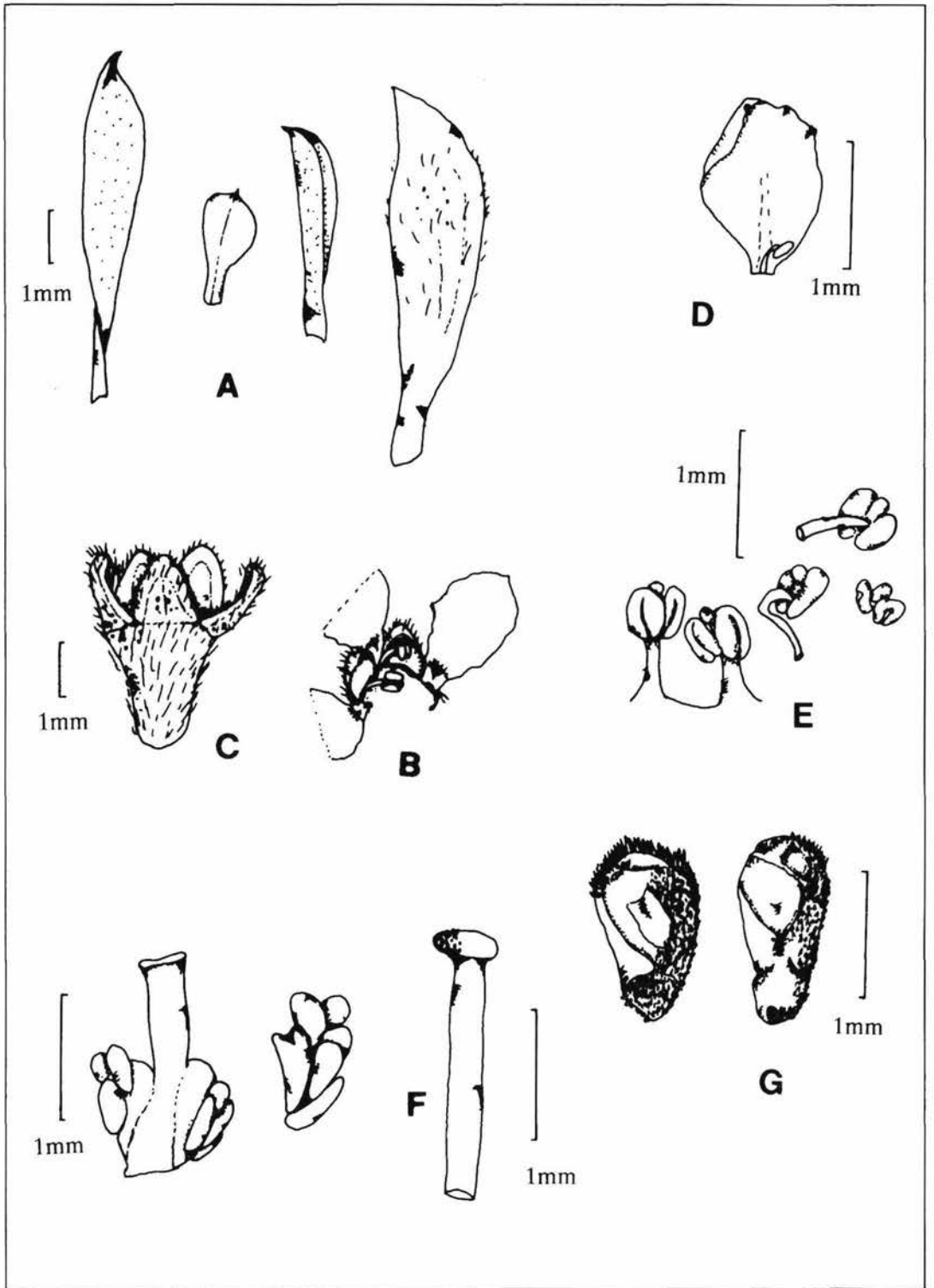


Figure 9. *Pericalymma spongiocaula*. A – leaves; B – portion of young flower; C – old flower; D – petal; E – stamens; F – two views of style and ovules; G – two views of seed.

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