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We are concerned with many aspects of the Australian flora. Here we concern ourselves with the home garden.

The home gardener wants reliable advice on how to plan the overall landscape design, how to prepare the area, what plants to plant and how to maintain that area to the best effect. As everyone's situation is different we approach this problem in three ways. In each issue we hope to show you, in colour, feature areas of successful gardens as we have done here. If you can see enough of these your own ideas will form and you can develop your own unique garden setting. For this I need colour slides of attractive areas of gardens from all parts of Australia. Readers, make a special effort with the camera this flowering season. Take a whole roll of slide film. For scene photographs you do not need a super camera or equipment although a wide angle lens will help.

The preparation and general gardening techniques will be examined in each case as has been done for this issue. The plants for use in various aspects have been presented over many issues and this will be carried on with reference to the wealth of knowledge already published. Finally we will encourage the development of selected plants, the very best forms for colour and shape especially bred for reliability. ■

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COVER PLATE

Gompholobium ecostatum

Photography by Neil Marriott.

Gompholobium ecostatum grows on Flinders Island (Tas.), in southern and western Victoria (e.g., Wilsons Promontory, Otways and the Grampians), and in the southern districts of South Australia. Its habitat is heath or dry sclerophyll (*Eucalyptus*) forest, in sandy or gravelly clay soils. The plant is low, with short stems which are procumbent at the base and ascending to about 30-40 cm at the tips. Its most attractive feature is the rich orange to red colour of the petals (sometimes they are paler, even yellowish). This usually serves to distinguish it from the yellow-flowered *Gompholobium minus* of New South Wales, with which it was previously included. The name *ecostatum* means 'lacking ribs' [on the calyx], which is another point of distinction from *G. minus*.

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My Garden — 2

by Graham Eastwood

The garden pictured on the next page is one that I left in the Latrobe Valley in 1987. My success here may be of interest. I hope to report on my new garden on the New South Wales south coast in a couple of years time.

The Latrobe Valley garden was on top of an undulating area. The soil was a greyish clay on a lower strata of yellow clay. I did not use any other soil in the garden. My house is the highest block in the street, the surrounding houses sloping away from mine. Being on top, the ground profile was a gentle slope, something like 0.5 metres fall over 10 metres. After the house was built I did not rush about buying as many plants as I could. Instead I straightened out and smoothed the soil and sowed grass to stabilize the soil. After more than twelve months I then bought some native plants. The number of species that I knew I could count no more than on my two hands. My planting methods may contribute to the success. The day I wish to plant, I water the plants in their pots. While in the pot I give every plant a fairly severe pruning. I believe that a plant suffers shock when it is removed from its ideal protected pot-life and planted in its new but harsh environment. I prepare a circular hole just a bit bigger than the pot. The ground must have only received rain. I put the plant in and press the soil firmly. I like my plants sitting above the soil by a couple of centimetres. Soil is then shaped up to and over the potted section of the plants leaving a little hillock. This stops water pouring into the disturbed soil. I never water my plants in.

I planted my first batch of plants in holes in the lawn. They were *Calothamnus villosus*, *Calothamnus quadrifidus*, *Banksia aemula*, *Eucalyptus lehmannii*, *Regelia inops* and a few smaller ones like *Boronia heterophylla* and *Boronia megastigma*. The lawn needed attention but I never watered the plants on the lawn which was allowed to go brown in summer. It was difficult to work around the plants and occasionally the weed slasher would injure a trunk so I expanded the area around the plants into plots.

Over a number of years, and as my knowledge of plants grew, I would plan ahead to gradually whittle down the lawn area. Every year a few square metres of lawn would vanish by killing the lawn using 'Zero'. On the Zeroed patch I would lay down plastic sheet and weight it down with red scoria to make the patch look attractive. In twelve months time when repeating this routine, the previous patch was resurrected and plants were put in. This method made sure that weeds and grass were absolutely eliminated. This allowed me to use the original soil. It also proved that native plants do not need special "doctored-up" soil, and could survive even if the soil in summer, especially the top of it, got like concrete. Eventually there was no lawn.

As you can see I have used red scoria stone to eliminate weeds and to conserve moisture in the ground. In the scoria I used bricks to walk on so as not to crush the scoria into the ground preventing compaction of the soil and aeration.



Garden of Graham Eastwood△

▽ *Thomasia pygmaea*





My Garden – 2

Grown and adored by Graham Eastwood

Front left, *Lechenaultia formosa*, and between it and the bright blue *Lechenaultia biloba*, but not in flower, *Dampiera purpurea* and *Dampiera rosmarinifolia*. The very low pink flowered plant in the centre is *Stylidium bulbiferum*, beside another orange flowered *Lechenaultia* and in front an orange flowered *Lechenaultia formosa*. Behind this is a *Boronia pilosa* in front of a large shrub, *Boronia mollis*. To the left of this against the brick fence is *Dryandra quercifolia* and to the right is the Waratah, *Telopea speciosissima* which is in front of *Banksia coccinea* with flowers just peeping over the top. Coming back along the brick fence on the right we have *Epacris impressa* (Bega form), an orange flowered *Lechenaultia formosa* and a large yellow flowered *Dryandra polycephala*.

Opposite top: A photograph of the same area but looking back to the house shows a flat low dome formed by the pink *Stylidium bulbiferum* with a red flowered *Lechenaultia* in front of it and the large orange *Lechenaultia* of the foreground of the other photograph. This particular plant has done extremely well, as this is in a rockery with some sand added to the original soil/clay? See 'Growing *Lechenaultia*' page 99. The plants growing against the house are from left to right, *Boronia thymosa*, *Epacris apacilis*, *Boronia fraseri*, *Boronia aneminophilla*, *Boronia pilosa* and *Epacris impressa*.

Opposite bottom: *Thomasia pygmaea*. A delightful little plant about 30 cm across, in Graham Eastwood's garden. Of all the beautiful, well grown plants I choose this photograph. we have not described this hardy group of plants in past issues and it is obviously time we did. Will readers please send notes and colour slides of species of *Thomasia* and other genera in the plant family. ■

It would be wrong to think that I never had plant failures. I did, but over the years, the successful plants eventually dominated. I never had disease problems and, particularly, never insect problems.

The following were planted in 1981/2/3 and are still doing well. *Adenanthos obovata*, *Banksia coccinea*, *B. blechnifolia*, *B. media*, *B. petiolaris*, *B. prostrata*, *B. spinulosa*, *B. victoriae*, *Beaufortia decussata*, *Blandfordia nobilis*, *Boronia anemonifolia*, *B. cymosa*, *B. fraseri*, *B. floribunda*, *B. heterophylla*, *B. mollis*, *B. molloyae*, *B. muelleri*, *B. pinnata*, *B. serrulata*, *Conostylis aculeata*, *C. bealiana*, *Correa pulchella*, *C. reflexa*, *Darwinia leiostyla*, *Dryandra proteoides*, *D. polycephala*, *Epacris impressa*, *E. reclinata*, *Eriostemon buxifolius*, *E. nodiflorus*, *Eucalyptus ficifolia*, *E. caesia*, *Grevillea 'Misty Pink'*, *G. longifolia*, *G. 'Robyn Gordon'*, *G. 'Sandra Gordon'*, *Lythrum salicaria*, *Melaleuca fulgens*, *M. steedmannii*, *Pultenaea subalpina*, *Telopea oreades*, *T. speciosissima*, *Thomasia pygmaea*, *Ricinocarpos pinifolius*, *Verticordia drummondii*, *V. monadelpha*. ■

Editor's Comment on the My Garden Article

When Graham Eastwood sent me photographs of his garden and a list of plants he has grown successfully, I was stunned. It was a list of the plants very experienced wildflower gardeners have tried to grow for years, and failed. I must admit I was rather sceptical, even suspicious. Was someone trying to pull my leg? The whole claim seemed a fantasy, but, there was photographic evidence. What is more the plants were more than five years old.

Following numerous letters, I finally got the story from him, as told here. This only served to confuse me further so I wrote the article on "Gardening In Clay Areas" and sent it to him for comment. His methods appeared to contradict the observations made over many years. He is on the top of a hill but does not water, he has not improved this clay soil, he digs a small hole for a new plant in which it should drown, he cuts the fresh growing ends off a plant before planting it, he does not water the plant in — all measures that should point to disaster. I go back to the photographs, trick photography?

Graham replies "Yes, I agree that drainage must be excellent. Before I put any plants in, in the early days, I tested various areas for drainage. I dug a hole about 30 cm by 30 cm and filled it with water. If the water went in one hour, that was good for Western Australian plants. Most of the property passed this test." Does this mean that, in fact, it is not really clay soil at all? What is it at Latrobe Valley. Graham goes on to say "Before development for housing, this was dairy farm country but in this particular area the drainage was too good to establish grasses and clover without excessive fertilization. Erosion has removed any top soil leaving what I understand to be a clay sub-soil."

A heavy soil holds nutrient and if the water can get away downhill, drains slowly. It seems Graham does not have the heaviest of clays which form in flat plain country and in addition there has been excavation for a driveway with brick retaining walls on either side, a long brick fence across the front to a footpath at a lower level. Such brick retaining walls must have good drainage behind them when erected or the water eventually pushes them out. I must conclude that Graham has a heavy soil that does permit slow drainage to the drained lower levels and that the natural rainfall in the Latrobe Valley is sufficient to maintain some sweet water low down encouraging deep rooting.

There is a vital lesson to be learnt from this garden and I hope that someone, competent to study and report on soil conditions, will take the time to go and examine this situation. We would all like a garden like this one. There appears to be a secret ingredient. Would the initial use as a lawn followed by twelve months fallow under plastic contribute? Will these ideal conditions deteriorate with time? Have another look at the photographs and ponder or, as in my case, share the envy and frustration. ■

Editor's Note to his notes: Fortunately Graham does not mind my critical assessment of his article. It is not intended as a criticism but rather to highlight certain aspects for further comment and advice.

Growing *Lechenaultia*

by Graham Eastwood

I took a fancy to the colourful *Lechenaultia* in latter years because of their prolonged flowering, colour and the little space they took up. In the photograph the *Lechenaultia* are growing in the normal garden soil. From November they are cut back to a very few strands a few centimetres from the main trunk. The photographs on page 97 show them planted directly into the garden. In addition, I built three rockeries that were 30 cm deep. The soil was made up of 50-50 washed sand and clay. Of course I tried a few other plants in the rockeries but the *Lechenaultia* always came first. Autumn was the most popular time for planting as a number of nurseries sold them only at this time of the year, if you could get them. Also the autumn rains dampened the soil. I would prune them back first even if they had flowers, dig a hole just larger than the pot, put them in and firmly press down the soil around them.

Each year the flowers would remain on till the first week or two in November. I would give them a severe pruning letting them regain their full stature in late autumn. The blue *Lechenaultia biloba* got the same treatment leaving just a few strands a few centimetres long from the main trunk. The plants were from four to six years old when I left, all doing well. ■

Gardening In Clay Areas

by W. H. Payne

Hopefully the photographs of the garden in this issue will put to rest the long-held myth that our wildflowers will only grow in poor sandy soils. In fact, those with poor sandy soil are at a real disadvantage in many instances.

Plants need a firm anchor in the ground, nutrition, sunlight and fresh sweet water. Heavy soil provides ideal anchorage and is rich in nutrients but has a water flow problem. Solution to this problem is easy on a sloping site. The garden beds can be cut into the slope always ensuring that the bottom of the garden bed is still sloping down to drain away water.

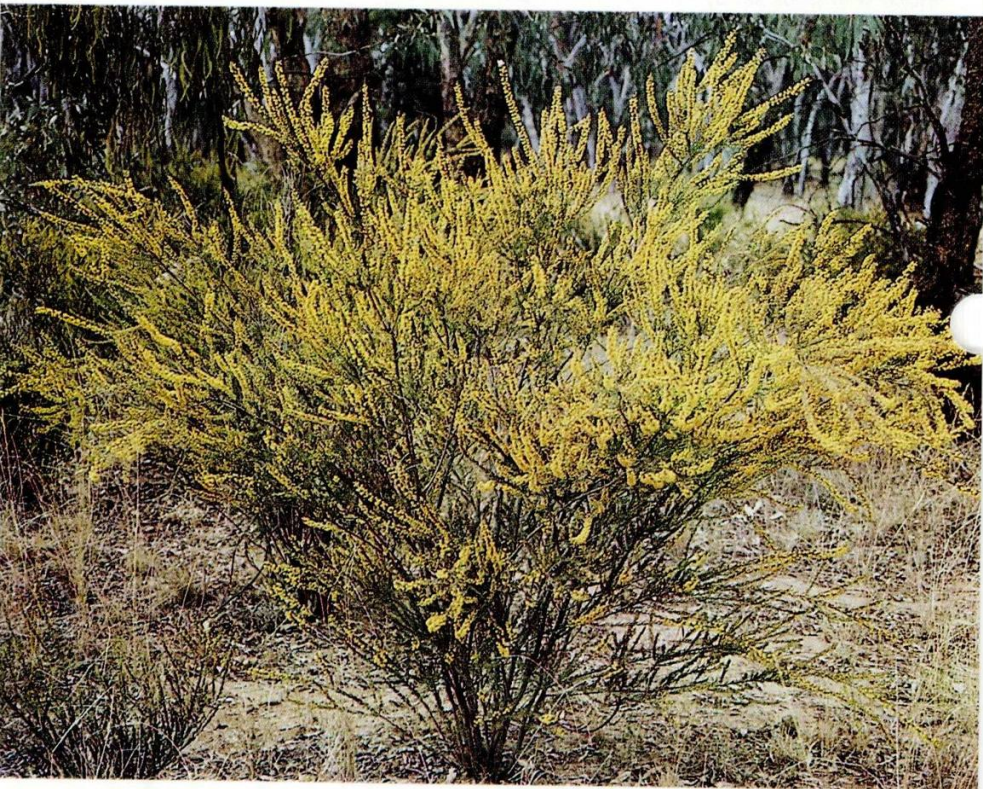
Many people are fortunate enough to live on the side of a gentle slope where the heavy soil is some distance down and the water from their neighbours further up the slope is running down the hill in a moving water table a metre or so underground. This is the ideal self watering, automatic fertilizing method that requires no artificial watering at all, just regular pruning to hold back vigorous growth. This type of situation is ideal for many plants, particularly the coloured flowering dwarf *Eucalyptus*. The water is moving slowly down the water table and like a country stream, maintains a fresh sweet attraction, at least for plants.

How to achieve this ideal of deep rich soil over a moving sweet-water table is the problem to be solved in situations less than this ideal. With at least some sort of slope enough for a drainage system, this is achieved by the initial installation of drainage pipes. A difficult, costly, unattractive task that most of us avoid and hope for some painless solution. If you are a keen gardener you will spend the rest of your gardening life fighting this problem, in frustration and ultimately conceding defeat. The other alternative is to build up the garden beds letting the surrounding paths be the drainage channels. This is the only solution on a flat clay site and many fine gardens have been built along this way. ■



Acacia cometes △

▽ *Acacia lineata*



Decorative Wattles

by Norm McCarthy, Toowoomba

There are more than 800 species scattered throughout our vast continent. Many are medium to small shrubs, some even prostrate in habit. With these moderate characteristics they are eminently suitable for gracing small suburban gardens. Also in large gardens they may be used as understory plants or even as border subjects to complement and lend colour and foliage variation to nearby larger vegetation.

The immense range and variation in form and foliage is amazing! Because of this many may be grown to provide infinite interest and diversity to this incredible genus of plants with a difference. Plants may be slender, upright, sprawling, low, spreading pendulous or ground hugging in habit. There are many attractive in-betweens, almost defying description in mere words, such is their complexity. The leaves botanically described as phyllodes in *Acacia*, occur in endless and in a bewildering array of forms. Some, as such, are described as ferny, large and small, entire, round, long, thin, terete, triangular and elliptical, to name a few. Harsh, hard, rough, crinkled, twisted and so on provides another dimension. Colour of the leaves plays an important part and can be said to appear white, grey, green, bluish and red in new growth.

The flowers abound in many shades, from brilliant golden yellow through to paler shades, to cream and white. One of our Queensland species is even purple. And this is not all! Flowers can occur in various ball formations — solitary, in pairs, clusters of a few together or in massed display to hide the foliage. In full bloom they provide a subject of great beauty to the beholder. Just to be different some have fingers of flowers.

The seed pods attract further interest and add further character to the appearance. Pods vary in size and shape and change considerably from their very beginning until they ripen and dissipate their seeds, finally disintegrating. Some are striped in greens and browns, others mealy or grey and also black in the latter stages. As they approach maturity many change shape and curl or twist, adding to the appearance. They then open their pods and dispel their seeds, which can be collected for germination.

It is frequently difficult to obtain plants in nurseries and other retail outlets. However, most species may be easily raised from seed. A simple exercise to obtain desirable plants. Quick and easy to germinate and fast growing, they are soon ready to put out in a permanent garden situation. Seed can be obtained from S.G.A.P. seed banks or commercial suppliers.

My selections from many small wattles that will grace your garden are:

Acacia amblygona may be spindly to two metres but selected forms are an almost prostrate spreading shrub growing to one metre with phyllodes that are narrow, triangular or lanceolate. The flowers are small, mid-yellow in colour occurring in heads of 10-15. The foliage is stiff and sharp providing a good ground cover over a large area. The plant is long living with an extended flowering period. Occurrence — New South Wales and Queensland — Volume 1 of "Acacias of Australia", see page 156.

Acacia acinacea (previously *A. rotundifolia*) is a spreading small shrub up to two metres, producing bright golden globular flower heads. The spectacular obovate or almost round phyllodes grow to a length of 0.5-1.5 cm and end in a fine point. Spiral seed pods are an added attraction in this species. *A. rotundifolia* is frost and drought resistant and occurs mainly in Southern Australia.

Acacia baeuerlenii is an unusual plant, slender and upright in growth. It can reach two metres in cultivation but can grow to four metres. The phyllodes are narrow, hairy, grey/green structures, 15 cms by 1 cm with parallel veins and tapering at both ends. The flowers normally occur in large, dense, creamy, white heads. The flowering period is from autumn to mid winter. The plant is hardy and attractive. Occurrence — New South Wales and S.E. Queensland.

Acacia beckleri is a shrub that grows to a height of perhaps three metres in good conditions, sometimes less in dry areas. The long and narrow, bright green, sometimes greyish phyllodes are 7-17 cm by 6-25 mm and taper towards the base. The large flowers occur in heads of 50 or more and are bright yellow in colour. The flowers are most complimentary to the foliage in winter and spring. Occurrence — NSW and S.A. — Volume 1 of "Acacias of Australia".

Acacia boormanii (previously *A. hunteriana*). A slender, many stemmed shrub growing to three metres tall which is inclined to sucker. The phyllodes (8 cm by 2-3 mm) are linear, grey-green in colour with a hooked tip. The small flower heads feature bright yellow balls of colour in spring. Occurrence — southern New South Wales and Victoria.

Acacia caroleae doratoxylon (previously var. *angustifolia*) is a spreading shrub of about two metres. The phyllodes are long and narrow (15 cm $\times$ 2 mm). Some can be a slender tree but mine has an open habit and is startling in full bloom featuring golden yellow rods of flower. A fine specimen. Occurrence — NSW and Qld. — Volume 1 of "Acacias of Australia".

Acacia conferta is a shrub usually growing to two metres (sometimes larger) with variable but fine to dense foliage which is somewhat sessile and pubescent (stem clasping and hairy). Flowers are large and brilliant yellow in colour. They may occur singly or in pairs and are profuse. The shrub is interesting even when not in flower. Flowering occurs mainly in August and September but some forms carry flowers constantly when in cultivation. Plentiful near Miles in S.E. Queensland and New South Wales — Volume 2 of "Acacias of Australia".

Acacia chinchillensis was named comparatively recently. It has typical ferny blue/grey leaves and a height of 1.5 m with spreading branches. Bright yellow flower balls occur in long racemes in July-August. Occurrence — Chinchilla area, Queensland — Volume 2 of "Acacias of Australia".

Acacia cometes is a plant which may exhibit either dwarf or prostrate characteristics. Bright yellow flowers complement the very fine short terete foliage. *Cometes* is a good specimen for the odd corner or small garden. It has an open loose spreading habit. Occurrence — W.A. — Volume 1 of "Acacias of Australia".

Acacia flexifolia (meaning to bend but not to break) is a column-like sparse shrub which may reach two metres. It features fine, linear, spathulate phyllodes up to 5 cm long. The flowers are small and yellow but distributed sparsely. This is a dainty, distinctive and interesting species. Occurrence — New South Wales, Queensland and Victoria — Volume 1 of "Acacias of Australia".

Acacia granitica (granite loving). A well grown specimen of this species growing on a bank commands instant attention. It can achieve a height from 1.5 to 2 m. The fine, linear, grey-green foliage, with its fine parallel veins, measures approximately 25 cm by 1-3 mm. The leaves can be so fine as to be almost terete. The flowers are short stubby rods of brilliant yellow about 12 mm long but are sometimes not over numerous. *A. granitica* is most attractive in form and foliage. Occurrence — NSW and Qld. — Volume 1 of "Acacias of Australia".

Acacia hispidula (meaning spiny or rough and refers to the young stems). An erect spreading shrub to 1.5 m. The phyllodes of this species are unique: broadly falcate, denticulate, scabrous and hairy. The pale, sparsely distributed flowers are small and reasonably insignificant. A most unusual but interesting small shrub. Occurrence — New South Wales and Queensland.

Acacia iteaphylla. Like *A. hunteriana* above this is a many stemmed shrub which grows to three metres. A feature of this shrub is its grey-green foliage which is delightfully red tipped when young. Individual plants can vary in that some may have foliage which droops while others are erect or upright in habit. Phyllodes approximately 10 cm × 0.5 cm. Profuse pale yellow flowers occur in globular heads. Occurrence — South Australia — Volume 1 of "Acacias of Australia".

Acacia lineata. An erect bushy plant which may reach a height of 1.5 metres with crowded foliage to ground level. The phyllodes are short and narrow about 12-25 cm by 2-4 mm. The plant is drought and frost hardy. Bright yellow, globular flower heads, singly or in pairs provide a dense display in spring. *A. lineata* is a most ornamental shrub, with good windbreak potential for interplanting. Occurrence — widespread. Photograph on page 100.

Acacia linophylla (known vernacularly as 'Horse mulga' and/or the 'mulberry Acacia'). This is a most attractive shrub from inland Australia and is a plant with many attributes growing to a height and spread of 2 metres. The phyllodes are approximately 15 cm by 0.3 cm, grey-green in colour, linear/terete, pungent, pointed and pleasantly curved. The flowers are short rods of bright gold, plentiful but not over abundant.

A. linophylla is unique when in full seed as the pods are delightfully striped and hang rigid and vertical. The species (although little known) grows well in Brisbane and Toowoomba but requires excellent drainage, perhaps in a raised bed. Germination of seeds is good but beware — seeds can 'damp off' with excess moisture.

This is probably the loveliest acacia I have grown. It prefers full sun and with care it will thrive for several years. Occurrence — the Northern Territory near Palm Valley, also Western Australia and South Australia.

Acacia macradenia (the zig-zag wattle). This plant is so named because of its zig-zag growth habit. It grows up to four by three metres. A feature of the plant is the most attractive falcate, dark green phyllodes (20 cm by 10-15 cm). It sometimes assumes a drooping habit. Flowers are bright golden heads in racemes to 8 cm in length. This desirable medium shrub prefers full or part sun and is most suitable for hot dry situations although it is frost hardy. Flowering occurs in late winter. Occurrence — west of Rockhampton in Queensland and adjacent areas — Volume 1 of "Acacias of Australia".

"Acacias of Australia" by Marion Simmons is a series of books describing our wattles. Each species has a page of simple description opposite a full page, full size sketch of a flower branch with a detail of the seed pod and seed. With 800 species, it will be appreciated that this is a huge but valuable task. It is available, so far, in two volumes from your bookseller, Volume 1 for \$29.95 and Volume 2 for \$50.00. The large number of species is presented in groups and you will readily identify any wattle or appreciate how it will fit into your garden.

Acacia trinervata (three nerves) is a medium semi-open shrub with grey-green foliage with linear phyllodes. The phyllodes feature three parallel veins tapering to a pungent point and measure 1-4 cms by 1-3 mm. The flowers are light bright gold in colour, occurring singly, in pairs or in clusters and often terminally. Flowering may occur two or three times per year. Seed pods are long narrow and prolific and enhance the overall appearance. The plant is very hardy but rare. Occurrence — New South Wales and Queensland.

Acacia uncinata (hooked — referring to the tips of the phyllodes) is a most variable shrub in all respects (height, phyllodes and flowering). A general description however, may be low and bushy to erect and spreading to three metres. It is robust and fast growing in cultivation and responds well to pruning. The phyllodes are broadly lanceolate or ovate, hairy, hooked and undulate, 7 to 25 mm long, and can be quite glabrous. Flowers occur singly or in heads of twenty to thirty and are pale lemon to bright gold. The species is long flowering. Occurrence — New South Wales and Queensland.

Acacia purpureapetala (purple petals) is a rare plant with mauve to purple flower heads. It occurs as a dwarf spreading shrub with lanceolate, hairy, leathery foliage 2 by 0.5 cms. The plant is unusual because of its flower colour. Flowers are small, sparse and occur sporadically from May to October. The seed is not easy to germinate and cuttings are difficult to propagate. This small shrub is difficult to sustain. The only known habitat of this species is in the Herberton district on the Atherton Tableland, North Queensland where it grows in most inhospitable soil conditions — Volume 1 of "Acacias of Australia". ■

Preparation for Planting Difficult Ground In Tasmania

by Bruce Champion

The method I use to prepare ground for growing natives is to first 'Round-Up' the nasty weeds such as twitch and oxalis twitch. Then break up the base dolerite clay with a pick, trying not to break a wrist on the buried rock! I then liberally spread sheep or horse manure over the area and cover the lot with 100 to 200 mm of eucalyptus bark. The bark has been high pressure water hosed off logs at the Triabunna (east coast of Tassie) woodchip mill and is short strands of fibrous bark. Just perfect for mulch.

When planting through this mulch, I mix a bucket or two of sandy loam and two-year-old, well broken down *Eucalyptus* bark 1:1, with 2 tablespoons of 6 month Osmocote per bucket of mix. Then I use a trowel to make a planting hole down through the bark mulch to the clay soil below. Pour in a bucket of water, and when it has drained away, position the well soaked plant with the loam mix to leave the original plant soil level about 25 mm below the bark mulch. The loam mix is used to fill around the plant. The bark mulch is spread back around the plant but not against the stem.

I found that the recent invasion of black birds to our previously undisturbed two hectare dry sclerophyll property disturbed the bark mulch just around the plant, sometimes leaving it high and dry with an empty 'moat' around it. I now surround the plants with a ring of rocks with the plant name label flat on the ground under the northern side rock (à la Jenny Closs).

Syzygium

Three name changes explained —
Peter G. Wilson, Royal Botanic Gardens, Sydney

In *Australian Plants* Vol. 14, No. 110 (1987) a summary was given of Bernie Hyland's revision of *Syzygium* and allied genera, followed by a synopsis of the species of *Syzygium*. Because of the abbreviated nature of that synopsis there was no emphasis given to the fact that a widely cultivated species had finally been identified and that two well-known species had had name changes.

Syzygium paniculatum Gaertn.

This was the first species of *Syzygium* to be collected in Australia. It was collected, probably by Joseph Banks, at Botany Bay in May 1770 during the time immediately following the Endeavour's arrival there. It is ironic that the name given by Gaertner in 1788 should have been misapplied for almost 200 years. It has been widely cultivated and previously generally considered to be a cultivar of *Syzygium coolminianum* (now=*S. oleosum*) because of its magenta fruit colour. In the wild it occurs close to the coast. Apart from the populations still to be found near Kurnell, particularly at Towra Point, it has also been collected from Jervis Bay, the Gosford area, and from near the Myall Lakes. Despite having such a limited natural distribution, *S. paniculatum* is probably one of the most widely cultivated *Syzygium* in Sydney, more commonly grown than *S. luehmannii*.

Distinguishing characteristics are: Branchlets smooth; Veins indistinct and oil dots obscure; Inflorescences terminal and fruits with polyembryonic seeds (usually seen as one large cotyledon and three or more small ones).

Syzygium oleosum (F. Muell.) B. Hyland

This species was previously known as *Syzygium coolminianum* in New South Wales. The name had to be changed when it was discovered that a plant described nearly 30 years earlier from northern Queensland was the same species. The advantage of this change is that the name is more appropriate since it refers to the conspicuous oil dots which are such a notable feature of the leaves. One of the most widely distributed species of *Syzygium* with a range extending from the Daintree River in northern Queensland to Stanwell Park in NSW. It occurs in rainforest and on rainforest margins.

Distinguishing characteristics are: Branchlets smooth; Main veins distinct, oil dots numerous and conspicuous; Inflorescences axillary, fruits with a single embryo (two cotyledons) in the seed.

Syzygium australe (Wendl. ex Link) B. Hyland

This species was previously known as *Syzygium paniculatum*. When the true identity of *S. paniculatum* was discovered, this species required a new name and the epithet from *Eugenia australis* (the oldest existing name for the species) was taken up. *Syzygium australe* has an even wider natural distribution than *S. oleosum* and is found from Mossman in northern Queensland to Milton on the south coast of New South Wales. It is predominantly a rainforest species, often occurring in riparian rainforests along rivers and streams.

Distinguishing characteristics are: Branchlets with four narrow wings that meet at each node and form a 'pocket' on each side; Main veins distinct, oil dots sparse and just visible to the naked eye; Inflorescence terminal, fruits with a single embryo per seed. ■

Crowea and Boronia In My Garden

By K. Rachel Makinson

After reading Norm McCarthy's very interesting article on Croweas in 'Australian Plants' 14 (116), September 1988, I wrote to him to offer a little supplementary information about their usefulness in the garden. The Editor has since asked if he can publish my letter as this article, and I am happy to comply, although I do not claim much expertise.

I have found *Crowea* to be very rewarding plants in difficult conditions. I did not expect them to do well in my garden at Mount Victoria in the Blue Mountains, New South Wales, and was surprised when they did. My garden is on the escarpment, at an elevation of more than 1 000 m. The soil is very poor; all the topsoil has been worn or blown away except in a few pockets. It often takes me an hour or more to dig a hole for a plant. The ground is full of *Eucalyptus* roots and the spaces between them are full of rocks. The soil sets like cement 24 hours after rain. The block slopes fairly steeply. I think there is a rock shelf not far down, because when we get heavy rain or when my neighbours water heavily, springs break out along the lower part. (This description refers only to the front garden. The back is sandy and falls very steeply to the cliff edge. I have left it almost in its natural state.)

The natural vegetation in the front garden was sparse, with scrawny trees (*Eucalyptus dives*, *E. piperita*, *E. sieberii* and *E. blaxlandii*) and an understorey dominated by very fine *Banksia spinulosa* var *cunninghamii*, leggy *Hakea dactyloides*, and leggy *Dillwynia retorta*. Most other plants in the understorey were marginal. I have planted other Australian plants among this natural vegetation.

I have *Crowea saligna* and *Crowea exalata*, and five of their hybrids: *Crowea* 'Parry's Hybrid', *Crowea* 'Cooper's Hybrid', *Crowea* 'Festival', *Crowea* 'Poorinda Ecstasy' and another *Crowea saligna* × *C. exalata*. I have several of each. All have done wonderfully well, through droughts when we were not allowed to hose, torrential rain, snow and frost. In 1986 we had -11°C of frost, which cut about one quarter of my natives down to ground level, and killed perhaps 10%, possibly fewer. (The others recovered). The *Crowea* were undamaged. All of them flower regularly. *Crowea saligna* usually flowers only once per year, in winter, but the others usually come in and out of flower right through the winter (not all at once, even if of the same type, so there are usually some in flower at any time in winter). This year, 1988-89, their behaviour has been different. We had a very mild winter, and for the first time they had only one flowering near the expected time, and it was later than usual. *Crowea* 'Parry's Hybrid', which I personally like better than *Crowea* 'Cooper's Hybrid', flowered poorly this year during spring, but early in January produced a wealth of flowers, which have continued through to the time of writing, early April. Soon afterwards the *Crowea* 'Festival' plants came into flower, then the *Crowea* 'Cooper's Hybrid' and the unnamed hybrids, and early in March the *Crowea saligna*, with exceptionally large flowers. Since then all have remained in flower, although a couple which were in an open position had some flowers withered by one of our few warm days early in March.

Crowea 'Parry's Hybrid' has a broadish leaf, more like that of *Crowea saligna*, though smaller, and *Crowea* 'Cooper's Hybrid' has a narrow leaf, like *Crowea exalata*. *Crowea* 'Festival' is much like Cooper's, but perhaps has a greater depth of colour. The unnamed hybrids have been in a year or less, and I have to admit that I have got some of them muddled with Cooper's, which they resemble. My form of *Crowea exalata* has a paler pink flower than most nursery forms, and is very pretty. The first one I put in is now one metre high and wide. I tip-prune only lightly as it maintains a good shape naturally.

I am not familiar with *Crowea angustifolia*, not having heard of it until I read Norm McCarthy's article. The conditions under which it grows naturally are not ones I could provide.

I have also been surprised at how well most *Boronia* do here. For the first four years I was here (1981-1985) we had a drought. I had *Boronia* 'Sunset Serenade' (a form of *Boronia muelleri*) and *B. heterophylla* in at the time, and they did not grow at all, but flowered well. Since the drought broke, they have grown steadily. About three years ago I put in two plants of *Boronia serrulata*, and I am very pleased with them. They grow fairly slowly, but flower wonderfully, holding their flowers for several months (a feature of many *Boronia*). At the time of the -11°C frost in 1986 both the *B. serrulata* were very small; one was damaged, but recovered. Subsequently a brick driveway was laid close to that plant, with a gutter fixed by cement 5 cm from it. I had plastic film put between the cement and the plant. That one is now very vigorous and healthy. It probably enjoys having its roots under the bricks. I also have *Boronia pinnata* (growing well), *B. thujona* (O.K.), *B. crenulata* (charming), a white, unnamed *Boronia* which is now a large bush and flowers prolifically, *B. floribunda* (which I may lose), *B. denticulata* (only fairly good), and *Boronia* 'Carousel' (*Boronia heterophylla* × *B. molloyae*), which has been in only about a year but seems O.K., plus several others put in only three weeks ago. In most cases I have at least two plants. I expect that I may lose *Boronia floribunda*, because I put in two plants, which came from Melbourne, in about October 1988, and one died in early January, probably from root rot. I saved the other at least temporarily with Fongarid, but that is not something that I want to use regularly. *Boronia denticulata* did very well at first, but has never been so good since the big frost. The only *Boronia* I have lost are the *Boronia floribunda* described above, a *B. serrulata* put in only a few months ago (probably to root rot), a *B. megastigma* (never long lived), and a charming double form of *B. pilosa* called 'Rose Blossom'. It was a small plant and did not last long.

I notice that Jean Galbraith, in the same issue of Australian Plants in which Norm McCarthy's article appeared, says that "cultural requirements for *Crowea exalata* are exactly the same as for *Eriostemon*." All I can say is that I had no trouble at all with *Crowea exalata*, but have had quite a lot of difficulty with several species of *Eriostemon*, including the supposedly easy *E. myoporoides*. ■

Eriostemon and *Phelialium* of the *Boronia* family.

The garden shown in colour on page 97 features a number of *Boronia* species. The closely related *Crowea* described above are equally attractive, usually pink flowered, plants. Also to be prized as small garden shrubs are species of *Eriostemon*. I am preparing an issue on *Eriostemon* and I need your help, your notes on cultivation experience and your colour slides to make the issue attractive and a valuable reference. *Phelialium* ? The recent issue gives just a glimpse of the horticultural potential of these plants. I need your help with notes and slides — Editor.

Conostephium

by Dr. Paul van der Moezel,
Univ. of Western Australia

Conostephium is a small Australian genus in the Epacridaceae family. Only seven species have been described and all are endemic to the temperate regions of Western Australia. They are all shrubs and are similar in habit and foliage to the more widely known *Astroloma* species (photograph opposite, bottom by J. B. Fanning), although the flowers are far less colourful. *Conostephium pendulum* is the most attractive species for cultivation, the long pendulous white flowers have a deep purple tip and appear during spring. In their natural environment *Conostephium* shrubs prefer a well-drained sandy soil and tolerate full sun or semi-shade. Propagation of *Conostephium* species can be done by cuttings, and this results in a very fine root formation.

Conostephium pendulum

Pearl Flower

<i>Habit</i>	Erect shrub 15-20 cm high
<i>Leaves</i>	Linear-oblong to obovate-oblong, flat with recurved margins, and a short pungent point 2-3 cm long.
<i>Flowers</i>	1.5-2 cm long on long reflexed peduncles. White corolla with purple tip. Flowering from May to November.
<i>Distribution</i>	Western Australia — south-west, mainly coastal.

The photograph, opposite, top is by Paul vander Moezel.

Conostephium minus

Pink-tipped Pearl Flower

<i>Habit</i>	Shrub up to 30 cm high.
<i>Leaves</i>	Narrow-linear, 1.5-1.8 cm long, glabrous with a small callous point, margins closely inrolled.
<i>Flowers</i>	1 cm long on short peduncles, erect at first, becoming recurved. Calyx white, corolla pink to red. Flowering from July to September.
<i>Distribution</i>	Western Australia — Perth region.

Conostephium roei

<i>Habit</i>	Shrub 30-50 cm high.
<i>Leaves</i>	Ovate to obovate or linear cuneate. Flat or with recurved margins, 1 cm long.
<i>Flowers</i>	1 cm long, almost sessile. Corolla white with purple tips. Flowering in September.
<i>Distribution</i>	Western Australia — south-west.

Conostephium preissii

<i>Habit</i>	Erect shrub 1 m high.
<i>Leaves</i>	Obovate-oblong to narrow-oblong. 1.5-3 cm long, flat or slightly curved margins.
<i>Flowers</i>	About 1 cm long on recurved peduncles. Corolla red. Flowering from December to May.
<i>Distribution</i>	Western Australia.



Conostephium pendulum △

▽ *Astroloma humifusum*



Conostephium drummondii

<i>Habit</i>	Erect shrub 60-90 cm.
<i>Leaves</i>	Ovate-lanceolate to linear-lanceolate. Flat or concave up to 1.2 cm long, prominently striate.
<i>Flowers</i>	1 cm long on short recurved peduncles. Corolla red-purple. Flowering in September.
<i>Distribution</i>	Western Australia — south coast.

Conostephium uncinatum

<i>Habit</i>	Erect shrub to 1 m high.
<i>Leaves</i>	Narrowly oblong-linear, 3.5-4.5 mm long, tightly revolute. Glabrous on upper side, silky hairy on lower surface. Pungent point.
<i>Flowers</i>	Solitary 6-7 mm long, sub-sessile. Corolla white, hairy. Flowering September-October.
<i>Distribution</i>	Western Australia — southern Mallee region

Conostephium marchantiorum

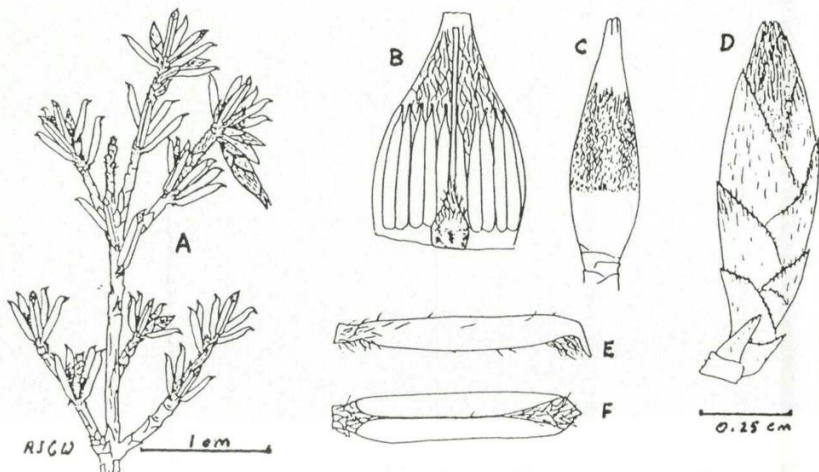
<i>Habit</i>	Erect shrub to 1.5 m high.
<i>Leaves</i>	Narrowly oblong-linear, 6.5-7 mm long. Closely revolute. Pungent point. Hairy throughout.
<i>Flowers</i>	Solitary in upper axils. 1 cm long on short recurved peduncles. Corolla hairy, white.
<i>Distribution</i>	Western Australia — southern Mallee region.

KEY TO THE SPECIES

- 1a Corolla tube cylindrical and glabrous inside 2
- b Corolla tube wider in the middle and hairy inside 3
- 2a Ovary glabrous; leaves obovate-oblong to narrow-oblong *C. preissii*
- b Ovary hairy on upper half; leaves ovate-lanceolate to linear-lanceolate; flat or concave, 1.2 cm long *C. drummondii*
- 3a Ovary glabrous; leaves flat or with recurved margins 4
- b Ovary hairy on upper half; leaves all revolute 5
- 4a Peduncles greater than 2 mm long; leaves linear-oblong to obovate-oblong, flat or with recurved margins, 2-3 cm long; flowers 1.5-2.0 cm long *C. pendulum*
- b Peduncles less than 2 mm long; leaves ovate to obovate or linear-cuneate, flat or with recurved margins, 1 cm long; flowers 1 cm long *C. roei*
- 5a Leaves with deflexed apex *C. uncinatum*
- b Leaves without deflexed apex 6
- 6a Leaves narrow-linear, 1.5-1.8 cm long, glabrous; bracteoles minutely pubescent on outer surface *C. minus*
- b Leaves narrowly oblong-linear, 6.5-7.0 mm long, hairy on both surfaces; bracteoles densely silky-hairy on outer surface *C. marchantiorum*

Two species have recently been described which, among other distinguishing characters, have hairs on the leaves and young branches as well as on the floral parts, *Conostephium marchantiorum* and *C. uncinatum*. The following sketch illustrates the characters used in the above key. *Conostephium preissii* and *C. drummondii* differ from the rest in having the corolla tube cylindrical (not wider in the middle as shown) and there are no hairs inside. *Conostephium pendulum* and *C. roei* have flat leaves, not recurved at the margins as shown. The revolute leaves of *C. uncinatum* are bent at the end (deflexed apex) and those of *C. minus*, not bent at the end are much narrower and less hairy on the outer surface than *C. marchantiorum*.

Conostephium is distinguished from the thirteen other genera in a section of the family *Epacridaceae* known as *Styphelieae*, by having wholly enclosed anthers and a conical corolla tube with minute erect lobes. A key to the species in the genus is as follows. (The notes below will assist you to read this key that is really quite simple).



Conostephium uncinatum: A — Flowering branch with one flower shown on the top right. The flower is shown enlarged in detail D, enveloped in coloured bracts. When these are removed the corolla tube is as shown in detail C being wider in the middle. In detail B, the corolla tube is opened out, showing its hairy inside and to show the ten stamens that would be attached to the centre of an ovary that is hairy on the upper half and supporting the style in the centre of the flower. The leaf is shown from two directions, showing the recurved margins, hairs on the enclosed surface and the deflexed apex. ■

The Epacrid Family, Epacridaceae

There are many very decorative plants in various groups of plants (genera) in the plant family Epacridaceae, the better known of which are *Epacris*, *Styphelia*, *Astroloma*, *Woollsia*, *Richea*, etc. Will readers please advise of their experiences in the cultivation of these plants, and send for checking any good slides they have of epacrids. — Editor.

Wattles and Pea-flowers from seed

This issue features many pea-flowered plants and *Acacia* (wattles), all of which are easy to grow and **all of which are easy to grow from seed**. What is more, seed of many of these species is available from the Western Australian Wildflower Society, P.O. Box 64, Nedlands, W.A. 6009, for \$1.00 a packet plus postage of 39¢ which would cover postage of a number of packets, or from Nindethana Seed Service, R.M.B. 939, Woogenilup 6324, for 60¢ a packet plus postage of 39¢. Place the seed in a cup, pour boiling water on them and leave to soak for a week. Wash off the dirty water and plant in a seed tray or shallow pot filled with a coarse sand or perlite or peat moss in equal parts, if you have any. As the seedlings grow to having four leaves, prick them out and plant in pots of sand mixed with soil and a little peat moss. You will get about 80% germination and this is a lot of plants to play with. Give it a go —Editor.



The Swamp Foxtail

by Russell Costin

Pennisetum alopecuroides — A showy grass

An ornamental in all aspects, this grass clump is fast growing and flowers all year in our garden. *Pennisetum alopecuroides* is one of the showiest of the native grasses. It is the only species of the genus that occurs naturally in Australia, though several exotic *Pennisetum* are grown, the most notable of which is Kikuyu grass. Fortunately, the swamp foxtail doesn't grow runners and take over the place like its African relative. The roundish bluish leaves curve back to the ground, while the purple flower spikes produced continually grow to one metre high, the whole clump eventually spreading to 1 m-1.5 m across. It appears to have few pests or diseases of the leaves and will grow with minimal attention on a wide variety of soils, though doing best where there is some moisture available. After a few years the clump may get a little untidy. Cut it down to ground level and it will quickly shoot back. Many people having seen it growing in our nursery gardens refer to it as a dwarf Pampas Grass. Certainly it would replace Pampas and be preferable to it in the home garden and be excellent in landscaping schemes. It is drought tolerant and handles quite severe frost, can tolerate grazing, and grows successfully as a clump even in lawns. It is generally grown from seed.

Our native grasses have been under utilized and are not widely appreciated. This plant is outstanding and a valuable addition to a native garden. As well as providing a pleasing appearance, a contrast in foliage and form, it provides a more balanced ecology feeding our native wrens and finches. ■



Gomopholobium huegelii △

▽ *Gomopholobium minus*



Gompholobium, The Glory Peas

by W. H. Payne

To the casual bushwalker of the eastern states of Australia, the dainty *Gompholobium* species are easily distinguished by their characteristic leaves, three fine leaves appearing to grow from the one point of the stem (except for *Gompholobium pinnatum*, *G. foliolosum* and *G. glabratum*, see below). If in flower they are a golden yellow and for the two most adored species, *Gompholobium latifolium* and *G. grandiflorum*, the largest, showiest pea flowered plants in the bush. Examine a flower and you will find that all ten stamens are free but this is a feature common to many other genera such as *Oxylobium*, *Dillwynia* and *Pultenaea*. A distinctive feature, however, is the calyx which cups the flower, they are deeply cleft into five lobes, dark-coloured on the outside and whitish-tomentose within.

If the plant has seed pods on it, you need to be alert to collect them in the first week of December. They are large, inflated, almost globular, containing four or more seeds. There is a creature that makes these round seed capsules its temporary home devouring the maturing seed, so if you see a small hole in the case, you have been beaten to the seed. I found some seed of *Gompholobium latifolium* some years ago and grew on some plants. Over the years I have grown many plants to adorn my garden and have a plentiful supply of fresh seed each year. They are easy to germinate; place in a cup, pour boiling water over them and after a week of soaking, plant in any open medium such as coarse sand or as I do, in a mixture of peat moss and perlite.

Gompholobium are magnificent plants for the garden with the large golden pea flowers to 4 cm across. They are readily cultivated in the sandstone areas of Sydney. I am referring here of course to the larger species *Gompholobium latifolium* to just over a metre high and *Gompholobium grandiflorum*, a much daintier bush, to less than one metre high. The other eastern species listed below are much smaller weaker shrubs but if someone would get me seed, I would love to grow them.

The impetus to write this article is to encourage other readers to share in the joy of growing *Gompholobium* and to get some information on cultivation of the western species. As listed below, the plants previously known as *Burtonia*, are now *Gompholobium*. *Gompholobium scabrum* (photograph on page 116) is a magnificent plant. I have occasionally got some seedlings up from seed but I cannot get them to maturity. Who has grown these plants? Is there a scientist who can suggest what research is needed to learn how to cultivate these legumes?

EASTERN SPECIES OF GOMPHOLOBIUM

Gompholobium ecostatum is shown on the cover of this issue and described in the caption for the cover plate on page 94. Who has grown this plant? I would appreciate it if a reader would send me some seed.

Gompholobium foliolosum was previously known as *Burtonia foliolosa* and is found in the Pilliga Scrub of northern New South Wales. It has many leaflets on each leaf. I do not know of this plant so will readers send notes and hopefully seed.

Gompholobium glabratum is a low sprawling shrub with slender stems to less than one metre. The leaves are deeply divided, in some cases to seven almost thread-like leaflets 1.7 cm long and 1 mm wide. The flower's larger petal is a bright yellow to 1.5 cm broad and the keel is black shading to yellow at the base.

Gompholobium grandiflorum is a dainty but robust shrub to one metre with the deeply divided leaves to three segments, each very narrow to 2 mm and to 3 cm in length. The dark yellow flowers can be up to 3 cm across.

Gompholobium huegelii is a small inconspicuous shrub unless displaying its bright yellow flowers that can be up to 3 cm across. The three pointed leaves rarely reach a length of 2.5 cm the narrow segments making this plant difficult to find. Colour photograph on page 113 is by Colin Woolcock.

Gompholobium latifolium is the largest shrub, to over one metre, the largest flowered, to 3.5 cm across, and has the largest, three-divided leaves, the segments being to 5.7 cm long and 8 mm wide.

Gompholobium minus is a very small sprawling shrub with noticeably hairy three-divided leaves, the segments rarely exceeding 1 cm in length. The calyx has ridges marking the junction of the lobes. The bright yellow flowers can be 1.3 cm broad. Colour photograph by Michael Crisp was taken at Mongarlowe, near Braidwood, NSW.

Gompholobium pinnatum is a small straggling shrub often in damp or grassy conditions. The unusual feature is that the leaves are pinnate with as many as thirty leaflets, each 1 cm long, arranged along a spine.

Gompholobium uncinatum is a small, low-growing shrub often forming small mats on the ground. The three-divided leaves have leaflets to 8 mm long and 1 mm wide. The flowers to 1.2 cm across can be numerous and bright, varying from scarlet to brick-red with a darker keel.

Gompholobium virgatum is a small bushy shrub to one metre high. The three leaflets can be to 3 cm in length and 2 mm wide. A variety *aspathoides* sometimes reaches two metres, with very narrow, revolute margined, leaflets and more abundant flowers. A variety *emarginatum* that occurs in Queensland, has larger broader leaflets.

Gompholobium nitidum is recorded from northern Queensland and Papua New Guinea. It has pinnate leaves with 7-11 segments that are oblong to cuneate, to 1.3 cm in length.

SPECIES OF *GOMPHOLOBIUM* (previously known as *Burtonia*)

Gompholobium asperulum was formerly *Burtonia asperula*. Western Australia.

Gompholobium confertum — previously *Burtonia conferta* syn. *B. violacea*. Western Australia.

Gompholobium foliolosum — previously *Burtonia foliolosa*. Eastern Australia.

Gompholobium gompholobioides — previously *Burtonia gompholobioides*. Western Australia.

Gompholobium hendersonii — previously *Burtonia hendersonii* syn. *B. minor* syn. *B. sessilifolia*.

Gompholobium polyzygum — previously *Burtonia polyzyga*. Central Australia.

Gompholobium scabrum — previously *Burtonia scabra* syn. *B. pulchella*. Western Australia.

Gompholobium subulatum — previously *Burtonia subulata*. Western Australia.

Gompholobium villosum — previously *Burtonia villosa*. Western Australia.

The remaining species previously listed as *Burtonia* are: *Burtonia brunioides* (unknown in sufficient detail), *Burtonia diosmaefolia* is *Latrobea diosmaefolia*; *Burtonia tenella* is *Latrobea tenella* and *Burtonia subalpina* has been incorrectly applied to *Pultenaea subalpina* because of the unusual pink flowers of this species. ■



Gompholobium scabrum (formerly *Burtonia scabra*), the flowers and the bush.





Gastrolobium parvifolium △ Photography by Colin Woolcock ▽ *Gastrolobium spinosum*



Australian Plant Cultivars

by W. H. Payne

Plants from the wild with exceptional horticultural value may be registered with The Australian Cultivar Registration Authority as plant cultivars in accordance with the international code of nomenclature. The following have been registered. They were produced, after trials, by competent horticulturalists, for the general market.

***Pultenaea pedunculata* 'Pyalong Gold'**

Pultenaea pedunculata is a dense prostrate ground cover type plant to a diameter of two metres that covers itself with yellow pea-flowers turning a dense green carpet into gold. This cultivar 'Pyalong Gold', is a selection from the wild, 3 km north of Pyalong on the Northern Highway in Victoria, by Peg McAllister of Montrose, Victoria. The usual form of the species has reddish striations on the standard (the large upper petal) or a pale green tinge to the keel, the boat shaped lower petals. The selection was made as the flower colour is a pure yellow throughout. The cultivar *Pultenaea pedunculata* 'Pyalong Gold' is relatively drought hardy and is frost resistant to at least -4°C.

***Pultenaea pedunculata* 'Pyalong Pink'**

Another selection from the wild at the same location as the cultivar above, this plant is similar in all respects except that the upper surface of the standard is pale pink with red striations radiating from the centre, while the underside is a deep pink.

***Pultenaea villosa* 'Wallum Gold'**

This is a low spreading, almost prostrate form of *Pultenaea villosa* that grows fairly quickly to a width of 1.5 m and a height of 0.4 m. The flowers are gold in colour and are most prolific from autumn to spring, with occasional flowers appearing during the remainder of the year. It was selected from a batch of seedlings grown from seed collected on the Sunshine Coast, and grown by Fairhill Native Plants of Yandina, Queensland. Cuttings of the original plant have been grown in a variety of conditions including dry clay and moist sandy soils, full sun and part shade. They have all thrived.

What is a plant cultivar?

Practically all plants in the horticultural trade are plant cultivars. They have been developed by careful selection and manipulation using wild plants from all parts of the world for commercial exploitation. A great deal of work over many years has produced the well known garden Rose, Poppy, Camelia, etc.

One of the greatest treasures in the world plant heritage is the Australian flora. The unique range of forms, colours and floral designs indicate that plants in the Australian flora may be developed to become the most widely sought after exotic garden shrubs throughout the world. To assist marketing, selected plants are given a unique cultivar name and the market place will determine its value over time.

Cultivars may be plants straight from the wild but selected because of a desirable character. The cultivars described above are in this category. Such unique plants are of little value unless they are rewarding and hardy and the horticulturists, who produced them have trialed vegetatively propagated plants to ascertain their hardiness in the home garden situation. Other cultivars may be the product of cross fertilization and/or selective breeding.

What can you do?

We all want to grow the best form. If you find, by chance, an exceptional form of species, larger or better coloured flower, unique foliage as general shape in the bush, etc., then let us know or register the plant as a cultivar and market it.

To register a plant as a plant cultivar, write to The Registrar, Australian Cultivar Registration Authority, Australian National Botanic Garden, Canberra.

Plant Variety Rights

Recent legislation has established royalty rights for the originator, for all plants registered correctly and sold on the market. Should you wish to proceed in this way rather than registering through the A.C.R.A. as above, I suggest that you seek advice. The minimum basic costs involved are quite high and unless you have a winner and can arrange adequate marketing, the cost involved is prohibitive. ■

Growing Pea-flowered Plants

W. H. Payne

The pea-flowered plants are easy to grow as there are species that will be suited to almost any growing conditions. There are species growing naturally in most parts of Australia and this issue features a range of these in full colour. There are so many of them, the beginner can be excused for being a little confused. Should you be interested in the technicalities of deciding which genus is which refer to other articles in this issue.

Two things are well known. The cultivation of legumes with other plants contributes to the balance and availability of nutrients to other plants below ground. They contribute to a healthy garden and to its overall floral spectacle. Consult with your specialist native plant nurseryman as to which species are most suitable for your garden.

The Pea-flowers and the Beginner

The botanists can continue to find minute differences in species and juggle the names but for the beginner, these are all beautiful plants, worth of a prime place in any garden. The important thing is that not only are they easy to grow, they are easy to propagate from seed.

Seed may be collected in early summer, usually the end of November or early in December, from plants on private land. Place the seeds in a cup, pour boiling water on them and leave to soak for a week. They may be planted in a seed tray or a shallow pot filled with a coarse sand. Keep the sand moist and watch them grow.



Nemcia capitata (above)

Photography by Colin Woolcock

While the botanists continue to juggle the scientific names of this group of pea-flowered plants, the horticulturalist readily recognises the enormous potential of these free flowering shrubs. Admire the following photographs, skip the next few pages, reporting on recent research and order some seed for plants for the garden.

Recent scientific research has concluded that a group of species formerly known as *Gastrolobium*, species with trifid bracts and condensed heads of flower, should be transferred to the genus *Nemcia*. These changes are listed on page 125. Further, species of *Oxylobium* with similar characters should also be transferred to the genus *Nemcia* as listed on page 125. Included in these are *Oxylobium capitatum* now to be *Nemcia capitata*, as above, *Oxylobium reticulatum* now to be *Nemcia reticulata* and *Oxylobium coriacea* now to be *Nemcia coriacea*, the latter two being shown in colour photographs on page 124.

Nemcia leakeana (Rear cover, page 140)

Photography by Colin Woolcock

This picturesque plant appears, to the layman, to have some different characters, the more noticeable of which is the flowers where the standard petal is not prominent and the flower colour is red. The indecision by botanists is indicated by previous names given to it of *Nemcia atropurpurea*, *Oxylobium* and *Gastrolobium*. one suspects that name changing has not finished here but for us it is a beautiful plant.

Oxylobium scandens (opposite, bottom)

Photography by Colin Woolcock

This attractive shrub is found on the south coast of New South Wales, from Bermagui to Batemans Bay. The study forshadows a probable name change but for now it is, to us, the same familiar, attractive shrub.

Urodon dasyphyllus (opposite, top)

Photography by Colin Woolcock

This very attractive plant has been known as *Pultenaea dasyphylla* or *P. lycopodioides*. It is returned a genus *Urodon* with only two or three species which, may in fact only be varieties of a single species *Urodon capitatus*.



Urodon dasyphyllus △

▽ *Oxylobium scandens*



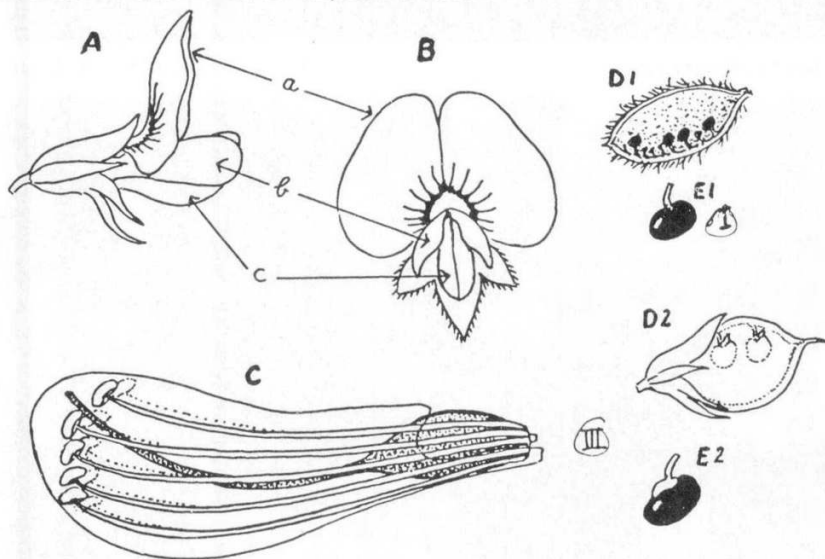
Fabaceae — The Pea-flowered Wildflower Family

By Dorothy and Colin Woolcock
with introduction by W. H. Payne

In a recently published paper (*Cladistics and Legume Systematics with an analysis of the Bossiaeeae, Brongniartieae and Mirbelieae*, published in 'Advances in Legume Systematics', Part 3, 1987, Royal Botanic Gardens, Kew) two taxonomic botanists, M. D. Crisp and P. H. Weston have put forward a number of changes in nomenclature in the pea-flower family (Fabaceae or Papilionaceae). These changes are at the genus rather than the species level and are a part only of an on-going examination of the family. The reasons for these changes are explained fully in their paper and are beyond the scope of a précis designed to list the range of name changes.

Recent changes in the botanical name of some plants will be of interest, but let us first have a brief simple look at the plants involved.

The plant kingdom of the world has been divided into groups called plant families with similar characteristics in the flower. Members of the plant family Fabaceae (from the Latin 'faba' meaning a bean) have a fruit comprising a pod-like structure housing the maturing seed being somewhat like the edible pea, where the fruit contains numerous seed. When one tries to simplify descriptions, one agitates the purist who can give notable exceptions such as *Daviesia* species where the pod is triangular with only one or two seed but the general description applies. Our wattles have a fruit comprising a pea-like pod also but these are in a closely allied family and who cannot tell the difference between a wattle flower and a pea-like flower.



A and B — A typical pea-flower from the side and front with four petals, the large standard or upper petal 'a', the two wing petals 'b' and two lower petals held together to resemble the keel of a boat 'c'. C — A look inside the keel will show 10 free stamens surrounding the female part of the flower, the stigma attached to the ovary inside the base of the flower. D — The fruit or pod with a number of seed maturing inside (D2 has two seed as in *Pultenaea* and D1, a number of seed as in *Oxylobium*). E1 — a seed without an aril (such as *Oxylobium*) and, E2 — a seed with aril, a white swelling at point of attachment, as with *Pultenaea*.

The plant family Fabaceae, has also been known as the plant family Papilionaceae (from the Latin 'papilio' — butterfly) as the relatively large flowers bear a fancied resemblance to a butterfly. It is this pea-like flower that is common to plants in the family. Variations in the structure of the pea-flower have enabled the botanist to subdivide the hundreds of species in the pea-flowered family into subgroups known as plant genera and it is these generic groups, *Pultenaea*, *Gompholobium*, *Nemcia* etc., that are included here.

Reference to the colour plates in this issue will show that the pea-flowers in these genera are similar. A significant feature that they all have in common is that there are ten stamens, free from each other over their entire length and this separates them from other groups of genera in the plant family Fabaceae. The sketches opposite show the general characters of the group.

The *Pultenaea* Group

The Western Australian species, *Pultenaea capitata* and *Pultenaea dasyphylla* (syn. *P. lycopodioides*) have been removed from *Pultenaea* and returned to former names of *Urodon capitatus* and *Urodon dasyphyllus*. These species lack stipules, and have bracteoles inserted at or below the base of the calyx. The seed also lack arils and are reticulately ornamented.

Four eastern and Tasmanian swamp *Pultenaea* species — *Pultenaea incurvata* (New South Wales), *P. cambagei* (New South Wales), *P. paludosa* (New South Wales and Victoria) and *P. subumbellata* (New South Wales, Victoria and Tasmania) together with *Dillwynia capitata* (Victoria) — are removed from the genus *Pultenaea* and will form a new genus of five species as yet unnamed. These lack well developed or joined stipules and have a distinctive habit, habitat and leaf shape.

The Western Australian species *Pultenaea neurocalyx*, which lacks stipules and is a very distinctive species, will be given a new generic name.

The New South Wales species, *Pultenaea brunioides*, becomes *Dillwynia brunioides* (where it was originally placed), as it has the properties of a *Dillwynia* rather than a *Pultenaea*.

Purged of these aberrant species, *Pultenaea* becomes easily recognized by its well developed stipules which are fused together behind the petiole. Species of this genus are described on page 126.

Burtonia and *Gompholobium*

The genus *Burtonia* has traditionally been distinguished from *Gompholobium* by ovule number and orientation of the funicles (stalk of the ovule). Further study has shown that these two factors are highly variable and overlap frequently. As there are no significant differences in the two genera, *Burtonia* has been eliminated and all species sunk into the genus *Gompholobium* as listed in "Gompholobium, The Glory Peas", page 114.

Templetonia

A study of the Bossiaeeae tribe in the family Fabaceae showed that the genus *Templetonia* did not fit into the Bossiaea generic group, which includes *Goodia*, *Bossiaea*, *Platylobium*, *Muelleranthus*, *Ptychosema* and *Aenictophyton*,



Nemcia reticulata△

Photography by Colin Woolcock

▽ *Nemcia coriacea*



and should be transferred to the *Brongniartieae* tribe (a tropical American taxon) to which it is closely related. The reduced *Bossiaeeae* then form a natural group closely related to the tribe *Mirbelieae* (formerly *Podalyrieae*). Further work on *Mirbelieae* is continuing.

Nemcia — Gastrolobium — Oxylobium

Nemcia — This genus of twenty-eight species has been expanded to include most Western Australian species of *Oxylobium*, plus all those in *Gastrolobium* that are non-poisonous. These have condensed inflorescences and trifid bracts. See footnote A.

Gastrolobium — This genus of 35-40 species, mostly in south-west Australia with two species in central to tropical Australia, has had the *Oxylobium parviflorum* group transferred to it. These species usually have long open inflorescences and carry the toxic substance fluoro-acetate. The bracts are not trifid. See footnote B.

Oxylobium — A genus of up to fifteen species in south-west and south-east Australia. *Oxylobium lanceolatum* is removed and restored as *Callistachys lanceolata*. *Oxylobium microphyllum*, together with an undescribed species, belongs to an undescribed genus of six species, which include *Burtonia simplicifolia*.

Footnote A — Western *Oxylobium* and non-poisonous *Gastrolobium* are transferred to *Nemcia*

<i>Nemcia acuta</i>	(<i>Gastrolobium acutum</i> , <i>Oxylobium acutum</i> , <i>Callistachys acuta</i>)
<i>Nemcia axillaris</i>	(<i>Gastrolobium axillare</i> , <i>Oxylobium reticulatum</i>)
<i>Nemcia brownii</i>	(<i>Gastrolobium brownii</i>)
<i>Nemcia capitata</i>	(<i>Oxylobium capitatum</i> , <i>Callistachys capitata</i>) Colour photograph on page 120.
<i>Nemcia carinata</i>	(<i>Eutaxia reticulata</i> , <i>Gastrolobium reticulatum</i>)
<i>Nemcia coriacea</i>	(<i>Chorizema coriaceum</i> , <i>Oxylobium retusum</i> , <i>Oxylobium coriaceum</i> , <i>Gastrolobium ovalifolium</i>) Colour photograph opposite, page 124.
<i>Nemcia crenulata</i>	(<i>Gastrolobium crenulatum</i>)
<i>Nemcia dilatata</i>	(<i>Oxylobium dilatatum</i> , <i>O. cuneatum</i> , <i>O. obovatum</i> , <i>O. dilatatum</i> , <i>Nemcia cuneata</i>)
<i>Nemcia emarginata</i>	(<i>Oxylobium emarginatum</i> , <i>Nemcia emarginata</i> , <i>Nemcia dorrienii</i>)
<i>Nemcia epacridoides</i>	(<i>Gastrolobium epacridoides</i>)
<i>Nemcia hookeri</i>	(<i>Gastrolobium hookeri</i> , <i>G. tricuspidatum</i> , var. <i>subinerme</i> , <i>G. stowardii</i>)
<i>Nemcia ilicifolia</i>	(<i>Gastrolobium ilicifolium</i> , <i>G. verticillatum</i>)
<i>Nemcia leakeana</i>	(<i>Gastrolobium leakeana</i> , <i>Oxylobium atropurpureum</i> , <i>Nemcia atropurpurea</i> , <i>Nemcia luteifolia</i>) Colour photograph on page 140.
<i>Nemcia lehmannii</i>	(<i>Gastrolobium lehmannii</i>)
<i>Nemcia obovata</i>	(<i>Gastrolobium obovatum</i>)
<i>Nemcia pauciflora</i>	(<i>Gastrolobium pauciflorum</i>)
<i>Nemcia plicata</i>	(<i>Gastrolobium plicatum</i>)
<i>Nemcia pulchella</i>	(<i>Gastrolobium pulchellum</i>)
<i>Nemcia punctata</i>	(<i>Eutaxia punctata</i> , <i>Gastrolobium reticulatum</i>)
<i>Nemcia pyramidalis</i>	(<i>Gastrolobium pyramidale</i> , <i>G. polycephalum</i>)
<i>Nemcia reticulata</i>	(<i>Oxylobium reticulatum</i> , <i>O. nervosum</i> , <i>Callistachys oxylobioides</i> , <i>C. reticulata</i>)
<i>Nemcia retusa</i>	(<i>Gastrolobium retusum</i> , <i>Oxylobium drummondii</i> , <i>O. cuneatum</i> , <i>O. virgatum</i> , <i>O. melinocaulae</i>)
<i>Nemcia rubra</i>	(<i>Nemcia atropurpureae</i> , var. <i>minorifolia</i>)
<i>Nemcia spathulata</i>	(<i>Gastrolobium spathulatum</i>)
<i>Nemcia stipularis</i>	(<i>Gastrolobium stipulare</i>)
<i>Nemcia tricuspidata</i>	(<i>Gastrolobium tricuspidatum</i>)
<i>Nemcia truncata</i>	(<i>Gastrolobium truncatum</i> , <i>G. crispifolium</i>)
<i>Nemcia heterophylla</i> , <i>N. parviflora</i> and <i>N. coriacea</i>	are excluded names.

Footnote B — Transfer the *Oxylobium parviflorum* group to *Gastrolobium*.

<i>Gastrolobium graniticum</i>	(<i>Oxylobium graniticum</i> , <i>O. kelsoi</i>)
<i>Gastrolobium heterophyllum</i>	(<i>Chorizema heterophyllum</i> , <i>Oxylobium heterophyllum</i>)
<i>Gastrolobium parviflorum</i>	(<i>Oxylobium parviflorum</i> , <i>Callistachys parviflora</i>)
<i>Gastrolobium racemosum</i>	(<i>Mirbelia racemosa</i> , <i>Chorizema magnifolium</i> , <i>Oxylobium bennettsii</i>)
<i>Gastrolobium rigidum</i>	(<i>Oxylobium rigidum</i>)
<i>Gastrolobium spectabile</i>	(<i>Oxylobium spectabile</i> , <i>Callistachys spectabilis</i>)
<i>Gastrolobium tetragonophyllum</i>	(<i>Oxylobium tetragonophyllum</i>)

The Pea-Flowers Called *Pultenaea*

by C. E. & D. T.
Woolcock

A pea-flower typically has flowers shaped as shown opposite and in the detail on page 122. The corolla comprises four petals, the large standard petal, two wing petals, and two lower petals held together to resemble the keel of a boat. The corolla (the five-petalled structure) is enclosed by a cup with five lobes (bracts) known as the calyx.

Is it a *Pultenaea*? To check this, gently open the keel to reveal the bundle of stamens. To be a *Pultenaea* there will be ten stamens on filaments which are individually free to their base (as shown on the sketches on page 122). This will mean the plant can be any one of a group of genera in the tribe *Mirbelieae* of the large pea-flowered family of Fabaceae. Two more characters are peculiar to *Pultenaea*.

Stipules are small leaf-like appendages growing in pairs at the base of the leaf-stalks. In the sketches opposite, they are shown as occurring in pairs at the base of each of the leaves. The presence of stipules is not confined to *Pultenaea* but many *Pultenaea* have prominent stipules that impart a characteristic appearance. The stipules are unique in the *Mirbelieae* section of the family Fabaceae, in being joined together at the base.

Bracteoles are present. These are small leaf-like miniature bracts that are attached in pairs to the calyx (the five-lobed cup at the base of the flower) either at the base as for the two species opposite, or attached part way up the calyx tube. Bracteoles are important in distinguishing species of *Pultenaea* and you will note that all the descriptions and sketches of the species feature the bracteoles as detailed opposite.

Seed Pods — Fruits. The plant may not be in flower. The seed pod is ovate (oval or egg-shaped) with never more than two seeds. The seeds have an aril, a whitish growth on one side.

Leaves are very variable. The series of articles opposite have grouped the many species according to leaf shape. The two species opposite have terete, one-channelled leaves, rolled up to almost form a tube with the channel uppermost as in section B3 opposite. The surface is tuberculate (warty) and the leaves are alternate. There are three *Pultenaea* with leaves like this, *P. divaricata*, *P. laxiflora* and *P. subalpina* (described in our No. 116 issue) as well as the two opposite. *Pultenaea* with terete leaves, one-channelled above, not tuberculate but pungent (ending in a sharp point) are described on the following page, *Pultenaea acerosa* and *P. vestita*.

There are other species of *Pultenaea* with terete leaves, one-channelled above, that are not tuberculate (warty) or pungent pointed and these are in two groups, those with flowers sessile heads, (in clumps at the end of branchlets) as described in the rest of this issue, and those with flowers singly or in pairs along the branches, as described in our No. 116 issue.

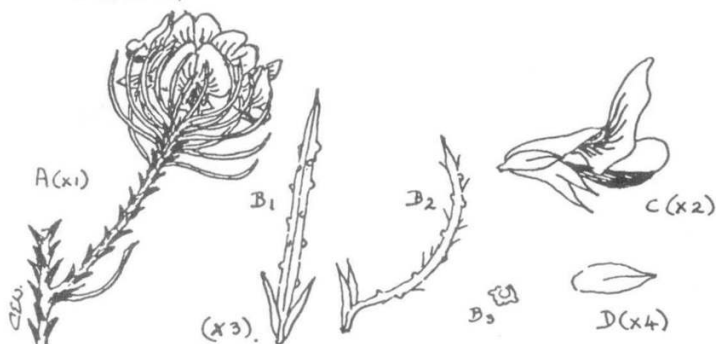
Bush Peas — The Genus *Pultenaea* Part 10

By C. E. and D. T. Woolcock

Species with terete leaves, one-channelled above, leaves alternate. Those with tuberculate leaves (continued from No. 116 issue where four other species, *Pultenaea brunioides*, *P. divaricata*, *P. laxiflora* and *P. subalpina*) are opposite and those with leaves not tuberculate but pungent follow, *Pultenaea acerosa* and *P. vestita*. Of the remaining species, those that present their flowers in sessile heads are then described. ■

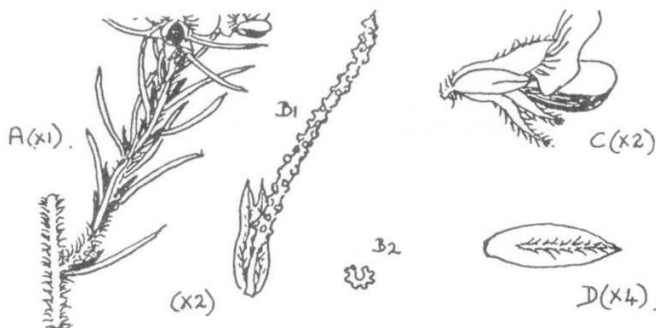
***Pultenaea echinula* Sieber ex. D.C.**

- Habit:** Shrub to 1.5 m high, glabrous or sparsely pubescent stems, older branches echinate. (A).
- Leaves:** Alternate, terete, one-channelled above, incurved, apex slightly recurved and with a short pungent point, often with scattered tubercles and sometimes with soft hairs, 10-15 mm long. Leaves crowded at the ends of branches. Stipules c. 3 mm long. ($B_1 B_2 B_3$).
- Flowers:** Sessile in dense terminal heads, floral bracts few or absent. Calyx 4-5 mm long, glabrous, lobes acuminate with a short almost pungent point. Lower lobes shorter than the tube. (C). **Flowering:** Spring-early summer.
- Bracteoles:** Lanceolate, glabrous, about as long as the tube and inserted just below the calyx base. (D).
- Distribution:** Confined to Central Tablelands of NSW (Blue Mountains area and uncommon).



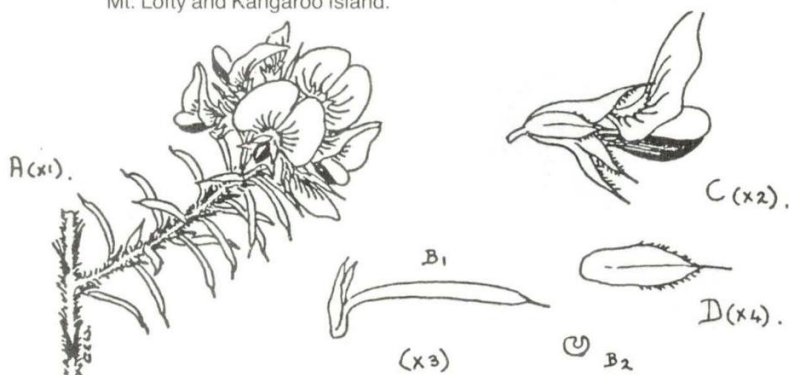
***Pultenaea baeuerlenii* F. Muell**

- Habit:** Small shrub to 1 m high; stems hairy. (A).
- Leaves:** Alternate terete, one-channelled above, glabrous but tuberculate, with short pungent point, 10-15 mm long. Large prominent stipules c. 6 mm long, reddish or dark brown. ($B_1 B_2$).
- Flowers:** Densely crowded at ends of branchlets, with large floral bracts (c. 7 mm long), which are two-lobed and hairy. Calyx also about 7 mm long, partly glabrous but some woolly hairs; lobes lanceolate, acuminate, the lower longer than the tube. (C). **Flowering:** Late spring.
- Bracteoles:** Oblong-elliptical keeled, glabrous or slightly hairy, longer than the tube and attached at its base. (D).
- Distribution:** NSW — Southern Tablelands (Braidwood district, Mt Currockbilly).



Pultenaea acerosa* R. Br.*Bristly Bush-pea**

- Habit:** Rigid, spreading, pungent shrub to 70 cm high. (A).
Leaves: Terete, 1-furrowed above, 5-10 mm long, crowded, spreading, glabrous, pungent-pointed. Stipules 3-4 mm long, prominent. (B₁ B₂).
Flowers: Pronounced leafy clusters near ends of branchlets, short pedicels or subsessile. Calyx lobes acuminate, pungent-pointed, with slight cilia on margins, otherwise glabrous. (C). **Flowering:** September-October.
Bracteoles: Oblong-acuminate, scarious with very slightly ciliate margins, fixed at base of calyx and longer than the tube. (D).
Distribution: Sth Aust. — Kangaroo Island, upper S.E. and Pt. Lincoln areas. Isolated findings in W. Vic. doubtful var. *acicularis* with leaves 10-15 mm long, slender; flowers axillary, solitary, on peduncles c. 2 mm long, occurs on Mt. Lofty and Kangaroo Island.

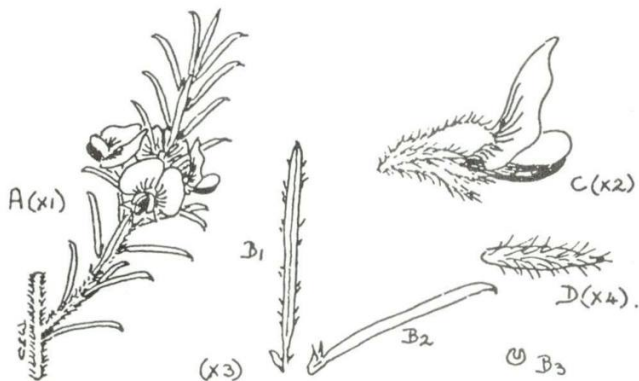
***Pultenaea vestita* R. Br.****Feather Bush-pea**

- Habit:** Stiff, woody, small shrub, 50-70 cm high. (A).
Leaves: Terete, 1-furrowed above, rigid, 6-10 mm, mucronate, crowded, sparsely villous becoming glabrous. Stipules red-brown, connate, imbricate, concealing the branches, c. 4-5 mm long. Petioles c. 1.5 mm long. (B₁ B₂).
Flowers: Leafy heads, terminal although occasionally axillary, small. Calyx with long subulate, villous lobes, pungent, tube less hairy. Flower enclosed in leaves with enlarged stipules, the crowded villous leaves and calyx giving a feathery appearance. (C). **Flowering:** October-January.
Bracteoles: Linear-lanceolate, sometimes with 2 lateral lobes, villous, longer than tube and attached at its base. (D).
Distribution: Sth Aust. (Kangaroo Is., Eyre Pen., and Coorong); W.A., Vic. (Little Desert).



***Pultenaea adunca* Turcz.**

- Habit:** Slender, heath-like erect shrub to 60 cm tall; young branches silky-pubescent. (A).
- Leaves:** Alternate, linear-terete, less than 12 mm long, obtuse or with hooked point, channelled above, glabrous or scabrous-pubescent. Stipules small. (B₁).
- Flowers:** In terminal heads at first, soon growing into leafy branches, leaving flowers axillary. Calyx silky-villous, lobes longer than the tube, upper lobes much larger than lower three, falcate and united to above the middle, lower ones short and narrow. (C). **Flowering:** October.
- Bracteoles:** Linear, inserted under the calyx, about as long as tube, villous. (D).
- Distribution:** W.A. — south-west and coastal (Stirling Range, Albany, Esperance).



***Pultenaea daltonii* H. B. Williamson**

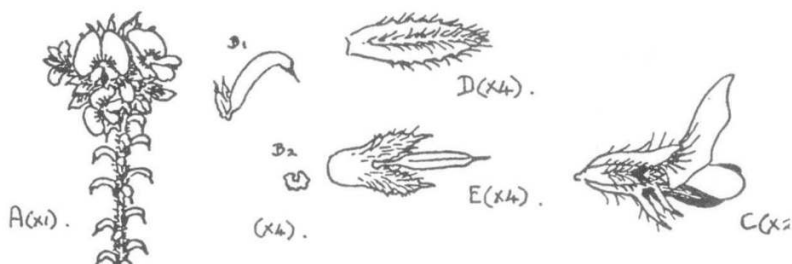
Hoary Bush-pea

- Habit:** Wiry, hairy shrub to more than 1 m high. (A). Photograph, page 136.
- Leaves:** Terete, 1-channelled above, spreading, apices slightly recurved, 6-10 mm long, hispid/villous. Stipules c. 1-2 mm long. (B₁ B₂).
- Flowers:** Sessile, crowded at end of branchlets, within bracts and enlarged stipules of floral leaves. Calyx villous, particularly on lobes which are acuminate and longer than tube. (C). **Flowering:** October-November.
- Bracteoles:** Leaf-like, green, hairy on central lobe, with stipules, longer than calyx tube and attached at its base. (D).
- Distribution:** Western areas of Victoria.



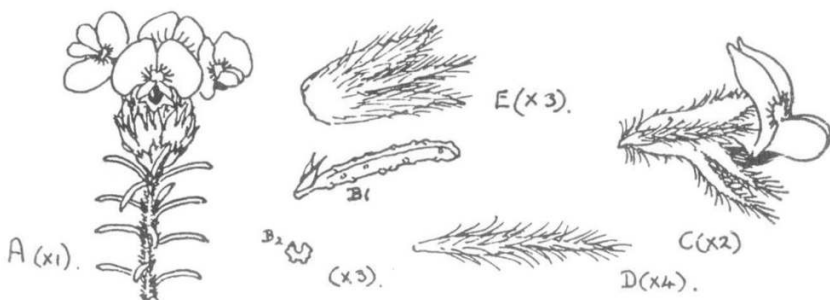
***Pultenaea empetrifolia* Meisn.**

- Habit:** Diffuse or divaricate shrub to 30 cm high. Hoary-pubescent branches. (A).
Leaves: Alternate, linear-terete, obtuse or shortly mucronate, mostly recurved at apex, often only 1-3 mm long but sometimes longer, 1-channelled above, glabrous or tubercular-scabrous. Stipules lanceolate, broad 1 mm long. (B₁).
Flowers: Small dense terminal heads. Bracts few, shorter than the calyx with 2 broad stipular lobes, shortly hairy with ciliate margins and usually a central green leaf-like lobe (E). Calyx glabrous or with a few long hairs. Lobes lanceolate, acute, rigid but not striate, as long as the tube, the lower ones usually with a dark spot in each sinus. Keel shorter than standard but longer than calyx lobes, deeply coloured. (C). **Flowering:** September-October.
Bracteoles: Oblong, acute, inserted under the calyx, slightly longer than tube. Midrib hairy and margins ciliate. (D).
Distribution: W.A. — Stirling Range, Albany to Bremer Bay.



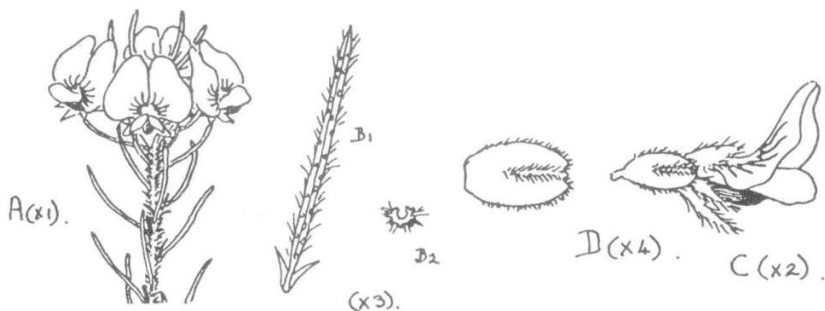
***Pultenaea ericifolia* Benth.**

- Habit:** Erect shrub to 60 cm tall. Pubescent branchlets. (A).
Leaves: Linear, terete, 1-channelled above, glabrous, alternate, tuberculate, spreading, slightly recurved towards tip, which is obtuse, usually 5-8 mm long. Stipules very fine, c. 2 mm long. (B₁ B₂).
Flowers: Dense terminal heads, globose within imbricate floral bracts which are trifid, deeply spreading, hairy and which completely enclose the calyx (E). The calyx is glabrescent on the tube and hairy on the lobes, which are acuminate and longer than the tube. Flowers often pink. Keel shorter than the wings and calyx lobes. (C). **Flowering:** Spring — September-October.
Bracteoles: Linear-lanceolate, hairy on both midrib and margins, longer than the tube and attached just below the base of the tube. (D).
Distribution: W.A. — South-west and South Coast.



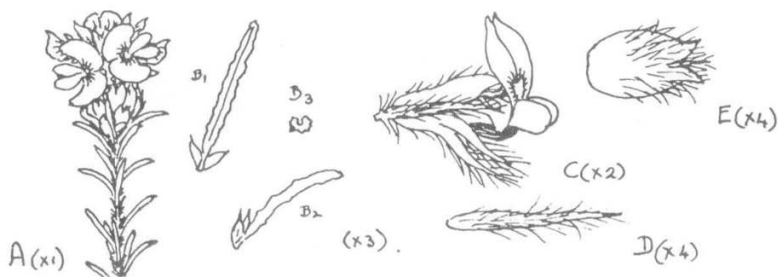
***Pultenaea radiata* Williamson**

- Habit:** Small upright shrub.—usually to about 50 cm high; branchlets hairy. (A).
Leaves: Terete, 1-channelled above, scabrid and villous, not crowded, 10-12 mm long, acute apex but not mucronate. Petioles c. 1 mm long; stipules fine, acuminate, brown, 2-3 mm long. (B₁ B₂). Photograph, page 136.
Flowers: Loose, terminal heads with sessile flowers. Floral bracts present but do not cover the calyx. Flowers distinctive and attractively coloured with yellow, orange and red markings. Calyx lobes acuminate, ciliate. Keel dark red and shorter than wings. *Flowering:* September-October.
Bracteoles: Ovate, as long as or longer than the calyx tube, brown with shortly ciliate margins and midrib, attached at base of tube. (D).
Distribution: Whicher Range near Busselton, W.A.



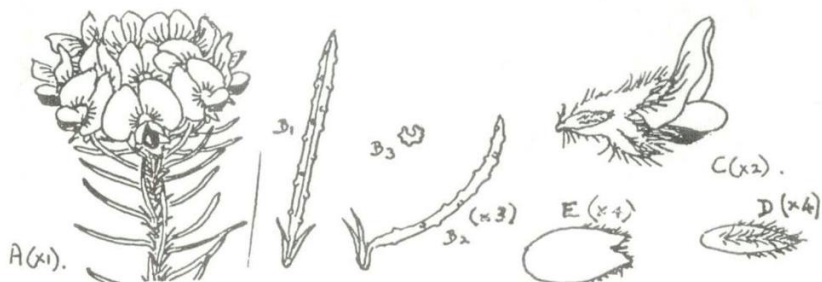
***Pultenaea strobilifera* Meisn.**

- Habit:** Erect, heath-like shrub, 15-45 cm tall, closely resembling *P. ericifolia* except in shape of flower heads and bracts. Branches virgate, minutely hoary. (A).
Leaves: Linear-terete, obtuse, 6-7 mm long, sometimes shorter, channelled above, rather thick, glabrous, smooth or slightly wrinkled. Stipules small. (B₁ B₂).
Flowers: Dense terminal, ovoid or almost globose heads. Bracts numerous and closely imbricate, broad, shortly toothed, pubescent or ciliate, inner ones 6-7 mm long. (E). Calyx 7-8 mm long, lobes narrow, acuminate, longer than tube. Keel not exceeding calyx-lobes. (C). *Flowering:* September-October.
Bracteoles: Linear or subulate, hirsute, inserted under calyx, longer than tube. (D).
Distribution: W.A., S.W. coast and near coast areas, Cape Naturaliste to Esperance.



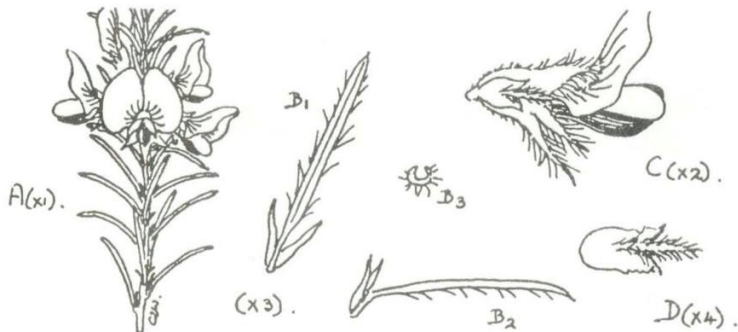
***Pultenaea verruculosa* Turcz.**

- Habit:** Erect heath-like shrub, usually 30-45 cm high. Young branches loosely pubescent. (A).
- Leaves:** Alternate, linear-terete or trigonous, obtuse or with very small mucro, usually less than 10 mm long, channelled above, glabrous, smooth or with tuberculate, incurved, rarely recurved, spreading. Stipules about 2 mm long, subulate. (B_1 , B_2 , B_3).
- Flowers:** In terminal heads, occasionally proliferous. Floral bracts few, broadly ovate, entire or shortly 2-lobed. (E). Calyx tube often glabrescent, lobes villous, acuminate, shorter than the tube. Keel shorter than wings and standard but longer than calyx lobes. (C). **Flowering:** July-October.
- Bracteoles:** Lanceolate, shorter than the tube with a hairy midrib and ciliate edges. (D).
- Distribution:** W.A. – Coastal or near coastal sand heath (Albany and Stirling Range to Esperance).
- Note:** var. *hirsuta* – spreading hairs on leaves. Floral bracts longer, numerous.
var. *brachyphylla* – leaves shorter (3-5 mm long), thicker and shortly mucronate. Flowers smaller, heads often proliferous with few bracts.



***Pultenaea* sp. (Unnamed Species)**

- Habit:** Small shrub to c. 50 cm high, stems mainly glabrous. (A).
- Leaves:** Linear-terete, 1-channelled above with recurved, mucronate tip, 6-10 mm long; young leaves lightly hairy, becoming glabrescent; sometimes minutely tuberculate. Stipules 3-4 mm long. (B_1 , B_2 , B_3).
- Flowers:** Clustered in leafy heads, sessile. Calyx lobes acuminate to mucronate and villous, calyx tube almost glabrous. Keel dark red. (C). **Fls:** October-November.
- Bracteoles:** 3-lobed, the central lobe hairy, lateral lobes brown, scarious; attached at base of calyx. (D).
- Distribution:** Western slopes of Central NSW – e.g. Bumbaldry.





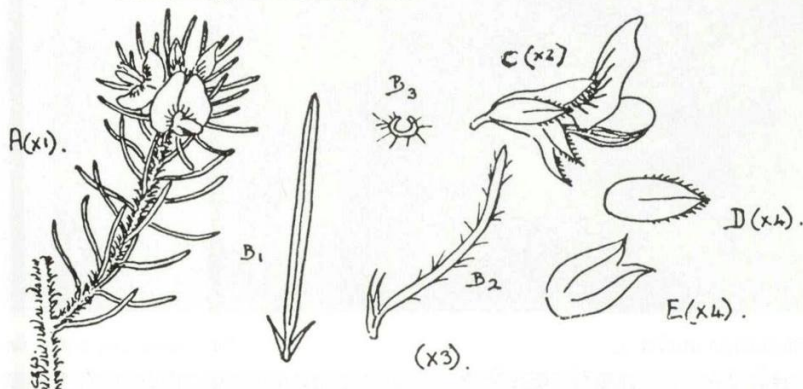
Pultenaea mollis △

▽ *Pultenaea williamsoniana*



***Pultenaea hibbertioides* Hooker**

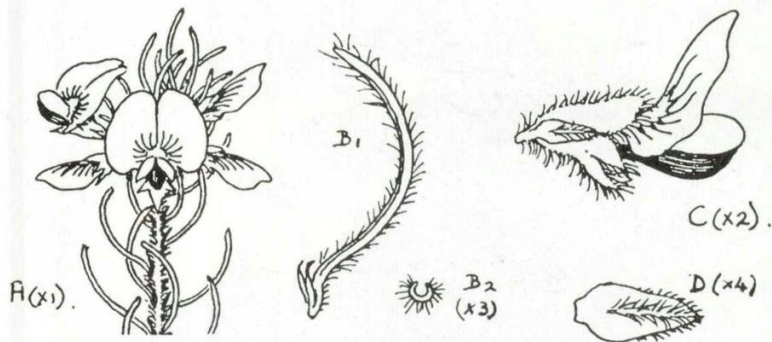
- Habit:** Variable diffuse shrub, usually from prostrate to less than 1 m high; softly hairy. (A).
- Leaves:** Linear-terete, crowded, channelled above, from glabrous to softly villous, c. 12 mm long, tip obtuse or shortly acute. (B₁ B₂ B₃). Stipules with long subulate points.
- Flowers:** In leafy heads at end of branchlets, on short pedicels, in numerous overlapping bifid floral bracts (E). Calyx glabrous, except ciliate on the margins. (C). *Flowering:* Summer — December/January.
- Bracteoles:** Lanceolate, keeled with slight cilia on margins, about as long as the calyx and inserted just below it. (D).
- Distribution:** Tas., Vic. — scattered localities (Mt. Buffalo, Grampians, Anglesea, Wilson's Promontory). A variable species.



***Pultenaea mollis* Lindl.**

Soft Bush-pea

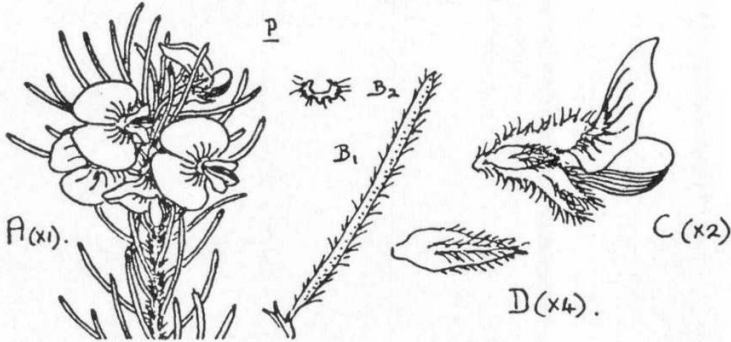
- Habit:** Tall, showy, diffuse shrub to 2 m tall. Branchlets hairy. (A).
- Leaves:** Linear-terete, inrolled, curled inwards towards stem, hairy, 10-15 mm long. Petioles c. 1 mm long, stipules slender c. 2 mm long. (B₁ B₂).
- Flowers:** Dense terminal heads, individual flowers large, subsessile. Calyx hairy, lobes shorter or no longer than the tube. (C). *Fls:* September/November.
- Bracteoles:** Lanceolate-ovate, hairy on midrib, about as long as calyx tube and attached at its base. (D). Photograph on page 133 by Colin Woolcock.
- Distribution:** Vic. — coastal and moist hilly areas, often widespread and prominent.



***Pultenaea teretifolia* H. B. Williamson**

Grooved Bush-pea

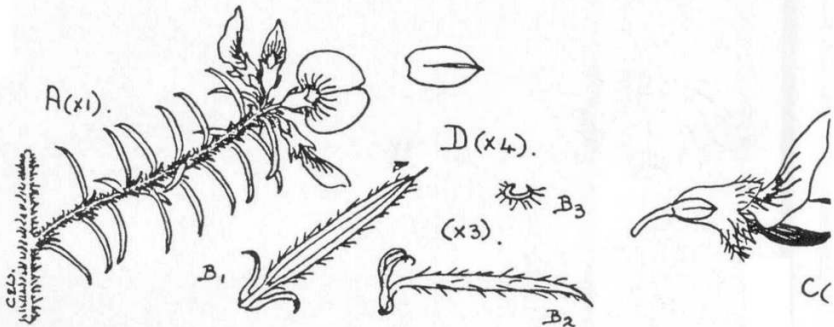
- Habit:** Shrub, sometimes spreading, to about 1 m high. Stems pubescent. (A).
Leaves: Terete, 1-furrowed above, crowded, hispid with scabrous undersurface, 7-15 mm long. Stipules 2-3 mm long. (B₁, B₂).
Flowers: Subsessile in leafy heads at end of branchlets. Calyx villous, 3 lower lobes acuminate and about as long as the tube. (C). **Flowering:** September-October.
Bracteoles: Linear-lanceolate, villous, as long as or shorter than calyx tube and attached at its base. (D).
Distribution: Sth. Aust. only – Southern Mt. Lofty Range, Eyre Peninsula.



***Pultenaea williamsoniana* J. Willis**

Williamson's Bush-pea

- Habit:** Erect shrub to 2 m tall. Stems pubescent. (A).
Leaves: Terete, incurved, 7-10 mm long, perpendicular to stem, a few sparse hairs; mucronate tip slightly recurved. Petiole c. 1 mm long; stipules prominent c. 3 mm long. (B₁, B₂, B₃). Photograph on page 133 by J. B. Fanning.
Flowers: 2-6 in umbel at end of branchlets, on pedicels 2-4 mm long. Calyx brown, viscid, lobes shorter than tube and with short sparse hairs, tube mainly glabrous. Keel dark red. (C). **Flowering:** Spring – September/November.
Bracteoles: Ovate, glabrous, shorter than calyx tube and attached at its base. (D).
Distribution: Endemic in the northern Grampians, Victoria.





Pultenaea radiata △

Photography by Colin Woolcock

▽ *Pultenaea daltonii*



Fungi . . . A point of view

by Gordon Cousins

Observations over more than two decades have resulted in my forming a simple hypothesis . . . but I'm not an evangelist trying to convert anyone to my viewpoint.

My hypothesis: Fungi can be divided into two classes . . . parasitic fungi and saprophytic fungi. Into this second class I have lumped all non-parasitic types, which is scientifically incorrect, but most convenient for my purpose.

First, our friends the saprophytes. Without them, mankind would not be enjoying his present favourable situation on this planet . . . and not just because penicillin and several other valuable antibiotics derived from soil fungi are curing and protecting him from killer diseases. These saprophytic fungi, together with other micro-organisms, play an enormously important part in soil fertility. They attack . . . that is, use for their nutrition . . . only dead organic matter.

Now for the parasitic fungi, which use living tissues for food and completion of their life cycle. They cause havoc. For example, we have all read accounts of the devastation in jarrah forests in W.A. *Phytophthora* species seem to be the culprits.

But to me, they are not a problem . . . never have been . . . though I accept that I may have met with them and not recognized them. Thus, when my plants die (which is not infrequent) I lift them and if I find no evidence of nematodes, collar rot, borers, etc., I do not say "*Phytophthora* QED." This conclusion seems to be reached commonly by many native plant growers, but I cannot accept this. There are so many causes and co-factors working against our efforts to grow plants from all over the Commonwealth in our own backyards. These parasites require wet conditions and heat, so I keep them at bay by hyperdrainage, the use of pebbles around trunks and stems instead of organic matter, and by avoiding over-watering.

In my primitive propagation system (use of ice cream containers enclosed in supermarket bags and a very open medium) my results satisfy me as I usually get 20% to 80% of cuttings away. I have rarely had 100% failure with cuttings but if this were to happen repetitively, I would suspect *Phytophthora*. When some cuttings fail and show a grey woolly fungus, years ago I would throw out the lot . . . pots, unit and medium. When I observed that often one or two cuttings remained green and viable in the grey mess, the truth dawned on me — the fungus was a saprophyte attacking already dead cuttings.

I re-use pots and medium and have not sterilized anything since retiring from medical practice some years ago.

Here's hoping that I will not be expelled from S.G.A.P. for heresy! ■

Australian Plants Needs YOUR Help

Without your help Australian Plants will not survive. How strongly do you feel that it should? I need comments from readers and good colour slides of the following plants that will be featured in issues in preparation. Plants in the family Liliaceae and related genera; this includes *Blandfordia* (Christmas Bells), *Arnocrinum*, *Johnsonia*, *Chamaescilla*, *Dianella*, *Stypandra*, *Bulbine*, *Hypoxis*. Most Myrtaceae but especially *Calytrix* and *Leptospermum*. Plants in the plant family Sapindaceae, especially *Dodonaea*, *Euphorbia*, etc. Plants in the plant family Rutaceae, especially *Eriostemon*, *Phebalium*. Most importantly, I need colour slides of native gardens — Editor.

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Nemcia leakeana (see page 120 and 125)

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