

Australian Plants

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***Pimelea*, an ornamental plant for the house and garden** Editor

We are concerned with the cultivation of Australian wildflowers in our gardens. This issue features cultivation practices and success in your guidance. See our cover and the following colour pages.

We are concerned with the decoration of our homes and this issue hopefully previews the introduction of charming flowering pot plants

We are concerned with scientific research to achieve these objectives. We need competent scientists such as Rod King and Tony Slater to guide us. Some contribute to the funding of research through The Australian Flora Foundation. I hope more will assist, see page 331.

We are concerned with the development of the Australian flora for horticulture and the expansion of an already significant export income.

We are concerned with the conservation of the unique Australian flora in the wild and in managed reserves. While this is listed last, to many of us this is the primary objective.

All of the above factors make a significant contribution to preservation. No longer can we ignore the ravages of civilization, development and increasing population. We cannot stop any of these so we must apply all our acquired knowledge to manage our natural resources better.

Will this "we" include you? We need your active support.

Exceptional Plants for Horticulture

To develop plants for decorative horticulture, we need the very best forms of species from the wild. Wild plants are very variable in the wild and occasionally nature produces a very good form, a larger flower, a good colour, a compact bush, etc. It is from these plants we want to start our propagation and plant development programmes. The bush is coming into flower now. Go out and enjoy yourself but look for the exceptional beauties. You can contact me, Editor.

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COVER PLATE — *Pimelea ferruginea* 'Bon Petite' is the rounded bush in the centre, covered with heads of red flowers to 3 cm across. *Dampiera linearis* is the blue/mauve ground cover plant in front while the yellow flowered *Petrophile squamata* may be seen in the background. Garden and photograph by Neil Marriott.

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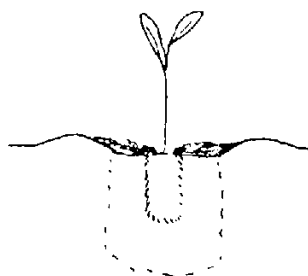
Publication date of previous issue. No. 138 was 1st march, 1994.

Our Garden

by Anne Dealtry*
One Tree Hill, South Australia

We live on a gently undulating property in the hills north of Adelaide. The soil is slightly acid, pH 6, and a gravelly clay, very compacted, having never been farmed, or ploughed. The natural vegetation would have been dry sclerophyll forest. We have built our house on the highest point, facing north. We have fenced an acre for the front yard, with a slope down from the house and an acre for the back yard which is almost flat.

Water is a major problem as we do not get runoff from other areas and rely on natural rainfall and precious water from our dam. We pump water up to a holding tank with a petrol pump and then use an electric pump to run some hoses. We use a hose to hand-water plants newly planted or looking limp. This was a big boost from the days when we carried buckets to tend the plants. To plant, we need a crowbar to dig a hole. Our garden is shown in pictures on the following pages. One secret of success is the following planting method.



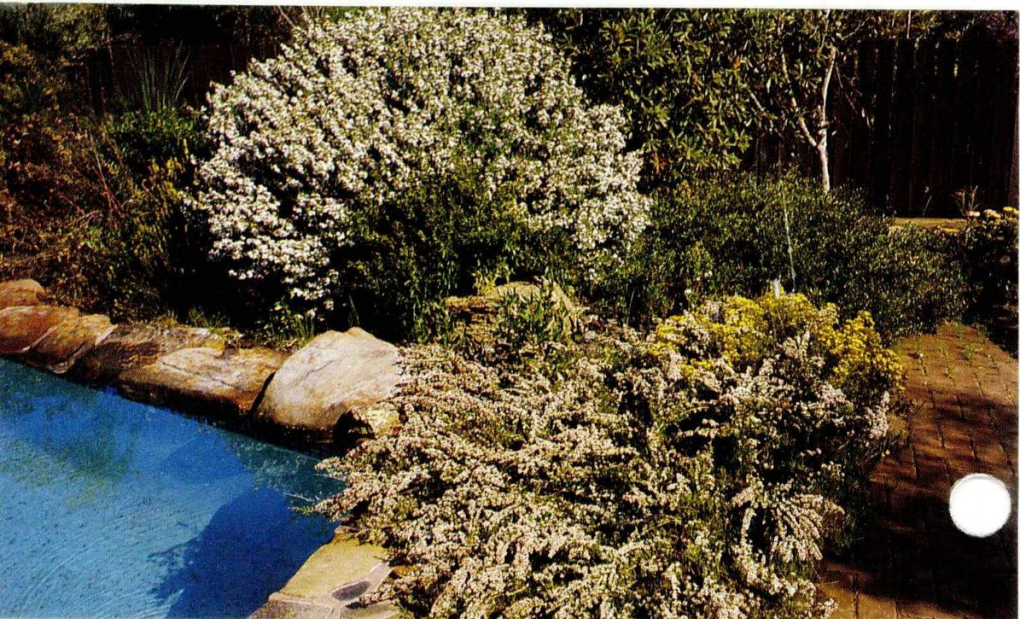
Factors to plant selection:

- soil type — clay, sand, acid or alkaline
- frost hardness
- rainfall — plants from a slightly higher rainfall can adapt to a lower rainfall area.
 - plants from a very low rainfall area can adapt to higher rainfall areas if drainage is good.
- tubestock trees usually grow quickest and form a more natural root system.

Clay, rocky or compacted soil should be ripped or broken prior to planting so that deep anchorage roots can form.

1. Dig a hole two or three times deeper and wider than the size of the plant's roots, mounded in a ring around the hole as shown.
2. Refill with some of the soil removed, mixed with composted soil. Form a hole large enough to take the plant root bowl. Blood and Bone or "native" Osmocote can be added to the back fill soil.
3. Scrape away weeds about 1 metre diameter around the site.
4. Pour water into the hole and wait until most drains away.
5. Remove the plant from the pot and firm the soil around it.
6. Mulch: layers of newspaper, bark, or other suitable material helps keep weeds from re-growing and aids moisture retention.
7. Water in, a good watering every week or two (depends on temperature and wind). This encourages deep roots. After the first summer a tree should be able to survive without regular watering. We try to give our plants a good deep water 3–4 times during summer.
8. Stake only if necessary to straighten plant against the wind, tie loosely. Remove stake when the plant seems more sturdy.

*Dealtry Native Plant Nursery, Lot 2 Trevilla Road, One Tree Hill, South Australia 5114. Phone 280 7079. Retail supplies of quality native plants.



△ *Micromyrtus ciliata*, centre front with masses of small pink flowers — *Verticordia chrysantha*, the rounded yellow flowered bush behind it — *Eriostemon myoporoides*, the larger white flowered shrub, a very hardy reliable plant providing that white so necessary in a garden to accent the colours and form of other plants — *Banksia integrifolia*, a large shrub/small tree to entice the birds for food and shelter.

▽ *Grevillea rosmarinifolia* 'nana' in the front, one of the many forms of this shrubby species that have proven reliable — *Lasiopetalum baueri* on left side with white/pale pink flowers — *Cryptandra scortechinii*, the small shrub with white ball flowers in front of — *Grevillea olivacea* the large background shrub and — *Grevillea* 'Poorinda Rondeau', a small shrub covered in red flowers — *Pimelea* 'Snow Cloud', a small shrub, the large white balls of flower just developing — *Conostylis candidans*, the yellow flower plant just visible and bordering the path — *Boronia denticulata*, the larger pink flowered shrub next to — *Guichenotia macrantha*, the upright mauve flower shrub with another plant on the right side behind — *Astartea heteranthera* with white flowers and — *Grevillea obtusifolia*, the green foliage ground cover. The bright red shrubs, *Pimelea ferruginea* 'Bon-Petite' of course, reliable and showy.





△ *Eutaxia obovata* (yellow) back, left of path — *Alyogyne huegelii*, young plants with *Hibiscus* like flowers varying from white to mauve — *Hibbertia racemosa*, yellow — *Grevillea montis-cole*, red — *Scaevola* 'Pink Perfection', pink — *Thysanotus multiflorus* the tufted plant with pink/purple flowers — *Eremophila glabra* 'Murchison River' with the silver foliage — *Grevillea thelemanniana* 'Guilt Dragon' with woolly grey foliage — *Lomandra longifolia*, a strappy plant — *Anigozanthos* 'Early Spring', red/orange behind *Halgania cyanea* with purple flowers.

▽ *Ricinocarpos cyanescens* is the white flowered open plant in the centre with *Pimelea* 'Snow Cloud' with masses of white flowers on the left and *Pimelea ferruginea* 'Bonne Petite' the rounded red plant on the right. *Boronia denticulata* is the pink flowered plant in the centre rear and *Conostylis candicans* is the small yellow flowered plant in front.



Pimelea

Their cultivation at Stawell, Victoria

by Neil R. Marriott, Stawell, Victoria

Many *Pimeleas* have been trialled at our nursery "White Gums" over the years. Most have proven to be reasonably hardy, given a well drained position in a sandy loam soil. They survive equally as well in a sunny or dappled shade situation, however, plants are far more compact and floriferous in more open sites. Most prefer an acid to neutral pH soil, although a number of Western Australian species, in particular *Pimelea ferruginea* and its cultivars do well in alkaline soils. Plants can become rather open and leggy with age, and as a result, they should be given a light annual trim with very sharp hedge clippers immediately after flowering. If clippers are not sharp, the tough bark on *Pimelea* tears and damages the stems instead of cutting cleanly. Some species that have proven popular are:

Pimelea ferruginea — This species is justifiably popular with most gardeners these days, particularly the deeper coloured and more compact cultivars 'Bonn Petite' and 'Magenta Mist'. Given a well drained, dry, sunny site, preferably with some form of lime in the soil, this species is naturally compact and easy to grow. Place it in a poorly drained site however and it will soon die.

Pimelea flava — If you cannot grow *P. ferruginea* because your garden is too wet, then *Pimelea flava* is the species for you. Coming naturally from moist forested areas, this species with its beautiful yellow flowers is ideal for damp, shady to partial sun sites. Plants are naturally erect and spindly and need to be regularly tip-pruned to create a good looking plant. Photograph, page 309.

Pimelea humilis — This widespread and common heathland and woodland plant of south east Australia makes a wonderful plant under cultivation. Once established it suckers vigorously to create an open to dense low thicket up to 30 cm high and up to 2 m wide. In the garden it suckers around other plants and creates a superb contrast in full flower with its massed, fluffy white heads. It does best in well drained open sandy loam in a sunny to dappled shade site. An excellent species for indigenous bush regeneration, as it suckers vigorously, stabilising areas otherwise prone to erosion. Photograph, page 325.

Pimelea linifolia — An extremely variable species ranging from the typical open, spindly shrub to 0.6 m, to small compact forms, or occasionally prostrate cushions. These latter forms occur on exposed coastal headlands, and two popular forms in cultivation come from Diamond Head, and Royal National Park, both on the New South Wales coast.

Pimelea linifolia 'Diamond Head' makes a spectacular low dense cushion with massed white flowers, and is ideal in a sunny, well drained rockery. Unfortunately it is extremely prone to mildew attack in wet weather, which usually results in the death of the plant. In our cold, wet Victorian winters, even inland from the Divide, we found it extremely difficult to keep alive for more than a season or two. This cultivar has been registered with the A.C.R.A.

Pimelea linifolia 'Coastal Cushion' of the Royal National Park, although not quite as dense and spectacular as the 'Diamond Head' form, is quite hardy and reliable. Being attractive in its own right it is proving to be a far better choice, in cooler areas at least.

Pimelea linifolia 'Pink and Shrubby'. There is also a delightful small shrubby form of *P. linifolia* available with attractive pink flowers. This form has proven to be handy and most attractive particularly when in flower. Out of the flowering season it usually passes without notice.

Pimelea brevifolia subspecies *modesta* — This delightful small shrub (to 0.3–0.5 × 0.5 m) from W.A. has a massed display of small white flower heads during late winter-spring. Plants become quite dense if pruned annually immediately after flowering. Hardy in most positions, it does best in a sunny, well drained site in neutral to slightly acid soil. Once established it is quite drought hardy. See page 316 for a photograph of a flowering plant in the garden.

Pimelea nivea — One of the most beautiful of all the *Pimelea*, this superb foliage plant is endemic to Tasmania. There is some variation in the species and one of the best *Pimelea nivea* 'Standup Point' has just been registered with the ACRA. Despite its rather unfortunate cultivar name, this form develops into a dense rounded shrub to 1.5 m high and 1–2 m wide. Foliage is perfect little green circles which contrast superbly with the white stems. Flowering is profuse in winter-spring with pink-blushed buds bursting open to a billowing mass of white fluffy flowers. This species responds well to regular tip pruning, with a slightly heavier pruning after flowering if necessary. It requires a well drained but moist site in acid sandy to clay-loam. Best results are achieved when given protection from the hot afternoon sun in an open to dappled shade site. Unfortunately this most attractive plant has proven to be difficult to propagate, and as a result is rarely available even from specialist nurseries. The secret to successful propagation is to use very fresh new (almost soft) tip growth for cuttings. Photograph, page 328.

Pimelea physodes — Undoubtedly one of the most spectacular of all *Pimelea* with its extremely large red and yellow bracted bell flowers. These are very similar looking to the 'Mountain Bell' *Darwinia* that occur nearby in the Stirling Range; one can only speculate at the parallel evolutionary forces at work to create such similar looking plants from totally unrelated genera. Unfortunately the 'Qualup Bell' has seldom been available in the nursery trade until recently when Brian Jack, from "Western Flora" began them, supplying beautiful young plants. Success has been achieved with these when planted either in very well drained acid sand or sandy loam in a sunny to dappled shade site, or in display tubs using an open mix. Plants should be lightly cut back on the completion of flowering to create a more compact shrub, with many more flowers the next season. Photograph, page 292.

Pimelea rosea — There are a number of forms of this Western Australian species under cultivation in both pink and white flowered varieties. The more widespread pink form grows naturally in deep acid sands, often in swampy areas, and as a result requires a light, well drained site in the garden. Plants grow to c. 0.5 m high and are generally fairly open and upright. When in flower in spring however, they are most attractive with their massed display of bright magenta-pink flowers. The white-flowered forms on the other hand grow naturally in the heavier soils of the Jarrah forests and as a result, have proven to be far easier to grow in the garden, particularly in heavier soils. White-flowered plants also have quite a different appearance, being more shrubby and compact with broader leaves and larger fluffy flower heads, widely sold as *Pimelea* 'Snow Clouds'. Photographs, pages 289 and 305.



△ *Pimelea spectabilis*. The individual four-petalled flowers clearly shown in the head.

△ Photo by F. W. Humphreys ▽ Photo by Neil Marriott

▽ *Pimelea physodes*, The Qualup Bell. The flower head is hidden by large coloured bracts.



Pimelea* sp. aff. *rosea 'Soft Pink' — A beautiful *Pimelea* collected in the lower south west of Western Australia, which looks very similar to *P. rosea* in its foliage. However, it is a shrubbier species to $0.6 \times .6$ m with beautiful white to soft pink flowers, deeper pink in bud. The flowers are enhanced in this species by a most attractive undulate fringe around the edge of each petal. It has proven to be quite hardy, growing in a range of well drained soils in sunny to dappled shade situations. Once established plants have proven to be hardy to frosts to at least -3°C and extended dry conditions. Prune back after flowering to create a rounded compact plant. Photograph, page 304.

Pimelea suaveolens — A delightful albeit spindly small shrub from Western Australia with numerous greeny-yellow bell flowers during winter-spring. Plants need to be regularly tip pruned to improve density; this should be done from an early age to create a good framework for the plant. This species grows best in a well drained acid to neutral sandy loam in a sunny to dappled shade site. Flowers are sweetly scented as the scientific name implies. Photo, page 312.

Pimelea spectabilis — As the name implies, this is a most spectacular species, coming from the dry lateritic ridgetops of the Darling Scarp east of Perth. Plants normally grow to around 1.5 m high $\times$ 1 m wide, of open habit with grey-green leaves c. 3–5 cm long. When not in flower plants are rather insignificant. However, when flowering commences, the shrubs are transformed. Flowers are extremely large fluffy white heads, surrounded by contrasting large bronze-pink bracts. Sadly, this species has proven to be extremely difficult to keep alive in the garden; it requires almost perfect drainage, yet it will not tolerate dry conditions. Plants need to be sited where there is good depth in the topsoil. In heavier soil areas this needs to be at least 1 m in depth. Plants need to be well mulched to keep the soil cool, and subsoil should remain moist although not wet. All this adds up to a most temperamental species. Fortunately it strikes readily from firm young growth, so a new batch of plants can be kept coming on at all times. As with most *Pimelea* species, this plant should also be given a good "haircut" immediately after flowering. Photograph opposite.

Pimelea treyvaudii — This is an attractive small grey-green shrub to c. 0.3 m from the hills of north-east Victoria, Canberra, up to Cowan, N.S.W. It is a hardy species, given a well drained site in either loam or clay soils in full sun to dappled shade. Flowers are in reasonably large white heads during spring. Plants respond to deep watering during dry spells, and have proven to be quite hardy to cold, frosty conditions. ■

***Pimelea* in Victoria**

by C. L. (Syd) Wheller

Pimelea ferruginea grew well at Tullamarine during the 1960–70s without any special care and has done likewise at Romsey since 1978 — elevations 300 ft and 1,500 ft respectively. It responds well to hard cutting but not into very old wood. Easily propagated from cuttings of semi-ripe wood.

Pimelea physodes grew and flowered well at Tullamarine for several years before dying out for no obvious reason. Photograph, page 292.

Pimelea humilis (large form) grew and flowered well at Romsey for several years in late 1980s–early 1990s dying out after damage by cats and wind. Easily propagated by cuttings it is now being re-established. Photo, page 325.

Pimelea spectabilis grew and flowered well at Romsey in late 1980s before dying out for no obvious reason. Recently replaced, it is one of the most attractive of the white-flowered species. Photograph opposite. ■

Pimelea as Flowering Pot Plants

by A. T. Slater
Institute of Plant Sciences,
Knoxfield, Victoria

Many species of *Pimelea*, are desirable horticultural plants and are grown for landscaping, mainly *Pimelea ciliata*, *P. ferruginea*, *P. glauca*, *P. humilis*, *P. imbricata*, *P. ligustrina*, *P. linifolia*, *P. nivea*, *P. rosea*, *P. spectabilis*, *P. suaveolens* and *P. treyvaudii*. The species bush collected for cut flowers, include *Pimelea ciliata*, *P. ferruginea*, *P. floribunda*, *P. physodes*, *P. rosea* and *P. suaveolens*. Currently, no *Pimelea* species are grown in significant numbers for the commercial cut flower industry. The international floricultural trade is a very lucrative business, which in 1990 was worth \$25 billion. For Australia exported crops were worth \$4.3 million in 1987/88, with domestic sales estimated at \$260 million.

Flowering pot plants growers in America are finding that pot plants are more profitable to produce in comparison to cut flower crops. The market in America is reflecting this trend, with flowering pot plants gaining a greater share of the market each year. Consumers are preferring pot plants as the flowers last longer, they remain on a living plant, a number of flowering displays can be obtained from one plant, and the plant can be re-used the following year or alternatively used as a landscape plant after the current flowering has finished.

This work has concentrated on two colour forms of *Pimelea ciliata* (pink and white). The results of this work were then tested on a number of species and forms of *Pimelea*: *Pimelea brachyphylla*, *P. ciliata* (2 forms), *P. ferruginea* (4 forms), *P. flava*, *P. glauca* (2 forms), *P. humilis* (2 forms), *P. imbricata* (3 forms), *P. ligustrina* (2 forms), *P. linifolia* (2 forms), *P. pendens*, *P. rosea*, *P. spectabilis* and *P. treyvaudii*. Whilst the majority of these could be produced as flowering pot plants, the most attractive were forms of *P. ciliata*, *P. ferruginea*, *P. linifolia*, *P. rosea* and *P. spectabilis*, photographs on page 305.

A *Pimelea* grown as a flowering pot plant must be attractively shaped, and covered in flowers that last up to three weeks inside, or up to six weeks outside on a patio or balcony. It was necessary to study propagation methods, the use of pruning or growth regulators, determine the conditions for flower induction, and establish their indoor flowering life as well as their reproductive biology to establish a breeding programme.

Propagation — The clones were propagated by dipping semi-hardened tip cuttings in a solution of 5,000 ppm IBA (indole butyric acid) in 50% ethanol for 5–10 seconds. The cuttings were then placed into a coarse sand, perlite, peat-moss (2:1:1) mix, and placed into a mist bed. By taking cuttings from plants growing in a glasshouse we increased the strike rate from 60–70% to 90–95%, and the time taken for the cuttings to strike was reduced from 6–8 weeks to 3–5 weeks. From plants growing in the glasshouse, cuttings could be taken at most times during the year, although cuttings taken in winter and spring were slower to strike, and produced flowers instead of vegetative growth.

Indoor flowering life — Five plants of each of three species were placed into an environment where the temperatures varied between a minimum and maximum of 10–25°C, a humidity of between 40 and 60% and a photo flux density of 10–20 $\mu\text{mol m}^{-2}\text{s}^{-1}$. The end of their indoor life was determined when the plants were no longer considered to be an attractive or saleable product. Under these conditions the plants of *P. ciliata* lasted for 19 days, while the plants of *P. imbricata* and *P. spectabilis* lasted 21 days.

Growth manipulation and plant production — To obtain a desirable shape when the plant flowers, the effects of BAP, paclobutrazol and manually pruning the plant were assessed. Application of BAP initially increased the number of branches on each plant, but at flowering the number of flowers had not increased. Paclobutrazol retarded the growth of the vegetative branches and was found to be useful in retaining a compact plant. Manually pruning the plant was found to be effective in increasing the number of branches and shaping the plant. Thus, a production protocol for *P. ciliata* designed to shape the plant and produce an even display of flowers, needs to include pruning to increase the number of branches. The application of paclobutrazol could be optional depending on the timing of the final pruning, and the environmental conditions in which the plants are growing. The final pruning should be done in early winter just prior to flower induction. A flowering pot plant of *P. ciliata* can be produced, from striking the cuttings through to flowering within 12 months.

The growth and flowering of 11 species of *Pimelea* were investigated, including *P. ciliata*, *P. ferruginea*, *P. glauca*, *P. humilis*, *P. imbricata*, *P. ligustrina*, *P. linifolia*, *P. pendens*, *P. rosea*, *P. spectabilis* and *P. treyvaudii*. All species responded to the same cultivation practices, although the production time varied as some species were slower growing.

Flower induction — Observation on the natural growth and flowering of *P. ciliata* at Knoxfield determined that flower buds would develop terminally on all branches in late winter, whether the plants were growing outside or in the glasshouse. After placing plants into a range of environmental chambers, plants were only found to flower after exposure to short days of 8-hour photoperiods at temperatures below a daily maximum and minimum of 21°C and 12°C respectively.

Breeding — The reproductive biology and breeding systems of a number of the species of *Pimelea* were examined and hybrid seed has been produced between desirable species and clones. The flowers were found to be strongly protandrous and seed was not set from all the crosses undertaken, particularly between parents which are taxonomically distant. The dormancy mechanisms preventing the germination of *Pimelea* seed has also been investigated. The dormancy of the seeds was broken after the thick black pericarp was removed and a combination of cytokinin and gibberellic acid was applied to the seed.

Acknowledgements

This work was funded by the Department of Agriculture Victoria and the Rural Industries Research and Development Corporation (RIRDC). I thank Michelle Bankier, David Beardsell, Francha Horlock, Ling Nar Sia and Siggi Reiners for assistance with this work.

Pimelea in Tasmania

by Marion Simmons*

Pimelea ferruginea flowers regularly without any attention and has been growing in the garden for about 5–6 years. *Pimelea nivea*, on the other hand, seems to last only a few seasons then dies. Fortunately we get healthy self-sown seedlings to carry on the species.

Pimelea filiformis is a gem. It is always quite prostrate and looks rather frail but it has been growing in the garden in several places in semi-shade for many years. It has been overrun by other plants and weeds but it still survives and flowers. It is very easy to grow from cuttings and is non-invasive. As you can probably guess from all that it is one of my favourites! Photo, page 329. ■

*For descriptions of Tasmanian species of *Pimelea* and their cultivation see the article by Marion in *Australian Plants*, Vol. 12, page 373.

Control of Growth and Flowering of *Pimelea*

Studies on two species by R. W. King *et al.*¹, CSIRO, Canberra.

Australian *Pimelea* species, especially those with a compact shape and abundant terminal flowers, have long attracted horticulturalists. Recently, several species have been examined for use as container plants including *Pimelea ferruginea* and *P. linifolia*. *Pimelea ferruginea* has shown horticultural hardiness and two cultivars 'Bonne Petite', a dwarf deep red flower form, and 'Magenta Mist', a deep pink form, are widely available commercially. The importance of selection of the most suitable form to develop from is illustrated by *Pimelea ferruginea* 'Magenta Mist'. They really did pick a winner as it propagates so well and flowers very synchronously and massively after a cool winter — often better than the provenances we have collected.

A recent study² using *Pimelea ferruginea* and *P. rosea* has yielded the following results:

Exposure to cool temperatures (less than 15°C) for more than 5 weeks is obligatory for the induction of flowering. The plants remain vegetative at warmer temperatures (e.g., 21°C) or in short days although the latter appeared to have a marginal effect. Subsequent floral development is slow in these cool conditions, increasing rapidly if the average temperature is raised to 21°C. *Pimelea rosea* was found to be daylength neutral whereas the flowering of *P. ferruginea* was enhanced, slightly, by a short day photo period of 10 h. Plant height was greater for both species in long days.

Ongoing studies of *Pimelea ferruginea* from natural populations along the coast of Western Australia show that to survive there has been adaptation to the winter temperature. Collections from sites near Geraldton required little winter chill for flowering compared with collections from near to Albany which is on average 3–4° cooler.

Plant height was greater for both species in long days. Benzylaminopurine (BA) was effective for increasing branching. Gibberellin A₃ (GA₃) and paclobutrazol were effective in controlling plant height in *Pimelea ferruginea*. Flower life was not altered by application of silver thiosulfate and BA, and was greatest when plants were grown in high photo synthetic photon flux density and at lower temperatures (15/10°C v 24/19°C).

Nutrition is not a difficulty. The origin of *Pimelea ferruginea* often on limestone outcrops seems not to have led to a lime requirement and we use perlite/vermiculite in an essential hydroponic situation with no detrimental effects. Nutrition is the subject of a further study yet to be reported upon.

Propagation is also the subject of a study shortly to be reported on. Sometimes we obtain 100% rooting in 3 weeks with IBA treatment (10,000 ppm powder or 1,000 ppm in 95% ethanol). A critical feature is keeping root zone temperature at least at 26° and the warmer the better providing humidity is maintained.

¹ Dr. R. W. King is from the CSIRO Division of Plant Industry, Institute of Plant Production and Processing, Canberra.

² Control of Growth and Flowering in Two Western Australian Species of *Pimelea* by R. W. King and I. A. Dawson. Australian Journal of Botany, 1992, 40.

Thymelaeaceae — The family

by Barbara Rye
CALM, Western Australia

Pimelea and its relatives

The Thymelaeaceae are characterised by a very stringy bark, which has been used by indigenous people in Australia and some other parts of the world to make string or rope. Other characteristics of the family include the simple leaves without stipules and the superior ovary with one pendulous ovule in each cell. However, the ovary may appear to be inferior because it is usually enclosed in a tube known as the hypanthium (see Fig. 1B, C; Fig. 1 repeated on page 303). The flowers are most commonly white, pink or yellow and the petal-like lobes are generally considered to be sepals. Some genera have smaller lobes referred to as petals, but these are usually inconspicuous or absent.

In Australia the family is widespread, occurring in a great range of habitats, including arid, alpine and relatively saline locations, the plants varying from slender annuals and dwarf undershrubs through to tall rainforest trees. Although there are seven native genera with a total of over 100 species the genus *Pimelea* accounts for the great majority of the species.

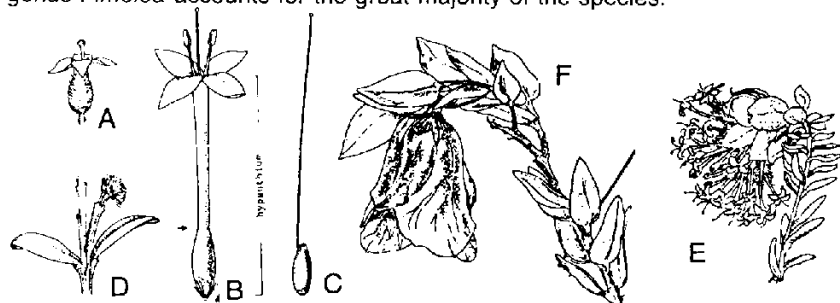


Fig. 1. Full captions on page 303.

Pimelea can be distinguished from most other native plant groups by the combination of four sepals (lobes) and two stamens as in Fig. 1B, although there is one odd Tasmanian species, *P. filiformis*, with only one stamen. Also with two stamens is a close relative, *Thecanthes*, which was previously included in *Pimelea*. This tropical genus includes two species with striking bright red to maroon flowers, as described on page 300 and illustrated in colour.

Many *Pimelea* species have the long slender flowers of Fig. 1B massed in attractive head-like clusters encircled by bracts as shown in Fig. 1E. There are also many species with smaller shorter flowers, including most of the dioecious ones (those with separate male and female flowers/plants). A typical female flower is shown in Fig. 1A.

Probably the most spectacular Australian species in the family is the Qualup Bell, *Pimelea physodes*, a species with long flowers in pendulous heads surrounded and hidden by very large colourful bracts Fig. 1F. The remarkable flower heads are often mistaken for Mountain Bells* and, like those unrelated species, are adapted for pollination by birds.

Other members of the genus are insect-pollinated. Butterflies and moths are apparently the main pollinators of *Pimelea* species with large slender flowers, while bees and flies are more important for pollination among the small-flowered species.

*Mountain Bells are some of the most attractive members of the genus *Darwinia*, family Myrtaceae.

Other Genera related to *Pimelea*

In the Plant Family Thymelaeaceae

The common characteristics of all genera in the family are given in the first paragraph on page 297. It is the manner in which the floral parts are arranged in the individual flower that distinguishes most of the genera from one another. These differences are illustrated in the following floral diagrams.

The sepals are the outer ring of open symbols, connected by a line if a hypanthium is present.

The petals are the next ring of filled symbols, present only in Figures C and F.

The stamens are the eight-shaped symbols in the next ring, radial lines indicating those that are connected to the hypanthium below the base of the sepals.

The ovary is the inner circle with the number of cells shown by radial lines.

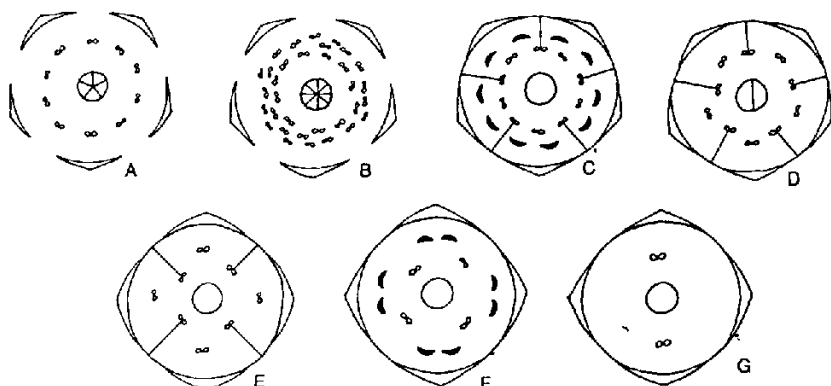


Fig. 2. Floral diagrams of the genera of Thymelaeaceae. A — *Arnhemia*. B — *Lethedon*. C — *Jedda*. D — *Phaleria* and *Oreodendron*. E — *Wikstroemia* and *Thymelaea*. F — *Kelleria*. G — *Thecanthes* and *Pimelea*.

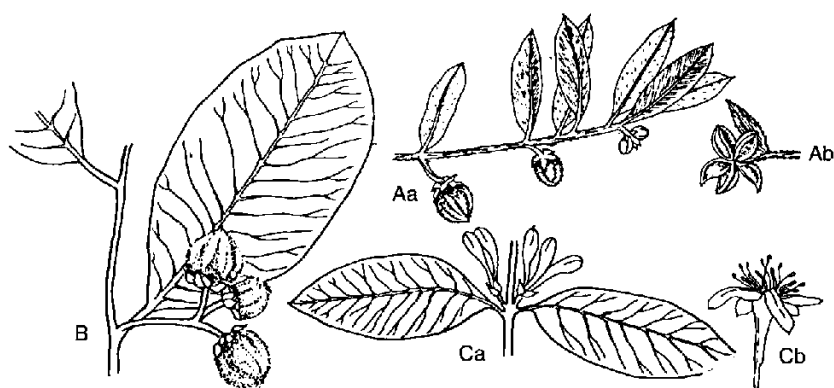


Fig. 3. A — *Arnhemia cryptantha*; a. flowering and fruiting branch showing the prostrate habit; b. opened fruit. B — *Lethedon setosa*; leaves and fruits. C — *Jedda multicaulis*; a. leaves and flower buds; b. flower.

Arnhemia — The single species *Arnhemia cryptantha* is restricted to Arnhem Land, NT. A more or less prostrate undershrub with leaves in two rows, flowers lacking a hypanthium and petals, with ca five non-overlapping sepals, ca 12 stamens in one whorl and a five-celled hairy capsule, Fig. 2A and 3A.

Lethedon — The Australian species *Lethedon setosa*, is a tall shrub with alternate leaves, flowers lacking a hypanthium and petals, with five sepals, numerous stamens and a many-celled hairy capsule, Fig. 2B and 3B. There are a further 11 species in Vanuatu and New Caledonia.

Jedda — Perhaps the most bizarre Australian species is *Jedda multicaulis*, only recently discovered from Cape York Peninsula and named in 1986. Compared with other members of the family, it has an exceptionally large fruit 6–8 cm long and, as in many mangrove plants, its fruit is able to germinate while still attached to the parent tree. A shrub with more or less opposite leaves, flowers with a hypanthium, 4–6 sepals, 8–12 petals alternating with an equal number of stamens, Fig. 2C and 3C.

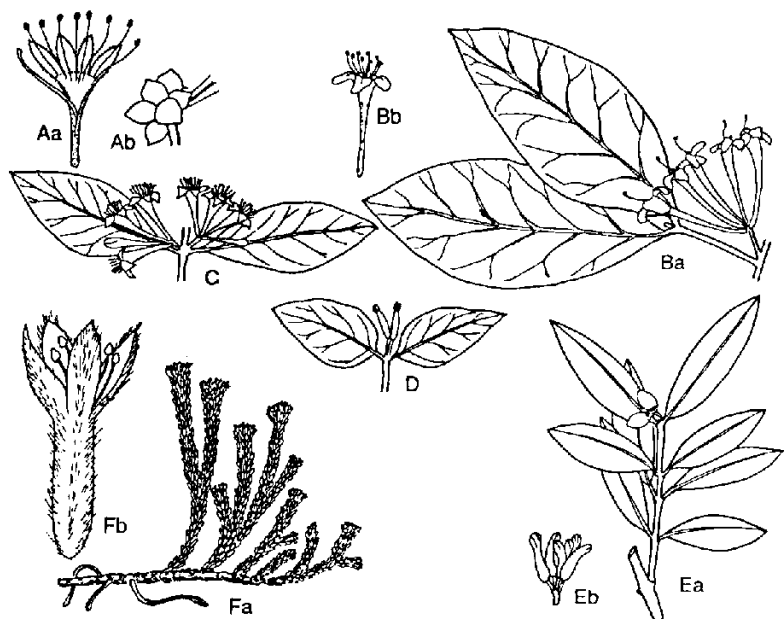


Fig. 4. A — *Phaleria octandra*; a. opened flower; b. cluster of fruits. B — *Phaleria clerodendron*, a species with bisexual flowers of two types, some flowers having short stamens and a very long style, the others having long stamens and a shorter style; a. leaves and long-styled flowers; b. flower with long stamens. C — *Phaleria chermsideana* leaves and flowers. D — *Oreodendron biflorum* leaves and flower buds. E — *Wikstroemia indica*; a. fruiting branch; b. flower buds. F — *Kellera dieffenbachii*; a. prostrate habit; b. flower, showing its four stamens.

Phaleria — 25–30 species, extending from Sri Lanka east to Polynesia, with the following four species in northern and eastern Australia: *Phaleria chermsideana*, *P. clerodendron*, *P. macrocarpa* and *P. octandra*. Shrubs or trees with opposite leaves, flowers with a hypanthium, 4–6 sepals, petals minute or absent, stamens ca twice as many as the sepals in two distinct whorls and a two-celled succulent drupe, Fig. 2D and 4A–4C.

Oreodendron — Consists of the single species *Oreodendron biflorum*, restricted to Queensland. Possibly, it should be included in *Phaleria* but can be distinguished by its two-flowered rather than 4–25-flowered clusters and more obvious pedicels (flower stalks) with minute hairs, Fig. 2D and 4D.

Wikstroemia — Some 70 species extending from tropical and eastern Asia east to Hawaii, with one species occurring in northern and eastern Australia. The Australian species, *Wikstroemia indica*, is a shrub with opposite leaves, flowers with a hypanthium, four sepals, no petals, stamens twice as many as the sepals in two whorls and a one-celled succulent red drupe, Fig. 2E and 4E.

Kelleria — Some 11 species from Borneo to New Zealand, with two species *Kelleria laxa* and *K. dieffenbachii*, in alpine areas of New South Wales, Victoria and Tasmania. Creeping subshrubs with alternate leaves, flowers with a hypanthium, four sepals, scale- or gland-like petals opposite the sepals, four stamens alternating with the petals and a one-celled fruit, Fig. 2F and 4F.

Thecanthes — The five species, *Thecanthes concreta*, *T. cornucopiae*, *T. filifolia*, *T. punicea* and *T. sanguinea*, all occur in northern Australia and two of them extend northwards, one as far as the Philippines. Annual herbs with opposite leaves, flowers with a hypanthium, four sepals, no petals, two stamens opposite the outer sepals and a dry one-celled fruit. This genus is closely related to *Pimelea* but can be readily distinguished from all the other genera by its unusual inflorescence, which has glabrous (i.e., hairless) flattened pedicels (flower stalks) arising from a hollow cone-shaped base, Fig. 2G and 5.

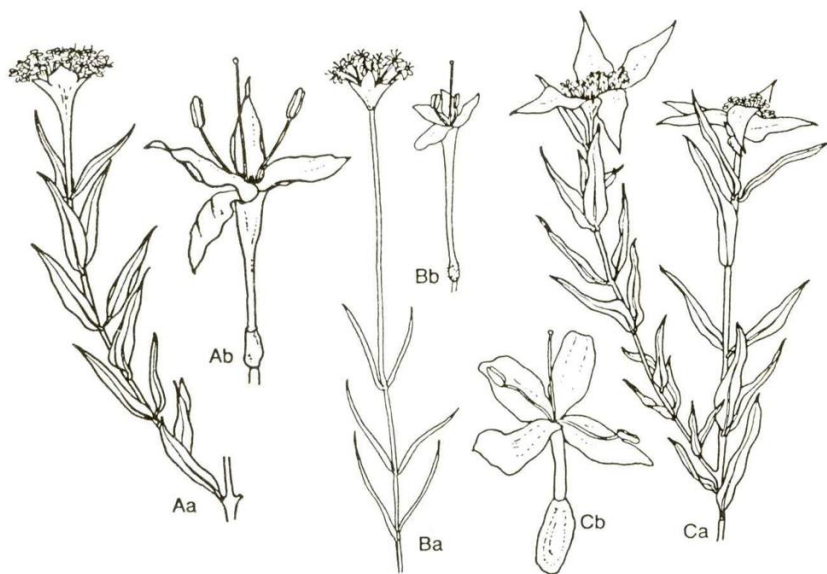


Fig. 5. Flowering branch and flower in *Thecanthes* species. A — *Thecanthes punicea* is a herb 0.2–0.6 m high, with leaves usually narrowly ovate, the flowers red with bright yellow anthers. B — *Thecanthes filifolia* is an erect herb 0.2–0.5 m high, the leaves very slender, the flowers pink with yellow to orange anthers. C — *Thecanthes sanguinea* is a semi-prostrate herb or up to 0.3 m high, the leaves usually narrowly ovate, the flowers red with bright yellow anthers.



△ *Thecanthes punicea*. An annual herb easily grown from seed — a pot plant? Photo by M. Fagg

▽ *Thecanthes sanguinea*. A semi-prostrate herb that could take tip pruning. Photo by F. D. Hockings



Fig. 6. Inflorescence types in *Pimelea*. The pedicels are really much shorter than they appear in this diagram. A — condensed raceme (resembling a head) with a convex receptacle and involucre bracts. B — elongated raceme (resembling a spike) without involucre bracts. C — elongated raceme (resembling a spike) with involucre bracts. b, each small circle is an individual flower.

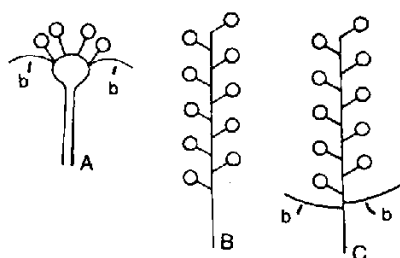


Table 1. Characteristics of the sections of *Pimelea*. 1. *Heterantheros*; 2. *Pimelea*; 3. *Epallage*; 4. *Calypstrosteigia*; 5. *Macrosteigia*; 6. *Stipostachys*; 7. *Heterolaena*.

☆ common or typical; + rare; = very rare; — absent.

Character	Section Number						
	1	2	3	4	5	6	7
Sex —							
Dioecious ^A	☆	☆	☆	+	—	—	—
Gynodioecious ^A	—	+	☆	☆	☆	—	—
Hermaphrodite ^A	—	+	+	☆	☆	☆	☆
Stems Hairy	—	☆	☆	☆	—	—	=
Glabrous	☆	☆	—	☆	☆	☆	☆
Inflorescence ^B							
Erect head	☆	☆	☆	☆	—	—	☆
Pendulous head	—	—	—	☆	☆	—	+
Continuous spike	—	☆	+	—	—	☆	—
Interrupted spike	—	☆	☆	—	—	—	—
Axillary clusters	—	☆	+	—	—	—	—
Bracts ^C							
Not stalked (sessile)	☆	☆	—	☆	☆	☆	☆
Shortly stalked	—	☆	☆	—	—	—	—
Absent	—	☆	☆	—	—	—	—
Hypanthium ^D							
Circumscissile	—	+	☆	☆	☆	☆	+
Irregularly split	☆	☆	—	—	—	—	—
Persistent	—	+	—	—	—	—	☆
Stamens							
Subsessile ^E	—	+	☆	+	—	—	+
Shorter than sepals	☆	☆	☆	☆	—	+	☆
Longer than sepals	☆	+	=	☆	☆	☆	☆
Ovary Hairy ^F							
Glabrous	☆	☆	=	+	☆	—	☆

^ADioecious — with separate male and female plants; Gynodioecious — with separate female plants and bisexual-flowered plants; Hermaphrodite — with bisexual flowers only.

^BInflorescence, flower arrangement in Fig. 6 above — a compact head of individual flowers, usually globular, or in a spike — cylindrical arrangement.

^CBracts — bracts surrounding the base of the inflorescence and usually brightly coloured but sometimes leaf-like or absent. See Fig. 6 above.

^DHypanthium-Circumscissile — splitting by a neat transverse cut at the position shown by the arrow 'x' in Fig. 1B, the top falling off and bottom remaining and enclosing the fruit; irregularly split — tearing irregularly near base, only a ragged edge left at base of fruit; Persistent — the whole hypanthium remaining with the enclosed fruit.

^ESubsessile — with the filament or stalk of the stamen very reduced, the anther almost directly attached to the hypanthium.

^FThe ovary usually just has a tuft of hairs at the summit.

Pimelea

The distinguishing features for *Pimelea* are illustrated in Fig. 1 and 2G.

1. Shrubs or undershrubs or very rarely herbs, with leaves usually very shortly petiolate (stalked).
2. Flowers always borne on short pedicels (but these are usually hidden or inconspicuous) in a raceme or cluster; raceme usually resembling a compact head and commonly closely surrounded by bracts (Fig. 1E, 6A), sometimes long and resembling a spike (Fig. 6B, C). Pedicels persistent after the fruits are shed, usually hairy (see Fig. 1D). Note that *Pimeleas* do not have true heads or spikes because their flowers are not quite sessile (stalkless).
3. Flowers with four sepals, no petals and almost always two stamens arising at the summit of a hypanthium (Fig. 1B).
4. Ovary free from, but enclosed in, the hypanthium. Style attached slightly below the apex of the ovary on one side, with a terminal stigma (Fig. 1C).
5. Fruit one-celled and one-seeded, enclosed in the base of the hypanthium or sometimes naked. In many species the hypanthium is circumscissile, breaking neatly off near the summit of the ovary (see Fig. 1B), whereas in others the hypanthium persists or tears off irregularly.

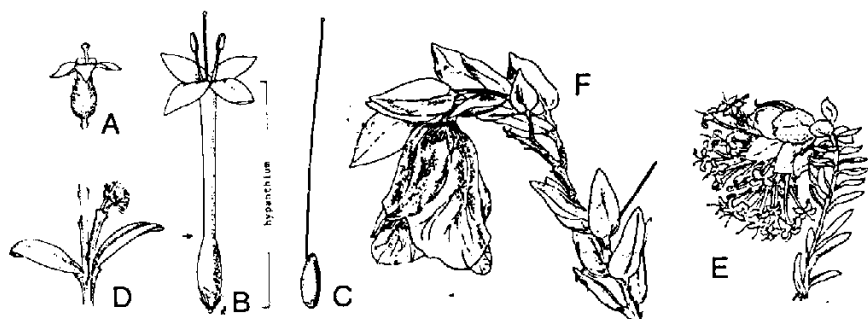


Fig. 1. Characteristics of *Pimelea* species. A — female flower from a small-flowered species that has separate male and female flowers, the four sepals borne not far above the top of the ovary. B — a more typical bisexual flower with two stamens on either side of the style, the sepals borne at the top of a long slender tube known as the hypanthium, and with a short hairy basal stalk known as the pedicel. The arrow shows the circumscission line where the top of the hypanthium and sepals fall off after the ovary has been fertilised. C — ovary and asymmetrically attached style of a bisexual flower. D — leaves and a cluster of hairy pedicels (resembling a pom-pom) persisting after the fruits have dropped off. E — a head of flowers cupped by bracts. F — flower head of *Pimelea physodes* with large colourful bracts hiding the flowers.

Sections and New or Resurrected Species of *Pimelea*

There are over 100 species, widespread in Australia except for parts of the far north, also represented on Lord Howe Is., New Zealand and Chatham Is.

Australian species may be grouped in seven sections, which are compared in Table 1. All *Pimelea* species in each section are given in Appendix 1 (page 318) together with flower colour and distribution, and those features that are typical for that species as compared with others in the section. References are also given to descriptions of the species in previous issues of *Australian Plants*. The following descriptions are for species that have only been named in the last 10 years and for a few others that were named long ago and have only recently been accepted again as being distinct species.



△ *Pimelea* 'Soft Pink' (see page 293) with *Homoranthus papillatus* (yellow).
 ▽ *Pimelea linifolia* ssp. *caesia*, one of the prostrate forms. Photos by Neil Marriott.





Container plants produced by A. T. Slater (see page 294).

△ *Pimelea ciliata*

▽ *Pimelea rosea*



The Genus *Pimelea* — Section 1. *Heterantheros*

A single Western Australian species, *Pimelea gilgiana*, which is unique in having female flower heads much hairier than the male flower heads. As shown in Table 1, the stems are glabrous, the flower heads erect, the bracts are sessile, the hypanthium is irregularly split and the ovary is glabrous, Fig. 7.

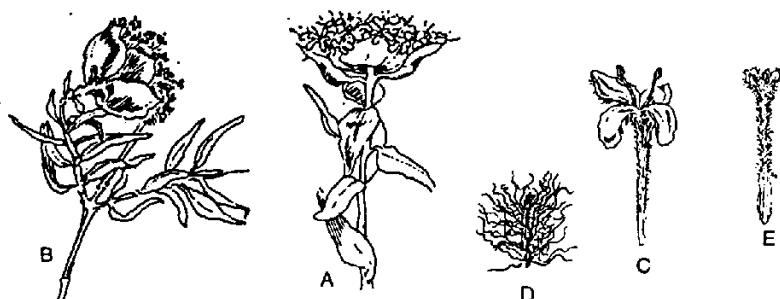


Fig. 7. *Pimelea gilgiana* is a shrub to 1.2 m high, with leaves 3–23 mm long, green bracts in male plants, reddish green bracts in female plants, which become deep red-purple in fruit, and white or pink flowers. A — flowering stem of male plant. B — flowering stem of female plant. C — male flower. D — very hairy sterile flower from female head. The sterile flowers give the female flower head its woolly appearance. E — female flower.

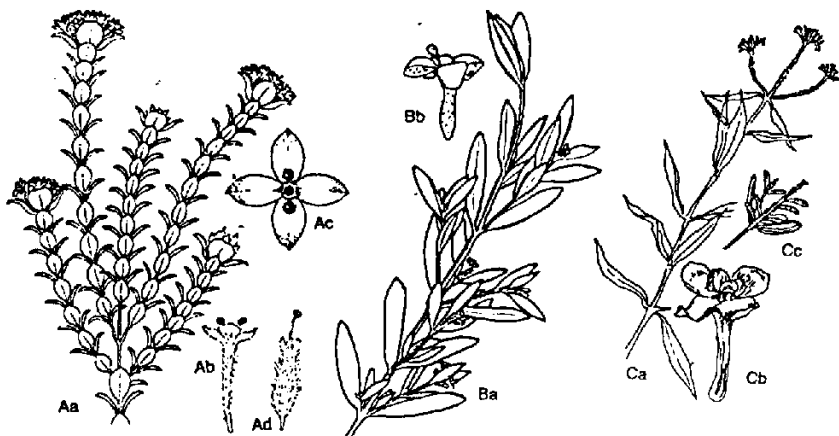


Fig. 9. A — *Pimelea flava* is an erect shrub to 2.5 m high, with hairy young stems and nine–many hairy yellow flowers cupped by bracts, which are usually larger and often more yellowish than the leaves; a. flowering branch; b, c. male flower; d. female flower. Photo page 309. B — *Pimelea axilliflora* — Ba, branch of dioecious shrub (sub sp. *oxiflora*) to 3 m from south-east coast to Bass Strait islands; Bb, a female flower. C — *Pimelea forrestiana* is a shrub to 1.5 m high, with longer than usual glabrous pedicels, the inflorescence elongating as the yellow flowers age or turn into fruits; a. male flowering branch; b. male flower; c. fruits on the old female inflorescence.

The Genus *Pimelea* — Section 2. *Pimelea*

Thirty-nine species, widespread in Australia and New Zealand, nearly all small-flowered, with bracts usually rather leaf-like or absent and the fruit sometimes succulent (photo, page 308). Some species in Figs 8, 9 and 15.

Pimelea dichotoma is a shrub 0.3–0.5 m high, with young stems hairy; leaves opposite, usually elliptic, glabrous, 5–20 × 2–10 mm; inflorescence a 9–many-flowered head; bracts 2 or 4, similar to the leaves; flowers male or female, hairy outside, white. It extends from Eyre Peninsula, South Australia, through western Victoria to West Wyalong, New South Wales.

Pimelea halophila is an undershrub up to 15 cm high, often cushion-like, the stems glabrous (without hairs); leaves alternate, elliptic to almost circular, glabrous, 0.5–3 × 0.5–1.5 mm; inflorescence a 4–20-flowered head; bracts 4, similar to the leaves but sessile; flowers male or female, densely hairy outside, white or cream. It occurs on low islands in salt lakes from Lake King to east of Esperance, Western Australia. Fig. 9A.

Pimelea neo-anglica is a shrub 0.5–2 m high, with glabrous stems; leaves opposite, narrowly elliptic, glabrous, 4–45 × 1–5.5 mm; inflorescence a 3–many-flowered head; bracts 2 or rarely 4, similar to the leaves but sessile; flowers male or female, glabrous or with a few short hairs outside, yellow or yellowish-green. It occurs mainly in clay and extends from near Springsure, Queensland, to Gloucester, New South Wales.

Pimelea pelinos is a shrub 30–60 cm high, the stems glabrous; leaves opposite, narrowly obovate, glabrous, 3–11 × 1–2 mm; inflorescence a 5–21-flowered head; bracts 2 or 4, green; flowers male or female, densely hairy outside, cream. It occurs north of Esperance, Western Australia, growing around salt lakes in clay or sandy clay. Fig. 9B.

Pimelea spinescens is a stunted undershrub 5–30 cm high, with glabrous spinescent branchlets; leaves opposite, narrowly elliptic or elliptic, glabrous, 3–10 × 1–2 mm; flowers in clusters along the stems, each cluster with 4 green bracts; flowers male or female, hairy or glabrous outside, pale yellow. It occurs on basaltic plains in Victoria. Fig. 9C.

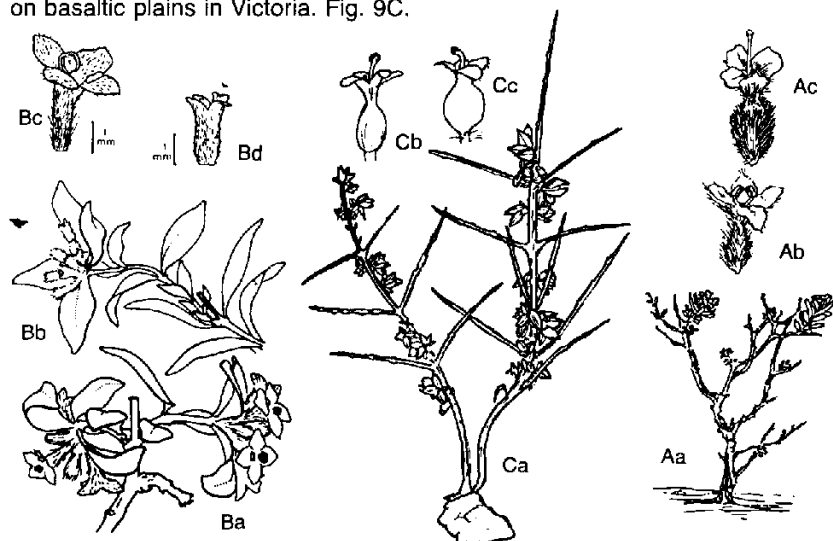


Fig. 8. A — *Pimelea halophila* described above; a. habit; b. male flower; c. female flower. B — *Pimelea pelinos* described above; a. male flowering branch; b. female flowering branch; c. male flower; d. female flower. C — *Pimelea spinescens* described above; a. habit; b. flower of subsp. *spinescens*; c. flower of subsp. *pubiflora*.



Pimelea drupacea, flower of an erect shrub to 2 m high Δ the black succulent fruit ∇
Photos by John Simmons.





△ *Pimelea flava*, an erect shrub to 2.5 m with male flowers. Sketch, page 306.

Photos by John Simmons.

▽ *Pimelea pygmaea*, a dwarf much-branched dense cushion bush of Tasmanian mtns. and moors.



The Genus *Pimelea* — Section 3. *Epallage*

Eighteen Australian species, with involucre bracts absent or petiolate and leaf-like, hypanthium usually hairy, stamens usually sessile or very short and opening inwards. Fig. 10.

Group 1: hypanthium very reduced, only shortly extended above the swollen base in bisexual or female flowers, with the sepals erect.

Pimelea elongata is a herb 10–50 cm high, the young stems hairy; leaves alternate, narrowly elliptic, glabrous or with scattered hairs, $3-18 \times 0.5-2.5$ mm; inflorescence starting as a terminal cluster, elongating into an interrupted spike up to 50 mm long; flowers bisexual, densely hairy outside, yellowish or reddish. It occurs in central eastern Australia from the Flinders Ranges, South Australia, to Charleville, Queensland, commonly in soil with both sand and clay.

Pimelea interioris is a shrub to 1.3 m high; young stems hairy; leaves alternate, narrowly elliptic, somewhat hairy, $15-29 \times 2.5-5$ mm; inflorescence of few-flowered axillary clusters with both male and female flowers; flowers creamy white or pale yellow. It is known only from Palm Valley, N.T. Fig. 10A.

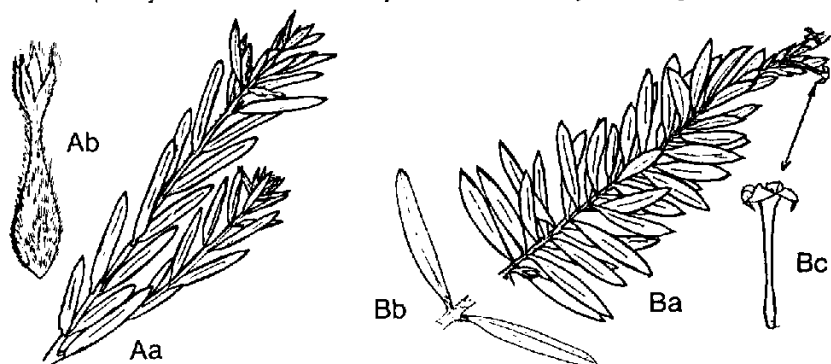


Fig. 10. A — *Pimelea interioris* described above; a. flowering branch; b. flower. B — *Pimelea aquilonia* described above; a. flowering branch; b. pair of opposite leaves; c. flower.

Group 2: hypanthium usually prominently extended above the swollen base (exception: *P. strigosa*), the sepals spreading.

Pimelea aquilonia is a shrub 0.7–3 m high, the young stems with shiny hairs; leaves opposite, narrowly elliptic, glabrous with a slightly hairy undersurface, $8-35 \times 2-7$ mm; flowers few in a terminal cluster, male or female or bisexual, white or cream. It occurs on Cape York Peninsula, Queensland, mainly in sandy coastal locations. Fig. 10B.

Pimelea leptospermoides is a shrub 0.3–1 m high, the young stems hairy; leaves alternate, narrowly obovate to elliptic, sparsely hairy, $7-22 \times 2-7$ mm; flowers in upper leaf axils, bisexual or male, densely hairy, white. It occurs between Marlborough and Rockhampton, Queensland, often on stony hillsides.

Pimelea venosa is a shrub up to 1.5 m high, with young stems hairy; leaves alternate, narrowly elliptic or narrowly obovate, with long hairs, $7-23 \times 2.5-8$ mm; flowers 3–6 in a terminal cluster, bisexual, white. It occurs in black sandy soil between granite boulders on the New England Tableland, New South Wales.

The Genus *Pimelea* — Section 4. *Calyptrastegia*

Thirty-three species, widespread in Australia, with a head-like inflorescence, anthers usually opening laterally, ovary usually hairy at apex. Recently named species are described and illustrated below and the remaining species on page 322.

Pimelea aeruginosa is a shrub up to 1.5 m high, with glabrous stems; leaves opposite, ovate to narrowly elliptic, glabrous, 6–18 × 3–8 mm; flower head pendulous; bracts in 3–6 pairs, broadly elliptic to circular, yellowish; flowers bisexual or rarely female, glabrous, yellow. Occurs in the W.A. wheatbelt in sandy soils. Fig. 11A.

Pimelea bracteata is a shrub 0.6–2 m high, with glabrous stems; leaves opposite, narrowly obovate to elliptic, glabrous, 5–20 × 2–6 mm; flower head pendulous; bracts 6 or 8, broadly ovate-elliptic, glabrous, pale green and usually partially reddish-purple; flowers bisexual, pale yellow. It occurs along watercourses or in other damp locations in the Kiandra area, New South Wales.

Pimelea calcicola is a shrub 0.2–1 m high, with glabrous stems; leaves opposite, narrowly elliptic or elliptic, glabrous, 13–27 × 3–7 mm; flower head erect; bracts 6 or 8, ovate, glabrous, green; flowers bisexual, glabrous outside, pale to deep pink; the coast at Perth and nearby, W.A., in sand with limestone. Fig. 11B.

Pimelea ciliolaris is a shrub 20–30 cm high, the young stems hairy near the flower head; leaves alternate, narrowly elliptic or linear, 5–16 × 1–3 mm; flower head erect; bracts 9–15, green; flowers bisexual, densely hairy outside, white. It occurs in the Warrumbungle Range of New South Wales.

Pimelea cracens is a shrub 0.4–1.5 m high, with glabrous stems; leaves opposite, narrowly elliptic to ovate, glabrous, 6–22 × 2–6 mm; flower head pendulous; bracts in 3–5 pairs, yellowish to pale green, the outer ones often darker or partly reddish; flowers bisexual or rarely female, cream or pale yellow. It occurs from near Manjimup to Israelite Bay, Western Australia. Fig. 11C.

Pimelea drummondii is a shrub 0.4–2 m high, with glabrous stems; leaves opposite, elliptic, 10–48 × 5–18 mm; flower head usually pendulous; bracts in 3 or more pairs, pale green to yellow and sometimes partly reddish; flowers bisexual, white or cream. It occurs along the southern W.A. coast from Albany to Israelite Bay, on coastal sand dunes or sandy soil over granite. Fig. 11D.

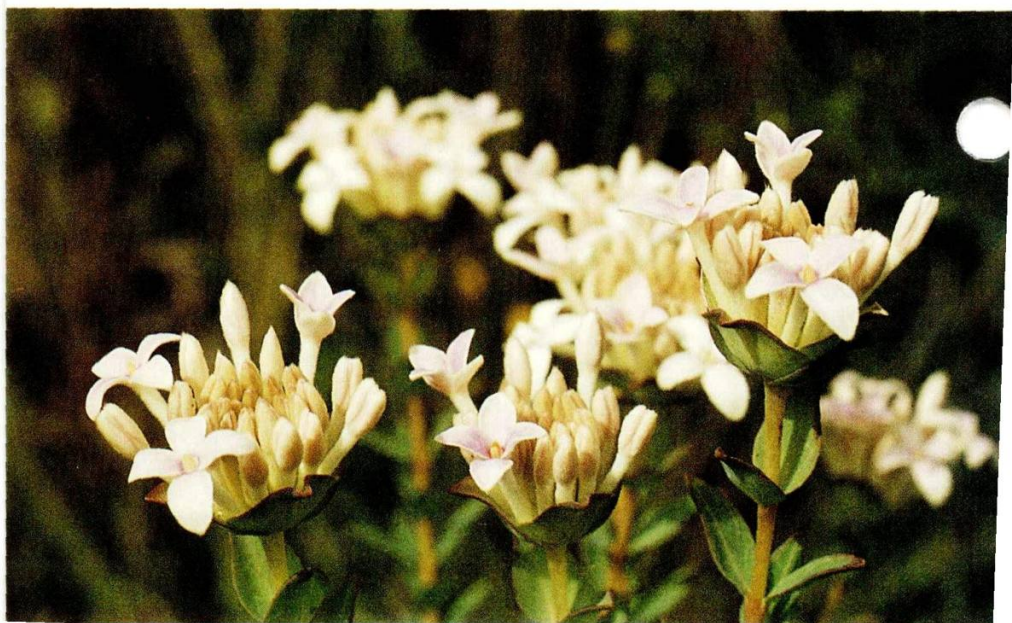
Pimelea erecta is a shrub 0.3–2 m high, with glabrous stems; leaves opposite, narrowly elliptic to ovate, glabrous, 5–20 × 1.5–5 mm; flower head erect; bracts ca. 10, densely ciliate, green with dark red at base; flowers bisexual, densely hairy outside, white or pale pink; in sand or clay, Ongerup to Israelite Bay, W.A. Fig. 11E.

Pimelea graniticola is a shrub 0.2–1 m high, with glabrous stems; leaves alternate, linear, glabrous, 4–17 × 0.5–1 mm; flower head erect; bracts ca. 40, narrow, ciliate, green; flowers bisexual, densely hairy outside, cream or white. It occurs in south-western Western Australia on granite outcrops. Fig. 11F.

Pimelea pagophila is a shrub 0.3–1.2 m high, with glabrous stems; leaves opposite, elliptic or narrowly elliptic, glabrous, 7–20 × 2–5 mm; flower head usually pendulous; bracts in 2–4 pairs, glabrous, pale green; flowers bisexual, glabrous outside, white. It occurs in The Grampians, Victoria.



△ *Pimelea suaveolens* — a small shrub, cultivation details, page 293. Photo by R. Paynter
 ▽ *Pimelea preissii*. Photo by R. Cranfield





△ *Pimelea haematostachya*. A northern perennial species. Photo by R. Paynter
▽ *Pimelea stricta*. Photo by Glen Woolcock



Pimelea pendens is a shrub 0.1–1 m high, with glabrous stems; leaves opposite, ovate to narrowly elliptic, glabrous, 6–18 × 3–8 mm; flower head erect; bracts in 1–3 pairs, glabrous, green; flowers bisexual or rarely female, glabrous, pale green. It occurs east of Esperance, Western Australia, recorded on coastal granitic scree slopes and in sandy clay. Fig. 11G.

Pimelea subvillitera is a shrub 15–60 cm high, the young stems hairy; leaves alternate, elliptic or narrowly elliptic, densely hairy, 2–8 × 1–3 mm; flower head erect; bracts 8–18, narrow, densely hairy, green; flowers female or bisexual, densely hairy outside, white. It occurs in the goldfields of Western Australia and on Eyre Peninsula, S.A., recorded on sandplains and rocky hillsides.

Pimelea tinctoria is a shrub 0.5–1 m high, with glabrous stems; leaves opposite, elliptic, glabrous, 9–21 × 4–10 mm; flower head pendulous; bracts in 4–7 pairs, densely ciliate, yellow or yellowish-green; flowers bisexual, hairy outside, yellow or yellowish-green. It occurs in Western Australia from Denmark to Stirling Range and Cape Riche, in sand, sometimes with gravel. Fig. 11H.

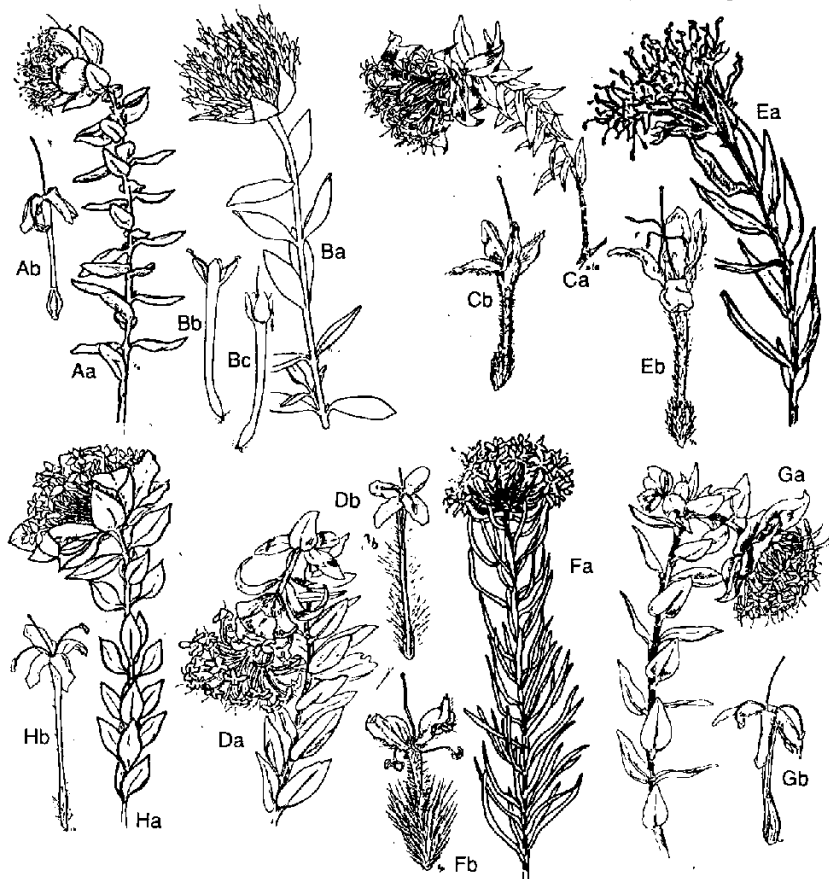


Fig. 11. Flowering branch and flower for each of the following species, all described on page 311. A — *Pimelea aeruginosa*. B — *Pimelea calcicola*. C — *Pimelea cracens*. D — *Pimelea drummondii*. E — *Pimelea erecta*. F — *Pimelea graniticola*. G — *Pimelea pendens*. H — *Pimelea tinctoria*.

The Genus *Pimelea* — Section 5. *Macrostegia*

A single Western Australian species, *Pimelea physodes*, with exceptionally large showy involucral bracts hiding the flowers and very long sepals and stamens. See Fig. 1F, page 303 and photograph on page 292.

The Genus *Pimelea* — Section 6. *Stipostachys*

Three species (*P. decora*, *P. haematostachya* and *P. holroydii*) from the Pilbara region of Western Australia and Queensland, with nodes flush with the stem rather than protruding, with long dense inflorescences and the bracts usually deciduous. Typical of the group is the one shown in the colour photograph of *Pimelea haematostachya* on page 313.

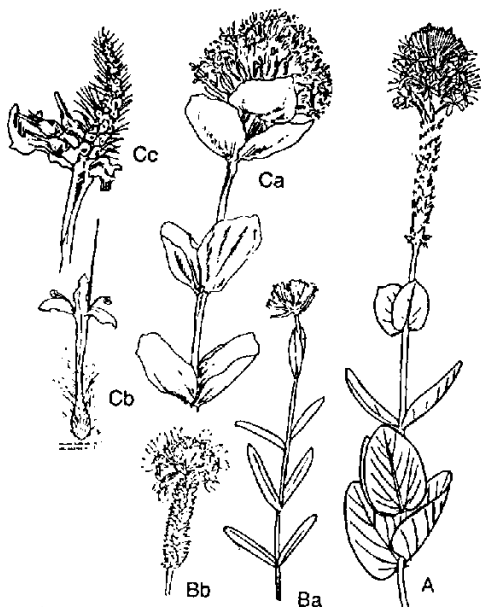


Fig. 12. A — *Pimelea decora*, B — *Pimelea haematostachya*, C — *Pimelea holroydii*, Ca flowering stem, Cb flower, Cc fruiting inflorescence.

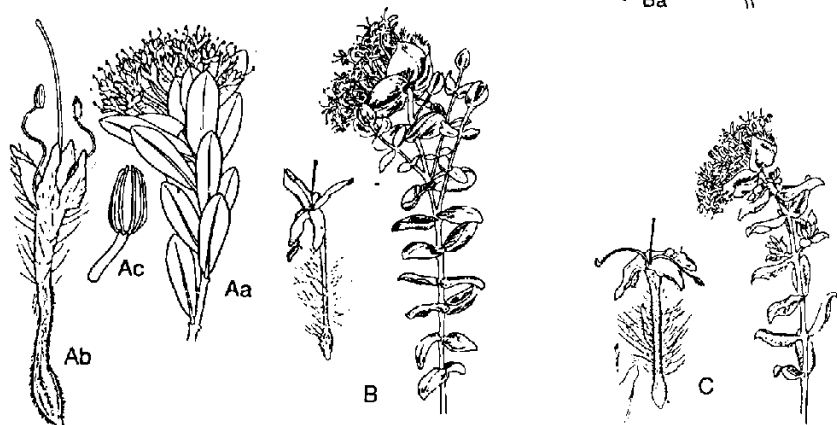
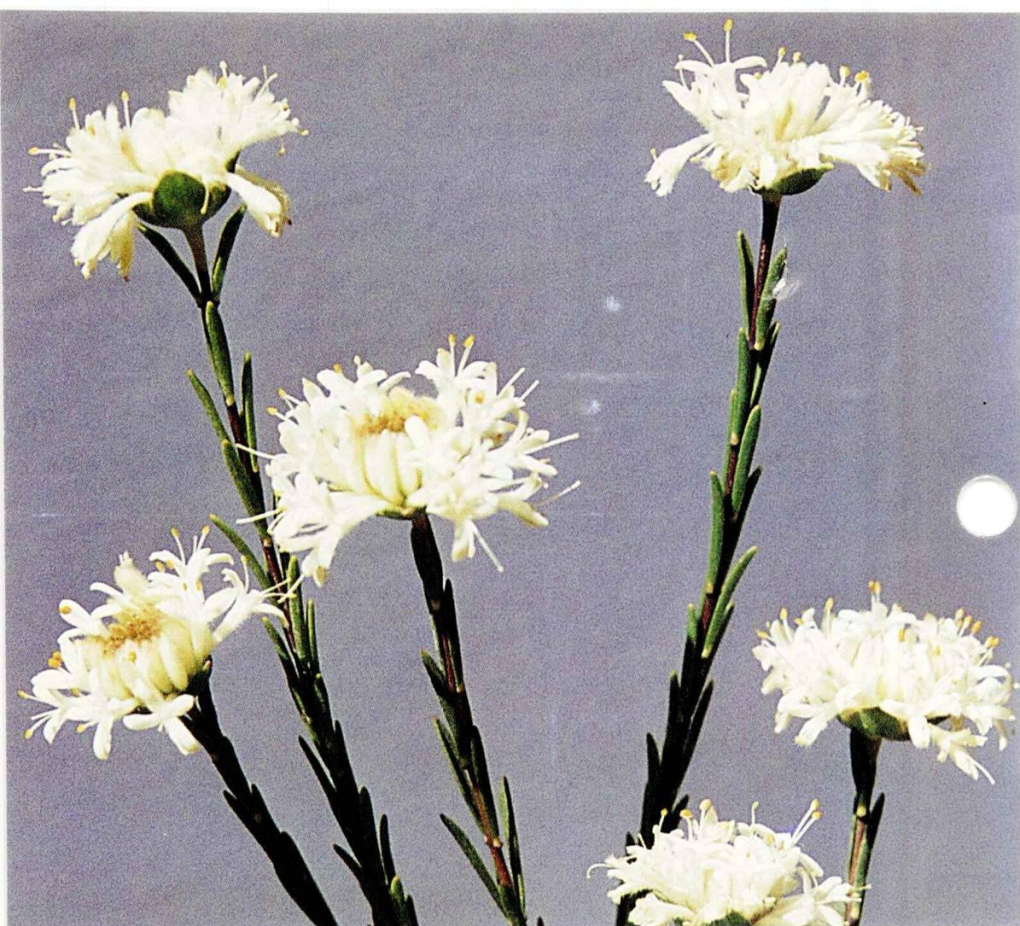


Fig. 13. Flowering branch (a) and flower (b) for each of the following species, all described on page 317. A — *Pimelea rara* (b) flower and (c) stamen, B — *Pimelea sessilis*, C — *Pimelea ciliata*.



△ *Pimelea angustifolia*. Photo by F. W. Humphreys

▽ *Pimelea brevifolia* ssp. *modesta*, an excellent small shrub for cultivation, see page 291. Photo by Neil Marriott.



The Genus *Pimelea* — Section 7. *Heterolaena*

Fourteen species, all from south-western Western Australia, with long flowers, most having a mixture of long and much shorter hairs above the swollen base of the hypanthium, which usually persists intact in fruit.

Pimelea avonensis is a shrub 0.4–1 m high; leaves ovate-elliptic or linear, $5\text{--}24 \times 0.5\text{--}3$ mm, margins recurved and becoming revolute; flower head erect; bracts 4 or 6; flowers bisexual, white (often pink in bud). It occurs in the Western Australian wheatbelt, mainly in sandy soils. Fig. 14A.

Pimelea brevistyla is a shrub 0.3–1.3 m high; leaves narrowly ovate, $7\text{--}28 \times 2\text{--}4$ mm, margins recurved; flower head erect; bracts 2 or 4; flowers bisexual, white. It occurs in lateritic or granitic areas of Western Australia from Perth to Serpentine and from Wubin to Hyden. Fig. 14B.

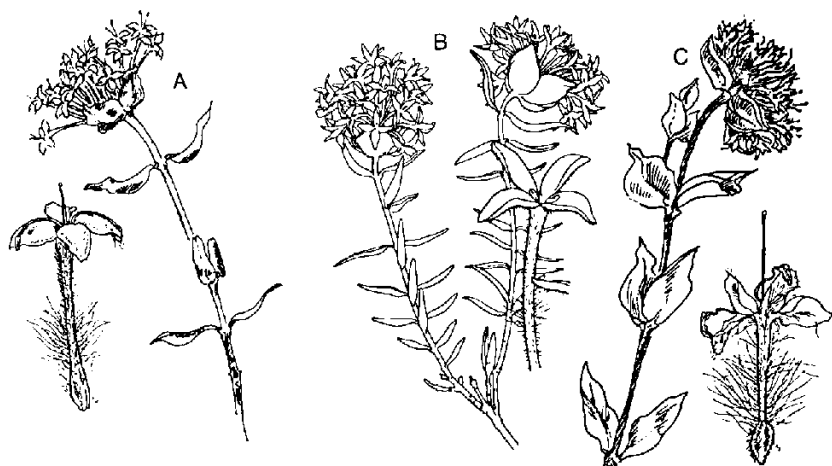


Fig. 14. *Pimelea avonensis*, *P. brevistyla* and *P. lanata*.

Pimelea ciliata is a shrub 0.5–1 m high; leaves ovate to almost linear, acute, $5\text{--}22 \times 2\text{--}7$ mm, margins recurved to revolute; flower head erect; bracts 4 or 6; flowers bisexual, white or rarely pale pink. It occurs in Western Australia from Bindoon to Margaret River and Porongurup Range, on hills in lateritic and granitic soils. Fig. 13C.

Pimelea lanata is a shrub 0.7–4 m high; leaves usually narrowly elliptic, margins flat or incurved; flower head erect; bracts 4, the outer ones with a distinctive yellow margin; flowers bisexual, white to deep pink, circumscissile. It occurs in swampy areas on coastal plains from Perth to Albany, W.A. Fig. 14C.

Pimelea rara is a shrub 20–35 cm high; leaves elliptic or obovate, $15\text{--}30 \times c. 8$ mm, margins flat; flower head erect or pendulous; bracts 4; flowers bisexual, with a ring of short hairs inside at the throat, white. It occurs on the Darling Range near Perth, Western Australia, in lateritic soil. Fig. 13A.

Pimelea sessilis is a shrub 15–40 cm high; leaves sessile and somewhat stem-clasping, elliptic to almost circular, $6\text{--}15 \times 6\text{--}9$ mm, margins recurved; flower head erect; bracts 4; flowers bisexual or rarely female, white or cream. It occurs in sand in the Kalbarri area, Western Australia. Fig. 13B.

Appendix 1: Australian Members of the Genus *Pimelea*

Flower colour and distribution are given for each taxon. The species with characters atypical for each section are indicated by describing the unusual characters in brackets. Other characteristics that may be useful in distinguishing the taxa are also given in brackets. (References to descriptions of species in the above article and in previous issues of *Australian Plants* have been added by the Editor.)

The Genus *Pimelea* — Section 1. *Heterantheros*

Characteristics: Involucral bracts distinctive, female heads much hairier than male heads, hypanthium long but non-circumscissile, ovary glabrous, fruit dry and naked.

1. *Pimelea gilgiana*, white or pink flowers, Western Australia (coastal, bracts becoming deep red-purple in fruit). Description page 306, sketch Fig. 7. 12:299; 17:306

The Genus *Pimelea* — Section 2. *Pimelea*

Characteristics: Nearly all species are small-flowered with involucral bracts usually absent or leaf-like. Fruit may be succulent.

2. *Pimelea petrophila*, white, South Australia, New South Wales (stems hairy, hypanthium circumscissile). 12:256D
3. *Pimelea dichotoma*, white, South Australia, New South Wales, Victoria (stems hairy, hypanthium circumscissile). Description page 307. 17:307
4. *Pimelea flava*, yellow, South Australia, Victoria, Tasmania (stems hairy, involucral bracts distinctive but petiolate). Photo page 309 12:254, 299; 17:290, 306, 309
5. *Pimelea hewardiana*, yellow, Victoria (stems hairy). 12:254
6. *Pimelea serpyllifolia* (mainly coastal, fls. glabrous or subglabrous outside). 12:302
 - 6a. subsp. *serpyllifolia*, yellow or rarely greenish to white, Western Australia, South Australia, New South Wales, Victoria, Tasmania (stems slightly hairy).
 - 6b. subsp. *occidentalis*, white to pale yellow, Western Australia.
7. *Pimelea halophila*, white or cream, Western Australia (dwarf shrub on saltlakes, ovary glabrous). Description page 307, sketch Fig. 9A. 17:307
8. *Pimelea pelinos*, cream, W.A. (stamens subsessile). See Fig. 9B. 17:307
9. *Pimelea pygmaea*, white, Tasmania (alpine cushion-like plant, stems hairy, hypanthium glabrous). Photograph page 309. 12:374; 17:309
10. *Pimelea milliganii*, Tasmania (alpine, stems very hairy, stamens opening almost inwards). 12:374
11. *Pimelea cinerea*, white, Tasmania (stems very hairy). 12:374
12. *Pimelea clavata*, white to pale yellow, Western Australia (coastal, stems slightly hairy, fruit succulent). Fig. 15A. 12:299; 17:319
13. *Pimelea microcephala*, white to yellow or greenish (ovary glabrous, succulent fruit).
 - 13a. subsp. *microcephala*, Western Australia, Northern Territory, South Australia, Queensland, New South Wales, Victoria. Fig. 15C. 12:254, 302; 17:319
 - 13b. subsp. *glabra*, South Australia (hypanthium glabrous or subglabrous).
14. *Pimelea neo-anglica*, yellow or greenish yellow, Qld, N.S.W. (hypanthium glabrous or subglabrous, ovary glabrous, succulent fruit). 12:254; 17:307
15. *Pimelea pauciflora*, usually yellowish, New South Wales, Victoria, Tasmania (flowers completely glabrous, succulent fruit). 12:254
16. *Pimelea spinescens*, pale yellow, Victoria (branchlets spiny, ovary glabrous).
 - 16a. subsp. *spinescens* (flowers glabrous). Sketch Fig. 8C. 17:154, 307
 - 16b. subsp. *pubiflora*.

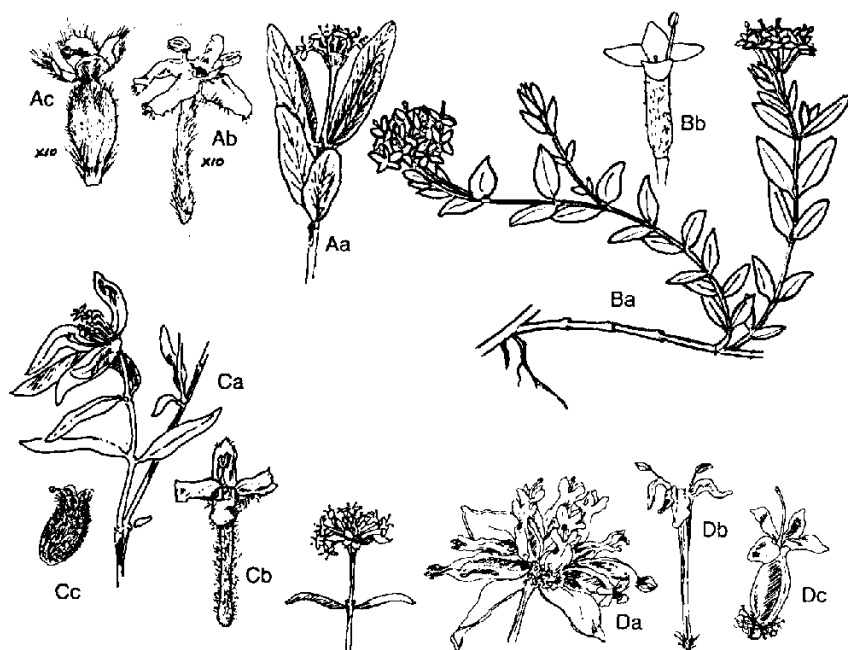


Fig. 15. Flowering branch and flower of the following species: A — *Pimelea clavata* is a dioecious shrub 1–5 m high with white to pale yellow flowers and a succulent fruit; B — *Pimelea filiformis* is a prostrate or semi-prostrate undershrub with pink or white bisexual flowers, with only one stamen; C — *Pimelea microcephala* is a dioecious shrub 0.7–2.5 m or more high, with a succulent fruit; D — *Pimelea spiculigera* is a dioecious shrub with glabrous yellow flowers.

17. *Pimelea axiflora*, white or whitish (axillary flower clusters, involucre bracts distinctive but small and petiolate). Description and sketch Fig. 8B. 12:254; 17:306
 - 17a. subsp. *alpina*, New South Wales, Victoria (alpine, flowers only sparsely hairy).
 - 17b. subsp. *axiflora*, New South Wales, Victoria, Tasmania.
 - 17c. subsp. *pubescens*, New South Wales (coastal, stems hairy).
18. *Pimelea drupacea*, whitish, Vic., Tas. (stems hairy, succulent fruit). Photo 308 12:258
19. *Pimelea filiformis*, pink or white, Tasmania (flowers glabrous or subglabrous, stamen solitary and longer than sepals). Photo 329, Fig. 15B. 12:374; 17:295, 306, 319, 329
20. *Pimelea spiculigera*, yellow or greenish yellow, Western Australia (flowers completely glabrous). Fig. 15D above. 12:303; 17:319
 - 20a. var. *spiculigera*, Western Australia (inflorescence long and interrupted).
 - 20b. var. *thesioides*, Western Australia.
21. *Pimelea forrestiana*, yellow, Western Australia (inflorescence long and interrupted, flowers completely glabrous). Description and sketch Fig. 8C. 12:299; 17:306
22. *Pimelea spicata*, white or pale pink, N.S.W. (coastal, inflorescence long and interrupted, flowers glabrous or subglabrous, hypanthium circumsissile). 12:253

The Genus *Pimelea* — Section 3. *Epallage*

Characteristics: Young stems hairy, involucre bracts absent or petiolate and leaf-like, hypanthium usually hairy, stamens usually sessile or very short and opening inwards, fruit dry and enclosed.

Group 1: Hypanthium very reduced, only shortly extended above the swollen base in bisexual or female flowers, with the sepals erect.

23. *Pimelea simplex*, white to yellowish green (inflorescence often long). 12:253

23a. subsp. *simplex*, South Australia, Queensland, New South Wales, Victoria.

23b. subsp. *continua*, South Australia, Queensland, New South Wales (arid zone).

24. *Pimelea sericostachya*, yellow, Qld (hairs shiny, inflorescence long).

24a. subsp. *sericostachya* (leaves narrow and with hairs larger on undersurface than on upper surface). 24b. subsp. *amabilis* (Cape York Peninsula). 12:253

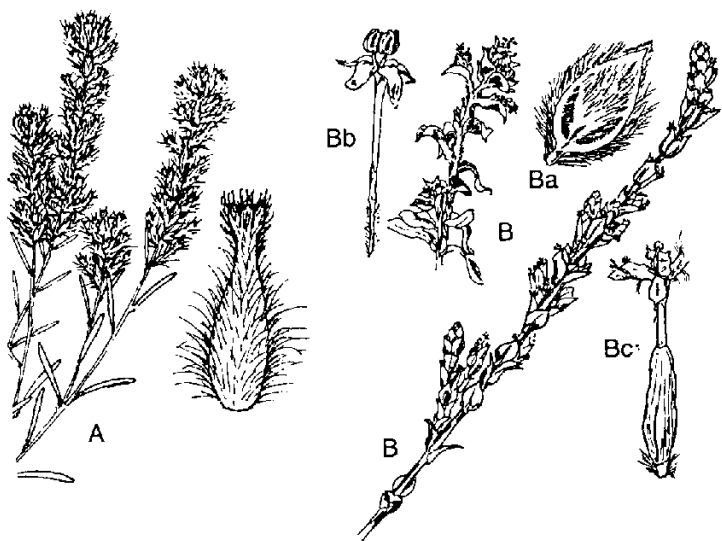


Fig. 16. A — *Pimelea trichostachya* is an annual semi-woody herb to 75 cm high, the inflorescence elongating as flowering proceeds, the flowers bisexual and densely white-hairy outside; a. flowering branch; b. flower. B — *Pimelea argentea* is an erect hairy often silvery shrub 0.4–1.8 m high, with male or female, usually yellowish flowers clustered in the leaf axils, the male flowers with a long pedicel; a. a leaf; b. male flowering branch; c. female flowering branch and flower.

25. *Pimelea williamsonii*, brownish, South Australia, Victoria (inflorescence long). 12:253

26. *Pimelea elongata*, whitish with yellowish or reddish sepals, S.A., Qld, N.S.W. (arid zone, herb, inflorescence long and interrupted). Description page 310. 17:310

27. *Pimelea trichostachya*, whitish, Western Australia, Northern Territory, South Australia, Queensland, New South Wales, Victoria (mainly arid zone, annual herb, inflorescence long and interrupted). Fig. 16A. 12:251, 303

28. *Pimelea interioris*, white to pale yellow, Northern Territory (arid zone, axillary flower clusters). Description page 310, sketch Fig. 10A. 17:156, 310

29. *Pimelea argentea*, white to yellow or greenish, W.A. (dioecious, hypanthium sometimes glabrous, stamens not sessile, opening laterally). Photo page 328. 12:298

30. *Pimelea micrantha*, whitish with red to yellow or brownish sepals, Western Australia, South Australia, New South Wales, Victoria.

Group 2: Hypanthium usually prominently extended above the swollen base (exception: *Pimelea strigosa*).

31. *Pimelea curviflora*, yellow, greenish yellow or reddish. 12:256
 31a. var. *curviflora*, New South Wales (coastal, leaves glabrous on upper surface).
 31b. var. *subglabrata*, N.S.W. (leaves glabrous on upper surface, sepals short).
 31c. var. *gracilis*, S.A., Queensland, N.S.W., Victoria (shrub up to 1.5 m high).
 31d. var. *sericea*, South Australia, Queensland, New South Wales, Victoria, Tasmania (leaves densely hairy on undersurface).
 31e. var. *divergens*, Queensland, New South Wales (leaves with long hairs and incurved margins).
 31f. var. *acuta*, New South Wales (often alpine, leaves yellowish and with long hairs).
 32. *Pimelea latifolia*. 12:256
 32a. subsp. *latifolia*, white, Queensland, New South Wales (leaves with small bumps on upper surface, inflorescence often long).
 32b. subsp. *altior*, white, Queensland, New South Wales.
 32c. subsp. *elliptifolia*, yellow to greenish yellow or reddish, New South Wales.
 32d. subsp. *hirsuta*, yellow with red sepals, N.S.W. (seeds with minute ridges).
 33. *Pimelea strigosa*, yellow or reddish, Queensland, New South Wales. (hypanthium short, fruiting peduncle long). 12:258
 34. *Pimelea biflora*, reddish, New South Wales, Victoria (alpine, inflorescence two-flowered). Sketch, Fig. 17C. 12:256; 17:321
 35. *Pimelea umbratica*, cream or white, Queensland, New South Wales. 12:258
 36. *Pimelea aquilonia*, white or cream, Qld (northern Cape York Pen.). 17:310
 37. *Pimelea leptospermoides*, white, Queensland. Description page 310. 17:310
 38. *Pimelea venosa*, white, N.S.W. (stamens not subsessile). 12:258, 17:310
 39. *Pimelea sericea*, white or pink, Tasmania (stamens not subsessile). 12:374
 40. *Pimelea nivea*, white to pink, Tas. (stamens not subsessile). Photo page 328. 12:373P

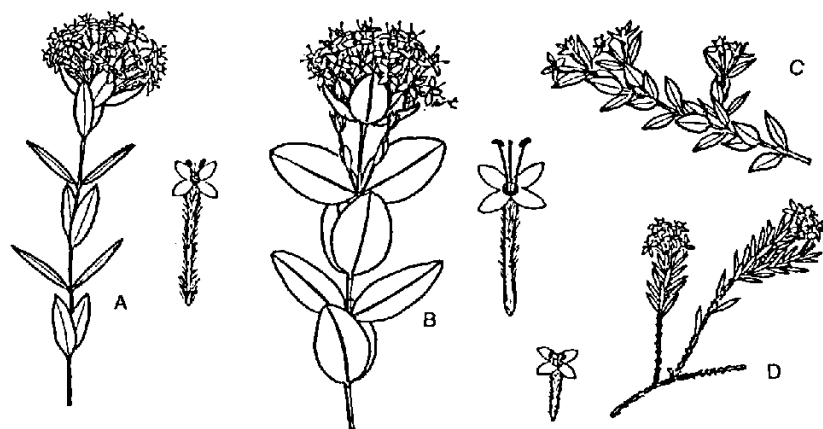


Fig. 17. Alpine *Pimelea* of Kosciuszko.

- A. *Pimelea linifolia* sub sp. *caesia* extends into the subalpine areas, see photo on page 304.
 B. *Pimelea ligustrina* sub sp. *ciliata* is widespread in subalpine areas to just above the tree line.
 C. *Pimelea biflora* is a prostrate shrub forming a mat of vegetation in alpine and the subalpine areas.
 D. *Pimelea alpina*, a prostrate or dwarf shrub with pink to white flowers, of the alpine and subalpine.
 Other alpine taxa are *Pimelea axilliflora* sub sp. *alpina* and the related genus *Kelleria* in Fig. 4F.

The Genus *Pimelea* — Section 4. *Calyptrostegia*

Characteristics: Inflorescence head-like, involucre bracts distinctive or leaf-like but sessile, anthers usually opening laterally, ovary usually hairy at apex, fruit dry and enclosed.

41. *Pimelea penicillaris*, white to yellow or pink, Northern Territory, South Australia, Queensland, New South Wales (mainly in arid zone, dioecious). 12:258
42. *Pimelea ammodaridensis*, white to deep yellow, Western Australia, Northern Territory (Pilbara and arid zone, dioecious). 12:294, 296P, 298
43. *Pimelea octophylla*, cream to pale yellow, South Australia, Victoria (inflorescence usually pendulous, anthers opening inwards). 12:256, 257
44. *Pimelea ciliolaris*, white, N.S.W. Description page 311. 17:311
45. *Pimelea graniticola*, cream to white, W.A. Description, page 311, Fig. 11F. 17:311
46. *Pimelea imbricata*. Fig. 18F. 12:288P, 295, 301, 17:294, 295, 322
 - 46a. var. *major*, white, Western Australia (coastal, stems glabrous, hypanthium with long hairs).
 - 46b. var. *simulans*, white, Western Australia (stems glabrous, hypanthium with long and short hairs).
 - 46c. var. *imbricata*, pale to deep pink, Western Australia (coastal, stems hairy).
 - 46d. var. *pilgera*, white to cream or pink-tinged, Western Australia (stems hairy).
 - 46e. var. *petraea*, white or cream, South Australia.
47. *Pimelea subvillifera*, white, W.A., S.A. (often arid zone). 17:314
48. *Pimelea villifera*, white, Western Australia. Sketch, Fig. 18H. 12:303
49. *Pimelea erecta*, white or pale pink, W.A., sketch Fig. 11E. 17:311, 314
50. *Pimelea sylvestris*, white or pink, Western Australia (flowers glabrous outside). Sketch Fig. 18E, photo page 329. 12:298, 303; 17: 322, 329
51. *Pimelea calcicola*, pale to deep pink, W.A. (coastal in limestone areas, flowers glabrous outside, stamens opening inwards). Sketch Fig. 11B. 17:246
52. *Pimelea phyllicoides*, white, South Australia, Victoria, Tasmania (stamens opening inwards). 12:258
53. *Pimelea longiflora*, white or cream, Western Australia (coastal, stamens subsessile and opening inwards). Sketch, Fig. 18G. 12:302, 322
 - 53a. subsp. *longiflora*, (involucre bracts glabrous inside).
 - 53b. subsp. *eyrei* (involucre bracts hairy inside).
54. *Pimelea preissii*, white to red, Western Australia. (stamens subsessile and opening inwards, ovary glabrous). Photo page 312. 12:295, 302
55. *Pimelea angustifolia*, white to yellow or pale pink, Western Australia (ovary usually glabrous). Sketch Fig. 18I. Photograph, page 316. 12:298; 17:316, 322
56. *Pimelea floribunda*, white or cream, W.A. (ovary glabrous). Sketch Fig. 18C. 12:289P, 291, 299; 17:322

Fig. 18. Flowering branch and flower of the following species: A — *Pimelea glauca* is a shrub to 1 m high but sometimes nearly prostrate, the leaves and four bracts usually bluish green, the flowers white or creamy. B — *Pimelea suaveolens* is a shrub 0.25–1.2 m high, with 8–14 usually yellowish bracts and pendulous pale to deep yellow flowers. C — *Pimelea floribunda* is a shrub 0.25–1 m high, the four broad bracts green with a red or pink base, the flowers white to cream. D — *Pimelea sulphurea* is a shrub 15–60 cm high, with six or more green or yellow bracts and pendulous yellow flowers. E — *Pimelea sylvestris* is a shrub 0.3–2 m high, with 4–8 bracts, which may become purplish, and glabrous white or pink flowers. F — *Pimelea imbricata* is a shrub to 1 m high, with 10–22 green or reddish bracts and white to deep pink flowers. G — *Pimelea longiflora* is a shrub 0.3–1.3 m high, with 4–6 green bracts, white to pink flowers and very short stamens. H — *Pimelea villifera* is a shrub 0.2–1 m high, with numerous narrow bracts, which are yellowish at the base, and white flowers. I — *Pimelea angustifolia* is a shrub 0.1–1 m high, with usually four green bracts and white or pale yellow flowers.



57. *Pimelea sulphurea*, yellow, W.A. (inflorescence pendulous). Sketch Fig. 18D.
12:293P, 298, 303; 17:322
58. *Pimelea ligustrina*, cream or white to pink. Sketch, Fig. 17B. 12:153, 250; 17:321
 - 58a. subsp. *ciliata*, New South Wales, Victoria (involucral bracts usually four and prominently ciliate).
 - 58b. subsp. *ligustrina*, South Australia, Queensland, New South Wales, Tasmania (involucral bracts usually six and usually not ciliate).
 - 58c. subsp. *hypericina*, New South Wales (involucral bracts 8–10 and hairy outside).
59. *Pimelea treyvaudii*, white, N.S.W., Victoria (ovary usually glabrous). 12:250; 17:293
60. *Pimelea humilis*, creamy white, South Australia, New South Wales, Victoria, Tasmania. Photo page 325, cultivation page 290. 12:250; 17:290, 325
61. *Pimelea glauca*, white or cream, South Australia, Queensland, New South Wales, Victoria, Tasmania (ovary often glabrous). Sketch Fig. 18A. 12:247; 17:294, 323
62. *Pimelea alpina*, reddish to white, N.S.W., Victoria (alpine). Sketch Fig. 17D.
12:250; 17:321
63. *Pimelea stricta*, white to yellow, South Australia, New South Wales, Victoria. 12:258
64. *Pimelea linifolia*. Photo page 304, cultivation page 290, Sketch Fig. 17A.
12:250; 17:290, 304, 321
 - 64a. subsp. *linoides*, New South Wales, Victoria, Tasmania.
 - 64b. subsp. *collina*, Queensland, New South Wales.
 - 64c. subsp. *linifolia*, South Australia, Queensland, New South Wales, Victoria, Tasmania.
 - 64d. subsp. *caesia*, N.S.W., Vic. Photo page 304. 17:304
65. *Pimelea pagophila*, white, Victoria (inflorescence pendulous, hypanthium glabrous outside). Description page 311. 17:311
66. *Pimelea bracteata*, pale yellow, New South Wales (inflorescence pendulous, hypanthium glabrous). Description page 311. 12:250; 17:311
67. *Pimelea macrostegia*, pale yellow, South Australia (Kangaroo Island, inflorescence pendulous). 12:250
68. *Pimelea pendens*, pale green, Western Australia (inflorescence pendulous, flowers completely glabrous). Description page 314, sketch Fig. 11G. 17:314
69. *Pimelea aeruginosa*, yellow, W.A. (inflorescence pendulous, hypanthium glabrous, ovary minutely hairy throughout). Description page 311, sketch Fig. 11A. 17:311, 314
70. *Pimelea cracens*, cream or pale yellow, Western Australia (inflorescence pendulous, ovary hairy throughout). Description page 311, sketch Fig. 11C. 17:311, 314
 - 70a. subsp. *cracens*.
 - 70b. subsp. *glabra* (hypanthium glabrous).
71. *Pimelea tinctoria*, yellow or yellowish green, Western Australia (inflorescence pendulous, ovary hairy throughout). Description page 314, Fig. 11H. 17:314
72. *Pimelea suaveolens*, pale to deep yellow, W.A. (inflorescence pendulous, ovary hairy throughout). Sketch Fig. 18B, Photo page 312. 12:288P, 298, 303; 17:312, 322
 - 72a. subsp. *suaveolens*.
 - 72b. subsp. *flava* (leaves glaucous).
73. *Pimelea drummondii*, white or cream, W.A. (coastal, inflorescence pendulous, ovary glabrous). Description page 311, sketch Fig. 11D. 17:311, 314



Pimelea humilis, the flower $\triangle$, Photo J. Simmons — ∇ the plant, photo Neil Marriott.
A dense, low thicket plant to 30 cm high and up to 2 m wide. Cultivation details on page 290.



The Genus *Pimelea* — Section 5. *Macrostegia*

74. *Pimelea physodes*, green or creamy, exceptionally large showy bracts hiding the flowers and very long sepals and stamens, W.A. Sketch Fig. 1F. 12:295, 302; 17:297

Characteristics: Inflorescence head-like and pendulous, involucre bracts very large and hiding flowers, ovary glabrous. fruit dry and enclosed.



Fig. 19. Flowering branch and flower of the following species, all of which usually have four broad bracts: A — *Pimelea terruginea* is a coastal shrub 0.3–1.5 m high, with pale to deep pink flowers; B — *Pimelea lehmanniana* is a shrub 0.3–1.2 m high, with white to yellow flowers having a ring of hairs inside the throat; C — *Pimelea hispida* is a shrub 0.4–1.5 m high, the bracts hairy inside, the flowers pink; D — *Pimelea leucantha* is a shrub 0.4–2 m high, with large cream or yellow flowers; E — *Pimelea spectabilis* is a shrub 0.5–2 m high, with large white to pale pink or pale yellow flowers, the sepals hairy inside; F — *Pimelea rosea* is a shrub 0.3–1 m high, with pink to deep red-purple flowers; G — *Pimelea brevifolia* is a shrub 0.1–1 m high, with small leaves and white to pale yellow flowers; H — *Pimelea brachyphylla* is a shrub 0.1–1 m high, with small leaves and small white flowers.

The Genus *Pimelea* — Section 6. *Stipostachys*

Characteristics: Stems glabrous, nodes flush with stem, inflorescence spike-like and erect, involucral bracts usually deciduous, flowers bisexual, ovary hairy at apex, fruit dry and enclosed.

75. *Pimelea decora*, red, Queensland (mainly arid zone, hypanthium with mixed long and short hairs throughout). Sketch Fig. 12A. 12:252P, 253; 17:315
76. *Pimelea haematostachya*, red, Qld. Sketch Fig. 12B, Photo page 313. 12:253; 17:315
77. *Pimelea holroydii*, white or cream, Western Australia (Pilbara, involucral bracts persistent). Sketch Fig. 12C. 12:295, 301; 17:315

The Genus *Pimelea* — Section 7. *Heterolaena*

Characteristics: Long flowers, most having a mixture of long and much shorter hairs above the swollen base of the hypanthium, which usually persists intact in fruit.

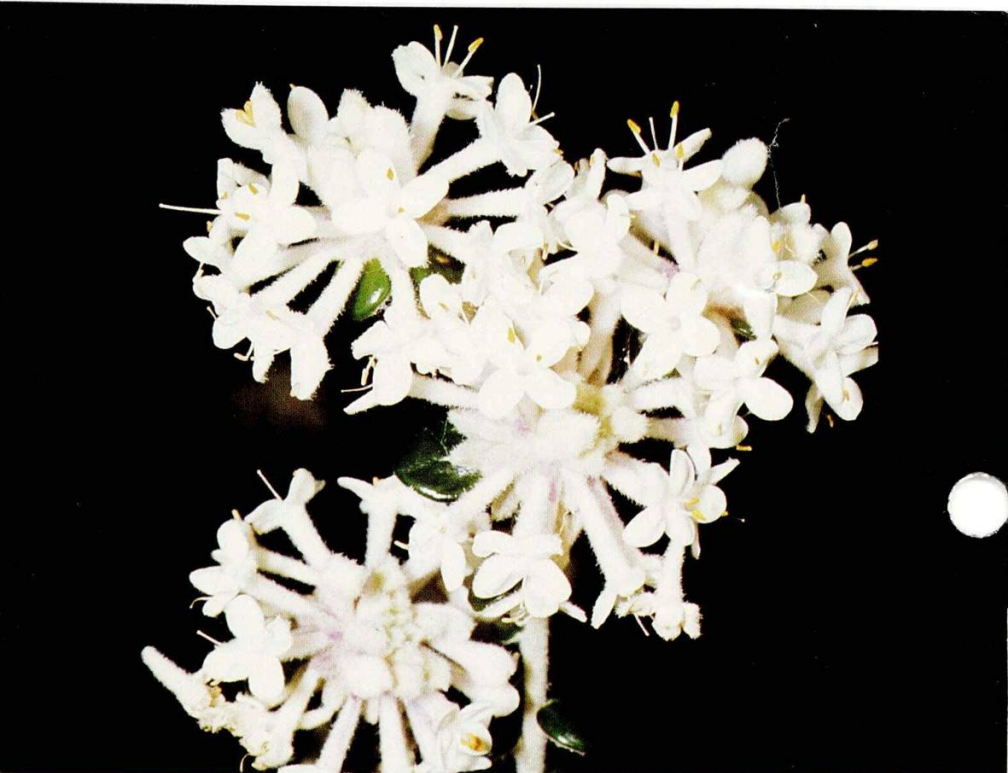
78. *Pimelea lehmanniana*, white to pale yellow, Western Australia (flower throat with a ring of long hairs). Sketch Fig. 19B. 12:285P, 295, 301
78a. subsp. *lehmanniana* (hypanthium hairy on swollen base and circumscissile).
78b. subsp. *nervosa* (hypanthium glabrous on swollen base).
79. *Pimelea sessilis*, white or cream, W.A. (leaves sessile). Sketch Fig. 13B. 17:317
80. *Pimelea rara*, white, Western Australia. Sketch Fig. 13E. 17:317
81. *Pimelea spectabilis*, white to pale yellow or pale pink, Western Australia (sepals hairy inside). Sketch Fig. 19E, photo page 292. 12:298, 302; 17:292, 293, 294, 326
82. *Pimelea leucantha*, pale yellow or cream, W.A. Sketch Fig. 19D. 12:295, 301; 17:326
83. *Pimelea avonensis*, white, Western Australia. Sketch Fig. 14A. 17:317
84. *Pimelea brevistyla*, white, Western Australia (stamens subsessile and opening inwards). Sketch Fig. 14B. 17:317
84a. subsp. *brevistyla* (Darling Range).
84b. subsp. *minor* (wheatbelt, small flowers).
85. *Pimelea ciliata*, Western Australia. Sketch Fig. 13C. 17:305, 315
85a. subsp. *ciliata*, white or rarely pale pink.
85b. subsp. *longituba*, pale pink (coastal).
86. *Pimelea rosea*, pale pink to red-purple, W.A. (coastal). Sketch Fig. 19F. 12:295, 302
87. *Pimelea ferruginea*, pale to deep pink, W.A. (coastal). Sketch Fig. 19A. 12:299, 292P
88. *Pimelea hispida*, pink, Western Australia (coastal). Sketch Fig. 19C. 12:300P, 301
89. *Pimelea lanata*, white to deep pink, W.A. (coastal). Sketch Fig. 14C. 17:317
90. *Pimelea brevifolia*, white or rarely pale yellow, W.A. Sketch Fig. 19G. 12:299; 17:326
90a. subsp. *brevifolia* (hypanthium with long erect hairs on swollen base).
90b. subsp. *modesta* (hypanthium with long spreading and short hairs on base).
91. *Pimelea brachyphylla*, white, Western Australia. Sketch Fig. 19H. 12:298; 17:326

AUSTRALIAN INDIGENOUS ORCHIDS — Vol. 2

by A. W. Dockrill

This completes the two-volume reference to Australia's epiphytic orchids and the terrestrials of the tropics. This book is the only complete up-to-date scientific reference to the orchids of Australia, excluding the terrestrial orchids of the southern temperate areas, and will be the standard reference for scientists throughout the world for at least 20 years. It will be maintained this way by presenting any changes as they are formally published and accepted in *Australian Plants*.

The unique feature of this scientific book is that any orchid lover can readily use it to identify species as each has a large, full-page drawing with clear details of all features. While the major part of the descriptions of each species, each covering a page, are in precise botanical terms, there are sections at the bottom of the page with a readily digested description of notable features of the plant and a guide to its cultivation. As the only complete reference you will need a copy. Volumes 1 and 2 are each priced at \$84 and orders placed during the next six months will receive a 10 per cent discount and will be post free. See page 331.



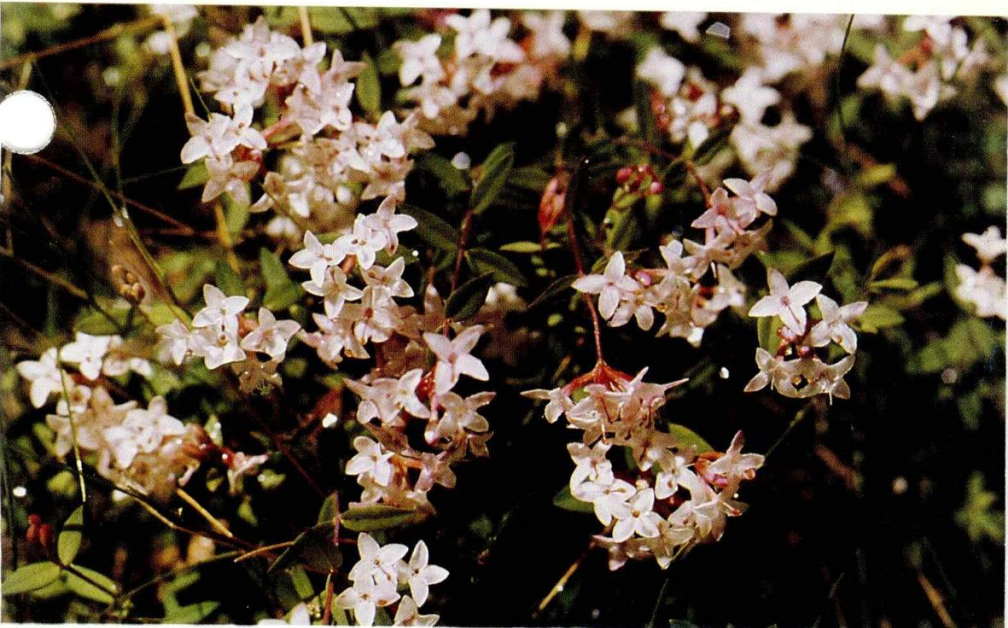
△ *Pimelea nivea*, an adaptable Tasmanian species ideal for cultivation, page 291.
Photo by John Simmons

▽ *Pimelea argentea*, a plant with male flowers. Photo by F. W. Humphreys





△ *Pimelea sylvestris*. Photo by F. W. Humphreys ▽ *Pimelea filiformis*. Photo by John Simmons



Kangaroo Island's Native Plants

Prepared by Ivan Holliday, Bev Overton and Dean Overton, this small book could be promoted as the ideal way to present the flora of an area. A major portion of the island's flora, 246 species, are presented, each by an excellent colour photograph and a brief, simple description. With four colour plates per page this has restricted their size but they are all so well photographed that the identification of the flowering plants of the island is quite simple. It is a real pity that those seeking a copy will be confined to visitors to the island. Be sure to get a copy if planning a visit — it is excellent value at \$14.00. For others, this book is a valuable photographic record of Australian flora.

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Dendrobium nindii

An Australian Orchid

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