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Pimelea leiophylla (Thymelaeaceae): a new endemic species from Tasmania's east coast

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Introduction

The genus *Pimelea* Banks & Sol. ex Gaertn. consists of approximately 125 species (Rye 1990, 1999; Copeland & Telford 2006; Burrows 2011). Of these species, 90 are endemic to Australia (Rye 1990, 1999; Copeland & Telford 2006) and a further 35 species occur in New Zealand (Burrows 2011). In Tasmania, the genus is represented by 18 species, seven of which are endemic to the state, including the novel species described here (de Salas & Baker 2015).

Rye's (1990) treatment of Australian *Pimelea* divided the genus into seven infrageneric sections. Rye (1999) later suggested that the boundaries of the proposed sections are unresolved and require work, particularly with addressing the placement of the New Zealand species. Burrows (2008, 2011) agreed, noting that some New Zealand species of *Pimelea* do not fit well with Rye's infrageneric classification, and as such it was not adopted for the species occurring in New Zealand. Instead, the New Zealand taxa were informally divided into two groups: those with leaf hair and those without (Burrows 2008). He later suggested that the genus originated in Australia and migrated to New Zealand where, unlike in Australia, it is rife with hybridisation between many species, complicating the taxonomy and species boundaries (Burrows 2011).

Characteristics of the group that are useful as diagnostic features include phyllotaxy (opposite or alternate), indumentum of the leaf

Abstract

Pimelea leiophylla A.M.Gray & M.Baker sp. nov., a new species restricted to Freycinet Peninsula and Schouten Island, Tasmania is described and illustrated, and its distribution and habitat are discussed. The new species is most similar to *Pimelea sericea* R.Br. but differs chiefly by its leaves being hairy on the adaxial surface and by its opposite-decussate phyllotaxy. The species is uncommon and localised throughout its distribution range.

Key words: granite, new species, taxonomy, diagnostic features, morphology, Australia

surfaces (e.g. presence and/or absence of hairs), hypanthium dehiscence (e.g. above or below the ovary) and indumentum, and characters of the fruit (e.g. naked or enclosed in the ovary section of the hypanthium and/or the fruit being dry or fleshy).

In 1989, A.M. Buchanan collected several samples of an unknown species of *Pimelea* from The Hazards mountain range, Freycinet National Park, and determined each as '*Pimelea* sp.'. Soon after, in 1991, J. Pannell collected a specimen from Callitris Creek on the southern Freycinet Peninsula, which he determined as *P. nivea* Labill., an endemic montane to lowland species that is widely distributed throughout the state especially in the central and eastern regions. One of us (A.M. Gray) examined this specimen in 2003 noting that 'the [leaf] indumentum in no way matched that of *P. nivea* but, rather, it was more typical of that of *P. sericea*!'. *Pimelea sericea* R.Br. is an endemic Tasmanian species of montane habitats on dolerite mountains of the Central Plateau, southern ranges and north-eastern highlands. For it to be growing at the Freycinet Peninsula was considered odd due to its being far removed from its known distribution, and growing on Devonian granite substrates, the dominant geological formation of the Freycinet Peninsula. This sheet, and some others, including one determined as '*Pimelea*' by Buchanan in 2001, were later examined and annotated by Gray as *Pimelea* sp. nov. In 2000, its range was extended by collections from the granite hills of Schouten Island, located off the southern tip of the Freycinet Peninsula and part of the Freycinet National Park. During the course of our study, a specimen collected by Canning and Telford from The Hazards in 1969, and identified as *P. sericea*, was examined and is regarded as the first collection of this putative new species.

Although not common throughout its range, it is somewhat surprising that this rather showy-flowered novelty should have remained unnamed for so long. We here recognise this taxon as a new species closely related to *P. sericea*, differing chiefly by the indumentum of the adaxial leaf surface and its phyllotaxy, and formally describe it as *Pimelea leiophylla* A.M.Gray & M.Baker.

Materials and methods

The study is based on wild-collected material by the authors and on collections held in the Tasmanian

Herbarium (HO). Two specimens held at the Australian National Herbarium (CANB) and the National Herbarium of Victoria (MEL) were also included. Due to the scarcity of fruiting material on herbarium specimens, measurements and characteristics of fruits and seeds were made from specimens of plants in cultivation at the Royal Tasmanian Botanical Gardens in Hobart.

Taxonomy

Pimelea leiophylla A.M.Gray & M.Baker, **sp. nov.**

Type: TASMANIA. The Hazards, saddle between Mt Parsons and Mt Dove, 29.xii.1989, A.M.Buchanan 11570 (holotype: HO 121035 (Fig. 1); isotype: MEL 2383961A).

Pimelea sp. Freycinet (A.M. Buchanan 15902) Tas. Herbarium sensu Baker & Duretto (2011).

Similar to *Pimelea sericea* but differing in its sparsely branched open habit, its opposite-decussate leaves and the presence of sparse, silky-villous hairs on the adaxial leaf surfaces.

Small shrubs, 0.3–1.5 m high. *Branches* sparse, slender, erect to spreading, \pm arranged dichotomously, initiating immediately below the previous season's floral receptacle, appressed silky-hairy, glabrescent; leaf scars prominent; bark tough, stringy. *Leaves* 5–15 mm long, 3–10 mm wide, pale to mid-green, opposite, decussate, spreading to loosely appressed, often crowded on younger branches; petiole c. 1 mm long; lamina broadly ovate to elliptic, flat; adaxial surface sparsely appressed silky-hairy, glabrescent with age; abaxial surface densely appressed villous to silky-hairy, soft, with the hairs extending beyond the margin; margin fimbriate; apex acute or minutely apiculate. *Inflorescence* an erect, compact terminal head of (10–)15–25+ flowers; receptacle densely hairy, \pm convex; involucre bracts 4 or 8, a little broader but otherwise scarcely differentiated from subtending leaves. *Flowers* female or hermaphrodite, protandrous; pedicels very short, obscured by long, dense hairs. *Hypanthium* bright white, occasionally pink, drying pale creamy-yellow, fusiform-tubular; style portion 8–15 mm long, circumscissile immediately above the ovary; ovary portion 4–6 mm long, persisting briefly post-anthesis; adaxial surface glabrous; abaxial surface densely appressed-hairy. *Sepals* 4, 3–5 mm long, spreading or slightly recurved, two sepals somewhat larger, often \pm cucullate, with a central, raised ridge; apices of lobes with a distinctive



TASMANIAN HERBARIUM
HOBART HO 121035

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cm
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Tasmanian Museum & Art Gallery



HOLOTYPE of:
Pimelea leiophylla A.M. Gray & M. Baker
DET./CONF.: A.M. Gray 18 May 2016
TASMANIAN HERBARIUM (HO)

Tasmanian Herbarium: Hobart
Flora of Tasmania District: east coast

Family: Thymelaeaceae

Pimelea

Collector: A.M. Buchanan **HOLOTYPE**
No: 11570 Date: 29 Dec 1989

Lat: 42° 09' S Long: 148° 18' E
Alt: 340 m. Precision Code: 1
Map: Freycinet Grid Ref: 083 326

Locality: Saddle between Mt Parsons and Mt Dove, The Hazards

Habitat: Heathy open woodland on granite

Habit: Erect spindly shrub c.1m tall

Notes: **DATA BASED**
Duplicate sent to MEL

* H O 1 2 1 0 3 5 *

A.M. BUCHANAN
11570

Tasmanian Herbarium
Pimelea sp. Freycinet (A.M. Buchanan 15902) Tas Herbarium
DATA BASED
Det: MF Duretto & AM Buchanan Nov 2010

Figure 1. Holotype of *Pimelea leiophylla* (HO 121035)

tuft of hairs. *Stamens* 2, inserted at the base of the larger sepals; filaments equal to or a little shorter than the sepal lobes, erect at first, then curving outwards during and following anther dehiscence; anthers 1–2.5 mm long, dehiscence latrorse. *Style* slender, filiform, enclosed, or exerted and often contorted, a little longer than the stamens; stigma minutely papillose. *Fruit* dry, sparsely hairy at the apex, enclosed within the persistent base of the hypanthium. *Seed* greyish-black, ovoid, 3.5–5 mm long, enclosed within a thin, green exocarp. Flowering Oct.–Feb. (Fig. 2).

Distribution and habitat: *Pimelea leiophylla*, as far as is known, is confined to the granite areas of the Freycinet Peninsula and Schouten Island (Fig. 3). It is uncommon throughout its range and rarely forms extensive or conspicuous populations. It usually occurs as isolated individuals or small, widely separated groups of few individuals, mostly in the shelter of large granite boulders in shaded areas with shallow soils and minimal moisture. The species appears to be more common on Schouten Island with at least 18 sites recorded (N. Tapson pers. comm.), whereas on the Freycinet Peninsula, it has been recorded from only three general locations. All known populations of this species are protected within the Freycinet National Park. Further investigation into the conservation status of this species may see it qualify for listing as 'rare' under the *Threatened Species Protection Act 1995* (Tas).

The associated vegetation consists of sparse, dry woodland, either of impoverished *Eucalyptus amygdalina* Labill. or, less commonly, *E. tenuiramis* Miq., with *Hakea* spp., *Kunzea ambigua* (Sm.) Druce and *Leptospermum* spp. all common components of the scrubby understory. Extensive areas of *Gleichenia microphylla* R.Br. form a low, tangled undergrowth in the damper and sheltered areas.

The Freycinet Peninsula, on Tasmania's East Coast, consists of a range of low mountains of rounded relief, composed mostly of pink Devonian granites. Schouten Island, a small island lying immediately to the south, is of added interest in that only the eastern section is granitic, whereas the majority of the western section is of Jurassic dolerite and conforms with the geology of the mainland Tasmanian coast immediately to the west.

The general topography is characterised by extensive, often very steep, slabs and shelves of granite. Craggy

outcrops and small to massive boulders are strewn throughout. Small gullies and clefts between the boulders accumulate soils that are generally skeletal and infertile and consist chiefly of leached humic peats combined with a high proportion of weathered granitic sands and gravels.

Fire frequency and scant, erratic rainfall with rapid run-off determine the development and composition of the vegetation. Despite environmental limitations, a diverse range of plant communities is present, including a suite of endemic or otherwise uncommon species, for example: *Philothea freyciana* Rozefelds, *Conospermum hookeri* (Meisn.) E.M.Benn., *Epacris barbata* Melville and *Boronia rozefeldsii* Duretto.

Remarks: The distinguishing morphological characteristics of *Pimelea leiophylla* include the nature of the sexual system, hairy leaves and stems, lack of any distinctive sessile involucre bracts, circumscissile hypanthium, and fruits that are hairy at the apex. The features place it in *Pimelea* sect. *Eppalage* (Endl.) Benth. *sensu* Rye (1988, 1990). In Australia, this section is comprised of 18 species and has a widespread distribution. It includes the following Tasmanian species: *P. sericea*, *P. nivea*, *P. micrantha* F.Muell. ex Meisn. and *P. curviflora* R.Br. Of these, *P. leiophylla* is most similar to the endemic *P. sericea* but differs in the presence of sparse hairs on the adaxial leaf surfaces. In contrast, the adaxial leaf surfaces of *P. sericea* are always glabrous. The two species also differ in their phyllotaxy, the leaves of *P. leiophylla* being opposite-decussate. We examined numerous herbarium sheets of *P. sericea* as well as fresh material from Mt Wellington and can confirm that the phyllotaxy of *P. sericea* is alternately arranged leaves forming spirals and not arranged in opposite ranks, as described by Rye (1990).

There are also floral differences between these two taxa. The length of the hypanthium is longer in *P. leiophylla* (8–15 mm) compared to that of *P. sericea* (5.5–7.5 mm). The inflorescences of *P. leiophylla* are usually more floriferous and are composed of up to 25 flowers whereas those of *P. sericea* rarely have more than 15 flowers per inflorescence. The indumentum of the hypanthium is longer and more densely packed in *P. leiophylla* and almost obscures the surfaces of the flowers. In contrast *P. sericea* has shorter hairs that scarcely obscure the flowers.

These species also differ in their habit and habitat. *Pimelea leiophylla* is an open, sparsely branched shrub, uncommon and restricted to lowland (< c. 450 m asl), skeletal granitic soils on the Freycinet Peninsula and Schouten Island on Tasmania's east coast, whereas

P. sericea is a densely compact shrub, common at high altitudes (> c. 900 m asl) on chiefly dolerite mountains of the Central Plateau, southern ranges and the north-eastern highlands. These differences are summarised in Table 1.



Figure 2. *Pimelea leiophylla* flowering branch, showing the adaxial leaf indumentum and the opposite and decussate leaf phyllotaxis that distinguish this species from *P. sericea* (photo courtesy of Tim Rudman)

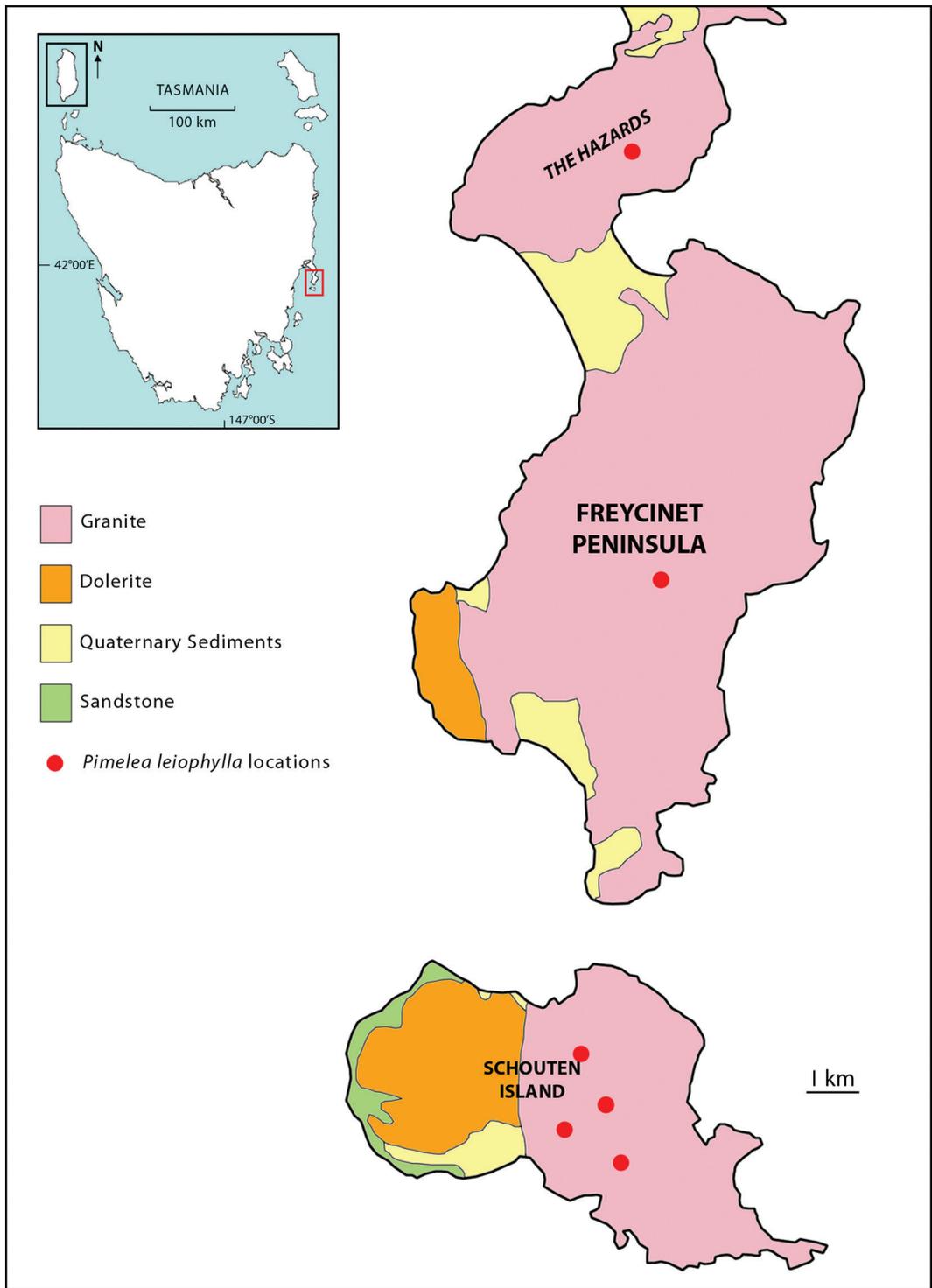


Figure 3. Distribution of *Pimelea leiophylla*

Table 1. Summary of key morphological and distribution features of *Pimelea leiophylla* and *P. sericea*

	<i>Pimelea leiophylla</i>	<i>Pimelea sericea</i>
Habit	sparsely branched, 'open' shrubs	densely branched, compact shrubs
Adaxial leaf surface	sparsely silky-villous, with the hairs antrorse, and glabrescent	glabrous
Leaf arrangement	opposite-decussate	alternate, spiral
Hypanthium length	8–15 mm long	5.5–7.5 mm long
Flowers per inflorescence	(10–)15–25+	10–15(–20)
Distribution	lowland habitats on granite substrates of Freycinet Peninsula and Schouten Island on the Tasmanian east coast	montane habitats on dolerite mountains of the Central Plateau, southern ranges and NE highlands

Pimelea nivea, an endemic species of montane to lowland habitats, is widely distributed throughout the state, particularly in the central and eastern regions. It differs from *P. leiophylla* by having elliptic to almost orbicular leaves and glabrous adaxial leaf surfaces.

Pimelea curviflora, a common species of dry, open forests, shrubberies and grasslands in the Derwent Valley, Bass Strait Islands and north and north-eastern parts of the state, differs from *P. leiophylla* by having a much shorter and slightly curved hypanthium tube. In addition, the leaves of *P. curviflora* are thinner in texture when compared to *P. leiophylla*. Some uncertainty exists regarding the presence of *P. micrantha* in Tasmania and specimens identified as such from the state are doubtfully distinct from *P. curviflora*. Further investigation into the taxonomy of these two species is warranted.

Whilst many of the mainland Australian species in this section bear at least some indumentum on the adaxial leaf surfaces, the combination of morphological characteristics, habitats, and locations where they grow do not concur with those of *P. leiophylla*. *Pimelea venosa* Threlfall, a rare species of granite boulder fields in north-eastern New South Wales, differs from *P. leiophylla* by having inflorescences with fewer flowers, and has leaves with a relatively sparse covering of long patent hairs on both leaf surfaces.

Several New Zealand *Pimelea* species have hairs on both leaf surfaces, but these species differ from *P. leiophylla*, in having fleshy fruits and/or less flowers per inflorescence.

Pimelea leiophylla flowers with pink coloration on the proximal portion of the hypanthium have been noted in plants grown at the Royal Tasmanian Botanical Gardens

for conservation purposes. This coloration is also shared with *P. sericea* and *P. nivea* and is occasionally seen in New Zealand species (Burrows 2008).

Etymology: From the Greek *leio* - smooth and *phylla* - leaves. The epithet refers to the very soft, smooth foliage of this taxon.

Selected specimens examined: TASMANIA. Mt Graham, Freycinet Peninsula, 10.ii.1969, *E.M. Canning and I.R. Telford 2576* (CANB, AD *n.v.*); The Hazards, gulch between Mt Parsons and Mt Dove, 29.xii.1989, *A.M. Buchanan 11569* (HO); Callitris Creek, Freycinet National Park, 29.ix.1991, *J. Pannell s.n.* (HO 142618); Milligans Hill, Schouten Island, 14.xi.2000, *A.C. Rozefelds 1905* (HO); Milligans Hill, Schouten Island, 14.xi.2000, *A.C. Rozefelds 1906* (HO); Schouten Island, 14.xi.2001, *A.M. Buchanan 15902* (HO); Western side of Mount Dove near saddle between Mount Dove & Mount Amos, Hazards, Freycinet Peninsula, 17.ii.2002, *A.C. Rozefelds and N. Papworth 2282* (HO); SW side of Schouten Island, 25.ii.2002, *A.C. Rozefelds 2294* (HO).

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