A taxonomic revision of *Pimelea* section *Epallage* (Endl.) Benth. (Thymelaeaceae) in Queensland

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Summary

Bean, A.R. (2017). A taxonomic revision of *Pimelea* section *Epallage* (Endl.) Benth. (Thymelaeaceae) in Queensland. ***Austrobaileya* 10(1): 1–46**. *Pimelea* section *Epallage* is revised for Queensland and comprises 24 species, with eight species newly described, *viz. P. approximans* A.R.Bean, *P. chlorina* A.R.Bean, *P. confertiflora* A.R.Bean, *P. fugiens* A.R.Bean, *P. gigandra* A.R.Bean, *P. mollis* A.R.Bean, *P. plurinervia* A.R.Bean and *P. rupestris* A.R.Bean. New combinations are *P. amabilis* (Domin) A.R.Bean, *P. leptospermoides* subsp. *bowmanii* (Benth.) A.R.Bean and *P. hirsuta* subsp. *elliptifolia* (Threlfall) A.R.Bean. The distributions of all taxa are mapped, the newly named species are illustrated, and photographic images are provided for several species. *P. altior* F.Muell., *P. hirsuta* Meisn. and *P. leptostachya* Benth. are restored to species rank. Lectotypifications are provided for *P. altior, P. bowmanii* Benth., *P. latifolia* R.Br., *P. leptospermoides* F.Muell. and *P. leptostachya* Benth. A key is provided for the identification of all *Pimelea* species occurring in Queensland.

Key Words: Thymelaeaceae, *Pimelea*, *Pimelea* section *Epallage*, *Pimelea altior*, *Pimelea amabilis*, *Pimelea approximans*, *Pimelea bowmanii*, *Pimelea chlorina*, *Pimelea confertiflora*, *Pimelea fugiens*, *Pimelea gigandra*, *Pimelea hirsuta*, *Pimelea hirsuta* subsp. *elliptifolia*, *Pimelea latifolia*, *Pimelea leptospermoides*, *Pimelea leptospermoides* subsp. *leptospermoides*, *Pimelea leptospermoides* subsp. *bowmanii*, *Pimelea leptostachya*, *Pimelea mollis*, *Pimelea plurinervia*, *Pimelea rupestris*, Australia flora, Queensland flora, new species, morphology, identification key, distribution maps, conservation status

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Introduction

The genus *Pimelea* Banks & Sol. ex Gaertn. comprises about 140 species, with around 35 species endemic in New Zealand (Burrows 2011), and the remainder in Australia and islands to its north, with the majority occurring in non-arid parts of southern Australia. Major taxonomic studies relevant to species occurring in Queensland have been Meisner (1857), Bentham (1873), Threlfall (1983) and Rye (1990). More recent phylogenetic studies in the family include Beaumont *et al.* (2009), Motsi *et al.* (2010) and Foster *et al.* (2016). Beaumont *et al.* (2009) discussed the non-monophyly of the large African genus *Gnidia* L., and flagged the possible reduction of *Pimelea* as a subgenus of it. Motsi *et al.* (2010) presented data suggesting that *Thecanthes* Wikstr. should be returned to synonymy with *Pimelea*, but due to limited sampling, the evidence was not conclusive. Foster *et al.* (2016) sampled a much wider range of taxa and examined several gene regions, and provided very strong evidence for including *Thecanthes* within *Pimelea*.

Rye (1990) provided a sectional classification of the genus, with seven sections recognised. The present paper is concerned with one of these sections, *Pimelea* section *Epallage* (Endl.) Benth., typified by *P. curviflora* R.Br. While *P.* section *Epallage* is distributed across Australia, it has its centre of diversity in Queensland and is also well represented in New South Wales. Its members are most readily distinguished from other sections by the presence of hairs all along the stems (not just at the nodes), inflorescence bracts mostly absent, the floral tube dehiscence circumscissile, the stamens with very short filaments inserted below the base of the sepals, and the broad connective with introrse anther cells. This section contains the well-known species *P. latifolia* R.Br. and *P. sericostachya* F.Muell.,

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both of which (as currently circumscribed) are complexes comprising several distinct species. 24 Queensland taxa are recognised here as belonging to the section, including eight newly described species and a number reinstated from previous synonymies. In addition, the new combination *P. hirsuta* subsp. *elliptifolia* (Threlfall) A.R.Bean is made for a New South Wales taxon.

Phylogeny

In the maximum-likelihood phylogram of the five-gene dataset of Foster *et al.* (2016), *Pimelea* section *Epallage sensu* Rye (1990) is polyphyletic, but only because *P. sericea* R.Br. appears in a separate "Tasmanian clade". If this species is excluded, section *Epallage* is monophyletic, comprising the sequenced taxa *P. argentea* R.Br., *P. biflora* Wakef., *P. clavata* Labill., *P. curviflora* var. *divergens* Threlfall, *P. curviflora* var. *gracilis* (R.Br.) Threlfall, *P. curviflora* var. *sericea* Benth., *P. latifolia* subsp. *elliptifolia* Threlfall, *P. leptospermoides* F.Muell., *P. micrantha* F.Muell. ex Meisn., *P. sericostachya* subsp. *sericostachya*, *P. simplex* F.Muell. subsp. *simplex*, *P. strigosa* Gand., *P. trichostachya* Lindl., *P. williamsonii* J.M.Black and *P. venosa* Threlfall. *P. clavata* was included by Rye (1990) in *Pimelea* section *Pimelea*.

In the current paper, some informal species groups based on morphological grounds (named for the first described species of that group) are recognised within the Queensland species of *P.* section *Epallage*:

a) the *P. latifolia* group: *P. altior*, *P. fugiens*, *P. gigandra*, *P. latifolia*, *P. leptospermoides*, *P. mollis*, *P. plurinervia* and *P. strigosa*

b) the *P. sericostachya* group: *P. amabilis*, *P. approximans*, *P. confertiflora*, *P. leptostachya* and *P. sericostachya*

c) the *P. simplex* group: *P. elongata* Threlfall, *P. simplex* and *P. trichostachya*

d) the *P. umbratica* group: *P. aquilonia* Rye and *P. umbratica* Meisn.

Pimelea chlorina, *P. curviflora* and *P. rupestris* are not readily assignable to any of these groups.

Hybridisation

Burrows (2008, 2009) reported that many New Zealand *Pimelea* species hybridise with each other, and he named some new species that he considered were "stabilised hybrids". During the current study, no instance of hybridisation (indicated by plants exhibiting morphologically intermediate characteristics) has been noted in the field, or indicated on herbarium specimen labels. This is despite the fact that in Queensland, it is not uncommon to find two (rarely more) *Pimelea* species occurring in moderately close proximity.

Toxicity

The toxic properties of *Pimelea simplex* (both subspecies), *P. elongata* and *P. trichostachya* are well known (Everist 1974; Fletcher *et al.* 2009, 2014; McKenzie 2012). Consumption of these plants by cattle causes St George disease (otherwise known as Marree disease). In his discussion of *Pimelea*, Everist (1974) noted that "nearly all of them appear to be distasteful" to livestock, and that "virtually any species of *Pimelea* would be toxic if eaten in sufficient amount".

Materials and methods

This revision is based on an examination of herbarium specimens from BRI, CANB, MEL and NSW, using a binocular microscope with graticule, as well as field observations for most species. Measurements of leaves and hairs are taken from dried material, while measurements of the flower parts and seeds are from spirit material or from material reconstituted with boiling water. Distribution maps have been compiled with DIVA-GIS Version 7.5.0 (http://www.diva-gis.org), using localities or geocodes given on the labels of specimens from the herbaria listed above. Images of type specimens not present at the herbaria listed above, have been viewed on the Jstor Plants website (Jstor 2017), and the Kew Herbarium Catalogue (Kew 2017). Species treatments are arranged in alphabetical order.

Abbreviations used in the text and for specimen citations are Mt (Mountain), NP (National Park), and SF (State Forest).

Notes on major characters used

1. Indumentum length, direction, location etc.

The hairs of *Pimelea* section *Epallage* are always simple and unicellular, but there is great diversity in their thickness, length, direction, density and distribution. In some species, the hairs are noticeably shiny, i.e. they reflect light strongly, apparently associated with an increased thickness. In this paper, the length of the *longest* hairs is recorded from each specimen for the various organs, so that the range of lengths recorded includes the longest hairs on that plant part over all the plant specimens examined.

2. Leaf phyllotaxis

The phyllotaxis of mature-aged specimens in *Pimelea* section *Epallage* is often diagnostic. Two species (*P. aquilonia*, *P. umbratica*) have strictly opposite leaves on mature plants; others have leaves that vary from opposite to sub-opposite on the same plant or branch (e.g. *P. altior*); others have consistently alternate leaves (e.g. *P. trichostachya*). The sub-opposite condition is defined as where the disjunction between the leaf pairs is less than 20% of the adjacent internode length. In alternate leaves, there is no discernible pairing of leaves, except very occasionally, and then only for a single node. From observations of hundreds of herbarium specimens, it is postulated that all species in *P.* section *Epallage* have opposite leaves at the juvenile stage, and that in some species the leaves become sub-opposite or alternate as the plant ages; certainly in some specimens that comprise a whole plant, the leaves are opposite at the base and alternate higher up.

3. Leaf venation

In some species, only the central longitudinal vein (midrib) of the leaf is evident. In several species, a few lateral veins (1–6 pairs) are faintly visible on the lower surface, while in *P. plurinervia*, 10–15 pairs of lateral veins are readily visible on the lower surface.

4. Inflorescence structure

Inflorescences in *Pimelea* section *Epallage* are invariably racemose, but often the rachis is extremely short so that flowers appear to be attached to a globose or ellipsoidal 'head' or 'capitulum', and with persistent pedicels that obscure the surface of the capitulum. In other species, the rachis is elongated and the persisting pedicels are widely spaced. This type of inflorescence has been commonly referred to as 'spicate' (Threlfall 1983; Rye 1990). An intermediate form is referred to in this paper as 'cylindrical' – here the rachis is longer than the ellipsoidal types, but the flowers are not as widely spaced as in the 'spicate' type. The rachis (with attached persistent pedicels) is held on the plant long after the flowers and fruits have abscised, and can usually be found on any given mature specimen. Its shape and length are diagnostic, as are the total flower number (best determined by counting pedicels on old rachises), the distance between adjacent pedicels, and the pedicel indumentum. The peduncle length is also diagnostic, and again is most reliably measured on old (spent) inflorescences/infructescences.

In all species the inflorescence is, strictly speaking, terminal, with flowers borne at the apex of the branchlet, but in some species, a vegetative shoot develops right alongside the flower buds, and by the time the flowers have reached anthesis, the vegetative shoot has extended well past the position of floral initiation. In these species, the inflorescence is referred to as axillary (when borne in a leaf axil) or lateral (when not associated with the leaf axil). In several species (e.g. *P. rupestris*), numerous old capitula can be seen along the sides of most branches. In the 'terminal' species (e.g. *P. gigandra*), the spent capitula or linear rachises are seen at the junction between two branches, which are otherwise sterile.

5. Sexuality

A range of sexual systems are present in *Pimelea* section *Epallage*. In some species, e.g. *P. trichostachya*, all flowers are bisexual. In many other species of this section, they are gynomonoecious, that is, with female flowers and bisexual flowers on the same plant (e.g. *P. mollis*). In these cases, the female flowers can be distinguished by the absent or rudimentary

(and non-functional) anthers. In other species (e.g. *P. gigandra*), female flowers and bisexual flowers occur in separate plants (gynodioecious), with fruits forming from both flower types. One species treated here, *P. rupestris*, is dioecious, with separate male and female plants in roughly equal proportion; the style in the male flowers is non-functional, and fruits do not form.

6. Seeds

The seeds of all species in this section are very similar, being ovoid-conical in shape and black in colour. Threlfall (1983) advocated the use of surface patterning to distinguish the various species. The present author finds that the differences in seed surface patterns are quite useful for distinguishing groups of species, such as the colliculate surface present in the *P. sericostachya* group. However, differences in seed surface features between individual species are often negligible. There are however, considerable differences between some species in the length of the seeds. For example, the seeds of *P. latifolia* (4.6–4.8 mm long) are considerably longer than the related *P. altior* (3.3–3.4 mm long).

Identification

A dichotomous key to the identification of all (not just for the section *Epallage*) Queensland *Pimelea* species is presented. Following the reduction of *Thecanthes* Wikstr. into *Pimelea* (Foster *et al*. 2016), two species formerly classified under *Thecanthes* (*P. sanguinea* F.Muell., *P. cornucopiae* Vahl) are included in the key.

Taxonomy

Pimelea section **Epallage** (Endl.) Benth., *Fl. Austral*. 6: 30 (1873); *Epallage* Endl., *Gen. Pl*. 331 (1837); *Calyptrostegia* [infragen. unranked] *Epallage* C.A.Mey., *Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Pétersbourg* ser. 2, 4(4–5): 74 (1845); *Pimelea* subsection *Epallage* (Endl.) Meisn. in DC., *Prodr*. 14: 511 (1857); *Banksia* sect. *Epallage* (Endl.) Kuntze, *Lex. Gen. Phan*. 60 (1903). **Type:** *P. curviflora* R.Br., (lecto: *fide* Threlfall 1983: 170).

Stems hairy. Leaves simple, entire, hairy at least on abaxial surface, node buttresses absent. Inflorescence terminal, axillary or lateral; flowers densely clustered on an ellipsoidal or globose receptacle, or borne along an elongate rachis, sometimes clustered but often well-spaced and not touching each other. Rachis ± same width as peduncle. Floral tube usually circumscissile above the ovary. Anther connective broad, anther dehiscence introrse. Ovary with erect hairs distally. Fruits dry.

30 species endemic to Australia, 21 species in Queensland.

1. Pimelea altior F.Muell., *Fragm*. 1: 84 (1859); *Banksia altior* (F.Muell.) Kuntze, *Revis. Gen. Pl*. 2: 583 (1891); *P. altior* var. *typica* Domin, *Biblioth. Bot*. 89: 436 (1928), *nom. illeg.*; *P. latifolia* subsp. *altior* (F.Muell.) Threlfall, *Brunonia* 5: 193 (1983); *P. latifolia* var. *altior* (F.Muell.) Threlfall, *Brunonia* 5: 193 (1983). **Type:** Queensland. Moreton District: Moreton Bay, July 1855, *F. Mueller s.n*. (lecto [here designated]: MEL 50362; isolecto: K 000900026).

Pimelea altior var. *parvifolia* Domin, *Biblioth. Bot*. 89: 436 (1928); *P. latifolia* var. *parvifolia* (Domin) Threlfall, *Brunonia* 5: 193 (1983). **Type:** Queensland. Moreton District: Ithaca Creek, January 1910, *C.T. White s.n*. (holo: PR *n.v.*; iso: BRI [AQ23514]).

***Illustration*:** Leiper *et al*. (2008: 194), as *P. latifolia* subsp. *altior*.

Perennial shrub, 90–140 cm high, bisexual. Young stems densely hairy, longest hairs 0.6–1.3 mm long, spreading, slender, white and opaque. Leaves opposite to sub-opposite, disjunction between leaf pairs 0–4 mm, internodes 15–28 mm long; petioles 1–1.7 mm long. Lamina elliptical to broadly elliptical, 14–38 mm long, 8–14 mm wide, 1.8–2.9 times longer than wide, midrib visible, lateral veins sometimes visible; apex obtuse, mucronate; margins flat. Upper surface of lamina moderately densely hairy; hairs slender, longest 0.5–1 mm long, *c*. 0.025 mm wide, patent. Lower surface of lamina moderately densely hairy; hairs antrorse to patent, slender, not shiny, white,

longest hairs 0.5–1.3 mm long, *c.* 0.025 mm wide. Inflorescence terminal, capitulate, with 4–7 flowers produced (= number of persistent pedicels), partly enclosed by four leafy bracts, two short and two rather longer. Rachis globose, at maturity *c.* 1 mm long, densely hairy; peduncle length 0–1 mm long. Flowers all bisexual. Pedicels 0.4–0.5 mm long. Floral tube 5.2–8.2 mm long at anthesis, white; outer surface with hairs sparse to moderately dense, patent, longer ones 0.3–0.4 mm long; inner surface sparsely hairy. Sepals erect, 0.9–1.6 mm long, apex obtuse, inner surface glabrous, outer surface densely hairy. Staminal filaments *c.* 0.05 mm long; anthers 0.8–1.2 mm long, dehiscence introrse. Style not or scarcely exserted. Seed ovoid, 3.3–3.4 mm long, black, surface ± smooth or very finely foveolate. **Fig. 1A.**

***Additional selected specimens examined*: Queensland.** Port Curtis District: SF 67, Bulburin, Sep 1985, *Gibson 776* (BRI); Blackmans Creek, N of Blackmans Gap, 18 km SW of Miriam Vale, Oct 1995, *Brushe JB252 & Brushe* (BRI). Burnett District: Just off Q-traverse, Gallangowan SF, NNW of Jimna, Feb 2009, *Bean 28599* (BRI, CANB). Wide Bay District: Upper reaches of Broken Creek, SE of Builyan, Sep 1995, *Bean 8944 & Robins* (BRI, MEL); East branch of Stony Creek, 1.3 km SSW of Mt Walsh, Mt Walsh NP, May 2008, *Young 2359* (BRI); Noosa Bay, *s.dat.*, *Eaves s.n.* (MEL 2181371); Conondale Range, Sep 1980, *Dillewaard 176 & Olsen* (BRI); Dog Grass Road, Mapleton SF, N of Mapleton, Apr 1993, *Bean 5952* (BRI). Moreton District: Stable Camp, Yarraman SF, Nov 1987, *Forster PIF3228 et al.* (BRI); Palmwoods, May 1907, *White s.n.* (BRI [AQ108716]); Archers Creek, brush under the mountain, Dec 1843, *Leichhardt s.n.* (MEL 50350); Kiamba, May 1959, *Thorne 21207 et al.* (BRI, CANB); Bellthorpe SF, Beacon Road, *c.* 18 km NW of Woodford, May 1984, *Sharpe 3550* (BRI); End of Regent Road, near Esk – Hampton Road, Oct 2015, *Bean 32422* (AD, BRI, CANB, MEL); Fifteen Mile Creek, 10 km NE of Toowoomba, near Murphy's Creek, Oct 1973, *Telford 3494* (BRI, CANB, NSW); Neurum Creek camping area, Mt Mee SF, Aug 2009, *Bean 29076* (BRI, CANB, MO, NSW); D'Aguilar Range, NW of Brisbane, Jun 1974, *Moriarty 1533* (BRI, CANB); Mt O'Reilly [W of Samford], Aug 1938, *Goy & Smith 517* (BRI); Just S of tower, Camp Mountain, WNW of Brisbane, Mar 2013, *Bean 32119* (BRI, MEL, NSW); One Tree Hill, Aug 1887, *Simmonds s.n.* (BRI [AQ108723]); Brisbane River, Jul 1874, *Bailey s.n.* (BRI [AQ108718]); Moreton Bay, 1872, *Eaves s.n.* (MEL 51283); Banks of Logan River, foot of Mt Ernest, Oct 1932, *Blake 4290* (BRI).

***Distribution and habitat*:** *Pimelea altior* is common in the south-east corner of Queensland, from the New South Wales border to Eumundi, with disjunct occurrences further north at Mt Walsh, and mountainous areas near Builyan (**Map 1**). In New South Wales, it extends as far south as Taree. It inhabits wet sclerophyll forest with tall *Eucalyptus* spp. and *Syncarpia glomulifera* (Sm.) Nied., or sometimes on the margins of rainforest. Soils are sandy-loams, loams, or red earths.

***Phenology*:** Flowers and fruits may be found at any time of the year.

***Typification*:** The specimen chosen here as the lectotype of the name *Pimelea altior* bears a label in Mueller's hand which reads (in part) 'in collibus petraeis', a phrase which is repeated in the protologue. The specimen matches the description given in the protologue very well. Walter Hill's name appears as co-collector in the protologue, but labelling on neither the lectotype nor the isolectotype mentions him.

***Notes*:** *Pimelea altior* is readily distinguishable from *P. latifolia sens. str.* and is formally reinstated to species rank here. It differs from *P. latifolia* by the opposite to sub-opposite leaves (alternate for *P. latifolia*); the leaves elliptic to broadly elliptic (obovate for *P. latifolia*); laminae 14–38 × 8–14 mm (31–67 × 13–24 mm for *P. latifolia*); the hairs moderately dense on the upper leaf surface (absent, or very sparse to sparse for *P. latifolia*); the rachis globose and *c.* 1 mm long (rachis ellipsoidal to cylindrical and 5–27 mm long for *P. latifolia*); the peduncles 0–1 mm long (2–6 mm long for *P. latifolia*); the sepals 0.9–1.6 mm long (1.6–2.3 mm long for *P. latifolia*); and the inner surface of the floral tube sparsely hairy (glabrous for *P. latifolia*).

Specimens from the Yarraman – Blackbutt area of south-east Queensland (e.g. *Forster PIF3228 et al.*, BRI) differ from the typical form by the longer, narrower leaves, the relatively short, sparse hairs on the upper leaf surface, and the greater number of flowers per inflorescence.

***Conservation status*:** *Pimelea altior* is a common and widespread species. A conservation status of **Least Concern** is recommended (IUCN 2012).

Fig. 1. A. ***Pimelea altior***. Mt Glorious (no voucher). Photo: J. Newland & R. Fryer. B. ***P. chlorina*** (*Bean 28851 & Jensen*, BRI). Photo: A.R. Bean. C. ***P. latifolia***. Scawfell Island (no voucher). Photo: H. Nicholson. D. ***P. confertiflora***. Irvinebank (no voucher). Photo: J. Newland & R. Fryer. E. ***P. fugiens*** (*Bean 28739*, BRI). Photo: A.R. Bean.

2. Pimelea amabilis (Domin) A.R.Bean **comb. et stat. nov.**; *Pimelea sericostachya* var. *amabilis* Domin, *Biblioth. Bot.* 89: 435 (1928); *P. sericostachya* subsp. *amabilis* (Domin) Threlfall, *Brunonia* 5: 150 (1983). **Type:** Queensland. Cook District: At the foot of the second calcifar karst hill in Chillagoe, February 1910, *K. Domin s.n.* (lecto: PR 529469, *fide* Threlfall 1983: 150).

***Illustrations*:** Domin (1928: 435, fig. 169), as *P. sericostachya* var. *amabilis;* Rye (1990: 162), as *P. sericostachya* subsp. *amabilis.*

Perennial shrub, 50–100 cm high, gynomonoecious. Young stems densely hairy, longest hairs 1.3–2.3 mm long, slender, white and opaque, appressed. Leaves often sub-opposite to opposite, disjunction between leaf pairs 0–5 mm, or sometimes alternate, with no discernible leaf pairs, internodes 10–25 mm long; petioles 0.3–1 mm long. Lamina narrowly-elliptic or elliptic, 20–36 mm long, 4–11 mm wide, 2.4–5.3 times longer than wide, with no veins visible or only midrib visible, apex acute, margins flat. Upper surface of lamina hairy; hairs slender, longest ones 0.7–1.5 mm long, *c.* 0.03 mm wide, appressed; dense to very dense. Lower surface of lamina hairy; hairs appressed, slender, shining, transparent, longest hairs 0.8–2 mm long, *c.* 0.03 mm wide, dense to very dense. Inflorescence terminal, spicate, with 75–250 flowers produced (= number of persistent pedicels), leafy bracts absent. Rachis cylindrical, at maturity 17–70 mm long, very densely hairy; peduncle length 10–29 mm long. Flowers bisexual or female. Pedicels 30–40 per cm of rachis, each 0.2–0.4 mm long. Floral tube 4.5–6.2 mm long at anthesis, yellow-green or yellow; outer surface with hairs very dense, antrorse, 0.7–1.6 mm long; inner surface glabrous. Sepals erect, 0.6–1.3 mm long, apex obtuse, inner surface glabrous, outer surface very densely hairy. Staminal filaments 0.05–0.1 mm long; anthers 1–1.1 mm long, dehiscence introrse. Style not or scarcely exserted. Fruit orientation at right angles to rachis. Seed ovoid, 3.7–4.2 mm long, dark brown, surface colliculate.

***Additional selected specimens examined*: Queensland.** Cook District: NE escarpment of Hann Tableland, *c.* 33 km NW of Mareeba, Apr 2013, *Mathieson MTM1531* (BRI); Boyle Creek, NW of Mareeba, Apr 1962, *McKee 9144* (BRI, CANB); Blackdown Road, 12 miles [19 km] from Station, Jan 1971, *MacDonald 2* (BRI); Stannary Hills area, *c.* 7 km S of Mutchilba, Aug 1979, *Clarkson 2507 & Byrnes* (BRI); 9 km from Mutchilba on road to Irvinebank via Stannary Hills, Jan 1982, *Clarkson 4232B* (BRI, CNS, K, MO, NT, PERTH); Stannary Hills, Jun 1908, *Bancroft s.n.* (BRI [AQ 97876]); 2.5 km from Lappa on Petford Road, Feb 1996, *Forster PIF18566 & Ryan* (BRI, CNS); *c.* 2.5 km by road E of Almaden, Jan 2005, *McDonald KRM3505* (BRI); junction of roads to Chillagoe and Ootan, 3 km W of Almaden, May 2003, *McKenzie RAM03/25* (BRI); Almaden, *s.dat.*, *Bick s.n.* (BRI [AQ730927]); Leaf Gold Weir road, 10 km W of Dimbulah, Apr 2001, *Sharp 323 et al.* (BRI); Bismark Range, E of Almaden, Jan 2011, *McDonald KRM10464* (BRI, DNA). North Kennedy District: 30 km SW of Mt Garnet, Apr 2002, *Bean 18916* (BRI, MEL).

***Distribution and habitat*:** *Pimelea amabilis* is endemic to north Queensland where it has a limited distribution from Hann Tableland (NW of Mareeba) to 30 km SW of Mt Garnet. It has been frequently collected around Almaden and Stannary Hills. There is an outlying population on Blackdown Station west of Chillagoe (**Map 2**). It inhabits skeletal soil on rocky outcrops of granite or rhyolite, although the type collection was reputedly made from a limestone outcrop.

***Phenology*:** Flowers and fruits are recorded from January to August.

***Notes*:** *Pimelea amabilis* differs from the related *P. confertiflora* by the longer hairs (0.7–1.5 mm long) of the upper leaf surface, with the hairs white or silvery, the often broader leaves (4–11 mm wide), and the shorter anthers (1–1.1 mm long). These species have separate though adjoining distributions; they apparently grow together only in the Stannary Hills area.

The intensely silvery leaves of *P. amabilis* are very beautiful, and the species deserves to be brought into cultivation.

***Conservation status*:** *Pimelea amabilis* is a common species. A conservation status of **Least Concern** is recommended (IUCN 2012).

3. Pimelea approximans A.R.Bean **sp. nov.** with affinity to *P. amabilis*, but differing by the antrorse villous hairs of the upper leaf surface, the longer strigose hairs on the lower leaf surface, the acute sepals, and the longer anthers and seeds. **Typus:** Queensland. Cook District: Ninian Bay, 14 May 1979, *J.A. Elsol 771 & T.D. Stanley* (holo: BRI; iso: CANB).

Perennial shrub, 50–60 cm high, gynomonoecious. Young stems densely hairy, longest hairs 1.8–2.5 mm long, coarse, shiny and transparent, appressed. Leaves sub-opposite to opposite (disjunction between leaf pairs 0–3 mm), or alternate, internodes 8–22 mm long; petioles 1.5–1.8 mm long. Lamina elliptic, 23–35 mm long, 5–11 mm wide, 2.7–4.6 times longer than wide, with only midrib visible, apex acute, margins flat. Upper surface of lamina glabrous or hairy; hairs slender, longest ones 0.6–1.1 mm long, *c.* 0.025 mm wide, antrorse; very sparse to moderately dense. Lower surface of lamina hairy; hairs appressed or antrorse, coarse, shining, transparent, longest hairs 2.2–2.7 mm long, *c.* 0.05 mm wide, sparse to moderately dense. Inflorescence terminal, spicate, with 50–130 flowers produced (= number of persistent pedicels), leafy bracts absent. Rachis cylindrical, at maturity 21–50 mm long, very densely hairy; peduncle length 10–28 mm long. Flowers bisexual or female. Pedicels 20–40 per cm of rachis, each 0.2–0.4 mm long. Floral tube 4.5–4.8 mm long at anthesis, yellow; outer surface with hairs dense, antrorse, 1.3–1.9 mm long; inner surface glabrous. Sepals erect, 1.2–1.8 mm long, apex acute, inner surface glabrous, outer surface densely hairy. Staminal filaments *c.* 0.05 mm long; anthers 1.2–1.4 mm long, dehiscence introrse. Style not or scarcely exserted. Fruit orientation at right angles to rachis. Seed ovoid, 3.9–4.5 mm long, dark brown, surface colliculate. **Fig. 2.**

***Additional specimens examined*: Queensland.** Cook District: Top of mountain near Coen River, 1891, *Johnson s.n.* (MEL 2182365); Upper Stuart River, 1891, *Johnson s.n.* (MEL 2182366); sources of the South Coen River, 1891, *Johnson s.n.* (CANB 250141, MEL 2182364); Stanley Island, Jun 1995, *Le Cussan 605* (BRI).

***Distribution and habitat*:** *Pimelea approximans* is endemic to north Queensland where it is known from the Bathurst Bay area and the Coen area of Cape York Peninsula (**Map 2**). It occurs in woodland or grassland on rocky hillsides.

***Phenology*:** Flowers and fruits are recorded for May and June.

***Affinities*:** *Pimelea approximans* has affinity with *P. amabilis.* The leaves and the inflorescence rachis are similar in size and shape. However, it differs from *P. amabilis* in a number of characteristics: *P. approximans* has hairs absent or very sparse to moderately dense on the upper leaf surface (versus dense to very dense for *P. amabilis*); the hairs on the lower leaf surface are thicker, sparse to moderately dense, 2.2–2.7 mm long (versus thin, dense to very dense, 0.8–2 mm long for *P. amabilis*); the sepals are acute, and the anthers are 1.2–1.4 mm long (versus sepals obtuse, anthers 1.–1.1 mm long for *P. amabilis*).

***Conservation status*:** *Pimelea approximans* is known from three subpopulations with an estimated area of occupancy of 3 km^2. No subpopulations are known to be directly threatened. Applying the Red List criteria (IUCN 2012), a conservation status of **Vulnerable** is recommended (criterion D2).

***Etymology*:** The epithet is from the Latin *approximans*, meaning 'approaching, approximating'. This is in reference to the morphological affinity between this species and *P. amabilis.*

4. Pimelea aquilonia Rye, *Fl. Australia* 18: 323 (1990). **Type:** Queensland. Cook District: Newcastle Bay, 2.5 miles [4 km] S of Somerset homestead, Cape York Peninsula, 11 May 1948, *L.J. Brass 18769* (holo: BRI; iso: A).

***Illustration*:** Rye (1990: 171).

Perennial shrub, 60–300 cm high, gynomonoecious. Young stems densely hairy, longest hairs 0.25–0.5 mm long, thick, shiny and transparent, antrorse. Leaves strictly opposite, internodes 1–7 mm long; petioles 0.4–1.1 mm long. Lamina narrowly elliptic to elliptic, 11–31 mm long, 2–6 mm wide, 4.2–7.3 times longer than wide, midrib visible, lateral veins sometimes faintly visible; apex

Fig. 2. ***Pimelea approximans***. A. flowering branchlet ×1. B. upper leaf surface ×3. C. lower leaf surface ×3. D. old inflorescence, where many flowers and fruits have abscised ×2. E. floral tube and sepals ×10. F. half flower ×12. G. ovary and style ×12. H. seed ×12. A–D, H from *Le Cussan 605* (BRI); E–G from *Elsol 771 & Stanley* (BRI). Del. W. Smith.

acute; margins flat. Upper surface of lamina glabrous. Lower surface of lamina hairy; hairs appressed, slender, somewhat shiny, transparent, longest hairs 0.2–0.3 mm long, *c.* 0.025 mm wide, sparse. Inflorescence terminal, capitulate, with 3–4 flowers produced (= number of persistent pedicels), leafy bracts absent. Rachis globular, at maturity 1–2 mm long, densely hairy; peduncle length 0–2 mm long. Some flowers bisexual, some female. Pedicels 0.5–0.7 mm long. Floral tube 9.7–12 mm long at anthesis, white; outer surface with hairs dense, appressed, longer ones 0.3–0.4 mm long; inner surface hairy. Sepals widely spreading, 2.4–4.2 mm long, apex acute, inner surface glabrous, outer surface densely hairy. Staminal filaments *c.* 0.05 mm long; anthers 2.3–2.5 mm long, dehiscence introrse. Style not or scarcely exserted. Seeds not seen.

***Additional selected specimens examined*: Queensland.** Cook District: N of Jardine River, *c.* 32 km NE of Bamaga, Oct 1971, *Dodson s.n.* (BRI [AQ3634]); Heathlands, road to Captain Billy beyond junction, May 1980, *Morton 627* (BRI); SE of Conical Hill, 4 km SE of Shelburne Bay, 3 km W of Thorpe Point, Jun 2008, *Forster PIF33778 et al.* (BRI, NSW); Shelburne Bay, May 1991, *Spencer s.n.* (BRI [AQ506113]); 6.5 km from Captain Billy Landing, Jun 1994, *Forster PIF15363* (BRI, CNS); 15 km N of Middle Peak road junction, Mar 1992, *Johnson 5115* (AD, BRI, MEL, NSW); 0.8 km N of Captain Billy Landing, Mar 1992, *Clarkson 9271 & Neldner* (BRI, DNA, K, MEL); Bolt Head, Jul 1990, *Clarkson 8772 & Neldner* (BRI, CNS, DNA, K, L); Temple Bay, Bolt Head, Jun 1996, *Forster PIF19362* (BRI); Shelburne holdings, near Harmer Creek boat launching site, Nov 1984, *Gunness AG1914* (BRI); Lake Wicheura, Cape York, Jun 1985, *Thiele 909* (BRI, CANB); Sharp Point, Jun 1978, *Clarkson 2108* (BRI); Upper reaches of Escape River, Jun 1978, *Clarkson 2055* (BRI); Richardson Range, 19 km along Middle Peak track to Shelburne Bay, Jun 2008, *Forster PIF33677 & McDonald* (BRI, NSW); Temple Bay, *c.* 4 km NW of Glennie Inlet, Jun 1978, *Clarkson 2171* (BRI); eastern slopes of Mt Pieter Botte, July 1983, *Godwin C2471* (BRI).

***Distribution and habitat*:** *Pimelea aquilonia* is endemic to north Queensland. Its distribution extends from Somerset (near the tip of Cape York Peninsula) to Bolt Head and Temple Bay, about 200 km to the south. There is also a highly disjunct occurrence at Mt Pieter Botte north of Daintree (see note below) (**Map 2**). It grows on sand dunes close to the coast, in *Thryptomene* shrubland or in fragmented rainforest with hoop pine and/or *Callitris*. In the case of Mt Pieter Botte, it occurs in granite crevices.

***Phenology*:** Flowers and fruits have been recorded for most months of the year.

***Affinities*:** *Pimelea aquilonia* and *P. umbratica* are the only Queensland species with strictly opposite leaves. *P. aquilonia* differs from *P. umbratica* by the antrorse stem hairs (appressed for *P. umbratica*), the 3–4 flowers per inflorescence (8–14 for *P. umbratica*), the floral tube 9.7–12 mm long (4.2–6.8 mm for *P. umbratica*), the obtuse sepal apex (acute for *P. umbratica*), and the anthers 2.3–2.5 mm long (1.4–1.8 mm long for *P. umbratica*).

***Note*:** There is some doubt about the provenance of the Godwin collection reputedly from Mt Pieter Botte, as the number given on the label (C2471) does not match the number on the tag attached to the specimen (C2470). The specimen is undoubtedly *P. aquilonia*, but perhaps it was collected from northern Cape York Peninsula.

***Conservation status*:** *Pimelea aquilonia* is a common and widespread species. A conservation status of **Least Concern** is recommended (IUCN 2012).

5. Pimelea chlorina A.R.Bean **sp. nov.,** distinguished by the alternate leaves, the inflorescences borne laterally on the stem, the long silky hairs on the stems and leaves, and the bisexual greenish-yellow flowers. **Typus:** Queensland. North Kennedy District: 0.8 km east of Taravale homestead, south-west of Paluma, 15 May 2009, *A.R. Bean 28851 & R. Jensen* (holo: BRI; iso: CANB, MEL, NSW, *distribuendi*).

Pimelea sp. (Bakers Blue Mt D.G.Fell DF1588); Bean (2016).

Perennial shrub, 50–150 cm high, bisexual. Young stems densely hairy, longest hairs 1.4–2.4 mm long, slender, somewhat shiny and transparent, antrorse to spreading. Leaves alternate, internodes 3–12 mm long; petioles 0.8–1.4 mm long. Lamina elliptic, obovate or broadly elliptic, 12–26 mm long, 4.5–11.5 mm wide, 1.8–3.2 times longer than wide, midrib visible, lateral veins not visible; apex

acute; margins flat. Upper surface of lamina consistently hairy; hairs slender, longest ones 0.7–2 mm long, *c*. 0.025 mm wide, appressed, antrorse or patent; moderately dense to dense. Lower surface of lamina hairy; hairs appressed, antrorse or patent, slender, somewhat shiny, transparent, longest hairs 1.7–2.5 mm long, *c*. 0.025 mm wide, moderately dense to dense. Inflorescence lateral, with 15–45 flowers produced (= number of persistent pedicels), leafy bracts absent. Rachis ellipsoidal or cylindrical, at maturity 3–9 mm long, very densely hairy; peduncle length 0–1.5 mm long. Flowers bisexual. Pedicels 0.7–0.8 mm long. Floral tube 4.3–6 mm long at anthesis, greenish-yellow; outer surface with hairs dense, appressed, longer ones 0.5–1.3 mm long; inner surface glabrous. Sepals at 45 degrees or erect, 1–1.6 mm long, apex obtuse, inner surface glabrous, outer surface densely hairy. Staminal filaments *c*. 0.05 mm long; anthers 0.9–1 mm long, dehiscence introrse. Style not or scarcely exserted. Seed ovoid, 3.4–3.8 mm long, black, surface foveolate. **Figs. 1B, 3.**

***Additional specimens examined*: Queensland.** Cook District: Bakers Blue Mt, Font Hills Station, 19 km S of Mt Carbine, Jan 1989, *Fell DF1588* (BRI); Bakers Blue Mt, Font Hills, Feb 1996, *Gray 6624* (BRI, CNS); Herberton Range, between Atherton and Herberton, May 1995, *Jago 3430* (BRI). North Kennedy District: Above Return Creek falls, Taravale, NW of Townsville, May 2009, *Bean 28870* & *Jensen* (AD, BRI); Return Creek Gorge, *c*. 8.4 km SSE of Taravale homestead on Mt Zero/Taravale Wildlife Sanctuary, May 2012, *Jensen 2595* (BRI); 17.1 km W of Paluma towards Hidden Valley, Nov 2000, *Jackes 2073* (BRI); Three Mile Creek Falls, Kallanda Station, Apr 2001, *Pollock ABP994* & *Turpin* (BRI); 17.7 km N of Greenvale Railway on Ewan – Laroona Road, Jan 1999, *Cumming 18239* (BRI); Blencoe Falls lookout (west side), Jun 1996, *Cumming 14837* (BRI); Hidden Valley, W of Paluma, Apr 1996, *Forster PIF18973* & *Ryan* (BRI, MEL); Taravale near Hell Hole Creek, 0.5–1.5 km E of homestead, Mar 1987, *Jackes 8756* (BRI); W of Mt Spec, Jul 1975, *Jackes s.n.* (BRI [AQ195443]); 21 km W of Paluma towards Hidden Valley, Dec 1976, *Jackes s.n.* (BRI [AQ195444]); 16 km SSW of Myola homestead, 84 km W of Charters Towers, Aug 1992, *Thompson HUG39* & *Sharpe* (BRI); Mingela Bluff, Maidavale, E of Mingela, Apr 1991, *Bean 2970* (BRI, MEL, PERTH).

***Distribution and habitat*:** *Pimelea chlorina* is endemic to north Queensland where it is sporadically distributed from Mt Carbine to Charters Towers (**Map 3**). It grows in sandy soils usually derived from granite, either on hillsides or associated alluvials, but at Mingela Bluff, it inhabits hillsides composed of quartzose sandstone.

***Phenology*:** Flowers and fruits have been recorded for all months of the year except September and October.

***Affinities*:** *Pimelea chlorina* is not apparently closely related to any other species. It is distinctive by virtue of the lateral inflorescences, comprising 15–45 greenish-yellow flowers, and the short, broad, rather silvery leaves. It is reminiscent of *P. latifolia*, but *P. chlorina* differs by the lateral inflorescences, the bisexual flowers, the yellow-green floral tube, and the smaller leaves with long hairs.

***Conservation status*:** *Pimelea chlorina* is known from ten subpopulations with an estimated area of occupancy of 10 km^2. Most subpopulations are either in conservation reserves or in areas unlikely to be cleared of vegetation. However, there is a threat from weed encroachment, particularly the invasive *Praxelis clematidea* (Griseb.) R.M.King & H.Rob. It is considered that this species does not meet the Red List criteria for Vulnerable (IUCN 2012), but it may do in the near future, and a conservation status of **Near Threatened** is recommended.

***Etymology*:** The specific epithet is derived from the Greek *chloros* meaning pale green or greenish-yellow, and refers to the flowers that are greenish-yellow.

6. Pimelea confertiflora A.R.Bean **sp. nov.,** with affinity to *P. amabilis*, but differing by the short antrorse hairs on the upper leaf surface, the thick strigose hairs of the lower leaf surface, the longer anthers and the longer staminal filaments. **Typus:** Queensland. Cook District: Mount Misery, 7 km from Irvinebank, on road to Silver Valley, 24 February 1990, *P.I. Forster PIF6271* (holo: BRI; iso: CANB, DNA).

Perennial shrub, 40–150 cm high, gynomonoecious. Young stems densely hairy, longest hairs 1.2–1.8 mm long, coarse, shiny and transparent, appressed. Leaves often sub-

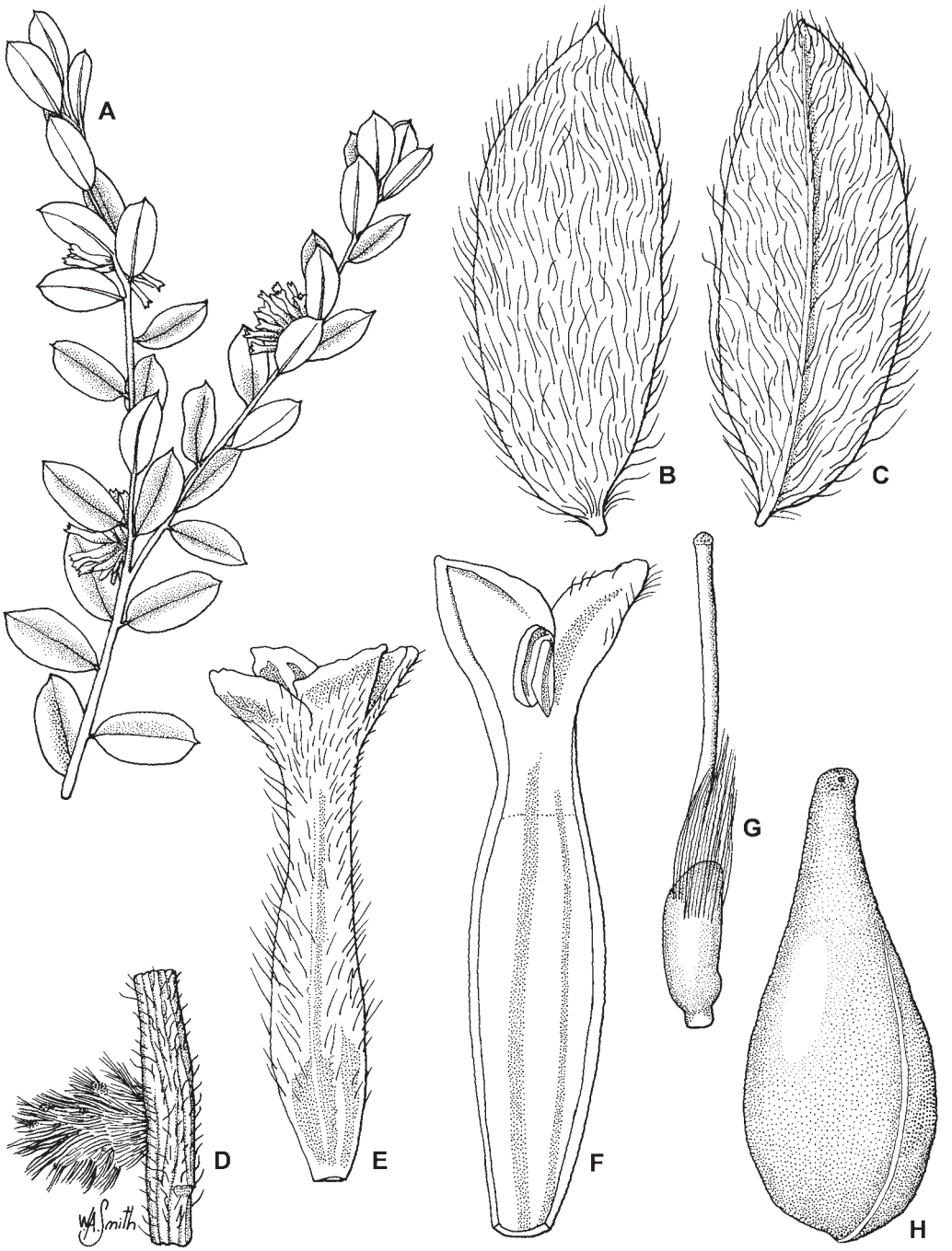

Fig. 3. ***Pimelea chlorina***. A. flowering branchlet ×1. B. upper leaf surface ×4. C. lower leaf surface ×4. D. old inflorescence, where all flowers and fruits have abscised ×4. E. floral tube and sepals ×10. F. half flower ×12. G. ovary and style ×12. H. seed ×16. All from *Bean 28851 & Jensen* (BRI). Del. W. Smith.

opposite to opposite (disjunction between leaf pairs 0–6 mm), or sometimes alternate, with no discernible leaf pairs, internodes 8–23 mm long; petioles 0.5–1.2 mm long. Lamina elliptic or narrowly-elliptic, 13–29 mm long, 2–6 mm wide, 3.7–9 times longer than wide, with no veins visible or only midrib visible, apex acute, margins flat. Upper surface of lamina hairy; hairs slender, longest ones 0.3–0.7 mm long, *c.* 0.025 mm wide, antrorse or patent; moderately dense to dense. Lower surface of lamina hairy; hairs appressed, coarse, shining, transparent, longest hairs 1.2–2.1 mm long, *c.* 0.05 mm wide, dense to very dense. Inflorescence terminal, spicate, with 52–130 flowers produced (= number of persistent pedicels), leafy bracts absent. Rachis cylindrical, at maturity 18–55 mm long, very densely hairy; peduncle length 2–30 mm long. Flowers bisexual or female. Pedicels 20–30 per cm of rachis, each 0.3–1 mm long. Floral tube 4.5–6.6 mm long at anthesis, yellow-green or yellow; outer surface with hairs very dense, antrorse, 0.9–1.2 mm long; inner surface glabrous. Sepals erect, 0.7–1.6 mm long, apex obtuse, inner surface glabrous, outer surface densely hairy. Staminal filaments 0.05–0.1 mm long; anthers 1.1–1.3 mm long, dehiscence introrse. Style not or scarcely exserted. Fruit orientation at right angles to rachis. Seed ovoid, 3.5–4.1 mm long, dark brown, surface verrucate. **Figs. 1C, 4.**

***Additional selected specimens examined*: Queensland.** Cook District: 35 km NW of Mt Carbine, Watershed Mine site, Apr 2008, *Wannan 5136* (BRI, NSW); Windsor Tableland NP, *c.* 35 km NNW of Mount Carbine, Apr 2013, *Mathieson MTM1448 & Forster* (BRI); *c.* 5 km N of Spencer Creek crossing on road to Windsor Tableland, May 1989, *Jones 4427 & Clemens* (BRI); Mt Windsor Tableland, 10 Sep 1980, *Hind 2747 & Forlonge* (BRI, NSW); *c.* 3 km SW along Bethels Crossing Road, adjacent to Mt Alto, 4 km WSW of Mt Carbine, Apr 2007, *Kemp JEK10126 & McKenna* (BRI); 5.2 km E of Davies Creek Road from Kennedy Highway, Aug 1993, *Neldner 4119* (BRI); Davies Creek forestry road, *c.* 15 miles [24 km] E of Mareeba, Aug 1963, *Schodde 3317* (BRI); 16 km NW of Mt Garnet, on road to Lappa, Jan 1993, *Bean 5476 & Forster* (BRI); Near granite gorge off Chewko Road, near Mareeba, Apr 1990, *van der Werff 11508* (BRI); Stannary Hills, 15.5 km S of Mutchilba, opposite Iona Mine, May 2006, *Forster PIF31696 & McDonald* (BRI); Mt Molloy, Apr 1932, *Brass 2467A* (BRI); The jump-up, between Carbeen and Turkinjee, *c.* 12 miles [19 km] N of Atherton, Apr 1953, *Melville 3718 et al.* (BRI); Mt Misery, near top of range, May 1979, *Clarkson 151* (BRI); Powerline track, 1.1 km N of Herberton – Irvinebank road, turnoff 5.8 km W of Herberton, May 2005, *Cumming 23205* (BRI); Undara western tunnel line, Mt Rosey, Nov 1989, *Godwin C3688* (BRI). North Kennedy District: Road to Baal Gammon mining area, W of Herberton, Jul 2004, *McDonald KRM2912 & Bean* (BRI); Road to Old Baal Gammon mine, off Herberton – Irvinebank Road, Mar 2004, *Sankowsky 2379 & Sankowsky* (BRI); Western firebreak, TR 245, near Ravenshoe, Jul 1999, *McDonald KRM32 et al.* (BRI); Road between Herberton and Watsonville, Jul 1967, *Brass 33608* (BRI); Herberton, Jan 1912, *Kenny s.n.* (BRI [AQ97870]); Evelyn Creek Conservation Park, W of Ravenshoe, Mar 2005, *McDonald KRM4190 & Winter* (BRI); Silver Valley Road, W of Ravenshoe, Apr 2005, *Forster PIF30723 & McDonald* (BRI).

***Distribution and habitat*:** *Pimelea confertiflora* is endemic to north Queensland occurring from Windsor Tableland (near Mt Carbine) to Undara NP (near Mt Surprise), and east to Davies Creek road, near Mareeba (**Map 3**). It inhabits hillsides with sandy or skeletal soil on rocky outcrops of granite or rhyolite.

***Phenology*:** Flowers and fruits may be found at any time of the year.

***Affinities*:** The name *Pimelea sericostachya* subsp. *sericostachya* has been widely misapplied to this species. *P. confertiflora* differs from *P. sericostachya* by the inflorescence rachis 18–55 mm long (63–250 mm long for *P. sericostachya*), 20–30 flowers per centimetre of rachis (4–8 per cm for *P. sericostachya*), and the much denser hairs on the lower leaf surface, rachis, floral tube and sepals.

***Conservation status*:** *Pimelea confertiflora* is a common and widespread species. A conservation status of **Least Concern** is recommended (IUCN 2012).

***Etymology*:** From the Latin *confertus* 'crowded' and *florus* 'flowers', referring to the flowers of this species that are crowded together on the rachis.

7. Pimelea curviflora R.Br., *Prodr.* 362 (1810). **Type:** New South Wales. Near Parramatta, June 1802, *R. Brown (Bennett No. 3186)* (holo: BM).

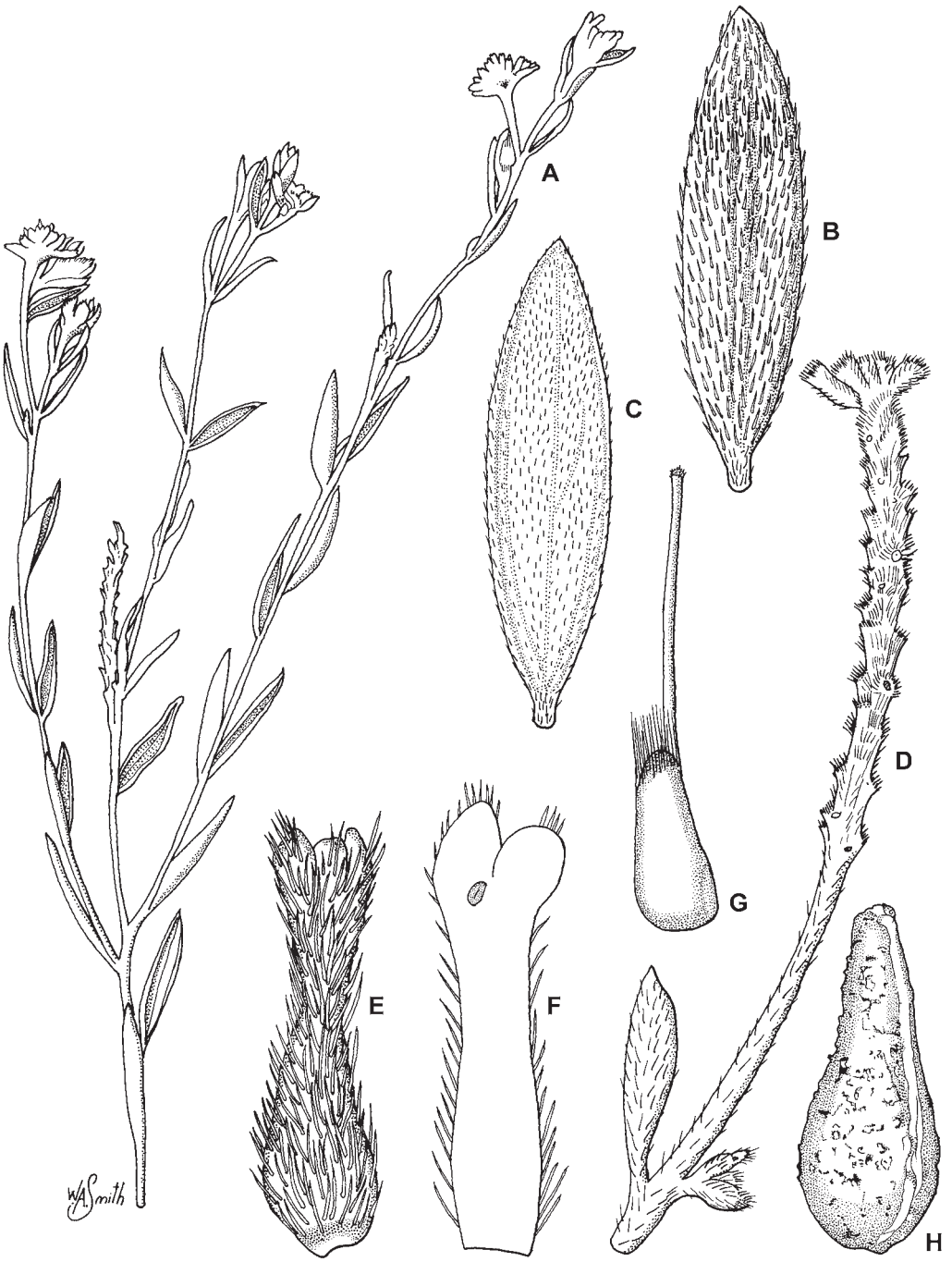

Fig. 4. ***Pimelea confertiflora***. A. flowering branchlet ×1. B. upper leaf surface ×3. C. lower leaf surface ×3. D. old inflorescence, where most flowers and fruits have abscised ×3. E. floral tube and sepals ×10. F. half flower ×12. G. ovary and style ×12. H. seed ×12. A–C from *Sankowsky 2379 & Sankowsky* (BRI); D from *Neldner 4119* (BRI); E–H from *McDonald KRM2912 & Bean* (BRI). Del. W. Smith.

Annual herb or perennial shrub, 20–45 cm high, gynomonoecious. Young stems sparsely to densely hairy, longest hairs 1.6–2.4 mm long, thick, shiny and transparent, antrorse. Leaves opposite to sub-opposite, disjunction between leaf pairs 0–4 mm, or sometimes alternate, internodes 7–27 mm long; petioles 0.8–1 mm long. Lamina oblanceolate, broadly-elliptic or elliptic, 12–20 mm long, 2.5–6 mm wide, 2.3–5.2 times longer than wide, with only the midrib visible, apex acute, margins flat. Upper surface of lamina glabrous. Lower surface of lamina hairy; hairs moderately dense, appressed to antrorse, thick, very shiny, transparent, longest hairs 1.6–2.2 mm long, *c.* 0.05 mm wide. Inflorescence terminal, capitulate, with 9–28 flowers produced (= number of persistent pedicels), partly enclosed by two or four leafy bracts. Rachis globose to ellipsoidal, at maturity 2–4 mm long, very densely hairy; peduncle length 0–1 mm long. Flowers a mixture of bisexual and female. Pedicels 0.3–0.5 mm long. Floral tube 4.6–6 mm long at anthesis, yellow; outer surface with hairs dense, appressed, 0.4–1.5 mm long; inner surface glabrous. Sepals erect, 1–2.5 mm long, apex obtuse, inner surface glabrous, outer surface densely hairy. Staminal filaments 0.05–0.1 mm long; anthers 1.2–1.3 mm long, dehiscence introrse. Style not or scarcely exserted. Seed ovoid, 2.8–2.9 mm long, black, surface foveolate.

Two varieties occur in Queensland, distinguished by the following key:

Longest leaf hairs 1.3–2.5 mm; flowers 5–15 per inflorescence . . **P. curviflora** var. **divergens**
Longest leaf hairs 0.6–1.0 mm; flowers 3–7 per inflorescence . . . . .**P. curviflora** var. **gracilis**

7a. Pimelea curviflora var. **divergens** Threlfall, *Brunonia* 5: 189 (1983). **Type:** New South Wales. Currububula District, 31 May 1940, *Glenfield Vet. Res. 40/812* (holo: NSW).

***Additional selected specimens examined*: Queensland**. Burnett District: Well Station Creek, *c.* 50 km SW of Mundubbera, Nov 2008, *Bean 28163 & Grimshaw* (BRI); Narayan Village, Mar 1973, *Hargreaves N1203* (BRI); Boyne River, *c.* 15 km W of Kingaroy, Oct 1954, *Johnson & Pedley s.n.* (BRI [AQ108793]); N of Bunya Mountains, 20 km N of Kumbia, Oct 1998, *Martin 99* (BRI); 6 km from Kumbia towards Bunya Mountains, Dec 1997, *Bean 12689* (BRI). Darling Downs District: SF98 (Bell – Jandowae), Dec 1984, *Specht 211* (BRI); Gowrie Junction, S of railway line, Oct 1999, *Bean 15616* (BRI); Wyreema, Mar 1931, *Hubbard 5893* (BRI); 2 miles [3 km] S of Pittsworth, Nov 1946, *Everist & Webb 1226* (BRI); Near Pilton, Oct 1954, *Everist s.n.* (BRI [AQ108788]); Near Swanfels, ENE of Warwick, Nov 1971, *Blake 23744A* (BRI); Glenlyon – Bonshaw Road, near Emu Park turnoff, Dec 1999, *Butler s.n.* (BRI [AQ492887]). Moreton District: 8 km W of Blackbutt, towards Yarraman, Nov 1996, *Bean 11397* (BRI); Mt Mistake, Jun 1887, *Simmonds s.n.* (BRI [AQ418743]).

***Distribution and habitat*:** *Pimelea curviflora* var. *divergens* occurs between Warwick and Mundubbera, with an apparent outlier near Bonshaw (**Map 4**). It also occurs in the north-western slopes region of New South Wales, south to around Tamworth. It inhabits hillsides with clay or clay-loam soils, usually derived from basalt.

***Phenology*:** Flowers and fruits are recorded mainly from October to December, and there is a single record from March.

***Notes*:** The specimens cited above are a very good match for the type of this variety. The Queensland specimens cited by Threlfall (1983) and Rye (1990) under the name *P. curviflora* var. *sericea* Benth. have been identified here as *P. curviflora* var. *divergens.* I could not find any Queensland specimens that match the type of *P. curviflora* var. *sericea*.

***Conservation status*:** *Pimelea curviflora* var. *divergens* is a common and widespread variety. A conservation status of **Least Concern** is recommended (IUCN 2012).

7b. Pimelea curviflora var. **gracilis** (R.Br.) Threlfall in Jessop & Toelken, *Fl. South Austral*. 4,4: 2147 (1986); *P. gracilis* R.Br., *Prodr.* 362 (1810). **Type:** [Tasmania] Western Arm, Port Dalrymple, 6 January 1804, *R. Brown (Bennett No. 3187)* (holo: BM, *fide* Threlfall 1983: 2147).

***Illustration*:** Leiper *et al.* (2008: 485).

***Additional selected specimens examined*: Queensland.** Darling Downs District: Hellhole Gorge, NE of Yangan, Oct 1996, *Bean 10941* (BRI, MEL); Near Swanfels, Nov 1971, *Blake 23744B* (BRI); Killarney, Oct 1891, *s. coll.* (BRI [AQ85861]). MORETON DISTRICT: Mt Mistake, Jun 1887, *Bailey s.n.* (BRI [AQ108794]); Mt Mistake, Nov 1930, *Hubbard 5218* (BRI); Mt Mistake, Apr 1939, *Blake 14005* (BRI, K, NSW).

***Distribution and habitat*:** In Queensland, *Pimelea curviflora* var. *gracilis* is confined to the vicinity of the Great Dividing Range, close to the New South Wales border (**Map 5**), but is otherwise widespread in New South Wales, Victoria, South Australia and Tasmania. Few Queensland specimens include habitat data, but it is recorded as growing "on edge of rainforest in rocky situations", "cliff faces in ecotone", and "on sandy soil over rhyolite, eucalypt woodland".

***Phenology*:** Flowers and fruits are recorded between April and November.

***Notes*:** The Queensland specimens cited above are not a particularly good match for the type of this variety, but they are maintained under this name merely for convenience until some future researcher completes a revision of the *P. curviflora* complex.

***Conservation status*:** *Pimelea curviflora* var. *gracilis* is a common and widespread variety. A conservation status of **Least Concern** is recommended (IUCN 2012).

8. Pimelea elongata Threlfall, *Telopea* 2: 55 (1980). **Type:** Queensland. Warrego District: Tributary of Beechel Creek, 3 miles [5 km] NW of Cheepie, 22 July 1970, *I. Clark s.n.* (holo: BRI [AQ24720]).

***Illustrations*:** Rye (1990: 162); Fletcher *et al.* (2009: 14, 15).

Annual forb, 15–40 cm high, bisexual. Young stems very sparsely hairy, longest hairs 0.3–0.6 mm long, slender, somewhat shiny and transparent, appressed to antrorse. Leaves alternate, internodes 1–14 mm long; petioles 0.5–0.6 mm long. Lamina narrowly-elliptic to oblanceolate, 7–15 mm long, 1.4–2.8 mm wide, 3.8–7.9 times longer than wide, with no veins visible, apex obtuse, margins flat. Upper surface of lamina glabrous. Lower surface of lamina glabrous or occasionally hairy; hairs appressed, slender, somewhat shiny, transparent, longest hairs 0.3–0.5 mm long, *c.* 0.025 mm wide, very sparse. Inflorescence terminal, spicate, with 17–42 flowers produced (= number of persistent pedicels), leafy bracts absent. Rachis linear, at maturity 18–100 mm long, sparsely hairy; peduncle length 0–8 mm long. Flowers bisexual. Pedicels 3–6 per cm of rachis, each 0.5–0.9 mm long. Floral tube 2.4–3 mm long at anthesis, green-yellow to yellow, but obscured by white hairs; outer surface with a dense to very dense layer of short appressed hairs 0.3–0.5 mm long; inner surface glabrous. Sepals erect, 0.5–0.8 mm long, apex obtuse, inner surface glabrous, outer surface moderately densely hairy. Staminal filaments 0.1–0.2 mm long; anthers 0.3–0.6 mm long, dehiscence introrse. Style not or scarcely exserted. Seed ovoid, 2.3–2.5 mm long, black, surface foveolate.

***Additional selected specimens examined*: Queensland.** Gregory North District: Tonkoro Station, 2.4 km from Gun Creek well at bearing 337 degrees, Aug 2013, *Pennay CP545 & Richter* (BRI). Mitchell District: 12 km E of Jundah, 2 km W of Paradise house, Dec 2008, *Milson JM1735* (BRI); 20 km E of Trinidad homestead on road to Milo, Nov 2007, *Silcock Trinidad1 et al.* (BRI). Gregory South District: Kyabra Creek rest area, on the Quilpie – Windorah Road, Sep 2010, *Bean 30283* (BRI); 9 km NW of Eromanga, Feb 1972, *Kelly s.n.* (BRI [AQ1653]). Warrego District: 104 miles [167 km] from Charleville on Quilpie Road, Sep 1963, *Everist 7528* (BRI); 5 km S of Toompine on Toompine – Thargomindah Road, Sep 2009, *Silcock PP09/082* (BRI); 1 km E of Thurlgoona homestead on N side of creek, *c.* 75 km SSE of Cunnamulla, May 2008, *O'Sullivan PP08/159* (BRI); *c.* 27 km NE of Thargomindah on Quilpie Road, Sep 1973, *Henderson H2082 & Boyland* (BRI); 35 km W of Thargomindah, Sep 2005, *Batianoff & Butler 0509208* (BRI); Moombidary Station, *c.* 48 km W of Hungerford, Nov 1954, *Smith 6040* (BRI). Maranoa District: 2 km NW of Carellen homestead, *c.* 90 km WNW of Bollon, Mar 2008, *Bean 27451 & Wang* (BRI); 64 km E of Cunnamulla on Balonne Highway, Sep 2003, *McKenzie RAM03/188* (BRI); 7 km NE of South Plain, May 1977, *Purdie 616E* (BRI); Dingwall Station, *c.* 156 km SSE of Charleville, Apr 1952, *Everist 5006* (BRI); Murra Murra, on flat immediately E of homestead, SW Bollon, Feb 2007, *Eddie CPE1085* (BRI).

***Distribution and habitat*:** *Pimelea elongata* is widespread in southern inland Queensland as far east as Bollon, and as far north as Vergemont (W of Longreach), but apparently absent from far south-western Queensland (**Map 5**). It also extends to far northern parts

of New South Wales. It grows along drainage lines or in the bed of ephemeral lakes, in clay or clay-loam soil. The vegetation community is often grassland, but it sometimes grows with *Eucalyptus coolabah* Blakely & Jacobs, *E. populnea* F.Muell. or *Acacia aneura* F.Muell. ex Benth.

***Phenology*:** Flowers and fruits may be found at any time of the year.

***Notes*:** *Pimelea elongata* is distinguished by its annual habit, leaves without visible venation and very sparsely hairy on the lower surface, the sparsely hairy linear rachises, the floral tube only 2.4–3 mm long at anthesis, and the anthers 0.3–0.6 mm long.

***Conservation status*:** *Pimelea elongata* is a common and widespread species. A conservation status of **Least Concern** is recommended (IUCN 2012).

9. Pimelea fugiens A.R.Bean **sp. nov.** with affinity to *P. strigosa*, but differing by the opposite or sub-opposite leaves, the shorter sepals, and the shorter hairs on the stems and the floral tube. **Typus:** Queensland. Port Curtis District: Thangool – Lookerbie Road, S of Thangool, 9 May 2009, *A.R. Bean 28739* (holo: BRI; iso: CANB, MEL, MO, NSW, P, *distribuendi*).

Perennial shrub, 30–40 cm high, bisexual. Young stems sparsely hairy, longest hairs 0.6–0.8 mm long, slender, somewhat shiny and transparent, appressed. Leaves opposite or sub-opposite, disjunction between leaf pairs 0–3 mm, internodes 9–25 mm long; petioles 0.7–1.2 mm long. Lamina elliptic, 15–33 mm long, 5–12 mm wide, 2.2–3.5 times longer than wide, midrib visible, lateral veins sometimes visible; apex acute, margins recurved. Upper surface of lamina glabrous or sometimes with a few hairs on midrib; hairs slender, longest ones 0.2–0.4 mm long, *c.* 0.02 mm wide, appressed; very sparse. Lower surface of lamina hairy; hairs appressed, slender, somewhat shiny, transparent, longest hairs 0.5–0.6 mm long, *c.* 0.02 mm wide, sparse. Inflorescence terminal or axillary, capitulate, with 12–18 flowers produced (= number of persistent pedicels), leafy bracts absent. Rachis globose to ellipsoidal, at maturity 2–4 mm long, very densely hairy; peduncle length 8–28 mm long. Flowers bisexual. Pedicels 0.2–0.4 mm long. Floral tube 3.6–4.6 mm long at anthesis, pale yellow; outer surface with hairs dense, appressed, 0.4–0.5 mm long; inner surface glabrous. Sepals erect, 0.9–1.3 mm long, apex obtuse, inner surface glabrous, outer surface moderately densely hairy. Staminal filaments 0–0.05 mm long; anthers 0.6–0.75 mm long, dehiscence introrse. Style not or scarcely exserted. Seed ovoid, *c.* 3.3 mm long, black, surface ± smooth. **Figs. 1D, 5.**

***Additional specimens examined*: Queensland.** Port Curtis District: Lookerbie road, *c.* 13 km S of Thangool, Apr 1996, *Bean 10252 & Turpin* (BRI); Dry Creek, Portion 3 Clifford, 29 km E of Biloela, Oct 1993, *Brushe 43 & Hoy* (BRI).

***Distribution and habitat*:** *Pimelea fugiens* is endemic to central Queensland and known only from two sites in the Biloela district (**Map 6**). It grows along dry gullies dominated by *Melaleuca bracteata* F.Muell., with other associated species including *Eucalyptus tereticornis* Sm. subsp. *tereticornis*, *Corymbia tessellaris* (F.Muell.) K.D.Hill & L.A.S.Johnson and *Pleiogynium timorense* (DC.) Leenh. and with introduced weeds *Dolichandra unguis-cati* (L.) L.G.Lohmann and *Lantana montevidensis* (Spreng.) Briq. The soil is brown clay with much stone.

***Phenology*:** Flowers and fruits are recorded for April, May and October.

***Affinities*:** *Pimelea fugiens* is apparently closely related to *P. strigosa*, but differs by the longest stem hairs 0.6–0.8 mm long (1.2–1.7 mm long in *P. strigosa*), the leaves opposite to sub-opposite (mostly alternate in *P. strigosa*); the glabrous upper leaf surface (upper surface hairy for *P. strigosa*); the hairs 0.4–0.5 mm long on the outer surface of the floral tube (hairs 0.6–0.9 mm long for *P. strigosa*); and the sepals 0.9–1.3 mm long (1.3–1.7 mm long for *P. strigosa*).

***Conservation status*:** Although this species is apparently not grazed by domestic stock, the known population is fewer than 100 plants, and there is a significant threat posed by

Fig. 5. ***Pimelea fugiens***. A. flowering branchlet ×1. B. upper leaf surface ×2. C. lower leaf surface ×2. D. old inflorescence, where all flowers and fruits have abscised, and peduncle ×4. E. floral tube and sepals ×12. F. half flower ×14. G. ovary and style ×14. A, E–G from *Bean 28739* (BRI); B–D from *Bean 10252* (BRI). Del. W. Smith.

alien invasive weeds, especially *Dolichandra unguis-cati* and *Lantana montevidensis*. Based on the IUCN Red List criteria (IUCN 2012), a conservation status of **Endangered** is recommended (B1ab(ii,iii,v)+2ab(ii,iii,v); D).

***Etymology*:** The epithet is from the Latin, and means 'avoiding, averse to'. This name is given because cattle avoid eating this plant, which is likely to be toxic. At the time the type was collected, this plant was thriving and untouched when many other nearby plant species had been heavily grazed by cattle.

10. Pimelea gigandra A.R.Bean **sp. nov.** with affinity to *P. altior*, but differing by the greater number of flowers per inflorescence, the longer floral tube and sepals, the hairs on the stems (away from the growing point) more or less appressed, the larger anthers, and the sparser tomentum on the upper leaf surface. **Typus:** Queensland. MORETON DISTRICT: 0.3 km along Duck Creek road, Lamington National Park, 29 February 2016, *A.R. Bean 32730 & J. Wang* (holo: BRI; iso: BM, MEL, NSW, *distribuendi*).

Pimelea altior var. *longifolia* Domin, *Biblioth. Bot.* 89: 436 (1928). **Type:** Queensland. MORETON DISTRICT: Tamborine Mountain, March 1910, *K. Domin s.n.* (holo: ?PR, *n.v.*).

Perennial shrub, 50–300 cm high, gynodioecious. Young stems densely hairy, longest hairs 0.6–1.3 mm long, appressed or antrorse, slender, transparent and somewhat shiny. Leaves opposite to sub-opposite, disjunction between leaf pairs 0–3 mm, internodes 15–36 mm long; petioles 1.8–3 mm long. Lamina elliptical, 33–82 mm long, 11–23 mm wide, 2.4–3.7 times longer than wide, midrib visible, lateral veins sometimes visible; apex obtuse or acute, mucronate; margins recurved. Upper surface of lamina very sparsely to sparsely hairy; hairs slender, longest ones 0.3–0.6 mm long, *c.* 0.025 mm wide, antrorse or patent. Lower surface of lamina sparsely to moderately densely hairy; hairs appressed to antrorse, slender, somewhat shiny, transparent, longest hairs 0.4–0.8 mm long, *c.* 0.025 mm wide. Inflorescence terminal, capitulate, with 10–19 flowers produced (= number of persistent pedicels), partly enclosed by four leafy bracts, two short and two rather longer. Rachis globose, at maturity 2–3.5 mm long, densely hairy; peduncle length 1–3 mm long. Some flowers female and some bisexual. Pedicels 0.5–0.8 mm long. Floral tube 8.5–11 mm long at anthesis, white; outer surface with hairs moderately dense to dense, patent near base and ± appressed near apex, longer ones 0.4–0.6 mm long; inner surface sparsely hairy. Sepals spreading, 3.1–4 mm long, apex acute, inner surface glabrous or sparsely hairy, outer surface sparsely to densely hairy. Staminal filaments 0.2–0.4 mm long; anthers 2–2.2 mm long, dehiscence introrse. Style not or scarcely exserted. Seed ovoid, 3.3–4.4 mm long, black, surface smooth. **Figs. 1E, 6, 7A.**

***Additional selected specimens examined*: Queensland.** MORETON DISTRICT: Tamborine Heights Park, Contour Road, Mt Tamborine, Jan 2017, *Bean 32882* (BRI); Mt Tamborine, Mar 1937, *Blake 12883* (BRI); Nerang Creek, *s.dat.*, *Schneider s.n.* (BRI [AQ108783]); Track to Bushrangers Cave, Numinbah Gap, Mar 2007, *Nicholson NJN2859* (BRI); Springbrook, Macpherson Range, Sep 1930, *Hubbard 4265* (BRI); Caves Circuit, Lamington NP, Dec 1986, *Grimshaw s.n.* (BRI [AQ930686]); Araucaria Lookout, Lamington NP, Dec 2009, *Bean 29316* (BRI); Numinbah Forest Reserve, at northern end of Springbrook Plateau, Jul 2006, *Halford Q9119* (BRI); Macpherson Range (National Park), Jan 1919, *White s.n.* (BRI [AQ108777]); W slopes of Mt Tenduragan, near Numinbah, Oct 1938, *Blake 13854* (BRI, CANB, K); Near Ankida Nature Reserve, Springbrook, Sep 2005, *Thompson MOR596* (BRI). **New South Wales.** NORTH COAST: Tweed River district, Mar 1896, *Betche s.n.* (NSW 121405); Brummies Lookout, SE of Tyalgum, Jul 1993, *Bean 6219* (BRI); Mt Nardi, NE of Nimbin, Sep 1972, *Rodd 2227* (NSW); Coopers Creek, via Mullumbimby, Aug 1936, *White 10461* (BRI, MO); Peates Mountain Road, Whian Whian SF, N of Lismore, Sep 1994, *Bean 7917* (BRI); Mt Warning, Oct 1898, *Forsyth s.n.* (NSW 127747); *ibid.*, Oct 1963, *Johnson 2740* (BRI); Richmond River, *s.dat.*, *Henderson s.n.* (MEL 50352); 2.9 km W of Rummery Road on Nightcap Road, in catchment of Rocky Creek Dam, Nightcap NP, Dec 2010, *Johnstone 2783 & Errington* (CANB, MEL, NSW); North Creek on the Richmond River, Aug 1884, *s. coll.* (MEL 57884); Richmond River, *s.dat.*, *Fawcett s.n.* (MEL 2181376); Mororo, NW of Iluka, Apr 2003, *Fensham 4876* (BRI).

***Distribution and habitat*:** *Pimelea gigandra* is confined to a relatively small area from Mt Tamborine, south-east Queensland to Mororo, north-east New South Wales (**Map 4**). It inhabits rainforest margins or tall open forest with *Eucalyptus grandis* W.Hill, *Corymbia intermedia* (R.T.Baker) K.D.Hill

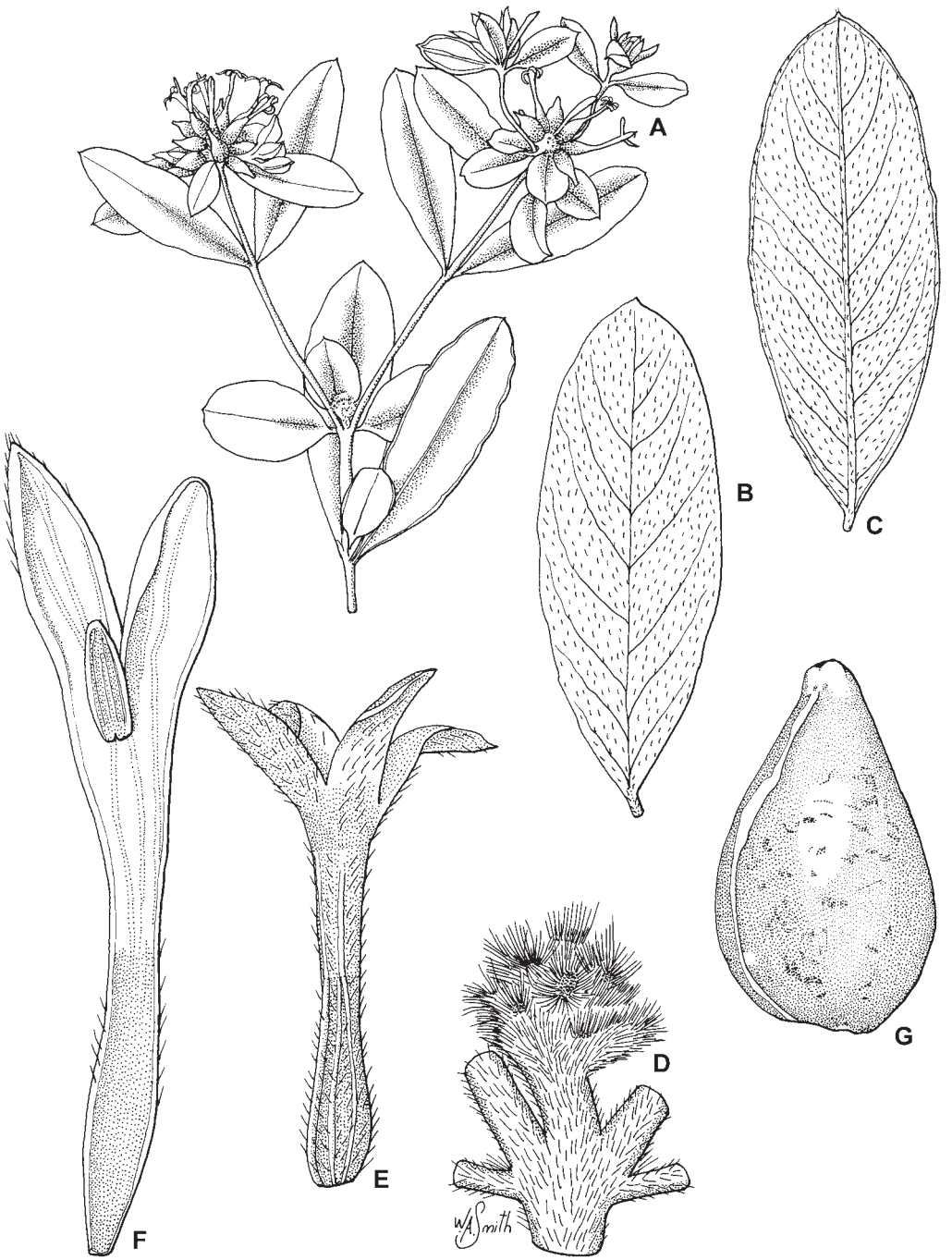

Fig. 6. ***Pimelea gigandra***. A. flowering branchlet ×1. B. upper leaf surface ×1.5. C. lower leaf surface ×1.5. D. old inflorescence, where all flowers and fruits have abscised, and peduncle ×6. E. floral tube and sepals ×6. F. half flower ×8. G. seed ×16. A–F from *Thompson MOR596* (BRI); G from *White s.n.* (BRI [AQ108777]). Del. W. Smith.

& L.A.S.Johnson, *Syncarpia glomulifera*, *E. pilularis* Sm. or *E. campanulata* R.T.Baker & H.G.Sm. It grows in shallow or deep basaltic soils.

***Phenology*:** Flowers and fruits may be found at any time of the year.

***Affinities*:** *Pimelea gigandra* differs from *P. altior* by the 10–19 flowers per inflorescence (4–7 flowers for *P. altior*), the floral tube 8.5–11 mm long and the sepals 3.1–4 mm long (floral tube 5.2–8.2 mm, sepals 0.9–1.6 mm for *P. altior*), the hairs on the stems (away from the growing point) more or less appressed, the anthers 2–2.2 mm long (0.8–1.2 mm long for *P. altior*), and the sparser tomentum on the upper leaf surface.

***Notes*:** *Pimelea gigandra* is unusual within *P.* section *Epallage* because of its long anthers (2–2.2 mm long), which exceed in length those of most other Queensland species in this section.

The type of *P. altior* var. *longifolia* has not been seen, but the description in the protologue confirms that it belongs in *P. gigandra*.

***Conservation status*:** While *Pimelea gigandra* is of relatively limited geographical range, it is a common species within that range. A conservation status of **Least Concern** is recommended (IUCN 2012).

***Etymology*:** From the Greek *gigas* meaning 'large or giant', and *andros* meaning 'man or male' (in botany, stamen or anther). The epithet refers to the size of the anthers in this species, which are much larger than those of *P. latifolia* and *P. altior*, with which it has been confused.

11. Pimelea latifolia R.Br., *Prodr.* 362 (1810); *Calyptrostegia latifolia* (R.Br.) Endl., *Gen. Pl. Suppl.* 4(2): 61 (1848); *Banksia latifolia* (R.Br.) Kuntze, *Rev. Gen. Pl.* 583 (1891); *Pimelea latifolia* subsp. *latifolia*, Threlfall in *Brunonia* 5: 192 (1983). **Type:** [Queensland]. Cumberland Islands, *s.dat., R. Brown [Bennett No. 3189]* (lecto [here designated]: BM 000895089; isolecto: BM 000895090, K 000844976, K 000844977, MEL 57877, P 00710502, P 00713797).

Perennial shrub, 30–150 cm high, gynomonoecious. Young stems sparsely to densely hairy, longest hairs 0.6–1 mm long, slender, somewhat shiny and transparent, antrorse to spreading. Leaves alternate, internodes 2–19 mm long; petioles 1.2–2.2 mm long. Lamina obovate, 31–67 mm long, 13–24 mm wide, 1.7–3.6 times longer than wide, midrib visible, lateral veins sometimes visible; apex acute or obtuse, mucronate; margins flat. Upper surface of lamina glabrous or sparsely hairy; hairs slender, longest ones 0.4–0.6 mm long, *c.* 0.025 mm wide, appressed to antrorse. Lower surface of lamina sparsely to moderately densely hairy; hairs appressed, slender, somewhat shiny, transparent, longest hairs 1–2 mm long, *c.* 0.02 mm wide. Inflorescence terminal, with 24–120 flowers produced (= number of persistent pedicels), leafy bracts absent. Rachis cylindrical, rarely ellipsoidal, at maturity 5–27 mm long, densely hairy; peduncle length 2–6 mm long. Flowers a mixture of bisexual and female. Pedicels 0.5–1 mm long. Floral tube 6.2–7.5 mm long at anthesis, white; outer surface with hairs sparse to moderately dense, antrorse, longer ones 0.2–0.5 mm long; inner surface glabrous. Sepals spreading, 1.6–2.3 mm long, apex obtuse, inner surface glabrous, outer surface densely hairy. Staminal filaments *c.* 0.05 mm long; anthers 0.9–1 mm long, dehiscence introrse. Style not or scarcely exserted. Seed ovoid, 4.6–4.8 mm long, black, surface ± smooth. **Fig. 7B.**

***Additional selected specimens examined*: Queensland.** North Kennedy District: Mt Elliot, *s.dat., Fitzalan s.n.* (MEL 57885); western summit ridge of Mt Elliot, S of Townsville, Aug 1991, *Bean 3586* (BRI); Cape Cleveland section, Bowling Green Bay NP, S of Townsville, *Bean 3432* (BRI); Mt Mueller, Sep 1863, *Dallachy 21* (MEL); Proserpine River, in 1890, *Birch s.n.* (MEL 57887); Port Denison, *s.dat., Fitzalan s.n.* (MEL 57883); Mid-reaches of Kelsey Creek, 8.5 km SSW of Proserpine, Aug 2007, *Fell DGF8447* (BRI); 2–4 km S of Mt Dryander, N of Proserpine, Apr 1985, *Rodd & Hardie 4447* (BRI, CANB, NSW); Mt Dryander, *s.dat., Kilner & Fitzalan s.n.* (MEL 57888); Earlando Beach, 28 km N of Airlie Beach, site 90, Sep 1992, *Batianoff 9209248* (BRI); Cape Conway, Conway NP, May 1994, *Batianoff 940538 & Dillewaard* (BRI). South Kennedy District: North Road, Cathu SF, S of Proserpine, Nov 2010, *Bean 30597 et al.* (BRI, CANB, NSW); Bloomsbury via Mackay, Jun 1960, *Wilbraham s.n.* (BRI [AQ85902]); SF 658, Carawatha, Apr 1991, *Forster PIF8186 & McDonald* (BRI, MEL); Mt Blackwood NP, *c.* 30 km NNW of Mackay, May

Fig. 7. F. ***Pimelea gigandra*.** Cultivated plant with fruit at the Brisbane Botanic Gardens Mt Coot-tha (no voucher). Photo: H. Nicholson. G. ***P. gigandra*.** O'Reilly's Guest House, Lamington NP (no voucher). Photo: H. Nicholson. H. ***P. plurinervia*.** (*McDonald KRM17658 & Jensen*, BRI). Photo: R. Jensen. I. ***P. leptostachya*** (*Bean 29758*, BRI). Photo: A.R. Bean. J & K. ***P. rupestris*** (*Bean 28492*, BRI). Photo: A.R. Bean.

1991, *Bean 3154* (BRI); Palm Bay, St Bees Island, 36 km NE of Mackay, Mar 1989, *Batianoff 11113A* (AD, BRI); Scawfell Island NP, 50 km ENE of Mackay, Nov 1986, *Batianoff 6081* (AD, BRI, NSW); Connors River, Sarina, Jun 1955, *Beauglehole ACB3543* (MEL); Prudhoe Island NP, 53 km SE of Mackay, Nov 1992, *Batianoff 921110* (AD, BRI). Leichhardt District: Wandoo, Jul 1959, *Gittins 267* (BRI, CANB); Pine Mountain, SF 79, Apr 1991, *Forster PIF8010 & McDonald* (BRI, MEL). Port Curtis District: Ogmore, Sep 1943, *Blake 15310* (BRI, MEL); Rockhampton, *s.dat., O'Shanesy 61* (MEL); Struck Oil, Feb 1986, *Hoy 118* (BRI); Head of the Dee [River], Jan 1867, *Bowman 47* (MEL).

***Distribution and habitat*:** *Pimelea latifolia* is endemic to eastern Queensland with a distribution extending from Townsville to just south of Rockhampton, including continental islands (**Map 1**). It grows on margins of rainforest or vinethicket, on shallow soils at altitudes below 400 metres. On the islands of the Whitsunday group, it is found on coastal headlands adjacent to littoral rainforest.

***Phenology*:** Flowers and fruits have been recorded for every month of the year except December.

***Notes*:** The name *Pimelea latifolia* has been widely misapplied to other species, mainly *P. altior.*

Plants from the islands tend to have obtuse and mucronate leaf apices, while those from mainland areas usually have acute and mucronate leaf apices.

***Conservation status*:** *Pimelea latifolia* is a common and widespread species. A conservation status of **Least Concern** is recommended (IUCN 2012).

12. Pimelea leptospermoides F.Muell., *Fragm.* 7: 2 (1869); *Banksia leptospermoides* (F.Muell.) Kuntze, *Revis. Gen. Pl.* 2: 583 (1891). **Type:** Queensland. Port Curtis District: Cawarral, *s.dat., A. Thozet s.n.* (lecto [here designated]: K 000844992; isolecto: K 000844991, MEL 57889, MEL 57890).

Perennial shrub, 30–100 cm high, gynodioecious. Young stems densely hairy, longest hairs 0.25–0.9 mm long, thick, white and opaque or shiny and transparent, appressed, antrorse or spreading. Leaves alternate, internodes 0.5–10 mm long; petioles 0.7–1 mm long. Lamina elliptic, obovate or oblanceolate, 8.5–26 mm long, 2.6–7 mm wide, 2.2–5.3 times longer than wide, midrib visible, lateral veins sometimes faintly visible; apex acuminate to mucronate; margins flat. Upper surface of lamina glabrous or with hairs very sparse to dense, hairs appressed, slender, 0.2–0.7 mm long. Lower surface of lamina hairy; hairs appressed, antrorse or patent, slender, somewhat shiny, white or transparent, longest hairs 0.25–0.9 mm long, *c.* 0.025 mm wide, dense or sparse. Inflorescence terminal or axillary, capitulate, with 3–7 flowers produced (= number of persistent pedicels), leafy bracts absent. Rachis globular, at maturity 1–2 mm long, densely hairy; peduncle obsolete. Bisexual flowers and female flowers on separate plants. Pedicels 0.3–0.5 mm long. Floral tube 4.8–8.2 mm long at anthesis, white; outer surface with hairs dense, appressed (antrorse), longer ones 0.2–0.6 mm long; inner surface hairy. Sepals

Two subspecies are recognised, distinguished by the following key:

Hairs on lower leaf surface antrorse to patent, dense, 0.8–0.9 mm long; hairs on floral tube 0.4–0.6 mm long . . . . . **12a. P. leptospermoides** subsp. **bowmanii**

Hairs on lower leaf surface appressed, sparse, 0.25–0.6 mm long; hairs on floral tube 0.2–0.3 mm long . . . . . **12b. P. leptospermoides** subsp. **leptospermoides**

widely spreading, 1.6–2.5 mm long, apex acute, inner surface glabrous, outer surface densely hairy. Staminal filaments *c.* 0.05 mm long; anthers 1.8–2.2 mm long, dehiscence introrse. Style not or scarcely exserted. Seeds 2.6–3.2 mm long, black, surface smooth or with faint lines.

12a. Pimelea leptospermoides subsp. **bowmanii** (Benth.) A.R.Bean **comb. et stat. nov.;** *Pimelea bowmanii* Benth., *Fl. Austral.* 6: 30 (1873), as 'bowmanni'. **Type:** Queensland. Port Curtis District: Broadsound, *s.dat., E.M. Bowman s.n.* (lecto [here designated]: K 000900014; isolecto: MEL 50537).

Young stems with longest hairs 0.8–0.9 mm long, antrorse to spreading. Lamina 8.5–18 mm long, 4–6 mm wide, 2.2–3.8 times longer than wide. Upper surface of lamina with hairs moderately dense to dense, hairs 0.5–0.7 mm long. Lower surface of lamina with hairs antrorse to patent, slender, longest hairs 0.8–0.9 mm long. Floral tube outer surface with hairs dense, longer ones *c*. 0.5 mm long.

***Additional specimens examined*: Queensland**. Port Curtis District: S of Atkinson Road, 1.8 km across open field near pylon line, *c*. 40 km SE of Marlborough, Apr 2008, *Reeves 3431 & Batianoff* (BRI, E, HO, MEL); Atkinson Road, *c*. 30 km W of Bruce Highway, W of Glen Geddes, Apr 2008, *Reeves 3450 & Batianoff* (BRI, E); S of Atkinson Road, 0.8 km across open field near pylon line, *c*. 30 km SE of Marlborough, Apr 2008, *Reeves 3427 & Batianoff* (BRI, E, MEL); Atkinsons Road, Canoona, 25 km from Bruce Hwy, Mar 1994, *Bean 7527 & Forster* (BRI); Broadsound, *s.dat*., *Bowman 50* (BRI, MEL).

***Distribution and habitat*:** *Pimelea leptospermoides* subsp. *bowmanii* is endemic to Queensland and is apparently confined to the Atkinson Road area west of Canoona, about 65 km north-west of Rockhampton (**Map 7**). It is restricted to shallow soils derived from serpentinite rocks, and occurs as an understorey plant in shrubby eucalypt woodland.

***Phenology*:** Flowers and fruits have been recorded in March and April.

***Affinities*:** *Pimelea leptospermoides* subsp. *bowmanii* differs from the typical subspecies by the indumentum pattern. The hairs are longer on all plant parts, antrorse to spreading on the stems and leaves (usually appressed in subsp. *leptospermoides*), and moderately dense to dense on the upper leaf surface (very sparse, sparse or glabrous for subsp. *leptospermoides*).

***Conservation status*:** *Pimelea leptospermoides* subsp. *bowmanii* is known from three subpopulations with an estimated area of occupancy of less than 1 km^2. The subpopulations are threatened by road widening, land clearing and grazing. Applying the Red List criteria (IUCN 2012), a conservation status of **Endangered** is recommended (B1ab(ii,iii)+2ab(ii,iii)).

12b. *Pimelea leptospermoides* subsp. *leptospermoides*

***Illustration*:** Melzer & Plumb (2007: 345).

Young stems with longest hairs 0.25–0.5 mm long, appressed to antrorse. Lamina 8–26 mm long, 2.6–7 mm wide, 2.2–5.3 times longer than wide. Upper surface of lamina glabrous, or very sparsely to sparsely hairy, hairs 0.2–0.4 mm long. Lower surface of lamina with hairs appressed, longest hairs 0.25–0.6 mm long. Floral tube hairs dense, appressed, longer ones 0.2–0.3 mm long.

***Additional selected specimens examined*: Queensland.** Port Curtis District: Marlborough, Oct 1937, *White 12114* (BRI); 8.5 km W of Marlborough, along Old Bruce Highway, Jun 2009, *Bean 28991* (BRI, CANB); 1 mile [1.7 km] N of Marlborough homestead, Jun 1963, *Lazarides 6879* (BRI, CANB); *c*. 12 km N of Marlborough on inland road to Sarina, Jun 1997, *Plumb JP45* (BRI); Mt Slopeaway, near Marlborough, Aug 1963, *Specht 1748* (BRI); Lot 11, Princhester Parish, about 10km SE of Marlborough, Jun 1995, *Sinclair GS95033* (BRI); Marlborough Creek, 25 km SW of Marlborough, Magpie mining lease, Nov 1997, *McCabe & Rayner 38* (BRI); Balmoral, vegetation monitoring site, *c*. 6 km N of Glen Geddes, Jun 1983, *Anderson 3402* (BRI); Marlborough Creek near Frasers Working Mine, 13 km south of Marlborough Station, May 1991, *Batianoff MC9105002 & Franks* (AD, BRI, CANB, CNS, MEL, NSW); Eden Bann, SE of Marlborough, May 1993, *Batianoff & Guymer s.n.* (AD, BRI [AQ796134], CANB, MEL, MO, NSW, NY); Site 11, Ramilles block, Marlborough, Dec 1998, *Batianoff 9812186 et al.* (BRI, CANB, MEL, NSW); Glen Geddes, 2–3 km from Bruce Highway, Apr 2008, *Reeves 3469 & Batianoff* (BRI, DNA, E, NSW); Glen Geddes, 8.3 km from Coorumburra SF turnoff, Oct 1991, *Batianoff 911010 & Robins* (AD, BRI, CANB, DNA, K, L, MEL, NSW); 1 km W of Glen Geddes Rail siding, May 1992, *Forster PIF9899* (BRI, CANB, K, MEL, NSW); Just west of Canoona, *c*. 45 km NW of Rockhampton, on the road to Mona Vale, Nov 1990, *Henderson H3493 & Robins* (BRI, MEL); Mt Wheeler, 12 km SW of Yeppoon, Oct 1991, *Batianoff 911022* (AD, BRI, DNA, MEL, NSW); Base of Mt Wheeler, 15 km E of Rockhampton, Aug 1981, *Shanahan 3* (BRI).

***Distribution and habitat*:** *Pimelea leptospermoides* subsp. *leptospermoides* is endemic to sub-coastal central Queensland, between Canoona and Marlborough (**Map 7**). It is restricted to shallow soils derived from serpentinite rocks, and occurs as an understorey plant in shrubby eucalypt woodland.

***Phenology*:** Flowers and fruits may be found at any time of the year.

***Typification*:** When citing the type of *Pimelea leptospermoides*, Threlfall (1983) stated "*Lectotypus:* Cawarra, *Thozet*, Herb. F. Mueller (K)." However, there are two sheets at Kew with these details. A second-stage lectotypification is made here.

***Conservation status*:** *Pimelea leptospermoides* subsp. *leptospermoides* is known from about 22 subpopulations with an estimated area of occupancy of 30 km^2. Most subpopulations are not threatened by land clearing or grazing. However, there is a significant threat from mining, as valuable minerals are extracted from the serpentinite rock upon which the subspecies grows. It is considered that this subspecies does not meet the Red List criteria for Vulnerable (IUCN 2012), but it may do in the near future, and a conservation status of **Near Threatened** is recommended.

13. Pimelea leptostachya Benth., *Fl. Austral*. 6: 24 (1873). **Type:** Queensland. Port Curtis District: Herbert's Creek, near Rockhampton, in 1871, *E.M. Bowman s.n.* (lecto [here designated]: MEL 57894; isolecto: K 000844980, MEL 57891, MEL 57893, MEL 58299).

Perennial shrub, 20–40 cm high, gynomonoecious. Young stems densely hairy, longest hairs 0.7–1 mm long, coarse, shiny and transparent, appressed. Leaves alternate (except at base of plant), internodes 1–16 mm long; petioles 0.7–1.1 mm long. Lamina narrowly-elliptic, 11–30 mm long, 3–5.5 mm wide, 3.7–6 times longer than wide, with only midrib visible, apex acute, margins flat. Upper surface of lamina glabrous. Lower surface of lamina hairy; hairs appressed, coarse, shining, transparent, longest hairs 0.6–1.2 mm long, *c.* 0.05 mm wide, very sparse. Inflorescence terminal, spicate, with 13–23 flowers produced (= number of persistent pedicels), leafy bracts absent. Rachis linear, at maturity 25–45(–80) mm long, sparsely hairy; peduncle length 2–11 mm long. Flowers bisexual or female. Pedicels 2–3 per cm of rachis, each 0.9–2 mm long. Floral tube 3.9–5 mm long at anthesis, maroon or yellow; outer surface with hairs sparse, antrorse, 0.4–0.6 mm long; inner surface glabrous. Sepals erect, 0.8–1.2 mm long, apex obtuse, inner surface glabrous, outer surface sparsely hairy. Staminal filaments *c.* 0.05 mm long; anthers 0.8–0.9 mm long, dehiscence introrse. Style not or scarcely exserted. Fruit orientation ascending. Seed ovoid, 3.6–3.7 mm long, black, surface colliculate. **Fig. 7C.**

***Additional specimens examined*:** **Queensland**. Leichhardt District: Bundoora SF, *c.* 40 km NE of Capella, May 2009, *Bean 28760* (BM, BRI, NSW, NY); Bundoora SF, *c.* 40 km NE of Capella, May 2009, *Bean 28758* (B, BRI, MEL, PRE); Bundoora SF, *c.* 40 km NE of Capella, May 2009, *Bean 28768* (BRI); Dalmally Road, S of Springsure, Oct 1998, *Bean 14056* (BRI, MEL); Injune – Rolleston Road, 86 km N of Injune, Mar 1994, *Hohnen 51* (BRI); Injune – Rolleston Road, 86 km N of Injune, Mar 1994, *Halford Q2162* (BRI, L, MEL); 56 km NW of Injune, Jun 2011, *Paterson s.n.* (BRI [AQ796629]); 4–5 km NE of Injune, Dec 2011, *Schell s.n.* (BRI [AQ798495]); Injune – Taroom Road, *c.* 54 km E of Injune, Apr 2010, *Eddie CPE1932* (BRI).

***Distribution and habitat*:** *Pimelea leptostachya* is endemic to Queensland, from Capella in the north to Injune in the south, and from Springsure to Rockhampton (**Map 6**). It inhabits sandy soils on hillsides, often adjacent to sandstone cliffs or outcrops.

***Phenology*:** Flowers and fruits are recorded from March to June and from October to December.

***Typification*:** Bentham cited specimens from Rockhampton (now at K) and Herbert's Creek (now at MEL), so he evidently saw all of Bowman's collections of it. I believe that all of Bowman's collections were from Herbert's Creek and that Mueller truncated the locality when writing the label of the specimen now at K. This latter specimen has roots and is a very good match for the lectotype and similarly is a plant that has been pulled up by the roots.

The year written by Mueller on the label of the lectotype appears to read '1878', but Bowman died in 1872. One of the isolectotypes has the year '1871' on its label. This is probably correct, as Bowman made many other collections from Herbert's Creek in 1871.

***Affinities*:** *Pimelea leptostachya* is closely allied to *P. sericostachya*, but the former differs by the 13–23 flowers per inflorescence (33–95 flowers for *P. sericostachya*); the

anthers 0.8–0.9 mm long (1.1–1.3 mm long for *P. sericostachya*); the sepals 0.8–1.2 mm long (1.5–2.1 mm long for *P. sericostachya*); and the hairs on the outside of the floral tube 0.4–0.6 mm long (1–1.4 mm long for *P. sericostachya*).

***Notes*:** A specimen from near Springsure (*Bean 14056*) has longer rachises (60–80 mm) than all other collections of *P. leptostachya*, but otherwise appears to conform to it.

***Conservation status*:** *Pimelea leptostachya* is known from six subpopulations with an estimated area of occupancy of 5 km^2. Most subpopulations are either in conservation reserves or are remote from disturbances such as roads or grazing, and there are no current perceived threats. Therefore a conservation status of **Least Concern** is recommended.

14. Pimelea mollis A.R.Bean **sp. nov.** with affinity to *P. latifolia*, but differing by the longer hairs on the stems and the floral tube, the very dense hairs on the floral tube, the consistently hairy upper leaf surface, the shorter sepals and the shorter seeds. **Typus:** Queensland. Port Curtis District: Callide Range, NNE of Biloela, 10 May 2009, *A.R. Bean 28756* (holo: BRI; iso: CANB, MEL, NSW).

Perennial shrub, 50–100 cm high, gynomonoecious. Young stems sparsely to densely hairy, longest hairs 1.8–2.6 mm long, slender, somewhat shiny and transparent, antrorse to spreading. Leaves opposite to sub-opposite, disjunction between leaf pairs 0–5(–7) mm, internodes 10–27 mm long; petioles 1.5–2.2 mm long. Lamina elliptic, 32–49 mm long, 11–17 mm wide, 2.4–3.5 times longer than wide, midrib visible, a few lateral veins sometimes visible; apex acute, obtuse or mucronate; margins flat. Upper surface of lamina consistently hairy; hairs slender, longest ones 1.1–1.7 mm long, *c.* 0.025 mm wide, antrorse; sparse. Lower surface of lamina hairy; hairs appressed to antrorse, slender, somewhat shiny, transparent, longest hairs 1.1–1.7 mm long, *c.* 0.025 mm wide, sparse to moderately dense. Inflorescence axillary, capitulate, with 24–45 flowers produced (= number of persistent pedicels), leafy bracts absent. Rachis ellipsoidal, at maturity 4–11 mm long, very densely hairy; peduncle length 4–16 mm long. Flowers a mixture of bisexual and female. Pedicels 0.7–1.1 mm long. Floral tube 5.5–7.2 mm long at anthesis, white; outer surface with dense, antrorse to patent hairs, longer ones 0.7–1.9 mm long; inner surface glabrous. Sepals at 45° or spreading, 1.3–1.7 mm long, apex obtuse, inner surface glabrous, outer surface densely hairy. Staminal filaments 0–0.1 mm long; anthers 1–1.25 mm long, dehiscence introrse. Style not or scarcely exserted. Seed ovoid, 3.4–3.7 mm long, black, surface ± smooth. **Fig. 8.**

***Additional specimens examined*:** **Queensland**. Leichhardt District: Rockland Spring, *c.* 22 miles [35 km] S of Bluff, Aug 1964, *Gittins 907* (BRI, CANB, NSW); Nugga Nugga Holding, 65 km SW of Bauhinia, Aug 2010, *Eddie CPE1606 & Harris* (BRI); Sunnyholt Holding, Arcadia Valley, *c.* 70 km NNE of Injune, Oct 2008, *Eddie CPE2124* (BRI); Lonesome Holding, at southern end of the Battleship just below summit, NE of Injune, Apr 2004, *Eddie Lot6 et al.* (BRI); Lonesome Holding, *c.* 51 km NE of Injune, Oct 2011, *Eddie CPE1997* (BRI); Kentucky, *c.* 45 km NE of Injune, May 2010, *Eddie CPE1587 & Harris* (BRI); 25.1 km ENE of Taroom, eastern slopes of Mt Glebe, Beaumont Station, Nov 1996, *Halford Q3107 & Dowling* (AD, BRI). Port Curtis District: TR170, Callide Range, NNE of Biloela, Apr 2003, *Bean 20201* (BRI, MEL); Greycliffe, Biloela, Sep 1992, *Noble s.n.* (BRI [AQ517498]); Davis Road, Biloela, Oct 1992, *Noble 2* (BRI); Blackman's Creek, 19 km SW of Miriam Vale, Dec 1990, *Brushe TOI203* (BRI). Burnett District: Fontainea Scrub, SF172, Gurgeena Plateau, Mar 1994, *Forster PIF15062* (BRI, CNS, MEL); Mondure SF, S of Hivesville, Apr 2015, *Forster PIF42239 & Thomas* (BRI); Meandu mine, near Nanango, site SW6BT1, Oct 2015, *Neldner 5715* (BRI); Tarong mine site, 18 km SW of Nanango, Jan 1997, *Bellairs 128* (BRI).

***Distribution and habitat*:** *Pimelea mollis* is endemic to southern Queensland, mainly away from the coast, as far south as Injune and Nanango, and north to Biloela and Dingo (**Map 5**). It most often inhabits semi-evergreen vinethicket and adjacent open eucalypt forest on plateaux with red lateritised basalt, but sometimes occurs in forest dominated by *Acacia rhodoxylon* Maiden.

***Phenology*:** Flowers and fruits have been recorded in March-April and also August-November.

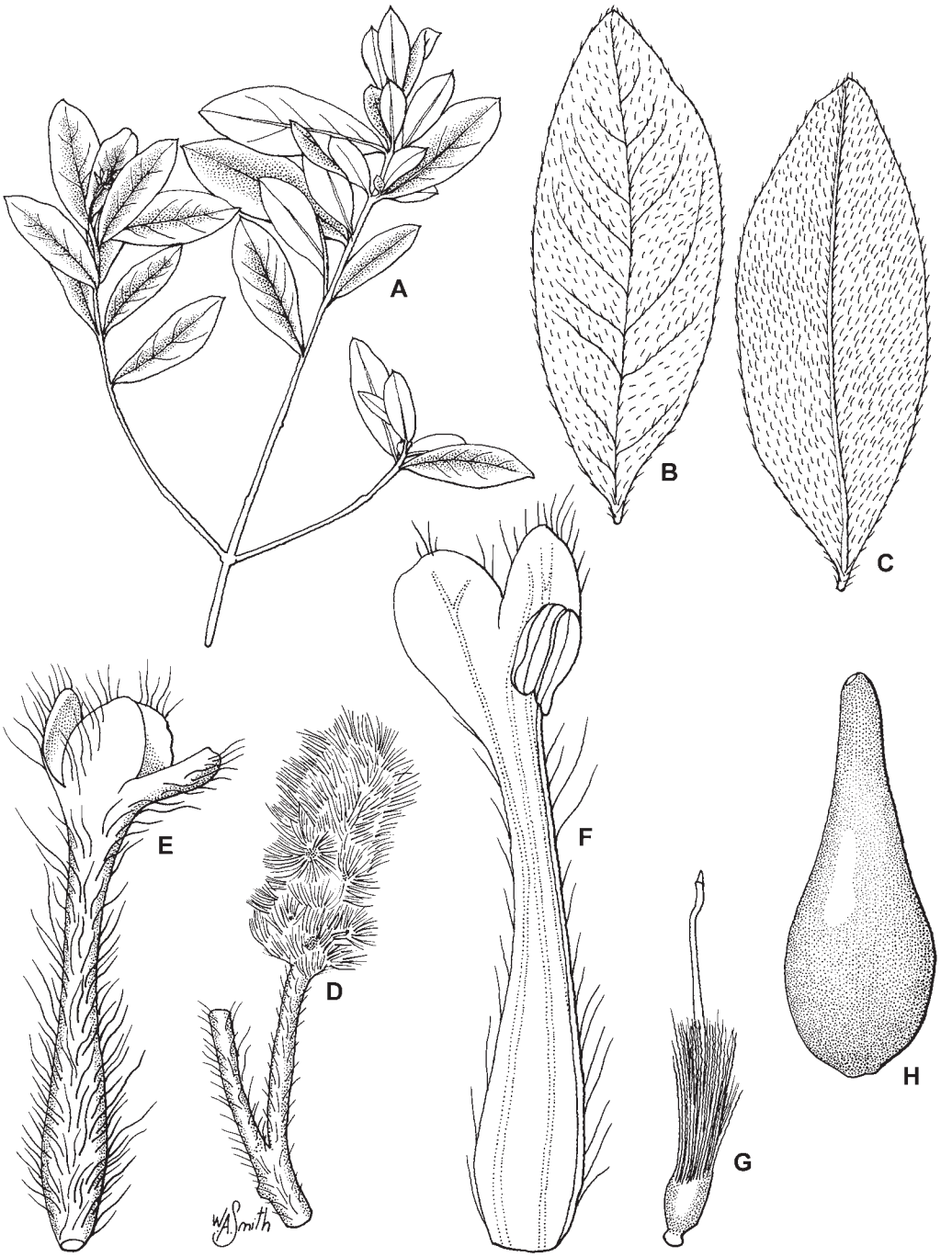

Fig. 8. ***Pimelea mollis***. A. flowering branchlet ×0.6. B. upper leaf surface ×2. C. lower leaf surface ×2. D. old inflorescence, where all flowers and fruits have abscised, and peduncle ×4. E. floral tube and sepals ×10. F. half flower ×12. G. ovary and style ×12. H. seed ×16. A–C from *Eddie CPE1606 & Harris* (BRI); D from *Noble s.n.* (BRI [AQ517498]); E–H from *Forster PIF42239 & Thomas* (BRI). Del. W. Smith.

***Affinities*:** *Pimelea mollis* is allied to *P. latifolia*, but differs by the longest stem hairs 1.8–2.6 mm long (0.6–1 mm long in *P. latifolia*), the elliptical leaves (obovate in *P. latifolia*); the consistently hairy upper leaf surface with hairs 1.1–1.7 mm long (upper surface often glabrous, hairs when present 0.4–0.6 mm long for *P. latifolia*); the peduncles (4–)6–16 mm long (2–6 mm long for *P. latifolia*); the very dense hairs 0.7–1.9 mm long on the outer surface of the floral tube (sparse to moderately dense hairs 0.2–0.5 mm long for *P. latifolia*); the sepals 1.3–1.7 mm long (1.6–2.3 mm long for *P. latifolia*), and the seeds 3.4–3.7 mm long (4.6–4.8 mm long for *P. latifolia*).

Pimelea mollis can also be confused with *P. strigosa*, but *P. mollis* differs by the leaves 11–17 mm wide (4.8–9.5 mm wide for *P. strigosa*), the hairs on the upper leaf surface 1.1–1.7 mm long (0.3–0.7 mm long for *P. strigosa*), the rachis 4–11 mm long (2–3 mm for *P. strigosa*), the 24–45 flowers per inflorescence (18–23 for *P. strigosa*), and the anthers 1–1.25 mm long (0.7–0.8 mm long for *P. strigosa*).

***Conservation status*:** *Pimelea mollis* is known from 13 subpopulations with an estimated area of occupancy of 5 km^2. There is some threat from road widening, vegetation clearing or weed encroachment, particularly *Lantana camara* L. It is considered that this species does not meet the Red List criteria for Vulnerable (IUCN 2012), but it may do in the near future, and a conservation status of **Near Threatened** is recommended.

***Etymology*:** The epithet is from the Latin *mollis* meaning soft. This is given for the soft hairs present on the stems and leaves.

15. Pimelea plurinervia A.R.Bean **sp. nov.** with affinity to *P. latifolia*, but differing by the numerous conspicuous lateral veins of the leaves, the shorter rachis and peduncles, the fewer flowers, and the hairy inner surface of the floral tube. **Typus:** Queensland. North Kennedy District: Bishops Peak, Hinchinbrook Channel National Park, N of Ingham, 31 May 1991, *A.R. Bean 3252* (holo: BRI; iso: CANB, *distribuendi*).

Perennial shrub, 50–200 cm high, gynomonoecious. Young stems densely hairy, longest hairs 0.6–1.2 mm long, slender, white and opaque or somewhat shiny and transparent, appressed, antrorse or spreading. Leaves alternate, internodes 2–13 mm long; petioles 1.5–2.8 mm long. Lamina oblanceolate, obovate or elliptic, 21–58 mm long, 6.5–14 mm wide, 2.4–5.1 times longer than wide, midrib and 10–14 pairs of lateral veins readily visible below; apex obtuse or acute, mucronate; margins recurved. Upper surface of lamina glabrous or hairy; hairs slender, longest ones 0.3–0.6 mm long, *c*. 0.025 mm wide, appressed, antrorse or patent; very sparse to sparse. Lower surface of lamina hairy; hairs appressed or antrorse, slender, somewhat shiny, transparent, longest hairs 0.35–1 mm long, *c*. 0.025 mm wide, sparse. Inflorescence terminal, capitulate, with 8–18 flowers produced (= number of persistent pedicels), leafy bracts absent. Rachis ellipsoidal or globular, at maturity 2–4 mm long, very densely hairy; peduncle length 0–1.5 mm long. Some flowers bisexual, some female. Pedicels 0.8–1.3 mm long. Floral tube 4.5–8.8 mm long at anthesis, white; outer surface with hairs moderately dense, antrorse to appressed, longer ones 0.35–0.6 mm long; inner surface sparsely hairy. Sepals widely spreading, 1.6–3.7 mm long, apex acute or obtuse, inner surface glabrous, outer surface sparsely hairy. Staminal filaments *c*. 0.05 mm long; anthers 1.8–2.8 mm long, dehiscence introrse. Style not or scarcely exserted. Seed ovoid, 3–4.1 mm long, black, surface foveolate or smooth. **Figs. 7D, 9.**

***Additional specimens examined*: Queensland.** North Kennedy District: Tully Falls Weir, Jun 1995, *Forster PIF16754* (BRI, MEL); Koombooloomba Weir Road, E of Tully Falls Road, S of Ravenshoe, Jan 2016, *McDonald KRM17658 & Jensen* (BRI); Tully Falls, Feb 1996, *Gray 6609* (BRI, CNS); NP 279, Tully Gorge, Dec 1995, *Gray 6475* (BRI, CNS); SFR756, Park LA, Tully Weir Road, Aug 1998, *Ford 2093* (BRI, CNS); 32 km S of Cardwell, Bishops Peak, Nov 1991, *Halford Q705* (BRI); Headland S of Sunken Reef Bay, Hinchinbrook Island, Sep 1994, *Cumming 13363* (BRI); 24 km S of Cardwell, *c*. 80 m W of Bruce Hwy at Waterfall Creek, May 1976, *Thorsborne & Thorsborne 213* (BRI); Hinchinbrook Island, *c*. 2.5 km NW of Mt Diamantina, Dec 2000, *Anderson TH2598* (BRI); NE slopes of Mt Diamantina, Hinchinbrook Island, Aug 1951, *Blake 18866* (BRI); Cardwell Range, E slopes of Bishop Peak, *c*. 0.5 km E of summit, Aug 1996,

Fig. 9. ***Pimelea plurinervia***. A. flowering branchlet ×1. B. upper leaf surface ×2. C. lower leaf surface ×2. D. old inflorescence, where most flowers and fruits have abscised, and peduncle ×4. E. floral tube and sepals ×6. F. half flower ×8. G. ovary and style ×8. H. seed ×16. A–C from *Anderson TH2598* (BRI); D–H from *Forster PIF16754* (BRI). Del. W. Smith.

Telford 12157 & Donaldson (BRI, CANB); Hinchinbrook Island, ridge 1 km N of Mt Bowen, Aug 1975, *Hockings s.n.* (BRI [AQ250232]); Hinchinbrook Island, *c.* 2 km WSW of Mt Bowen, Dec 2000, *Kemp TH2906* (BRI); Hinchinbrook Island, upper south Zoe Creek, Sep 1994, *Hohnen s.n.* (BRI [AQ650755]); Cardwell Range, Apr 1947, *Flecker 10908* (NSW).

***Distribution and habitat*:** *Pimelea plurinervia* is endemic to north-east Queensland where it is known from Hinchinbrook Island, Bishop's Peak (mainland opposite Hinchinbrook Island), and in the Tully Falls area south of Ravenshoe (**Map 3**). It inhabits wet sclerophyll forest with rainforest elements, rainforest margins, and rocky mountains with *Allocasuarina littoralis* (Salisb.) L.A.S.Johnson, *Banksia plagiocarpa* A.S.George or *Kunzea graniticola* Byrnes. In all cases, the geology is granite, and the soil is shallow or skeletal.

***Phenology*:** Flowers and fruits are recorded from August to February, and also in May and June.

***Affinities*:** *Pimelea plurinervia* is allied to *P. latifolia*, but differs by the leaves having numerous conspicuous lateral veins (lateral veins either not visible, or a few faintly visible for *P. latifolia*), the rachises 2–4 mm long (5–27 mm long for *P. latifolia*), the 8–18 flowers per inflorescence (24–120 flowers for *P. latifolia*), the peduncles 0–1.5 mm long (2–6 mm long for *P. latifolia*), and the inner surface of the floral tube sparsely hairy (glabrous for *P. latifolia*).

***Note*:** Female flowers in this species have shorter floral tubes and sepals than the bisexual flowers occurring in the same inflorescence.

***Conservation status*:** *Pimelea plurinervia* is known from six subpopulations with an estimated area of occupancy of 15 km^2. Most subpopulations are within conservation reserves, and no specific threats have been identified. Therefore a conservation status of **Least Concern** is recommended.

***Etymology*:** From the Latin *pluri* meaning 'many' and *nervis* meaning 'nerves' or 'veins'. This refers to the leaves of this species having numerous conspicuous lateral veins.

16. Pimelea rupestris A.R.Bean **sp. nov.**, distinguished by its dioecious habit, the persistent floral tube that is conspicuously hairy on the inner surface, the ellipsoid rachis and very short peduncles. **Typus:** Queensland. Wide Bay District: Western slope of Widgee Mountain, *c.* 30 km W of Gympie, 7 February 2009, *A.R. Bean 28492* (holo: BRI; iso: CANB, MEL, NSW, *distribuendi*).

Perennial shrub, 50–100 cm high, dioecious. Young stems moderately to very densely hairy, longest hairs 0.2–0.3 mm long (Qld) or 0.6–0.7 mm long (NSW), slender, white and opaque, appressed. Leaves alternate, internodes 2–6(–9) mm long; petioles 1.3–2.3 mm long. Lamina obovate to elliptical, 10–29 mm long, 4.5–9 mm wide, 2.2–4 times longer than wide, midrib visible, lateral veins usually visible; apex acute or obtuse, mucronate; margins recurved. Upper surface of lamina usually glabrous but sometimes hairs present along midrib; hairs slender, longest ones 0.15–0.25 mm long, *c.* 0.025 mm wide, appressed. Lower surface of lamina sparsely hairy; hairs appressed, slender, somewhat shiny, transparent, longest hairs 0.2–0.3 mm long, *c.* 0.025 mm wide. Inflorescence axillary, capitulate, with 40–80 flowers produced (= number of persistent pedicels). Rachis ellipsoidal, at maturity 2–4 mm long, densely hairy; peduncle length 0–1.5 mm long. Flowers either all female or all male on any given plant. Pedicels 0.2–0.3 mm long. Floral tube 3–4.4 mm long at anthesis, white, persistent, not circumscissile; outer surface with hairs dense to very dense, appressed, longer ones 0.25–0.3 mm long (Qld) or *c.* 0.5 mm long (NSW); inner surface conspicuously hairy. Sepals erect to spreading, 1.5–2.2 mm long, apex acute, inner surface sparsely hairy, outer surface densely hairy. Staminal filaments 0.2–0.5 mm long; anthers 1–1.2 mm long, dehiscence introrse. Style exserted in female flowers, *c.* 3.5 mm long. Seed ovoid, 2.5–2.7 mm long, black, surface smooth. **Figs. 7E–F, 10.**

***Additional specimens examined*: Queensland**. Wide Bay District: Western slope of Widgee Mt, *c.* 30 km W of Gympie, Feb 2009, *Bean 28488* (BRI); *ibid.*, Feb 2009, *Bean 28489* (BRI, CANB, NSW); Mt Widgee, Mar 2000, *Forster PIF25317 & Booth* (AD, BRI, MEL,

Fig. 10. ***Pimelea rupestris***. A. flowering branchlet ×2. B. upper leaf surface ×4. C. lower leaf surface ×4. D. old inflorescence, where all flowers and fruits have abscised ×6. E. floral tube and sepals ×12. F. half flower ×14. G. seed ×24. A–F from *Bean 28489* (BRI); G from *Bean 17340* (BRI). Del. W. Smith.

NSW); Mt Widgee, summit area, south-western slopes, Sep 1996, *Leiper s.n.* (BRI [AQ650112]). **New South Wales.** North Coast: 4.3 km along Carnham Road, Fine Flower, NW of Grafton, Feb 2001, *Bean 17340* (BRI, NSW); Carnham Road, Fine Flower, NW of Grafton, Sep 2001, *Bean 17950* (BRI, MEL, NSW); Wave Hill Station, Jan 2003, *Specht s.n.* (NSW 619948).

***Distribution and habitat*:** *Pimelea rupestris* is known from just three locations; Mt Widgee in south-east Queensland, and Fine Flower and Wave Hill station in north-east New South Wales (**Map 4**). It is confined to serpentinite outcrops in hilly or mountainous terrain, with shallow or skeletal soil.

***Phenology*:** Flowers and fruits are recorded for January, February, March and September.

***Affinities*:** *Pimelea rupestris* is not obviously related to any other species. The dioecious habit, the floral tube that lacks circumscissile dehiscence, and the conspicuous hairs on the inner surface of the floral tube are diagnostic. It is perhaps reminiscent of *P. altior*, but differs from that species by the dioecious habit, the alternate leaves, the many more flowers per inflorescence and the acute sepals.

***Notes*:** The populations from New South Wales differ in minor ways from those at the type locality; the stem indumentum is not as dense, with longer individual hairs, and the hairs on the floral tube are longer.

***Conservation status*:** Nothing is known about the Wave Hill subpopulation of *Pimelea rupestris*. Fewer than 20 plants are known at Fine Flower in the Gordonbrook Serpentinite Belt, but that formation is about 25 km long (Holland 2017), so it is likely that further subpopulations could be located. At Mt Widgee, the subpopulation is estimated at 100–200 plants, occupying about 10 hectares. Using the Red List criteria (IUCN 2012), a conservation status of **Endangered** is recommended (criterion D).

***Etymology*:** From the Latin *rupestris*, 'of rocks, living in rocky places'. This refers to the habitat of the species.

17. Pimelea sericostachya F.Muell., *Fragm.* 4: 162 (1864); *Pimelea sericostachya* var. *sericostachya*, Benth., *Fl. Austral.* 6: 24 (1873); *Banksia sericostachya* (F.Muell.) Kuntze, *Revis. Gen. Pl.* 2: 583 (1891); *Pimelea sericostachya* subsp. *sericostachya*, Threlfall, *Brunonia* 5: 149 (1983). **Type:** Queensland. South Kennedy District: Sellham [Sellheim] River, [1864], *E.M. Bowman 100* (lecto: MEL 58313, *fide* Threlfall (1983: 148); isolecto: MEL 58314, MEL 58315).

Pimelea sp. (Hughenden D.A.Halford Q242); Pollock (2010), Bean (2016).

Perennial shrub, 50–100 cm high, gynomonoecious. Young stems densely hairy, longest hairs 0.5–1.4 mm long, coarse, shiny and transparent, appressed. Leaves alternate, internodes 4–28 mm long; petioles 0.7–1.5 mm long. Lamina oblanceolate, or narrowly-elliptic, 14–32 mm long, 3–9 mm wide, 3.6–7.6 times longer than wide, with only midrib visible, apex acute, margins flat. Upper surface of lamina glabrous or hairy; hairs slender, longest ones 0.4–0.8 mm long, *c.* 0.025 mm wide, antrorse or appressed; very sparse, sparse, or moderately dense. Lower surface of lamina hairy; hairs appressed, coarse, shining, transparent, longest hairs 1–1.7 mm long, *c.* 0.05 mm wide, sparse to moderately dense. Inflorescence terminal, spicate, with 33–95 flowers produced (= number of persistent pedicels), leafy bracts absent. Rachis linear, at maturity 30–250 mm long, moderately hairy; peduncle length 10–24 mm long. Flowers bisexual or female. Pedicels 4–6(–8) per cm of rachis, each 0.3–0.8 mm long. Floral tube 5.5–6.4 mm long at anthesis, yellow-green or yellow; outer surface with hairs sparse, moderately dense, or dense, antrorse, 1–1.4 mm long; inner surface glabrous. Sepals spreading at *c.* 45°, 1.5–2.1 mm long, apex obtuse, inner surface glabrous, outer surface sparsely hairy. Staminal filaments 0.05–0.1 mm long; anthers 1.1–1.3 mm long, dehiscence introrse. Style not or scarcely exserted. Fruit orientation at right angles to rachis. Seed ovoid, 3.5–4 mm long, dark brown, surface colliculate.

***Additional selected specimens examined*: Queensland.** Cook District: Morgans Folly, Blackdown Station, May 1999, *Forster PIF24357 & Booth* (BRI, CNS); Blackbraes NP, 13 km NNW of Blackbraes old homestead, 185 km N of Hughenden, Jun 2013, *Leitch QDA002403* (BRI); Pannikin Springs area, Jan 1993, *Bean 5613 & Forster* (BRI); Blackdown Station Road, 37 km from

Rookwood, Jun 1996, *Gray 6769* (BRI); Donkey Spring Creek, Bulleringa NP, 80 km NW of Mt Surprise, Apr 1998, *Forster PIF22507 & Booth* (BRI, DNA, MEL); 51 km along Almaden road, from junction with Gulf development road near Mt Surprise, May 2004, *McDonald KRM2598* (BRI). Burke District: 68 km N of Hughenden, May 1990, *Halford Q242* (BRI, PERTH). North Kennedy District: Taravale, *c.* 1.5 km before the homestead, May 2009, *Jensen 1755* (BRI); 19 km W of Paluma towards Hidden Valley, Aug 1993, *Cumming 12555* (BRI); *c.* 7.5 km NW of Hidden Valley township, along powerline road, Apr 2001, *Pollock ABP1057 & Turpin* (BRI); Herveys Range Developmental Road, 76 km W of Townsville, Jul 1989, *Jobson 694* (BRI, MEL); Castle Hill, Townsville, Feb 1992, *Bean 4050* (BRI, MEL); 6 km SE of Glencoe homestead on road to Killarney homestead, 101 km W of Charters Towers, Sep 1992, *Thompson HUG40 & Sharpe* (BRI); Near Charters Towers, May 1962, *Gittins 491* (CANB); Ravenswood, Mar 1943, *Blake 14869* (BRI); Charters Towers, *s.dat.*, *Plant s.n.* (BRI [AQ97868]); Fanning River Station, Aug 1989, *Godwin C3699* (BRI); The Bluff, E of Mingela, *c.* 70 km S of Townsville, Sep 1989, *Cumming 9352* (BRI); Top of peak, Bogie Range, Sep 1950, *Smith 4534* (BRI); Eastern slopes of Mt Kelly, *c.* 14 km SW of Ayr, May 2009, *Bean 28834* (BRI); Round Mountain, 3 km W of Ross River Dam, Townsville, Jun 1991, *Bean 3299* (BRI); 34 km N of Pentland, Jul 1975, *Chapman 1343* (BRI, CANB, K, NT, PERTH). South Kennedy District: W escarpment Dicks Tableland, *s.dat.*, *Pearson SP596* (BRI).

***Distribution and habitat*:** *Pimelea sericostachya* is endemic to north-east Queensland with a distribution that extends from Bellevue Station (west of Port Douglas) to the Sellheim River, south-east of Charters Towers, and east to the Dicks Tableland, west of Mackay. It occurs mainly away from the coast, except in the Townsville area (**Map 2**). It inhabits hills and ridges in sandy or sandy-loam soil, derived from sandstone or granite.

***Phenology*:** Flowers and fruits may be found at any time of the year.

***Typification*:** Under Article 9.9 (McNeill *et al.* 2012), Threlfall's use of the term "holotype" is correctable to "lectotype".

***Affinities*:** *Pimelea sericostachya* is most closely related to *P. leptostachya* (see notes under that species).

***Conservation status*:** *Pimelea sericostachya* is a common and widespread species. A conservation status of **Least Concern** is recommended (IUCN 2012).

18. Pimelea simplex F.Muell., *Linnaea* 25: 443 (1853). **Type:** South Australia. Cudnaka [Kanyaka], October 1851, *F. Mueller s.n.* (holo: MEL 58319).

Annual forb, 15–40 cm high, bisexual. Young stems sparsely hairy, hairs slender, somewhat shiny and transparent, appressed to antrorse. Leaves alternate; lamina narrowly-elliptic, with no veins visible or only midrib visible, margins flat. Upper surface of lamina glabrous or hairy; hairs slender, appressed. Lower surface of lamina hairy; hairs appressed, slender, somewhat shiny, transparent, *c.* 0.025 mm wide, sparse. Inflorescence terminal, spicate, leafy bracts absent. Rachis cylindrical, very densely hairy. Flowers bisexual. Floral tube yellow, inner surface glabrous. Sepals erect, apex obtuse, inner surface glabrous, outer surface densely hairy. Anther dehiscence introrse. Style not or scarcely exserted. Seed ovoid, black, surface foveolate.

Two subspecies are recognised and can be distinguished by the following key:

Floral tube hairs 0.6–0.9 mm long; rachis length 3–6 mm. . . . **18b. P. simplex** subsp. **simplex**
Floral tube hairs 1.4–2.8 mm long; rachis length 6–15 mm . . **18a. P. simplex** subsp. **continua**

18a. Pimelea simplex subsp. **continua** (J.M.Black) Threlfall, *Brunonia* 5: 152 (1983); *P. continua* J.M.Black, *Trans. & Proc. Roy. Soc. South Australia* 39: 96 (1915); *P. simplex* var. *continua* (J.M.Black) J.M.Black, *Fl. S. Austral.* 3: 400 (1926). **Type:** South Australia. Ketchowla, NE of Hallett, January 1911, *s. coll.* (holo: MEL 50666).

***Illustrations*:** Rye (1990: 162); Fletcher *et al.* (2009: 14, 15).

Longest stem hairs 0.8–1.1 mm long. Leaves internodes 2–18 mm long; petioles 0.3–0.5 mm long. Lamina 7–23 mm long, 1.7–2.5 mm wide, 4.1–11 times longer than wide, apex

obtuse or acute. Upper surface with longest hairs 0.3–0.5 mm long, *c.* 0.025 mm wide; sparse. Lower surface of lamina with longest hairs 0.5–0.7 mm long. Inflorescence with 35–100 flowers produced (= number of persistent pedicels). Rachis at maturity 6–15 mm long; peduncle length 1–10 mm long. Pedicels 60–120 per cm of rachis, each 0.4–0.7 mm long. Floral tube 3.7–5.3 mm long at anthesis; outer surface with hairs very dense, antrorse to spreading, 1.4–2.8 mm long. Sepals 0.5–0.7 mm long. Staminal filaments 0.3–0.5 mm long; anthers 0.65–0.75 mm long. Seed 2.7–3 mm long.

***Additional selected specimens examined* (from 101 specimens): Queensland.** Gregory North District: *c.* 165 km WSW of Longreach, Aug 1989, *Pedley 5469* (AD, BRI, DNA, MO); Tonkoro Station, 2.4 km from Gun Creek Well at bearing of 337 degrees, Aug 2013, *Pennay CP546 & Richter* (BRI); Winderere, 15 km W of Winton, Aug 2007, *Sanders PP07/186* (BRI); 44 km by road W of Winton on road to Boulia, Sep 2005, *Thomas 2943 & Halford* (BRI). Mitchell District: Mt Victoria, 55 km W of Longreach, Aug 2007, *Faggotter JM1725* (BRI); Noonbah Lake Yards Holding Paddock, 8.5 km W of Noonbah homestead, *c.* 150 km SW of Longreach, Jul 2008, *Milson JM1732* (BRI); Adalonga, 70 km W of Longreach, Aug 2010, *Neldner 4582* (BRI, PE); *c.* 7 km N of Jundah, May 1988, *Nicholson & Novelly 75* (BRI); Mayland, 32 km NE of Muttaburra, *s.dat.*, *Shield s.n.* (BRI [AQ4206]); Tancred, 136 km S of Torrens Creek, Jun 1989, *Bolton MPB992B* (BRI). Gregory South District: WARLUS I, Site 187, 240 km NW of Noccundra, Jul 1971, *Boyland 3087* (BRI); Thylungra, *c.* 75 miles [121 km] NW of Quilpie, Oct 1955, *Everist 5752* (BRI). Warrego District: Clover Downs, 45 km SE of Cunnamulla, Sep 2007, *Silcock PP07/215* (BRI); 33 km NE Charleville, Oct 2008, *Burton PP08/428* (BRI); 40 km E of Cunnamulla on Balonne Highway, Sep 2003, *McKenzie RAM03/187* (BRI); 70 km SSE of Cunnamulla, just N of Thurrulgoona Road, E of house, Oct 2008, *Silcock PP08/250* (BRI). Maranoa District: 120 km SW of Bollon on road to Noorama from Murra Murra road, Oct 2008, *Silcock PP08/251a* (BRI).

***Distribution and habitat*:** *Pimelea simplex* subsp. *continua* occurs in Queensland from Muttaburra and Winton in the north to the New South Wales border south-east of Cunnamulla (**Map 6**). It also occurs in South Australia and far-western NSW. Soils vary from red sandy loams to heavy grey clays. It is often found in treeless areas with *Astrebla* spp., but also may be in communities dominated by *Acacia tephrina* Pedley, *A. cambagei*, *A. aneura* F.Muell. ex Benth. or *Eucalyptus populnea*.

***Phenology*:** Flowers and fruits are recorded from June to January.

***Notes*:** The Queensland specimens of *Pimelea simplex* subsp. *continua* are not a very good match for the type and other South Australian material, as the hairs attached to the floral tube are much longer in Queensland plants. It is possible that there is an unrecognised taxonomic distinction, but more study is required to elucidate the matter.

***Conservation status*:** *Pimelea simplex* subsp. *continua* is a common and widespread subspecies. A conservation status of **Least Concern** is recommended (IUCN 2012).

18b. Pimelea simplex F.Muell. subsp. **simplex**

***Illustrations*:** Fletcher *et al.* (2009: 14, 15); Rye (1990: 162).

Longest stem hairs 0.6–0.9 mm long. Leaves internodes 2–10 mm long; petioles 0.2–0.6 mm long. Lamina 8–16 mm long, 1.7–3.5 mm wide, 3.9–5.3 times longer than wide, apex obtuse. Upper surface with longest hairs 0.3–0.4 mm long, *c.* 0.025 mm wide; very sparse. Lower surface of lamina hairy; hairs appressed, slender, somewhat shiny, transparent, longest hairs 0.5–0.9 mm long. Inflorescence with 25–50 flowers produced (= number of persistent pedicels). Rachis at maturity 3–6 mm long; peduncle length 0–9 mm long. Pedicels 60–80 per cm of rachis, each 0.3–0.5 mm long. Floral tube 2.3–4.7 mm long at anthesis; outer surface with hairs very dense, antrorse, 0.6–0.9 mm long. Sepals 0.4–1.3 mm long. Staminal filaments 0.2–0.3 mm long; anthers 0.5–0.85 mm long. Seed 2.8–3.1 mm long.

***Additional selected specimens examined*: Queensland.** Warrego District: Minoru, 81 km SSE of Cunnamulla on Thurrulgoonia Road, Sep 2007, *Silcock PP07/219* (BRI); Talbarea, 62 km SSE of Cunnamulla, Sep 2007, *Silcock PP07/216* (BRI); 70 km SSE of Cunnamulla, just N of Thurrulgoona Road, E of house, Oct 2008, *Silcock PP07/216* (BRI); Thurulgoona, Cunnamulla, Sep 2003, *McKenzie RAM03/184* (BRI); 25 km from Adavale, Nov 2006, *Berry BB4A* (BRI). Maranoa District: A few km E of River Road on Surat – Glenmorgan Road, N of road, Sep 2007, *Silcock PP07/217* (BRI); Cambridge Downs, River Road, *c.* 10 km E of Surat, Sep 2007, *Silcock PP07/194* (BRI); 11 km N of St George at junction of Moonie and Carnarvon Highways, Sep 2008, *Silcock &*

Mann PP08/244 (BRI); 10 km E of Surat and 700 m N along River Road, Oct 2007, *Silcock P07/263* (BRI); 120 km SW of Bollon on road to Noorama from Murra Murra road, Oct 2008, *Silcock PP08/251b* (BRI); Wilga Park, St George, Balonne Shire, Jul 1989, *Oliver s.n.* (BISH, BRI [AQ456674], MO, NSW); Basin Downs, 38 km S of Surat, Aug 1990, *Newman s.n.* (BRI [AQ473916]); 19 km W of Hebel at junction of Mundah and Woolabilla Roads, Dec 2001, *Halford Q7706 & Batianoff* (BRI); Koomalah, 37 km S of Dirranbandi, Nov 2004, *Fraser s.n.* (BRI [AQ611715]); 10 miles [16 km] S of Surat on St George Road, Aug 1956, *Everist 5820* (BRI); Carnarvon Highway, 45 miles [75 km] NE of St George, near Donga Creek, Sep 1960, *Everist 6236* (BRI); Carnarvon Highway between St George & Surat at junction with Moonie Highway (Dalby turnoff), Willathaw Plain, Sep 2003, *Eddie Lot52* (BRI).

***Distribution and habitat*:** In Queensland *Pimelea simplex* subsp *simplex* is found from Surat to Hebel, and west to Cunnamulla, with an apparently isolated occurrence near Adavale (**Map 5**). It also occurs in western New South Wales and semi-arid South Australia. It grows on reddish-brown or cracking brown to grey clay soils, in communities dominated by *Eucalyptus populnea* or *Acacia cambagei* R.T.Baker, or in *Astrebla* grassland.

***Phenology*:** Flowers and fruits are recorded from July to November.

***Notes*:** *Pimelea simplex* subsp. *simplex* differs from subsp. *continua* mainly in the length of the hairs on the floral tube (0.7–0.9 mm for subsp. *simplex*; 1.4–2.8 mm for subsp. *continua*); there does not appear to be a clear separation in any other character. The distributions of subsp. *simplex* and subsp. *continua* in Queensland are largely separate, but they do overlap in the Thurulgoona area S of Cunnamulla, and SW of Bollon. In these two areas, both subspecies have been collected from the same GPS location, apparently without intergradation or hybridisation.

***Conservation status*:** *Pimelea simplex* subsp. *simplex* is a common and widespread subspecies. A conservation status of **Least Concern** is recommended (IUCN 2012).

19. Pimelea strigosa Gand., *Bull. Soc. Bot. France* 60: 419 (1913). **Type:** New South Wales. Warrumbungle Ranges, October 1899, *Forsyth s.n.* (holo: ?LY, *n.v.*; iso: NSW 120783).

Perennial shrub, 20–60 cm high, gynomonoecious. Young stems sparsely to densely hairy, longest hairs 1.2–1.7 mm long, thick, shiny and transparent, antrorse. Leaves alternate (except near base of plant), internodes 2–23 mm long; petioles 1–2 mm long. Lamina elliptic, 19–43 mm long, 4.8–9.5 mm wide, 2.9–5 times longer than wide, with only the midrib visible, apex acute, margins recurved. Upper surface of lamina with hairs sparse to moderately dense; hairs slender, longest ones 0.3–0.7 mm long, *c.* 0.025 mm wide, appressed to antrorse. Lower surface of lamina hairy; hairs moderately dense, appressed to antrorse, thick, very shiny, transparent, longest hairs 0.8–1.3 mm long, *c.* 0.05 mm wide. Inflorescence terminal or axillary, capitulate, with 18–23 flowers produced (= number of persistent pedicels), leafy bracts absent. Rachis globose, at maturity 2–3 mm long, very densely hairy; peduncle length 10–32 mm long. Some flowers bisexual, some female. Pedicels 0.3–0.5 mm long. Floral tube 4.1–5.2 mm long at anthesis, yellow-green to yellow; outer surface with hairs dense, appressed to antrorse, 0.6–0.9 mm long; inner surface glabrous. Sepals erect, 1.3–1.7 mm long, apex obtuse or acute, inner surface glabrous, outer surface densely hairy. Staminal filaments 0.05–0.1 mm long; anthers 0.7–0.8 mm long, dehiscence introrse. Style not or scarcely exserted. Seed ovoid, *c.* 2.9 mm long, black, surface foveolate.

***Additional selected specimens examined*: Queensland.** Leichhardt District: Kareela, S of Springsure, Aug 1990, *O'Keeffe 931* (BRI); Carnarvon Gorge, May 1962, *Johnson 2397* (BRI); Robinson Gorge NP, upstream section of main gorge in Get Down area, Sep 1992, *Forster PIF11298 & Sharpe* (BRI, MEL); SF46, *c.* 70 km W of Taroom, Sep 2002, *Bean 19313* (BRI, MEL). Maranoa District: East Maranoa River, Mt Moffatt NP, Dec 1997, *Bean 12936* (BRI, MEL). Darling Downs District: Upper Freestone, NE of Warwick, Nov 2003, *Bean 21171* (BRI); Warwick, *s.dat.*, *Beckler s.n.* (MEL 50795); Warwick, Mar 1911, *Boorman s.n.* (BRI [AQ97852]); Connolly Dam, S of Warwick, Oct 1996, *Bean 10865* (BRI, MEL, NSW); Cherribah, *c.* 25 km SSE of Warwick, Oct 2008, *Cooper CSP04* (BRI); Old Stanthorpe Road, between Dalveen and Warwick, Nov 2001, *Halford Q7053* (BRI, HO); Ballandean cattle station, Red Rock Gorge, Jan 1940, *Smith 735* (BRI); Sundown NP, northern end, Feb 2004, *Haselgrove 275* (BRI).

***Distribution and habitat*:** *Pimelea strigosa* occurs in Queensland and New South Wales. In Queensland it is found mainly in the southern Darling Downs district, in the Warwick – Stanthorpe area, but there are some disjunct occurrences between Taroom and Springsure (**Map 5**). It also occurs in northern New South Wales, west of the Great Divide. It inhabits sandy soils derived from granite or sandstone, often in riparian or alluvial situations.

***Phenology*:** Flowers and fruits are recorded for nearly every month of the year.

***Affinities*:** *Pimelea strigosa* can easily be confused with *P. curviflora*, a species of similar appearance. *P. strigosa* is most readily distinguished from the latter by the long (10–32 mm) peduncles, and can also be separated by the mainly alternate leaves, the shorter stem hairs, the hairy upper leaf surface, the shorter hairs on the lower leaf surface, and the shorter anthers.

***Conservation status*:** *Pimelea strigosa* is a common and widespread species. A conservation status of **Least Concern** is recommended (IUCN 2012).

20. Pimelea trichostachya Lindl. in T.L.Mitchell, *J. Exped. Trop. Australia* 355 (1848). *Calyptrostegia trichostachya* (Lindl.) Walp., *Ann. Bot. Syst.* 3: 325 (1852); *Banksia trichostachya* (Lindl.) Kuntze, *Revis. Gen. Pl.* 2: 583 (1891). **Type:** [Queensland] subtropical New Holland [near Camp XXXI], 18 October 1846, *W. Stephenson s.n.* (holo: CGE, *n.v., fide* Threlfall (1983)).

***Illustrations*:** Rye (1990: 162); Moore (2005: 430); Fletcher *et al.* (2009: 14, 15);

Annual forb, 20–60 cm high, bisexual. Young stems sparsely hairy, longest hairs 0.8–1 mm long, slender, somewhat shiny and transparent, appressed to antrorse. Leaves alternate, internodes 3–17 mm long; petioles 0.4–0.8 mm long. Lamina narrowly-elliptic, 4–12 mm long, 0.7–1.3 mm wide, 4–8.8 times longer than wide, with no veins visible, apex obtuse or acute, margins flat. Upper surface of lamina glabrous or rarely hairy; hairs slender, longest ones 0.25–0.45 mm long, *c.* 0.025 mm wide, appressed; very sparse. Lower surface of lamina glabrous or hairy; hairs appressed, slender, somewhat shiny, transparent, longest hairs 0.5–0.8 mm long, *c.* 0.025 mm wide, sparse. Inflorescence terminal, spicate, with 45–85 flowers produced (= number of persistent pedicels), leafy bracts absent. Rachis linear, at maturity 20–120 mm long, moderately densely hairy; peduncle length 2–20 mm long. Flowers bisexual. Pedicels 7–20 per cm of rachis, each 0.7–1 mm long. Floral tube 3.1–4.3 mm long at anthesis, yellow, but obscured by white hairs; outer surface with two layers of hairs; a very dense layer of short patent hairs 0.2–0.3 mm long, and a moderately dense layer of patent hairs, 1.5–2 mm long; inner surface glabrous. Sepals erect, 0.4–0.6 mm long, apex obtuse, inner surface glabrous, outer surface moderately densely hairy. Staminal filaments *c.* 0.5 mm long; anthers 0.45–0.55 mm long, dehiscence introrse. Style not or scarcely exserted. Seed ovoid, 2.4–2.5 mm long, black, surface foveolate.

***Additional selected specimens examined*: Queensland**. Burke District: 43 miles [69 km] NE of Camooweal on road to Thorntonia, Jul 1974, *Ollerenshaw PO1309 & Kratzing* (BRI). South Kennedy District: Glen Innes, NW of Alpha, Jul 2003, *Fensham 4894* (BRI). Gregory North District: *c.* 3 km SW of Green Tank, Diamantina NP, SE of Boulia, SW of Winton, Sep 2005, *Mostert MM306* (BRI). Mitchell District: Erne, *c.* 45 miles [75 km] NNE of Blackall, Jun 1939, *Everist 1812* (BRI); Lancevale, 90 km N of Blackall, Feb 2008, *Burton PP08/165* (BRI); 43 km NE of Aramac, Jul 2008, *House PP08/163* (BRI); 47 km SW of Jericho, near Blendon Station, Sep 2000, *Thompson JER260* (BRI); Narbethong, Yalleroi, Blackall Shire, Aug 1990, *Cottam 1343* (BRI); 12 km E of Jundah, 2 km W of Paradise house, Dec 2008, *Milson JM1737* (BRI). Gregory South District: 20.2 km WSW of Eromanga, on Cooper Developmental Road, Aug 2010, *Bean 30020* (BRI); 122 km W of Birdsville on track to Poeppel Corner, Simpson Desert NP, Sep 1998, *Halford Q3621* (BRI). Warrego District: Mount Maria, [in 1876], *Bailey s.n.* (BRI [AQ86130]); Bulloo Downs, *c.* 110 km SW of Thargomindah, Oct 2000, *Elsworth BDEA12* (BRI); 271.2 km by road W of St George on road to Cunnamulla, Sep 2005, *Thomas 2792* (BRI); Lake Wyara, Currawinya NP, Oct 1991, *Williams 91012* (BRI); 12.5 km S of Charleville, Sep 1987, *Wilson 477* (BRI); Tinderry, Feb 1960, *Johnson 1570* (BRI); Charleville, Jan 1931, *Hubbard 6139* (BRI); 36 miles [60 km] SE of Quilpie on Cowley Station, Feb 1972, *Kelly s.n.* (BRI [AQ1720]). Maranoa District: Spring Hill, 50 km NNW of Roma, Oct 1986, *Newman 3* (BRI); Barlin, NE of Mitchell, Dec 1990, *Schefe B1* (BRI); 25.1 km N

of Womblebank, NW of Injune, Oct 1998, *Bean 14325* (BRI, MEL, NSW); Miltonise, *c.* 30 miles [48 km] W of St George, Mar 1936, *Blake 10801* (BRI); 11 km SE of Gradule, W of Goondiwindi, Sep 2001, *Bean 17837* (BRI). Darling Downs District: 1 km E of Hannaford Road intersection with Tara to Glenmorgan Road, Sep 2007, *Silcock PP07/211* (BRI); Moonie River, *c.* 5 miles [8 km] WSW of Southwood, Sep 1958, *Johnson 588* (BRI); Near E boundary of Bendidee SF, *c.* 40 km NE of Goondiwindi, Dec 2007, *Bean 26993* (BRI).

***Distribution and habitat*:** *Pimelea trichostachya* is a very widespread species in Queensland in areas west of the Great Dividing Range, extending as far east as Milmerran, and north to Aramac, with an outlier north-west of Mount Isa (**Map 1**). It also occurs widely in all other mainland states and territories. It grows in flat or undulating terrain in red or brown sand or sandy-loam. Commonly associated tree species include *Eucalyptus melanophloia* F.Muell., *E. populnea*, *Acacia aneura*, *Angophora melanoxylon* R.T.Baker, *Acacia excelsa* Benth. and *Callitris glaucophylla* Joy Thomps. & L.A.S.Johnson.

***Phenology*:** Flowers and fruits may be found at any time of the year.

***Notes*:** *Pimelea trichostachya* is distinctive by virtue of the narrow leaves, annual habit, long patent hairs on the floral tube, linear rachis and short anthers.

***Conservation status*:** *Pimelea trichostachya* is a common and widespread species. A conservation status of **Least Concern** is recommended (IUCN 2012).

21. Pimelea umbratica Meisn. in DC., *Prodr.* 14: 510 (1857). **Type:** [Queensland]. Base of Great Dividing Chain, W of Moreton Bay, in 1827, *A. Cunningham s.n.* (holo: G-DC).

***Illustrations*:** Rye (1990: 171); Leiper *et al.* (2008: 451).

Perennial shrub, 100–500 cm high, gynomonoecious or gynodioecious. Young stems moderately to densely hairy, longest hairs 0.3–0.6 mm long, thin, shiny and transparent or white and opaque, appressed. Leaves strictly opposite, internodes 2–12 mm long; petioles 1–1.8 mm long. Lamina narrowly elliptic to elliptic, 12–27 mm long, 4–7 mm wide, 3–5.3 times longer than wide, midrib visible, lateral veins sometimes faintly visible; apex acuminate or occasionally acute; margins flat or recurved. Upper surface of lamina glabrous or hairy; hairs slender, longest ones 0.2–0.35 mm long, *c.* 0.01 mm wide, appressed; very sparse. Lower surface of lamina hairy; hairs appressed, slender, somewhat shiny, transparent, longest hairs 0.3–0.5 mm long, *c.* 0.01 mm wide, sparse. Hairs on leaf margins longer and thicker (0.6–0.9 mm long and *c.* 0.25 mm wide). Inflorescence terminal, capitulate, with 8–14 flowers produced (= number of persistent pedicels), leafy bracts absent. Rachis globular, at maturity 1–2 mm long, densely hairy; peduncle length 0–1.5 mm long. Some flowers bisexual, some female, sometimes produced on the same plant, sometimes on separate plants. Pedicels 0.6–0.8 mm long. Floral tube 4.2–6.8 mm long at anthesis, white or yellow-green; outer surface with hairs moderately dense to dense, appressed, longer ones 0.3–0.45 mm long; inner surface glabrous or hairy. Sepals widely spreading, 1.7–3 mm long, apex acute, inner surface glabrous, outer surface sparsely hairy. Staminal filaments 0.05–0.1 mm long; anthers 1.4–1.8 mm long, dehiscence introrse. Style not or scarcely exserted. Seeds ovoid, *c.* 3.7 mm long, black, surface smooth.

***Additional selected specimens examined*: Queensland.** Darling Downs District: Mt Cordeaux, below summit, Dec 1981, *Guymer 1664 & Jessup* (BRI, CANB, NSW); Mt Cordeaux, Great Dividing Range, *c.* 2 km along walking track to summit, Dec 1986, *Beesley 795 & Ollerenshaw* (BRI, CANB, PERTH); Mt Mitchell, Cunningham's Gap, Aug 1992, *Forster PIF11099 & Reilly* (BRI, MEL); Spicers Peak, E peak, Main Range NP, Sep 1995, *Forster PIF17667 et al.* (BRI); Mt Colliery area, NE of Killarney, adjacent to Main Range NP, Mar 2015, *Forster PIF42128 et al.* (BRI, MEL); Mt Bell, Main Range NP, above Teviot Falls, Aug 1998, *Leiper s.n.* (BRI [AQ664039]); Wilsons Peak, Aug 1994, *Forster PIF15697* (BRI, NSW). Moreton District: Top of Buchanan's Fort, Christmas Creek area, Sep 1995, *Forster PIF17679 & Leiper* (BRI).

***Distribution and habitat*:** *Pimelea umbratica* has a restricted distribution in south-east Queensland on mountains close to the New South Wales border, extending as far north as Mt Cordeaux (**Map 4**). It is also known from Mebbin Rock in far north-eastern New South Wales. It grows on skeletal rhyolite mountaintops and slopes, in shrubland or low open woodland.

***Affinities*:** *Pimelea umbratica* is closely related to the recently named *P. cremnophila* L.M.Copel. & I.Telford from northern New South Wales (Copeland & Telford 2006). Among the Queensland species, it seems closest to *P. aquilonia* (see notes under that species).

***Phenology*:** Flowers and fruits have been recorded for March, August, September and December.

***Conservation status*:** *Pimelea umbratica* is known from seven subpopulations with an estimated area of occupancy of 10 km^2. Most subpopulations are within conservation reserves, and there are no current perceived threats. Therefore a conservation status of **Least Concern** is recommended.

Key to the Queensland taxa of *Pimelea*

1 Internodes and lower leaf surface with at least a sparse covering of hairs (visible with a hand lens), and often conspicuously hairy **2**
1. Internodes and leaves glabrous (sometimes hairs present at the nodes) **28**

2 Both sides of the leaf very densely hairy, hairs obscuring the surface **3**
2. Hairs not obscuring the surface of the leaf (under magnification), at least on the upper side (section *Epallage*) **4**

3 Inflorescence hemispherical to globose, with 6–12 involucral bracts . . . . . **P. penicillaris**
3. Inflorescence cylindrical, involucral bracts absent . . . . . **P. amabilis**

4 Longest rachis 1–18 mm long (at fruiting stage or after all flowers/fruits have fallen) **5**
4. Longest rachis 18–250 mm long (at fruiting stage or after all flowers/fruits have fallen) **21**

5 Leaves alternate, except at base of plant **6**
5. Leaves opposite to sub-opposite throughout **15**

6 Longest stem hairs > 1.2 mm long **7**
6. Longest stem hairs < 1.2 mm long **9**

7 Peduncles 10–32 mm long . . . . . **19. P. strigosa**
7. Peduncles 0–1.5 mm long **8**

8 Upper leaf surface glabrous; inflorescences terminal; seeds 2.8–2.9 mm long . . . . . **7. P. curviflora**
8. Upper leaf surface conspicuously hairy; inflorescences lateral; seeds 3.4–3.8 mm long . . . . . **5. P. chlorina**

9 Largest leaves 13–24 mm wide . . . . . **11. P. latifolia**
9. Largest leaves 1.7–14 mm wide **10**

10 Longest rachises cylindrical (3–)4–15 mm long (at fruiting stage or after all flowers/fruits have fallen); petioles 0.2–0.6 mm long; hairs on the floral tube 0.7–2.8 mm long **11**
10. Longest rachises globose to ellipsoidal (at fruiting stage or after all flowers/fruits have fallen), 1–4 mm long; petioles 0.7–2.8 mm long; hairs on the floral tube 0.2–0.6 mm long **12**

11 Floral tube hairs 0.6–0.9 mm long; rachis length 3–6 mm . . **18b. P. simplex** subsp. **simplex**
11. Floral tube hairs 1.4–2.8 mm long; rachis length 6–15 mm . . **18a. P. simplex** subsp. **continua**

12 Pedicels 40–80 per inflorescence; floral tube 3–4.4 mm long, not splitting; inner surface of sepals sparsely hairy; anthers 1–1.2 mm long . . . . . **16. P. rupestris**
12. Pedicels 3–18 per inflorescence; floral tube 4.5–8.8 mm long, circumscissile; inner surface of sepals glabrous; anthers 1.8–2.8 mm long **13**

13 Petioles 1.5–2.8 mm long; lamina with 8–12 pairs of lateral veins; lamina margins recurved . . . . . **15. P. plurinervia**
13. Petioles 0.7–1 mm long; lamina with only midrib visible, or with 1–5 pairs of lateral veins; lamina margins flat **14**

14 Hairs on lower leaf surface appressed, sparse, 0.25–0.6 mm long; hairs on floral tube 0.2–0.3 mm long . . . . . **12b. P. leptospermoides** subsp. **leptospermoides**
14. Hairs on lower leaf surface antrorse to patent, dense, 0.8–0.9 mm long; hairs on floral tube 0.4–0.6 mm long . . . . . **12a. P. leptospermoides** subsp. **bowmanii**

15 Peduncles 0–3 mm long at fruiting stage **16**
15. Peduncles 4–28 mm long at fruiting stage **20**

16 Leaves strictly opposite **17**
16. At least some leaf pairs sub-opposite, separated by 1–5 mm on stem **18**

17 Stems hairs appressed; pedicels 8–14 on each rachis; floral tube 4.2–6.8 mm long; sepals acute . . . . . **21. P. umbratica**
17. Stems hairs antrorse; pedicels 3–4 on each rachis; floral tube 9.7–12 mm long; sepals obtuse . . . . . **4. P. aquilonia**

18 Lamina 2.5–6 mm wide, upper surface glabrous . . . . . **7. P. curviflora**
18. Lamina 8–23 mm wide, upper surface hairy **19**

19 Lamina 33–82 mm long; sepals 3.1–4 mm long, acute; floral tube 8.5–11 mm long . . . . . **10. P. gigandra**
19. Lamina 14–38 mm long; sepals 0.9–1.6 mm long, obtuse; floral tube 5.2–8.2 mm long . . . . . **1. P. altior**

20 Longest stem hairs 0.6–0.8 mm long, appressed; upper leaf surface glabrous; pedicels 12–18 on each rachis . . . . . **9. P. fugiens**
20. Longest stem hairs 1.8–2.6 mm long, antrorse or patent; upper leaf surface hairy; pedicels 24–45 on each rachis . . . . . **14. P. mollis**

21 Rachis readily visible between the persistent pedicels (pedicels 2–20 per cm at midpoint of rachis) **22**
21. Rachis obscured by tightly packed persistent pedicels (pedicels 20–90 per cm at midpoint of rachis) **25**

22 Annual herbs; leaves 0.7–2.8 mm wide; sepals 0.4–0.8 mm long **23**
22. Perennial shrubs; leaves 3–9 mm wide; sepals 0.8–2.1 mm long **24**

23 Hairs on the floral tube 0.3–0.5 mm long, appressed; 17–42 pedicels per inflorescence . . . . . **8. P. elongata**
23. Hairs on the floral tube 1.5–2 mm long, patent; 45–85 pedicels per inflorescence . . . . . **20. P. trichostachya**

24 Floral tube 4.2–5.4 mm long, with longest hairs 1–1.4 mm long; sepals 1.5–2.1 mm long . . . . . **17. P. sericostachya**
24. Floral tube 3.1–3.9 mm long, with longest hairs 0.4–0.6 mm long; sepals 0.8–1.2 mm long . . . . . **13. P. leptostachya**

25 Leaves obovate, 13–24 mm wide; longest stem hairs 0.6–1 mm long, antrorse to patent; floral tube white, with longest hairs 0.2–0.5 mm long . . **11. P. latifolia**
25. Leaves elliptic to narrowly-elliptic, 2–11 mm wide; longest stem hairs 1.2–2.5 mm long, appressed; floral tube yellow-green to yellow, with longest hairs 0.7–1.9 mm long **26**

26 Petioles 1.5–1.8 mm long; lower leaf surface with sparse to moderately dense hairs, the longest ones 2.2–2.7 mm long. . . . . **3. P. approximans**
26. Petioles 0.3–1.5 mm long; lower leaf surface with dense to very dense hairs, the longest ones 0.8–2.1 mm long **27**

27 Hairs on the upper leaf surface 0.7–1.5 mm long; anthers 1–1.1 mm long . . . **2. P. amabilis**
27. Hairs on the upper leaf surface 0.3–0.6 mm long; anthers 1.1–1.3 mm long . . . . . .**6. P. confertiflora**

28 Largest leaves 35–70 mm long **29**
28. Largest leaves 10–35 mm long **31**

29 Inflorescence hemispherical, with several involucral bracts; flowers white. . . . . .**P. ligustrina** subsp. **ligustrina**
29. Inflorescence cylindrical; involucral bracts absent; flowers red **30**

30 Leaves 1.5–3(–3.5) times longer than broad; hairs on fruit 4–6 mm long; longest hairs on upper part of floral tube 2–3 mm long, antrorse . . . . . **P. decora**
30. Leaves 3–7 times longer than broad; hairs on fruit 1.5–2.5 mm long; upper part of floral tube with longest hairs 0.3–1.5 mm long, patent . **P. haematostachya**

31 Involucral bracts 2; fruits fleshy **32**
31. Involucral bracts 4; fruits dry. **33**

32 Floral tube hairy throughout . . . . . .**P. microcephala** subsp. **microcephala**
32. Floral tube glabrous. . . . . **P. neoanglica**

33 Floral tube with hairs, at least in upper part; involucral bracts free **34**
33. Floral tube glabrous; involucral bracts fused in lower half. **35**

34 Sparse hairs extending to base of floral tube; all bracts glabrous . . . .**P. linifolia** *sens. lat.*
34. Lowest 1–3 mm of floral tube glabrous; at least the upper pair of bracts with ciliate margins. . . . . **P. glauca**

35 Erect herb; flowers white; pedicels 1–4 mm long. . . . . **P. cornucopiae**
35. Prostrate or sprawling herb; flowers red; pedicels 0.2–1 mm long . . . . . **P. sanguinea**

Taxonomic and nomenclatural adjustments for taxa occurring outside of Queensland

Taxonomic amendment is needed for two subspecies of *Pimelea latifolia* proposed by Threlfall (1983), and confined to New South Wales. *P. latifolia* subsp. *hirsuta* differs from *P. latifolia sens. str.* in a number of characters (e.g. much smaller leaves with long hairs, much shorter rachis, sessile inflorescences, shorter floral tubes), and is here reinstated to species rank. *P. latifolia* subsp. *elliptifolia* Threlfall is also very different from *P. latifolia*, but is very similar to *P. hirsuta*. It can perhaps be maintained at subspecies rank under *P. hirsuta*, as it differs from typical *P. hirsuta* by the generally larger leaves, the hairs on the leaves antrorse to appressed (antrorse or spreading in *P. hirsuta sens. str.*), and the flowers often more numerous (5–15) in the inflorescence (2–8-flowered for *P. hirsuta sens. str.*). None of these characters is absolutely diagnostic, but in combination they suggest that a taxonomic distinction should be preserved.

Pimelea hirsuta Meisn. in A.DC., *Prodr.* 14: 513 (1856); *Banksia hirsuta* (Meisn.) Kuntze, *Rev. Gen. Pl.* 2: 583 (1891); *Pimelea latifolia* subsp. *hirsuta* (Meisn.) Threlfall, *Brunonia* 5: 194 (1983). **Type:** New South Wales. Tomah and Newcastle, in 1834, *R. Cunningham s.n.* (lecto [here designated]: K 000900025).

P. hirsuta subsp. *hirsuta* is found from the Nowra area to Newcastle, with an outlier further north at Lansdowne State Forest near Taree. It usually occurs close to the coast.

Pimelea hirsuta subsp. **elliptifolia** (Threlfall) A.R.Bean, **comb. nov.**; *Pimelea latifolia* subsp. *elliptifolia* Threlfall, *Brunonia* 5: 195 (1983). **Type:** New South Wales. junction of Cedar and Deep Creeks, Millfield, 16 September 1954, *E.F. Constable s.n.* (holo: NSW 30784; iso: BRI [AQ522104]).

P. hirsuta subsp. *elliptifolia* is found mainly from Cessnock to Merriwa in the Hunter valley, but also at Glen Davis and Colo River further south.

Pimelea altior is closely related to *P. hirsuta*, but differs from both subspecies by the white flowers (yellow or greenish-yellow flowers for *P. hirsuta*), the opposite to sub-opposite leaves (alternate for *P. hirsuta*); leaves 14–38 mm long (7–14(–20) mm long for *P. hirsuta*), and the rachis 1–2 mm long (1–4 mm long for *P. hirsuta*).

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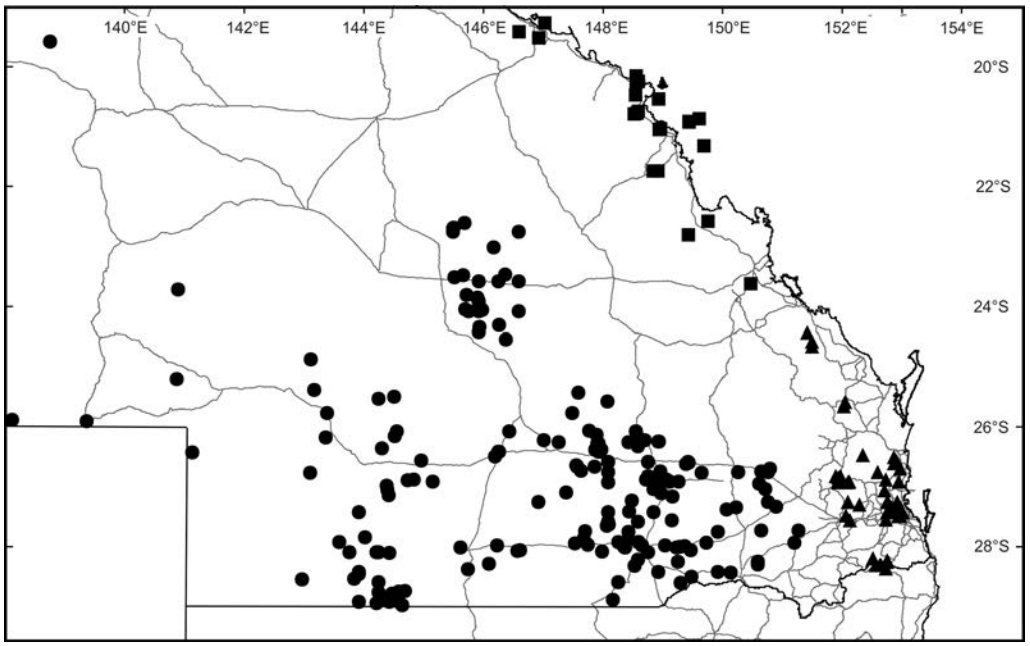
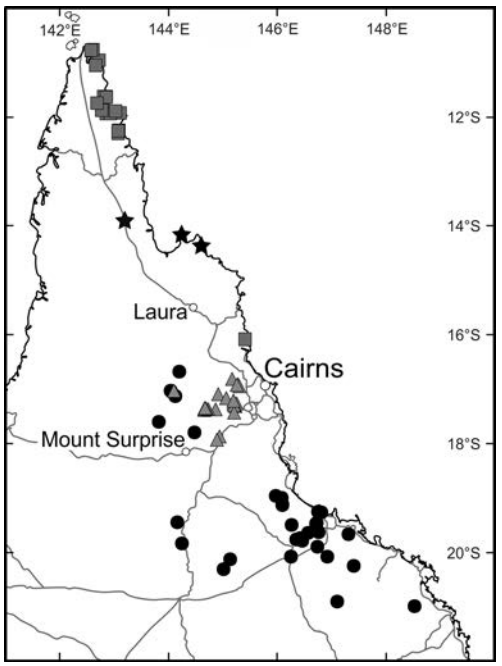
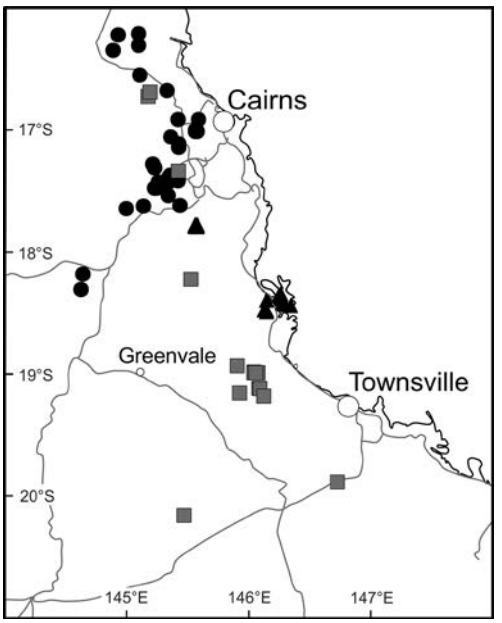


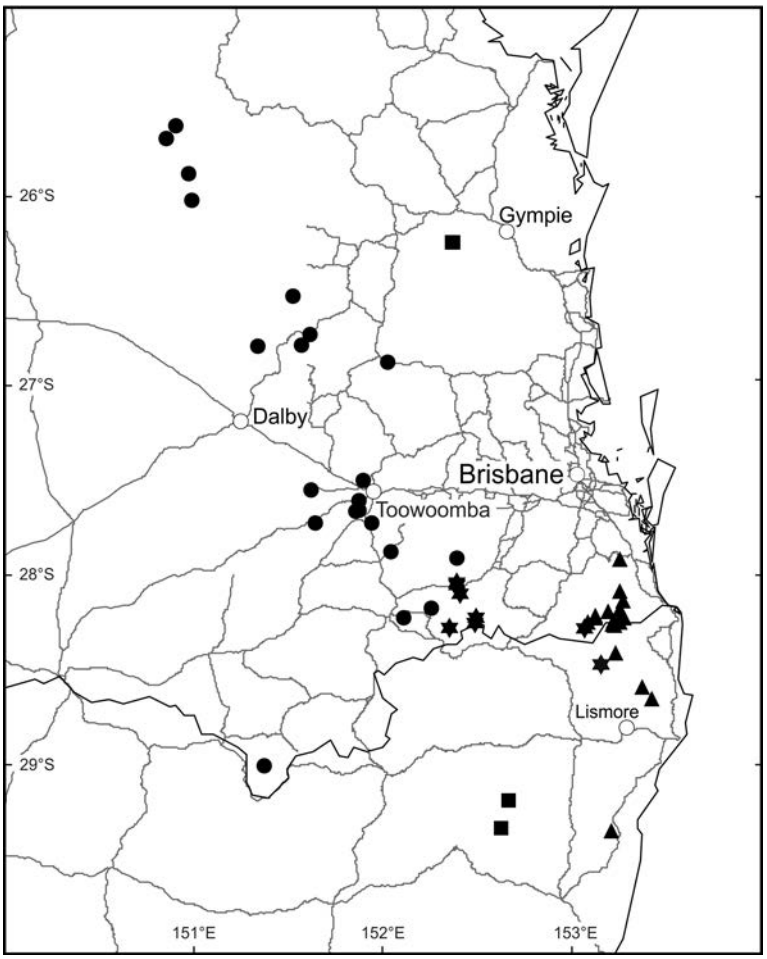
Map 1. Distribution of ***Pimelea altior*** ▲ (Queensland records only), ***P. latifolia*** ■, ***P. trichostachya*** ● (Queensland records only).



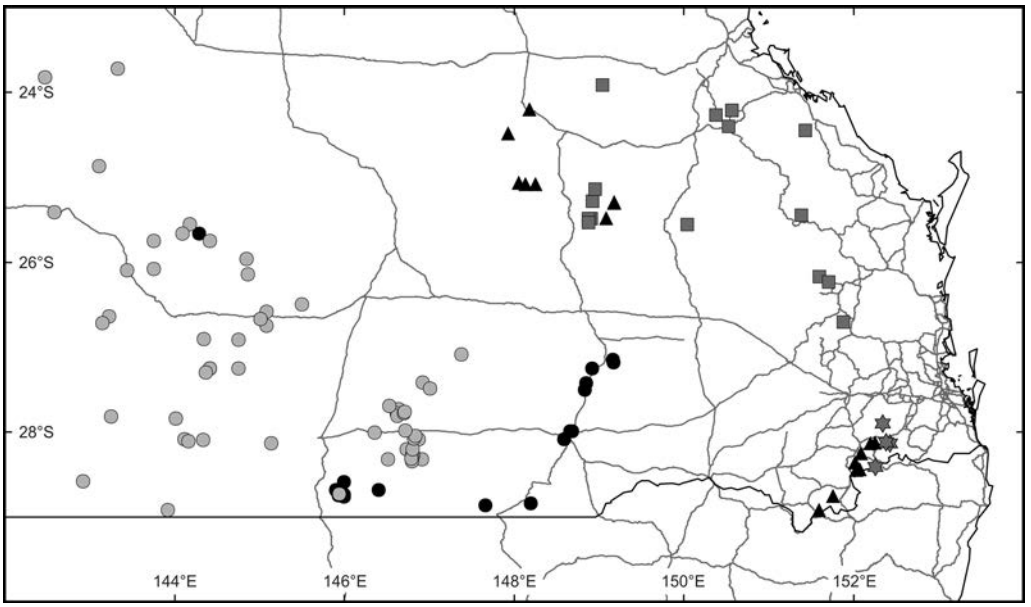
Map 2. Distribution of ***Pimelea amabilis*** ▲, ***P. approximans*** ★, ***P. aquilonia*** ■, ***P. sericostachya*** ●.



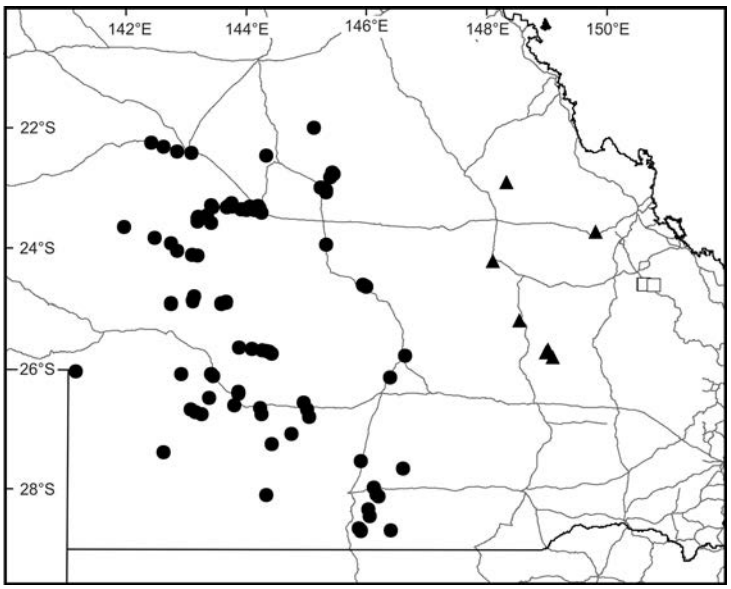
Map 3. Distribution of ***Pimelea chlorina*** ■, ***P. confertiflora*** ●, ***P. plurinervia*** ▲.



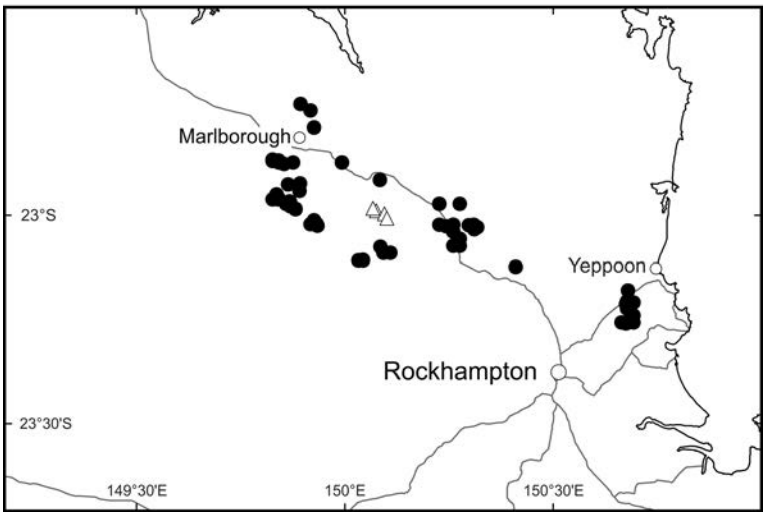
Map 4. Distribution of ***Pimelea curviflora*** var. ***divergens*** ● (Queensland records only), ***P. gigandra*** ▲, ***P. rupestris*** ■, ***P. umbratica*** ★.



Map 5. Distribution of ***Pimelea curviflora*** var. ***gracilis*** ★ (Queensland records only), ***P. elongata*** ● (Queensland records only), ***P. mollis*** ■, ***P. simplex*** subsp. ***simplex*** ●, ***P. strigosa*** ▲.



Map 6. Distribution of ***Pimelea fugiens*** □, ***P. leptostachya*** ▲, ***P. simplex*** subsp. ***continua*** ● (Queensland records only).



Map 7. Distribution of ***Pimelea leptospermoides*** subsp. ***bowmanii*** △, *P.* ***leptospermoides*** subsp. ***leptospermoides*** ●.