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Wildflowers in the Iris Family

A Note for Beginners by Editor

We have all admired the garden *Iris*, developed from a wildflower of another land. The native 'iris' of Australia are also attractive in the garden and are equally as hardy. On page 194 I discuss details of propagation and cultivation in the garden. In this series of articles for beginners, new readers to our Journal, I hope to encourage readers to be patient with our use of scientific names for the plants. With so many plants in the flora there is really no other way. Hopefully, you will forgive me for cramming this issue with so many plant descriptions, there seemed no other way.

Just concentrate on handling the first or generic name. Opposite we have *Patersonia* (pat-ter-so-nia), *Diplarrena* (dip-lar-re-na) and *Libertia* (li-ber-tia). Then we have *Grevillea* (grev-il-lea), *Orthrosanthus* (or-thro-san-thus), *Smilax* (smi-lax), *Eustrephus* (eu-stre-phus), *Geitonoplesium* (ge-it-ono-ple-sium), *Petermannia* (peter-man-nia), *Ripogonum* (ri-po-go-num), *Rinzia* (rin-zia), *Faradaya* (far-a-day-a), *Epacris* (e-pac-ris), and *Dracophyllum* (drac-o-phil-lum). That is all there is in this issue. Our first volume included pronunciation as above. Would you like us to return to this practice.

Botany for the Beginner

We begin a series that will enable the beginner to study flowers and read the simple descriptions we publish of our wild flowers. There are so many beautiful flowers in our flora, it is not only necessary to use scientific names but to also publish simple descriptions using a minimum of technical terms. See page 218 for this new series.

Ideal for children, why not join your children in this simple illustrated series on the parts of flowers.

Smilax

Many will be familiar with this happy wanderer, a climber/twiner with masses of white flowers. Did you know there were so many species and plants that are close relatives. The descriptions and clear sketches on page 209 make an interesting study. The author has kept the descriptions simple.

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COVER PLATE

The silky Purple-flag Iris, *Patersonia sericea*. A reliable plant for that sunny rockery. See pages 191 and 207 for a description and page 194 for details of cultivation.

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Australian IRIS

The South-eastern Species
by Ross Garnett*

While fourteen species of Purple-flag (family Iridaceae) are endemic in Western Australia only four are likely to be seen in the south-eastern part of the continent — all four in Victoria, three in Tasmania, New South Wales and Queensland and two in South Australia. Also in the plant family Iridaceae in Australia are two other plant groups, the Morning Iris, *Orthrosanthus*, chiefly of Western Australia although *Orthrosanthus multiflorus* extends right across to south-western Victoria where it is a picture in October in the Portland area, and *Isophysis* which is confined to Tasmania.

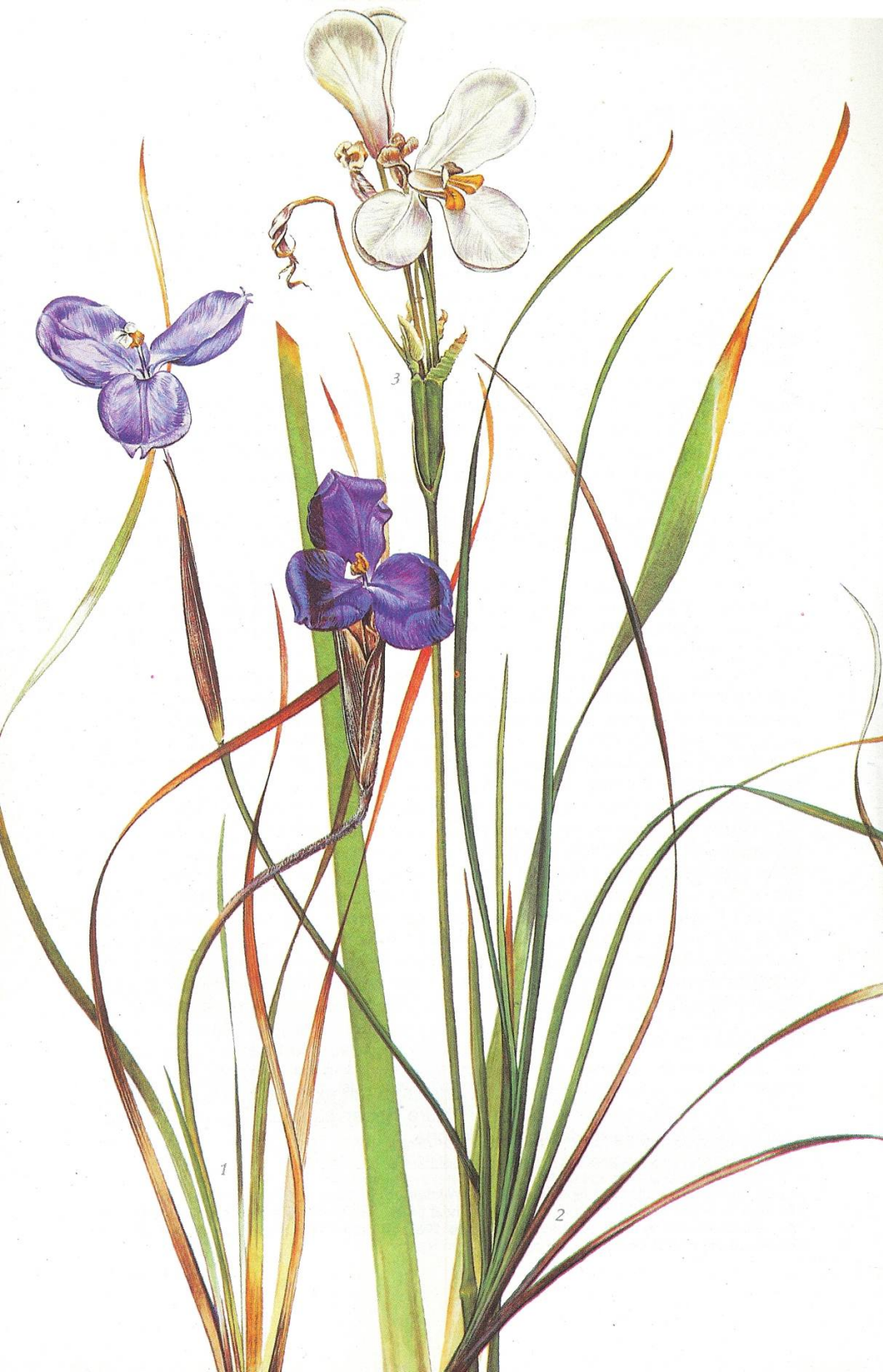
Patersonia sericea, the Silky Purple-flag, is known only in the three eastern mainland states and nearly always in damp heathlands, but has been noted among granite rocks on Pine Mountain, Victoria. It flowers in Aug. and Sept.

Patersonia glabrata, the Leafy Purple-flag, has a similar distribution and flowering time to *P. sericea*. Should it happen that the plant one finds is more or less beset with silky or woolly hairs, especially on the edge of the lower part of the leaves and on the outer bracts of the flower, one may be sure that the species is either *P. glabrata* or *P. sericea*, and they in turn are distinguished as *P. sericea*.

Patersonia fragilis and *Patersonia occidentalis* are tufted herbs with linear leaves but those of *P. fragilis* are often pungent, sharp on the ends. These species, together with all the 17 species of *Patersonia*, are described in this issue of Australian Plants from page 202.

Another iris is *Diplarrena moraea*, the Butterfly Flag, a robust perennial of somewhat variable habit, commonly seen as a plant with numerous long, glossy leaves that arise from a short, creeping root-stock, and conspicuous by reason of its tall, erect scapes bearing a few large stalked flowers. An alpine form, variety *latifolia*, formerly known as *Diplarrena latifolia* Benth, is fairly abundant in the mountain country of Tasmania. It also is an erect plant but its foliage is generally broader than that of the lowland form and its flowers are more colourful. Instead of the usual white with yellow blotches on the throat, its flowers are variegated in white, yellow and blue or lilac. Another Tasmanian form has long, rather lax leaves and prostrate flower scapes which tend to take root at the tips, in this way producing dense colonies of plants. Quite commonly the Butterfly Flag flowers at night and its large white flowers often wither within a few hours of sunrise, although on dull days they remain open rather longer and the succeeding flowers begin to expand in the afternoon so that the passer-by in daylight hours is unlikely to miss seeing them. At any time from September to December a traveller along the road through the Yanakie Isthmus, in the course of his journey to Tidal River in Wilson's Promontory National Park, may chance upon colonies of the plant in bloom among the roadside heaths — especially in places where moist ground persists long after the fall of winter and spring rains. The genus is monotypic and restricted to the extreme south-east corner of New South Wales, in the Nadgee Nature Reserves near Cape Howe, Tasmania and the southern districts of Victoria. ■

*Based on the descriptions of Ross Garnett in "Wildflowers of South-Eastern Australia". See page 234 for a book review and a colour plate on the next page, reprinted by permission. The Australian "iris" are described by another author from page 198 and notes by Ross Garnett on *Libertia* are included at the end of this article, on page 208.





Isophysis tasmanica

The only species in the genus *Isophysis*, this unique little plant in the irid family occurs in Tasmania on exposed summits of mountains near the west coast and on peaty moors to sea level in the south-west, where it flowers in December and January. It is distinguished from all other members of the family in having a superior (not inferior) ovary. It has a woody rhizome with linear to ensiform leaves 5-30 cm long and 3-5 mm wide with brown scarious margins. The flowers are dark purple-brown with sepals similar to the petals, 2-4 cm long and 3-9 mm wide, the style is about 3 mm long and has three stigmatic lobes 1-2 mm long.

Native Iris Reproduced by permission from "Wildflowers of South-Eastern Australia" as an example of the beautiful colour plates in the book. From the left, *Patersonia sericea*, then *Patersonia glabrata* with *Diplarrena moraea*, the Butterfly Flag Iris, top right.

Growing Australian Iris

by W. H. Payne

You will find the Australian Iris species easy to grow if you give them full sun, reasonable drainage, full sun, reasonable moisture in early spring, full sun, practically any type of soil if it is reasonably drained and full sun, and full sun. Get the point?

Getting the plants is the first problem. Unfortunately they are not often available in nurseries. If you have a friend with a plant a few years old, the easiest way is to divide the plant as you would any other iris or tufted plant. Division is simple enough, just cut a mature plant in half with a spade and lift one half out of the ground. You will probably be able to divide it again by pulling it apart; hold one half of the rhizome-root in each hand and pull. Do not be greedy and go for too many plants or you could lose the lot. As with any other plant removed from the ground with the roots largely free of soil, treat it as a cutting. Keep in filtered shade progressively moving it to a more sunny position over a four week period, watering the plant sections daily.

Propagation from seed has not been so successful for me. I do not see why they cannot be readily grown from seed so perhaps the seed I purchased was too old. Would readers please collect some seed for me and I will try again.

I have had plants of *Patersonia* and *Orthrosanthus laxus* growing in sandy soil for twenty years. The *O. laxus* has been particularly successful, divisions over the years providing some thirty plants that adorn the front edge of a garden bed. During spring the display is spectacular, the pale blue flowers to 5 cm across, appearing in abundance. Each flower only lasts for the first half of the day, hence the common name Morning Iris, but each plant reliably flowers every day.

There is one secret with maintaining healthy plants. About November each year, tear off the outer dead leaf on each group of leaves. The leaves grow out in a row with an even number on each side of the centre facing in. The outer ones in each row are dying off. If removed carefully it seems to give the whole plant room to breathe and make new growth. These remarks apply to *Orthrosanthus laxus* but could apply to the flag lilies, *Patersonia* as well.

I grew *Orthrosanthus multiflorus* hoping for an even better display, as the name implies. The *O. multiflorus* grew well, too well, making dense clumps of leaves to half a metre high and round. The floral display was fair with flowers of a darker blue, but the plants did not look as good in flower as *O. laxus*. Out of flower, they are just dense, space wasting dominant clumps, that to me were not worth the effort so they were pulled out, all except for two kept just for a change. The botanist, David Cooke, advises "the difference between *Orthrosanthus laxus* and *O. multiflorus* is that the rhipidia (flower groups) in the former species are on slender stalks but in the latter some are sessile. There is no difference in the foliage". Perhaps someone knows of a less vigorous *O. multiflorus* that produces more flower than foliage for me to try? ■

Kings Park Native Plant Annual, 1987

This 34-page booklet is a remarkable production, well worth the modest expenditure for a copy. The large glossy pages (30 × 21 mm) provide space for the spectacular colour plates, usually a close up of a flower head and another on the opposite page of the whole flowering plant. However, it is the text, especially prepared for the interested home gardener that is so valuable. The new issue is available for \$3.95, or as a special, in conjunction with the first issue for \$4.95, post free, from Mapco, P.O. Box 85, North Perth, WA 6006.

Grevillea 'Granya Glory'

This is a hybrid of *Grevillea lanigera* and *Grevillea polybractea*.

Grevillea lanigera is the Woolly Grevillea from New South Wales and Victoria named because of the woolly appearance of the foliage and stems. It is a rounded shrub to 1.5 m but often less and there is a form that has become quite popular that is prostrate making a good ground cover. The soft blunt linear hairy grey leaves are 2 cm long. The flowers are red or red and cream in semi-erect clusters. A very good plant for the garden.

Grevillea polybractea is an erect spreading shrub from New South Wales and Victoria. The flowers are wider, to 5 mm, and the red flowers are in tight pendant clusters.

Grevillea 'Granya Glory' has grey-green leaves that are larger and broader than both parents and take on an attractive "plum" colour for many months. The rose-red and flower heads are also larger and profuse, and lack the prominent bracts of *G. polybractea*. Growing to only 0.4 m high this small shrub is frost hardy and very drought hardy and is a reliable and spectacular plant in cultivation. It suckers lightly through the garden in a most pleasing manner. It has been trialled and found to be most adaptable from Brisbane to Perth. It also makes a superb tub specimen flowering profusely from an early age.

It is a naturally occurring hybrid which was collected on Mt. Granya in N.E. Victoria. Persons interested in this selection should contact White Gums Nursery, Box 107, Stawell, Vic. 3380.

Australian Cultivar Registration Authority: The cultivar described above has recently been registered with the authority. Cultivars are selected plants developed for horticultural use. The parents of this fine cultivar are also excellent plants for use in horticulture and are described and illustrated in the colour plates that follow. Selected forms of the two parent species, that have specialty features or have proven unusually hardy in cultivation may also be registered as plant cultivars.

Grevillea lanigera

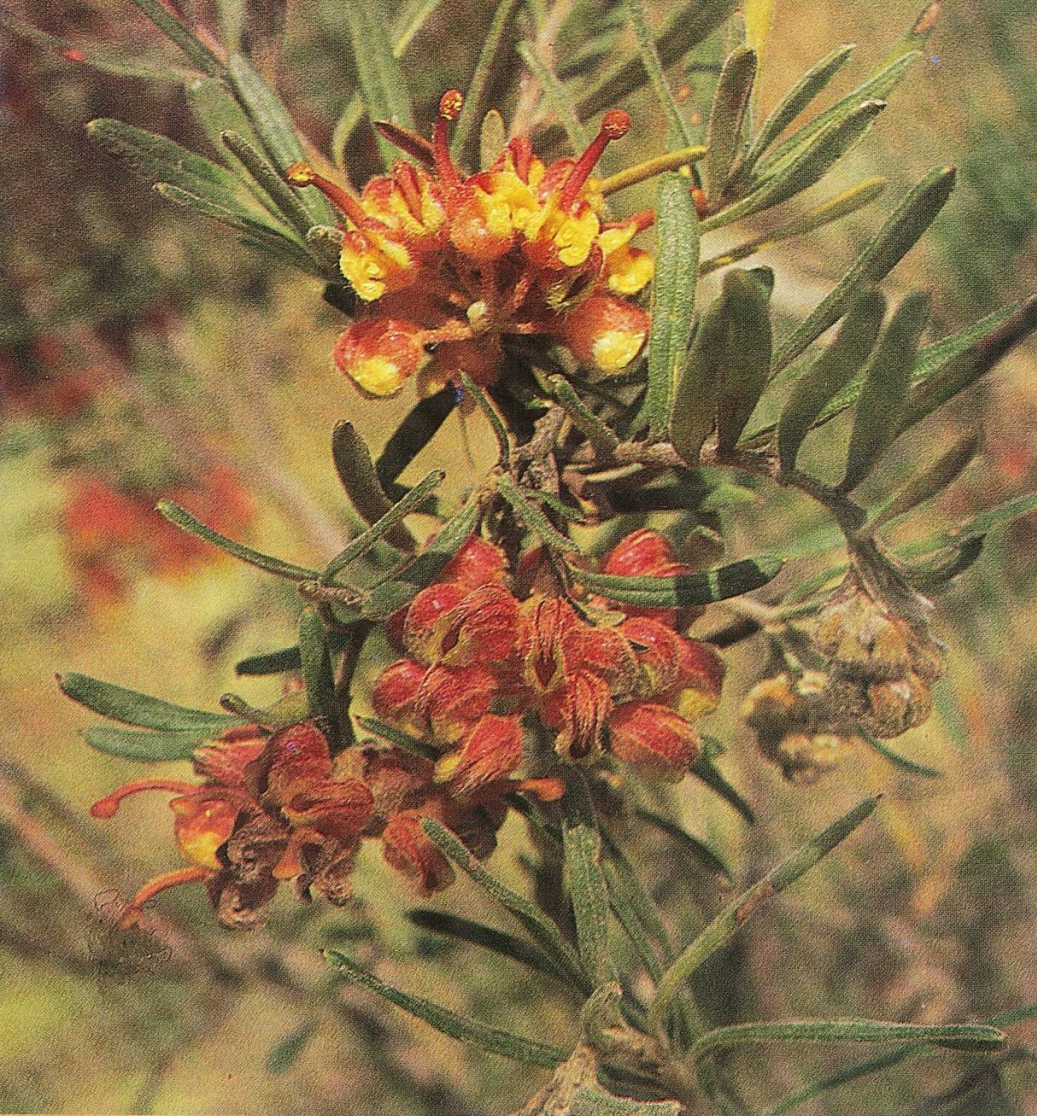
From Neil Marriott

Grevillea lanigera is a widespread and extremely variable species. Its habit varies from a large spreading bush to 2 × 2 m to a small and compact, often suckering shrub often only 30-40 cm high. A number of beautiful prostrate forms occur, chiefly in exposed coastal areas including Wilson's Promontory in Victoria and Green Cape in New South Wales. The prostrate form from near Wilson's Promontory has been sold incorrectly for a number of years as 'Mt. Tamboretha'; forms from this alpine area have quite different leaves and are not prostrate.

Flowers range from the rare cream or yellow-green to the typical, showy reddish-pink. In cultivation they bloom for many months of the year with some forms flowering from early autumn right through to mid summer. This makes them a delight in the garden, and a great favourite with honey eating birds. Forms can be selected as large background screens, rockery plants or superb ground covers.

They grow readily in a wide range of situations, doing best in sunny to semi-shaded sites in well drained, acid, sandy or gravelly loams. Flowering and vigour is increased by the occasional deep summer watering if necessary. Fertilizing is rarely necessary.





Grevillea polybractea (above)

Photography by Neil Marriott

A distinctive *Grevillea* from the drier stony or gravelly hills of southern NSW and north eastern Victoria. It has linear-elliptical hairy leaves and attractive orange and red flowers in dense pendant clusters; these are enclosed in numerous prominent bracts when in bud – hence the scientific name. A small shrub in cultivation that can reach two metres but can usually be kept to less than half a metre in height, it requires excellent drainage. It has proven hardy in extended dry conditions once established. — N. Marriott.

***Grevillea* 'Granya Glory'** (opposite top)

Photography by Neil Marriott

A horticultural cultivar developed by crossing *Grevillea lanigera* and *Grevillea polybractea* as described on page 195.

Grevillea lanigera (opposite bottom)

Photography by Neil Marriott

The form that produced *Grevillea* 'Granya Glory' is a reliable plant in the garden. See page 195 for a description.

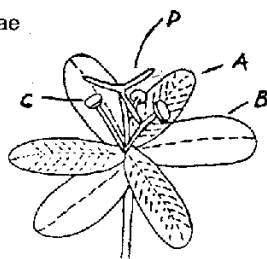
Iridaceae

The family
by P. E. Bailey

A family of monocotyledons containing about 85 genera and 1 500 species with *Diplarrena*, *Isophysis*, *Libertia*, *Orthrosanthus* and *Patersonia* native in Australia. They are perennial herbs from a corm, bulb or rhizome rootstock. The leaves are parallel-veined with closed basal sheaths. The flowers are terminal with each flower having three sepals, three petals, three stamens and a style with three branches or lobes.

Diagrammatic sketch showing features typical of Iridaceae

Genus	Petals (A) and Sepals (B)	Stamens (C)	Style (D)
<i>Diplarrena</i>	unequal	1 is sterile	Long, lobes small
<i>Isophysis</i>	Equal	Exserted	Short, lobes small
<i>Libertia</i>	Subequal to very unequal	Exserted	Short, lobes long between stamens
<i>Orthrosanthus</i>	Equal to sub- equal	Exserted	Short, lobes long between stamens
<i>Patersonia</i>	Petals very small	Exserted	Short, lobes small



THE GENUS DIPLARRENA

Densely tufted perennial herbs with linear-ensiform (sword-like) leaves, the scape is erect and rarely branched. The flower sepals are unequal, the petals are oblong and shorter with two spreading and the third hooded over the three stamens, two are fertile and the third is a staminode. A genus of two species endemic in Eastern Australia.

Diplarrena differ from other genera in the family in having two stamens fertile and the third a staminode (not all three fertile) and from *Patersonia* in having petals and sepals equal or nearly so. See the colour plates on page 192.

Diplarrena latifolia Benth.

A perennial herb with leaves 30-100 cm long and 10-20 mm wide, the scape is 60-120 cm long. The flowers are white with the sepals broadly elliptic, 3.5-4.2 cm long and 2.5-3 cm wide, the petals are narrowly oblong and about 2.5 cm long, the spreading two are purple-veined at the sides and often yellow toward the apex. It occurs in southern and western Tasmania, mainly in heaths including peaty moorland near the coast and in montane heaths, flowering from January to March. It is distinguished in having leaves over 1 cm wide.

Diplarrena moraea Labill.

A perennial herb with leaves 10-70 cm long and 5-10 mm wide, the scape is 20-100 cm long. The white flowers have sepals broadly oblanceolate, 2.5-3.5 cm long and 1.5-2.2 cm wide, the petals are narrowly oblong, 2-2.5 cm long and usually purple-tinged or finely purple-veined and often yellow toward the apex. It occurs on the coast and Great Dividing Range of south-eastern New South Wales and southern Victoria east of the Otway Ranges, widespread in Tasmania except the south-west, in heath and open forest, flowering from October to January. It is distinguished in having leaves to 1 cm wide.

THE GENUS ORTHROSANTHUS

Tufted, evergreen perennial herbs with numerous linear erect basal leaves. The flowers have spreading sepals and petals that are shortly united at the base and the style is deeply trifid with the branches projecting horizontally between the stamens. A genus of about seven species with four endemic in Australia. Cultivation advice is given on page 194.

They are distinguished from *Libertia* in having flowers and capsules almost sessile (not exserted from the spathes on long pedicels), *Diplarrena* in having three fertile stamens (not two fertile and one staminode) and *Patersonia* in having petals and sepals equal or subequal (not manifestly unequal).

***Orthrosanthus laxus* (Endl.) Benth.**

A herb 20-55 cm tall with rigidly erect leaves 12-45 cm long and 3-5 mm wide. The pale blue flowers have sepals and petals obovate to oblong, 15-19 mm long and 7-10 mm wide, often minutely apiculate, the style branches are 4-7 mm long. Widespread in south-western Western Australia from Geraldton to Albany where it flowers from August to October. It is distinguished from *O. multiflorus* in having the stamens free (not monadelphous).

The variety *gramineus* (Endl.) Geer. differs from the var. *laxus* in having leaves 1-2 mm wide (not 3-5 mm).

***Orthrosanthus muelleri* Benth.**

A herb 20-30 cm tall with rigidly erect leaves 10-20 cm long and 1.5-2.5 mm wide with densely pubescent to tomentose margins.

It occurs in Western Australia in the Stirling Range and Gnowangerup area where it flowers in October. It is distinguished from *O. laxus* and *O. multiflorus* in having leaves less than 20 cm long and margins densely pubescent to tomentose (not mostly over 20 cm with glabrous margins).

***Orthrosanthus multiflorus* Sweet**

A herb 30-60 cm tall with leaves 16-50 cm long and 2-6 mm wide, glabrous, the bases with scarious brown margins. The flowers have sepals and petals obovate to oblanceolate, obtuse, 12-20 mm long and 6-10 mm wide, the style branches are 4-5 mm long. Colour plate on page 201.

It occurs in Western Australia on the south coast from Stirling Range to Israelite Bay, Kangaroo Island and Eyre Peninsula, South Australia and south-western Victoria in heath and scrub-heath. Flowering is from September to December. It is distinguished from *O. laxus* in having stamens that are monadelphous (not free).

***Orthrosanthus polystachyus* Benth.**

A herb 60-100 cm tall forming large tufts with grass-like leaves 25-60 cm long and 2.5-6 mm wide, glabrous, the margins are often scabrous. The flowers have obovate sepals and petals with acute apices, 15-19 mm long and 7-10 mm wide, the petals are slightly narrower and glabrous, the style branches are 4-7 mm long.

It occurs in south-western Western Australia between Busselton and the Warren River area in forest gullies, often along streams where it flowers in October and November. It is distinguished in having each pair of spathes enclosing one flower (not two or more flowers).





Orthrosanthus multiflorus (above)

Photography by Colin Woolcock

A very easily grown Morning Iris. The notes on cultivation on page 194 describe how to grow this plant easily. It is also rather critical of the bulk of leaf and relative lack of abundance of flower in relation to *Orthrosanthus laxus* which has very similar flowers to those above although a little paler. The above colour plate appears to indicate that there are good forms. A plant that is easy to grow and is leafy can be used to advantage to form a permanent border. It has also been used as a potted plant for indoor use.

Patersonia fragilis (opposite top) description page 203.

Photography by Neil Marriott

Patersonia occidentalis (opposite bottom) description page 206. Photography by F. W. Humphreys.

THE GENUS *PATERSONIA*

Perennial herbs with leaves that are usually linear or ensiform. The flowers are mostly blue-violet but sometimes white or yellow. They develop on an erect scape and are enclosed by an involucre of two opposite spathes. Each flower has three broad and spreading sepals and three petals that are very small and erect, the style has three stigmatic lobes at the apex. About 19 species with 17 endemic in Australia and one or two in Malesia (i.e. Malaysia, Singapore, Indonesia, Philippines, New Guinea and adjacent islands).

They are distinguished from *Diplarrena*, *Libertia* and *Orthrosanthus* in having petals and sepals manifestly unequal. The arrangement of petals and sepals is sketched on page 198 and they show well in the colour plates.

***Patersonia argyrea* D. Cooke**

A tufted herb with linear-ensiform leaves 20-42 cm long and 2-5 mm wide, biconvex, deeply grooved, the grooves hairy, the margins and bases villous to pubescent. The scape is 20-35 cm long and completely villous. The spathes are elliptic, cymbiform and 3.5-5.2 cm long, prominently veined, sparsely silky and dark chestnut-brown. The sepals are violet.

It occurs in Gairdner Range, Western Australia in heath on sandy soils, flowering from September to November. It is distinguished by the combination of grooved, biconvex leaves and dense white indumentum giving the plant a silvery-grey appearance.

***Patersonia babianoides* Benth.**

A herb replacing its leaves annually. The leaf is usually solitary, linear to elliptic, 7-16 cm long and 5-12 mm wide with the margins and several prominent veins pilose with hairs 3-6 mm long. The scape is 2-3 cm long and pilose. The spathes are narrowly triangular to lanceolate, 2-3.4 cm long, prominently veined, villous and green. The flower sepals are blue-violet, obovate, 1.5-2 cm long, 1.2-1.4 cm wide and the petals are linear. Photograph on page 204.

It occurs in the Darling Range, Western Australia between Helena Valley and Collie and occasionally further south in Jarrah forest on laterite, flowering from September to November. It is distinguished by having only one or two leaves with the bases narrowed and petiole-like (not sheathing).

***Patersonia drummondii* F. Muell. ex Benth.**

A tufted herb growing almost shrubby with linear leaves 10-30 cm long and 1.5-4 mm wide, the margins minutely pubescent and brown. The scape is up to 27 cm long, glabrous or sparsely pubescent and clasped by one reduced leaf. The spathes are lanceolate, 3.2-6 cm long, grooved, glabrous and green. The flower sepals are pale violet, obovate, 1.5-2.5 cm long, 1.2-2 cm wide and the petals are narrowly lanceolate.

It occurs in Western Australia from the Murchison River southwards and inland to the Southern Cross area in heath and scrub-heath of sandplains and mallee on sandy loam, flowering from August to October. It is distinguished from *P. fragilis* in having pubescent leaf margins (not glabrous) and *P. inaequalis* in having pale violet flowers (not white).

***Patersonia fragilis* (Labill.) Asch. & Graebner**

A tufted or tussock-forming herb with linear leaves that are often pungent, 20-60 cm long and 1-6 mm wide, biconvex to terete, grooved and glabrous. The scape is 4-25 cm long, glabrous and clasped by one reduced leaf. The spathes are lanceolate, 2.5-4.5 cm long, green to pale brown and similar to the leaves in texture. The flower sepals are pale violet to blue-violet, obovate to rhomboid, 1.2-2.3 cm long, 1-1.5 cm wide and the petals are oblanceolate.

It occurs on the coast from Kangaroo Island, South Australia to south-east Queensland and the north and east coast of Tasmania on heathlands and wet-heaths in the southern states, flowering from August to December. This variable species is distinguished from *P. drummondii* and *P. inaequalis* in having glabrous leaf margins (not pubescent to villous). Photograph, page 200.

***Patersonia glabrata* R. Br.**

An undershrub 30-80 cm tall with leaves 10-40 cm long and 2-5 mm wide, flat, finely veined and glabrous. The scape is 10-30 cm long and glabrous. The spathes are lanceolate, 4-6.5 cm long, finely striate, sparsely sericeous, becoming glabrous and dark brown. The flower sepals are pale violet, ovate to orbicular, 2-3 cm long, 1.5-2.6 cm wide and the petals are lanceolate. This species is shown on the colour plate on page 192.

It occurs on the coast and tablelands from about Townsville, Queensland to east of Wilson's Promontory, Victoria in woodland and open forest on sandstone and granite and in coastal heath on sand, flowering from August to October. It is distinguished from *P. pygmaea* in having leaves 10-40 cm long (not 5-15 cm) and the plant is 30-80 cm tall (not to 20 cm).

***Patersonia graminea* Benth.**

A herb forming dense clumps with linear leaves 5-16 cm long and 1-3 mm wide, bifacial, keeled, with pilose to glabrous margins. The scape is 20-33 cm long, deeply grooved, tomentose at the base. The spathes are lanceolate, 1.5-2.5 cm long, veined, glabrous and green. The flower sepals are pale violet, obovate, 2-2.5 cm long, to 2 cm wide and the petals are minute.

It occurs in Western Australia from the coast near the Murchison River southwards and inland to the Watheroo area in heath and scrub-heath on sandplain and granite hills, flowering in September and October. It has leaves less than half the scape length, soft and soon withering.

***Patersonia inaequalis* Benth.**

A tufted herb, almost shrubby with linear leaves 11-32 cm long and 1.2-2.5 mm wide, biconvex with deep papillose grooves, the margins are minutely pubescent and brown. The scape is 18-23 cm long and glabrous. The spathes are lanceolate, one straight and 2.2-3 cm long, the other bent and 1.8-2.6 cm long, grooved and green. The flower sepals are white, rhomboid, 1-1.5 cm long, 0.8-1.4 cm wide and the petals are obovate.

It occurs in Western Australia on the coast between Stokes Inlet and Mon-drain Island in heath and scrub-heath, flowering from August to October. It is distinguished in having white flowers.



Patersonia pygmaea ▲

Photography by Greg Keighery

▼ *Patersonia babianoides*



***Patersonia juncea* Lindley**

A densely tufted herb with linear leaves 7-22 cm long and 0.6-1.4 mm wide, terete, deeply grooved, papillose, the bases with scarious brown margins. The scape is 5-24 cm long and glabrous. The spathes are narrowly lanceolate, 3-4.5 cm long, glabrous and chestnut brown. The flower sepals are pale violet, obovate to orbicular, 1.5-2 cm long, 1.3-1.8 cm wide and the petals are linear.

It occurs in south-western Western Australia from the Stirling Range to Eneabba in Jarrah forest, woodland, mallee and scrub-heath, and occasionally on coastal plain between Stirling Range and Israelite Bay, flowering from August to October. It is distinguished from *P. maxwellii* in having terete leaves.

***Patersonia lanata* R. Br.**

A densely tufted herb with ensiform leaves 15-40 cm long and 2-7 mm wide, flat and glabrous, the margins are brown-tomentose near the base and glabrous above. The scape is 12-40 cm long and brown-tomentose, clasped by one reduced leaf. The spathes are triangular, 2.5-3.2 cm long, prominently veined and dark brown. The flower sepals are blue-violet, broadly elliptic, obtuse, 2-3 cm long, 1.8-2.7 cm wide and the petals are cuneate.

It occurs in Western Australia on coastal plain between Two Peoples Bay and Israelite Bay in open and lightly wooded heath and on stabilized dunes, flowering from August to November. It is distinguished from *P. sericea* and *P. rudis* in having brown-tomentose scapes (not silky to velvety with white hairs).

The form *calvata* D. Cooke is distinguished from the type form *lanata* in having leaf margins, scape and spathes lacking brown tomentum.

***Patersonia ilmbata* Endl.**

A tufted herb with ensiform leaves 18-40 cm long and 4-11 mm wide, finely veined and glabrous, the margins thickened, about 1 mm wide, hard, glabrous and brown. The scape is 27-38 cm long, glabrous and clasped by two short leaves. The spathes are elliptic, 4.2-5 cm long, glabrous and dark brown. The flower sepals are violet, ovate to orbicular, often apiculate, up to 3 cm long, 2.5 cm wide and the petals are linear.

It occurs in south-western Western Australia in the Stirling Range-Albany area and along the coast to Cape Arid, with scattered populations in southern Darling Range, in heath, scrub and woodland, mainly on poorly drained sites, flowering in September and October. It is distinguished from *P. occidentalis* and *P. lanata* in having leaf margins thickened, about 1 mm wide.

***Patersonia macrantha* Benth.**

A herb forming large tufts with linear-ensiform leaves 18-45 cm long and 4-9 mm wide, flat, finely striate, glabrous or papillose, the margins are pubescent to glabrous. The scape is 22-50 cm long, smooth and pubescent near the top. The spathes are elliptic, 4.3-6.8 cm long, prominently veined, very sparsely silky and pale brown. The flower sepals are pale violet, obovate to elliptic, 3-4 cm long, 2.5-3 cm wide and the petals are lanceolate.

It occurs in Northern Territory north from about Katherine in eucalypt forest and woodland on laterite and sandy soils derived from sandstone, flowering from January to March. Distinguished in locality, it is closely related to *P. sericea* differing in having spathes pale brown, sparsely silky (not dark brown to black, silky to tomentose).

***Patersonia maxwelli* (F. Muell.) F. Muell. ex Benth.**

A tufted herb with linear leaves 15-24 cm long and 1-2 mm wide, biconvex, deeply grooved and papillose, the brown margins are minutely ciliate with incurved hairs. The scape is 5-20 cm long and glabrous. The spathes are lanceolate, 2.5-3.5 cm long, glabrous and chocolate brown. The flower sepals are violet, broadly obovate, 1.2-2 cm long, 1-1.5 cm wide and the petals are ovate.

It occurs in Western Australia on coastal plain between Albany and Israelite Bay in heath on poorly drained soils. Occasionally in the southern Darling Range in seasonally wet Jarrah forest, flowering from September to November. It is distinguished from *P. occidentalis* in having grooved, papillose, smaller leaves and *P. juncea* in having leaves biconvex (not terete).

***Patersonia occidentalis* R. Br.**

A tufted herb with linear-ensiform leaves 8-55 cm long and 2-10 mm wide, flat, finely veined, glabrous with margins glabrous or brown-pubescent. The scape is 10-80 cm long, glabrous and clasped by one reduced leaf. The spathes are elliptic to lanceolate, 3-5 cm long, glabrous or puberulous on the keel and brown. The flower sepals are blue-violet, ovate, obtuse, 2-3.5 cm long, 1.2-2.2 cm wide and the petals are lanceolate. Photograph on page 200.

It occurs in south-western Western Australia from Murchison River to Israelite Bay, mainly near the coast and in south-eastern South Australia, coastal Victoria and northern and eastern Tasmania in heath, scrub and woodland, chiefly on poorly drained sites, flowering from September to December. The eastern populations have been referred to as *P. longiscapa* Sweet. It is distinguished from *P. lanata* in having spathes lanceolate to elliptic and smooth (not triangular and striate).

***Patersonia pygmaea* Lindley**

An undershrub 10-20 cm tall with ensiform leaves 5-15 cm long and 1.5-2.5 mm wide, flat and glabrous, the margins villous becoming glabrous. The scape is 1-6 cm long, glabrous or tomentose. The spathes are narrowly elliptic, 3-4.5 cm long, glabrous or pubescent on the keel and dark brown. The flower sepals are blue-violet, broadly ovate, 1.5-2.5 cm long, 1.2-1.8 cm wide and the petals are lanceolate. There is a colour photograph on page 204.

It occurs in Western Australia in the south-west from Darling Range to Stirling Range and Albany mainly in Jarrah forest on laterite but also in heathland, flowering from August to November. It is distinguished from *P. glabrata* in having leaves 5-15 cm long (not 10-40 cm) and plant is smaller to 20 cm tall).

***Patersonia rudis* Endl.**

A densely tufted herb with linear-ensiform leaves 30-70 cm long and 3-7 mm wide, flat or slightly biconvex. The scape is 20-50 cm long, densely or sparsely pubescent, clasped by one reduced leaf. The spathes are lanceolate, 4-6.3 cm long, prominently veined, sparsely white-silky to velvety and blackish. The flower sepals are violet, obovate, 2.5-3.5 cm long, 2-3 cm wide and the petals are lanceolate.

It occurs in Western Australia in the Darling Range between New Norcia and Dwellingup in Jarrah forest and woodland on laterite, flowering from October to December. It is distinguished from *P. sericea* in having leaf bases with dense general pubescence (not glabrous except on margins).

The subspecies *velutina* D. Cooke occurs in Western Australia in the Southern Cross-Coolgardie area in semi-arid woodland and shrubland and is apparently uncommon. It is distinguished from subsp. *rudis* in having leaves only up to 3 mm wide (not more than 3 mm) and shorter spathes 3-4 cm long.

***Patersonia sericea* R. Br.**

A densely tufted herb with linear-ensiform leaves 15-50 cm long and 1.5-6 mm wide, flat and faintly striate to terete and prominently grooved, the margins tomentose, pubescent or becoming glabrous. The scape is 10-45 cm long, pubescent in the upper part, clasped by one reduced leaf. The spathes are ovate to lanceolate, 3.5-6 cm long, prominently veined, white-silky becoming glabrous. The flower sepals are blue-violet, broadly ovate, obtuse, 2-3 cm long, 1.5-2.5 cm wide and the petals are ovate. Photograph on page 189.

It occurs on the coast and tablelands from eastern Victoria to Rockhampton, Queensland in coastal heath on sand and in woodland and open forest on sand and stony soils derived from sandstone or granite and extends to subalpine woodland in Victoria, flowering from June to November. It is distinguished from *P. rudis* in having leaf bases glabrous except on margins (not with dense general pubescence).

The variety *longifolia* (R. Br.) C. Moore & E. Betcher occurs from Genoa River, Victoria to Hunter River, New South Wales in open forest and heath on sandstones of the Great Dividing Range and sandy soil near the coast. It is distinguished from var. *sericea* in having leaves smooth (not prominently grooved), 1-2 mm wide (not 1.5-6 mm) and margins with a single row of inflexed hairs 1-2 mm long (not tomentose, pubescent becoming glabrous) and spathes 2-3.5 cm long (not 3.5-6 cm).

***Patersonia umbrosa* Endl.**

A loosely tufted herb with linear-ensiform leaves 30-90 cm long and 4-6 mm wide, flat, glabrous to puberulous, the bases with thin, brown, scarious margins. The scape is 30-80 cm long, glabrous, clasped at the base by the one reduced leaf. The spathes are narrowly lanceolate, 6-8.5 cm long, veined, green, glabrous or puberulous on keel. The flower sepals are blue-violet, ovate to rhomboid, 2.5-3.5 cm long, 2-2.5 cm wide and the petals are narrowly lanceolate. The variety *xanthina* has bright yellow flowers.

It occurs in south-western Western Australia from Deep River to Stirling Range and Fitzgerald River in poorly drained habitats within scrub-heath, woodland and Jarrah forest, flowering from August to November. It is distinguished from *P. drummondii*, *P. fragilis* and *P. inaequalis* in having leaves flat, without deep grooves (not biconvex to terete, deeply grooved).

The *Patersonia* Study: This report on *Patersonia* and other genera in the family Iriaceae summarises recent research. For a more complete report, refer to Vol. 46 of Flora of Australia and the review by Mr David A. Cooke of The Botanic Gardens of Adelaide. The easiest method of identification of species is by examination of the spathes and bracts and Fig. 3 page 17 of Vol. 46 of Flora of Australia contains full size sketches of 11 species. The spathe is a form of bract, a leaflike assembly that encloses the flower in bud. In our No. 112 issue, on page 178, we seek your help in collection of a flower and stalk together with a leaf to go to Peter Bailey, 969 Ferntree Gully Road, Wheelers Hill, 3150. Now we have described the species as above, go out next flowering season and join in this small project. — Editor.

THE GENUS LIBERTIA

Tufted, evergreen perennials with numerous basal grass-like leaves. The white or cream-white flowers have spreading sepals and petals and the style is deeply trifid with the filiform branches projecting horizontally between the stamens. There are about 12 species with two native in Australia and one endemic.

They are distinguished from *Orthrosanthus* in having flowers and capsules exerted from the spathes on long pedicels (not almost sessile), *Diplarrena* in having three fertile stamens (not two fertile and one staminode) and *Patersonia* in having petals and sepals subequal or very unequal (not manifestly unequal).

***Libertia paniculata* (R. Br.) Sprengel**

A densely tufted herb with linear leaves 24-60 cm long and 4-12 mm wide. The scape is shorter than the leaves and 2-3 mm in diameter, sometimes with one reduced leaf. The flowers are white, the sepals are obovate, 8-13 mm long, 4-7 mm wide and the petals are ovate, 6-8 mm long and 1.5-3 mm wide.

Occurs on the Great Dividing Range from eastern Victoria to south-eastern Queensland in warm temperate rainforest and moist gullies in wet sclerophyll forest, flowering in October and November. It is distinguished from *L. pulchella* in having leaves more than 20 cm long (not less than 20 cm) and the flower petals and sepals are very unequal (not subequal).

***Libertia pulchella* (R. Br.) Sprengel**

A loosely tufted herb with linear to falcate leaves 5-18 cm long and 2-7 mm wide. The scape exceeds the leaves in length and is 1-2 mm in diameter, leafless or with one or two reduced leaves. The flower sepals and petals are cream-white, ovate and about 5 mm long with the sepals slightly narrower.

It occurs along the Great Dividing Range in New South Wales from Victoria to Barrington Tops, is widespread in Tasmania in cool temperate rainforest, subalpine woodland and moist gullies in wet sclerophyll forest where it flowers from November to January. It is distinguished in having leaves less than 20 cm long (not more than 20 cm) and petals and sepals subequal (not very unequal). ■

Libertia of South-Eastern Australia

by J. Ross Garnet

A member of the Iridaceae, *Libertia paniculata*, the Branching Grass-flag, is recognizable by its tuft of long, narrow and rather stiff, curved, grass-like leaves which arise from a short rhizome. From the midst of the leaves emerges the stem (or stems) which bears a loose and irregular panicle of flowers arranged in umbellate clusters of up to six white blooms. The stems may be as much as 60 cm (2 ft) long and they terminate well above the level of the leaves.

When *Libertia paniculata* has finished flowering, towards the end of the spring months, the ripening three-celled ovaries persist on their long pedicels as black, three-cornered capsules, a habit that is helpful in identifying the plant even in the absence of flowers. The plant has a very limited distribution in Victoria (only in moist, coastal forests between Orbost and Mallacoota). In New South Wales it extends along the coast up to the Macpherson Ranges.

Libertia pulchella, the Pretty Grass-flag, is a smaller plant. The flower clusters are few or even solitary. The Pretty Grass-flag extends from the creek valleys of Queensland's southern ranges to cool gullies of northern and western Tasmania. The plant is likely to be seen in natural grasslands, in damp places along roadsides, in open forested areas of the coastal ranges, in the Blue Mountains and other ranges of eastern New South Wales, as well as in similar habitats in the south, north-east and east of Victoria. In the higher altitudes flowers will be seen in December and January but in its lowland habitats they appear in late spring. ■

Smilacaceae in Australia

by J. G. Conran, Department of Botany
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The Smilacaceae are a large, pantropical family of monocots, and as recognized by Cronquist (1981), and used in the *Flora of Australia* (Conran and Clifford 1986) consist of 12 genera and about five subfamilies, with five genera and c.15 species in Australia. Although many authors recognize about six families out of Cronquist's Smilacaceae, the broad concept is used here to maintain parity with the *Flora of Australia*.

The Australian species are perennial vines or sub-shrubs with branched, leafy stems mostly with net-veined leaves and short, subterranean non-tuberous stems. The flowers have parts in sixes and the ovary is superior (it sits above the rest of the floral parts) except in *Petermannia* F. Muell. (Fig. 1). Fruits are either berries, or (in *Eustrephus* R.Br. ex Ker Gawler) fleshy capsules. In many species the leaves have reticulate or "net" venation instead of the usual "parallel" monocot venation, and closely resemble dicots.

The Smilacaceae are largely confined to eastern and northern Australia, with most species occurring in rainforest, although some extend to drier forests. Several species were used for food or medicinally by the Aborigines and early settlers and a number have potential as horticultural plants.

Key to the Genera of Smilacaceae in Australia

- A. Plants climbing by tendrils
 - B. Tendrils paired on the leaf stalks; plants unisexual (separate male and female plants) *Smilax*
 - BB. Tendrils single, opposite the leaves; flowers bisexual *Petermannia*
- AA. Plants not climbing by tendrils
 - C. Leaf venation reticulate (net), dicot-like *Ripogonum*
 - CC. Leaf venation parallel, monocot-like
 - D. Leaves inverted, (petioles twisted through 180 degrees); fruit a black berry *Geitonoplesium*
 - DD. Leaves not inverted, fruit a fleshy orange capsule *Eustrephus*

Eustrephus latifolius (Fig. 1:C,D)

Eustrephus R. Br. ex Ker Gawler is a monotypic (single species) genus occurring in eastern Australia from Cape York to east Gippsland in Victoria, and extending to Malesia and the Pacific Islands. *Eustrephus latifolius* R. Br. ex Ker Gawler (Wombat Berry) is highly variable, especially in leaf shape, and is a rhizomatous vine or sub-shrub with twining, branched stems to c.5 m and tuberous roots. The alternate leaves are narrow to ovoid, 2.5-12 cm long, 2-35 mm wide and their axils bear clusters of pale purple, mauve or white 10-18 mm wide flowers with fringed petals which are followed by 10-20 mm diam. succulent orange capsules opening to reveal shiny black seeds with fleshy, white appendages (arils). *Eustrephus* occurs under a wide range of conditions from rainforest to dry, open forest, and is common along railway lines in far north Queensland.

Cultivation of this species is not difficult from seed, with germination in a few weeks, and in sub-tropical climates flowering after 12 months. Mature plants can be transplanted fairly readily, although the rootstock and rhizome are usually deeply buried. The plants are very slow to recover from severe water stress, and all affected aerial shoots usually do not survive. *Eustrephus* is an ideal plant for cultivation, producing both attractive flowers and fruits, and growing to a manageable size under a wide range of conditions.

The tuberous roots and the fleshy arils on the seeds are both edible and were used by the Aborigines for food.

***Geitonoplesium cymosum* (Fig. 1:A,B)**

Geitonoplesium Cunn. ex R. Br. is another monotypic genus, which with *Eustrephus* should probably be placed in the Geitonoplesiaceae and related to the Phormiaceae (*Phorminium*, *Dianella* etc.). *G. cymosum* (R. Br.) Cunn. ex R. Br. (Scrambling Lily) occurs in eastern Australia from Cape York to east Gippsland in Victoria, and extends to Malesia and the Pacific Islands. The species is highly variable, especially in leaf shape, and is a rhizomatous vine or sub-shrub to c.10 m with twining, branched stems and fibrous roots. The stems bear alternate, narrow to ovoid leaves 2-13 cm long and 2-35 mm wide, and have clusters of 10-22 mm wide, white, greenish-white or pale mauve flowers at the ends, which are followed by succulent, 7-20 mm diam. black berries containing numerous shiny black seeds. *Geitonoplesium* occurs in a wide range of habitats from rainforest to dry, open forest.

Cultivation by seed is not difficult, and germination occurs in a few weeks from untreated seed in warm weather. Flowering usually occurs within 12 months to two years from seed. Adult plants do not transplant as well as *Eustrephus*, but are just as susceptible to water stress. The plant is ideal for cultivation, producing attractive flowers and fruit, and able to tolerate a wide range of conditions. Plants grown in very heavy shade may, however, prove difficult to flower.

The young shoots are edible, and similar to asparagus, although, as mature shoots contain numerous calcium oxalate raphides (needle-like crystals also found in unripe *Monstera* fruits) care should be taken.

***Petermannia cirrosa* (Fig. 1:E)**

Petermannia F. Muell. contains a single species: *P. cirrosa* F. Muell., usually placed in the family Petermanniaceae. The genus has a very restricted distribution between the Queensland-New South Wales border and the Macleay River in northern New South Wales. *Petermannia* is a prickly stemmed, tendrillar climber to c.6 m with a short rhizome and fibrous roots. The net-veined leaves are alternate, ovate, 40-85×15-20 mm and occur opposite branched tendrils. The flowers occupy the same position as the tendrils (the tendrils are actually sterile inflorescences). The 8-12 mm flowers are red or reddish-green, and followed by succulent 7-18 mm bright red berries with numerous brown, angular seeds. The genus is confined to rainforest and associated forest types, usually at altitudes above 500 m.

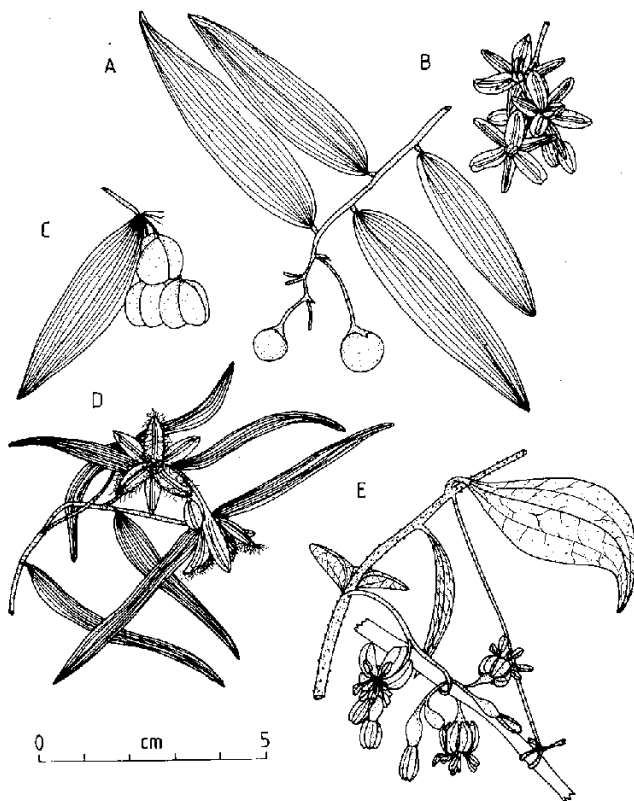


Figure 1: *Geitonoplesium cymosum*: A: fruiting branch x1; B: flowers x2 *Eustrephus latifolius*: C: fruiting branch of broad leaved form x1; D: narrow leaved form with flowers x2; *Petermannia cirrosa*: E: flowering branch with tendril x 1.5. All to indicated scale.

Cultivation from seed is not difficult, with germination after about 4-6 weeks without treatment. Seedling growth is slow and erratic, however, and adult plants do not transplant well. The plant forms large tangled clumps which are difficult to penetrate due to the prickles, and would be recommended for inclusion only in "wilderness" rainforest gardens. The flowers are attractive, and given the plant's restricted natural distribution and general rarity, it would be worth including in cultivation. No uses are known for the plant, and although there are no reports of the fruits being poisonous, they contain numerous calcium oxalate raphides, so eating them would not be advisable.

Ripogonum (Fig. 2)

The genus *Ripogonum* Forster & G. Forster (better placed in the family Ripogonaceae) occurs in eastern Australia from east Gippsland in Victoria to Cape York and extends to Papua New Guinea and New Zealand. There are six species of which five are Australian (four endemic) and one in New Zealand. The species are all rainforest or dry vine thicket vines to sub-shrubs with twining, branched stems and inflorescences of white, cream to greenish flowers followed by succulent black, purplish or sometimes red berries turning black at maturity. The species grow under a range of light conditions, with some apparently confined to the rainforest floor whereas others extend well into dry areas and high light exposure.

Ripogonum grows well from fresh seed (dried seeds will often not germinate) although germination tends to be slow and erratic, occurring over a period of about 6-12 months. Like most of the Australian Smilacaceae, *Ripogonum* does not do well if severely water stressed, and established plants tend to transplant badly. As most species are large vines they are not really suitable for most gardens, however the large leaves and white flowers make an attractive display if space is available. An exception is *R. discolor* which grows as a shrub on subtropical rainforest floors, and which would be an ideal subject for rainforest or moist, shaded gardens.

Although no Aboriginal uses have been recorded for the Australian species, the New Zealand species was used by the Maoris to make baskets and fish traps, and the many-jointed stalks of all species gave rise to the common name supplejacks.

Key to the Australian Species of *Ripogonum*

- A. Stems hairy
 - B. Ovary covered with fine hairs 4. *R. elseyanum*
 - BB. Ovary smooth 5. *R. fawcettianum*
- AA. Stems smooth
 - C. Leaves elongate, more than three times as long as broad 3. *R. discolor*
 - CC. Leaves broad, less than three times as long as broad
 - D. Flowers sessile; leaves gradually tapering 2. *R. brevifolium*
 - DD. Flowers stalked; leaves abruptly narrowing to an elongated point 1. *R. album*

1. *Ripogonum album* R. Br. (Fig.2:A)

White Supplejack

Stout, smooth or prickly stemmed vine to about 20 m, multi-stemmed, much-branched. Leaves whorled, opposite or alternate, elliptical, tapering towards the apex into an elongated point; 8-17 cm long, 2.5-5.5 cm wide. Flowers numerous, stalked; 6-10 mm wide. Berry 6-15 mm wide, black at maturity. One of the largest, and most widespread species, extending from Papua New Guinea to Victoria. Easy to cultivate, but definitely not a species for small gardens.

2. *Ripogonum brevifolium* Conran and Cliff. (Fig.2:B,C)

Stout, smooth or prickly stemmed sub-shrub or vine to about 10 m, multi-stemmed and much branched. Leaves opposite or alternate, elliptical and not tapering; 5-10 cm long, 2-3 cm wide. Flowers numerous, sessile; 8-12 mm wide. Berry 8-20 mm wide, black at maturity. A recently described species from Cape York to central New South Wales in rainforest and vine thickets near water courses.

3. *Ripogonum discolor* F. Muell. (Fig.2:D)

Prickly Supplejack

Shrub or stout climber to about 4 m, multi-stemmed and branched, smooth or prickly stemmed. Leaves opposite or alternate, oblong, elongate; bluntly pointed; 9-20 cm long, 3-5 cm wide. Flowers numerous, sessile or stalked; 20-30 mm wide. Berry 8-20 mm wide, purple to black at maturity. An uncommon species from the Manning River in New South Wales to the MacPherson Ranges in south-east Queensland.

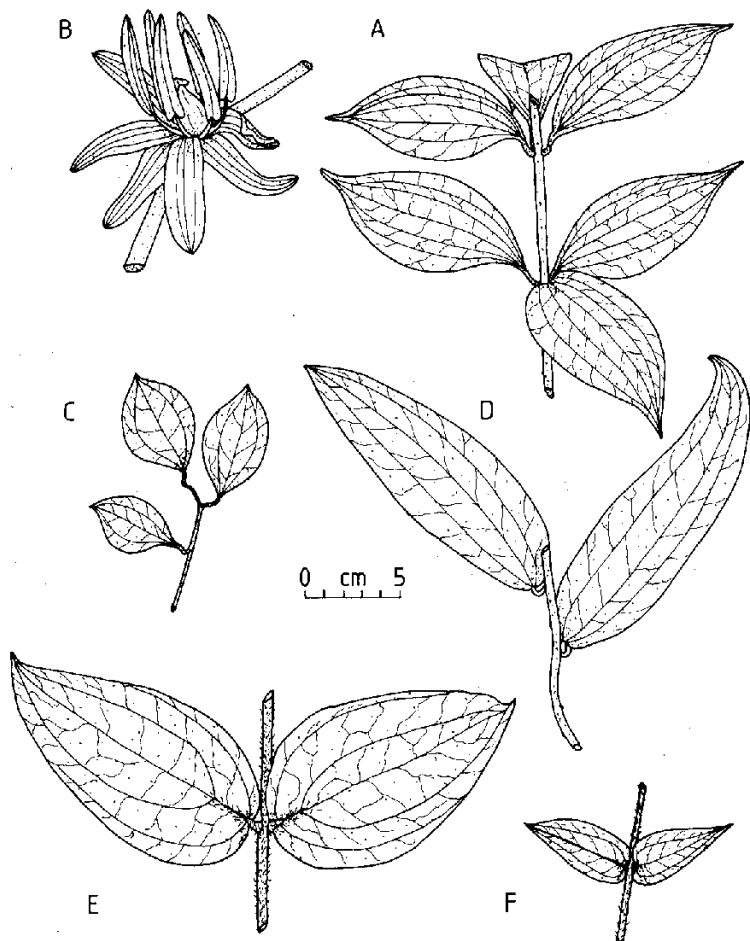


Figure 2: *Ripogonum* spp.: A: *R. album* shoot x1; *R. brevifolium* B: flower x12; C: shoot x1; D: *R. discolor* shoot x1; E: *R. elseyanum* shoot x1; F: *R. fawcettianum* shoot x1. All to indicated scale.

4. *Ripogonum elseyanum* F. Muell

Hairy Supplejack

Vine to about 8 m, multi-stemmed and branched, smooth or prickly stemmed; stems hairy, rust-coloured. Leaves opposite; 9-18 cm long, 4-6 cm wide; hairy (Fig.2:F). Inflorescence hairy, axillary. Flowers sessile, numerous, 10-15 mm diam., ovary densely hairy, pale rusty brown. Berry 6-15 mm diam., black. This species has an unusual distribution, with one population on the Atherton Tablelands in North Queensland, and the other from Kin Kin in SE Queensland to Dorrigo in New South Wales.

5. *Ripogonum fawcettianum* F. Muell. ex Benth.

Small Supplejack

Stout climber to about 4 m, multi-stemmed and branched, smooth or prickly stemmed; stems hairy, rust-coloured. Leaves opposite, tapering to a fine point, heart-shaped at the base (Fig.2:E); 6-10 cm long, 30-35 mm wide. Flowers numerous, stalked; 10 mm wide. Berry 8-12 mm wide, red to purple-black at maturity. Another uncommon species, confined to the area between the MacPherson Range in SE Queensland and Gosford in New South Wales.

Smilax

Smilax L. is a large genus with several hundred species worldwide. In Australia there are about seven species, most of which occur in far northern Australia as well as Papua New Guinea and Asia, but at least two species extend to east Gippsland in Victoria. *Smilax* at present in Australia is still being studied, and the numbers and names of some of the species may well change. All of the species are vines, and most have spiny stems, climbing by paired, stipular tendrils. The plants are dioecious (there are separate male and female plants) with heads of small greenish or creamy flowers followed by succulent black, purplish or red berries. Most species occur in wet tropical or monsoonal rainforest, but several extend to dry vine scrub, wet and dry sclerophyll forests and areas of high light exposure.

Propagation of *Smilax* can be from cuttings or seed. Species such as *S. australis* R.Br. will grow from mature stem sections, but very thin-stemmed species such as *S. glycophylla* Smith do not seem to respond well to this method. All species can be grown from seed, but germination is very slow and erratic. The propagation of *S. australis* is described in more detail by Conran (1986). Several of the native *Smilax* spp. such as *S. blumei* A.DC. and *S. leucophylla* Blume are large rainforest vines and would therefore not suit most gardens, however, species such as *S. australis*, *S. calophylla* Wallich ex A.DC. and *S. glycophylla* are smaller growing, and tolerant of a wider range of climatic conditions. All species are difficult to transplant, and do not recover from severe water stress. *Smilax* would be useful vines to add to cultivation.

Smilax is used extensively for herbal medicine throughout the world, and the Australian species, especially *S. glycophylla*, were used by the early settlers as a source of sarsaparilla, hence the common names of Austral Sarsaparilla for *S. australis* and Sweet Sarsaparilla for *S. glycophylla*.

Key to the Australian Species of *Smilax*

- A. Stems never spiny
 - B. Leaves pale bluish and waxy beneath; tendrils present 5. *S. glycophylla*
 - BB. Leaves not waxy or pale blue beneath; tendrils apparently absent 6. *S. kaniensis*
- AA. Stems spiny (sometimes very sparsely)
 - C. Leaves waxy beneath 7. *S. leucophylla*
 - CC. Leaves not waxy
 - D. Stems densely spiny
 - E. Leaves thick, stipules large, x prominent 2. *S. australis*
 - EE. Leaves thin, stipules not prominent 1. *S. aculeatissima*
 - DD. Stems sparsely spined
 - F. Stipules large, prominent, leaves with 3-7 main veins 3. *S. blumei*
 - FF. Stipules not large or prominent, leaves usually with 3 main veins 4. *S. calophylla*

1. *Smilax aculeatissima* Conran (Fig.3:A)

Climber to about 5 m, multi-stemmed and branched; stems yellowish and densely prickly. Leaves thin; 5-nerved; 7-22 cm long, 2.5-9 cm wide; stipules not much inflated; dark green, paler below. Inflorescence single or branched. Flowers numerous, 5-7 mm diam.; pale green; stamens 5-7 mm long; ovary

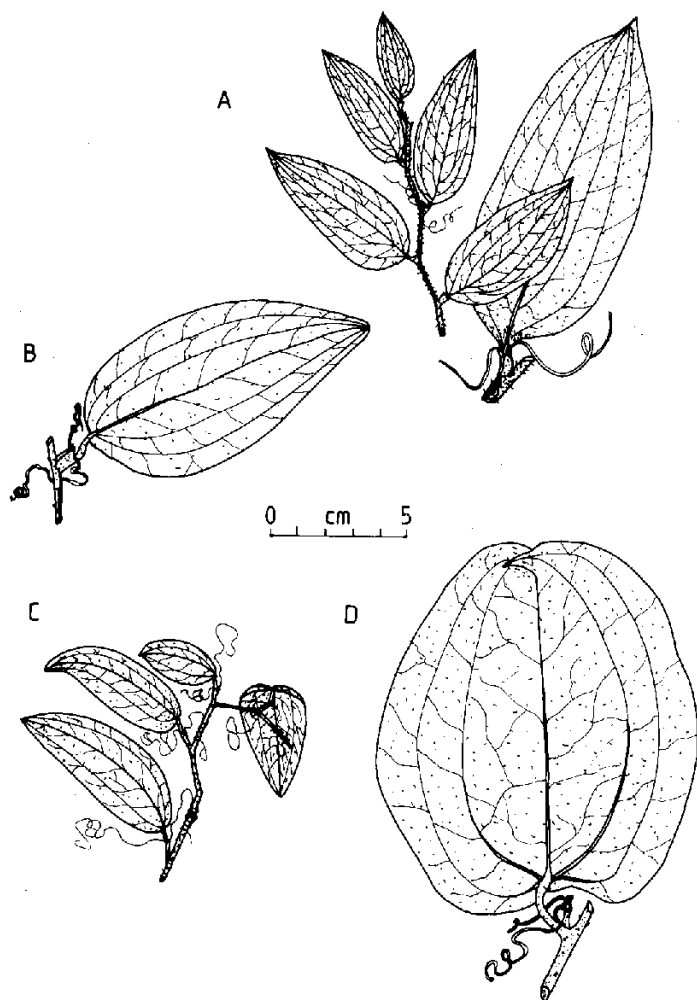


Figure 3: *Smilax* spp.: A: *S. acutestissima* shoots showing range of leaf size x1; B: *S. leucophylla* leaf x1; C: *S. calophylla* shoot x1; D: *S. blumei* leaf x1. All to indicated scale.

small, ovoid. Berry 6-12 mm diam.; black at maturity. Seeds single or few, 5-8 mm long; dark brown. This species is apparently restricted to the region of the Atherton Tablelands in North Queensland, however, more study is needed to determine the differences between it and *S. calophylla* in Australia.

2. *Smilax australis* R.Br. (Fig.4:E-J)

Austral Sarsaparilla

Tangled, multi-stemmed climber to about 7 m, branched and prickly or sometimes not. Leaves thick, 5-veined; 5-15 cm long, 3-10 cm wide; stipules prominent or not, with tendrils. Inflorescence single or branched. Flowers pale green, pinkish-green in bud; 5-7 mm diam. Berry 6-10 mm diam.; black at maturity. A widespread and variable Australian species occurring from the top end down the east coast to east Gippsland in Victoria.

3. *Smilax blumei* A.DC. (Fig.3:D)

Large climber to about 20 m with stout stems, prickles few. Leaves large, thin, 3-7 veined; 13-25 cm long, 8-17 cm wide; dark green, paler below; stipules prominent, with tendrils. Inflorescence single or branched. Flowers c.10 mm long; greenish-white. Berry 8-12 mm wide; dark purple to black at maturity. An Asian species known only from a few collections on Cape York Peninsula.

4. *Smilax calophylla* Wailich ex A.DC. (Fig.3:C)

Weak climber to about 3 m with branched smooth or prickly stems. Leaves thin, 3 (rarely 5) veined; 5-20 cm long, 2-15 cm wide, dark green above, pale below; stipules slightly inflated, tendrillar. Inflorescence single. Flowers 5-7 mm diam.; pale green. Berry 6-12 mm diam., black at maturity. This species is illustrated by K. Williams in *Native Plants of Queensland Vol. 2* as *Smilax* sp. and occurs from Cape York to the Queensland/New South Wales border.

5. *Smilax glycyphylla* Smith (as *S. glycyphylla*) (Fig.4:A-C)

Sweet Sarsaparilla

Climber to about 4 m with branched, smooth, reddish stems. Leaves thin, 3-veined; 4-10 cm long, 1.5-4 cm wide, green above, glaucous below, stipules not prominent, tendrillar. Inflorescence single or branched. Flowers 3-4 mm diam.; cream to whitish. Berry 6-10 mm diam., black at maturity. This species occurs in a wide range of habitats from northern Australia to central-southern New South Wales.

6. *Smilax kaniensis* Krause (Fig.4:D)

Climber to about 2 m without spines. Leaves thin but stiff, 3-veined; 8-15 cm long, approx. 2-3.5 cm wide; darker green above; stipules slightly or not inflated; tendrils absent. Inflorescence single or branched. Flowers 3-4 mm. Berry 6-10 mm diam., red. A Papua New Guinean species extending to Cape York.

7. *Smilax leucophylla* Blume (Fig.3:B)

A stout climber to about 20 m, stems largely smooth, reddish. Leaves large, thin, 3-7 veined; 13-25 cm long, 8-17 cm wide, dark green above, bluish and waxy below; stipules large and prominent, tendrillar. Inflorescence single or branched. Flowers c.8 mm diam., greenish-white. Berry c.10 mm diam., black. Known for Australia from a single collection.

References

- Conran, J. G. (1986). Notes on the propagation of *Smilax australis*. *Aust. Pl.* 13: 275.
Conran, J. G. and Clifford, H. T. (1986). Smilacaceae. *Flora of Australia* 46: 180-196.
Cronquist, A. (1981). *An Integrated System of Classification of Flowering Plants*. Columbia Univ. Press, New York. ■

Mount Tomah Botanic Garden

The first Bicentennial project has been officially opened. A new botanical garden on the mountains 105 km west of Sydney on the Bell's Line of Road. Go west from Kurrabung on one of the most picturesque roads through the Blue Mountains. Specializing in the collection of cool climate plants from the southern hemisphere, the spectacular beds of *Rhododendron* also entice the tourist to visit. The feature that will make this botanic garden unique in the world and a wonderland for alpine plant lovers, is the magnificent rock garden covering 0.5 hectares with its massive local basalt boulders cradling splendid water cascades and a waterfall. Segments of this rockery are set aside for alpine plants of regions such as South Africa, Chile, etc., and the area for Australian plants is large and prominent. This area, providing the only botanic garden for Australia's alpine or cold area flora, could become world famous both as a collection and a spectacle.

A perfect place for a day visit even just to sit on the extensive deck of the kiosk and survey the valleys and crags of the Blue Mountains. Real value for Bicentennial expenditure and a credit to the Wrens, the Johnsons and the original donors of the land, the Burnetts, and all those with the foresight to support such a national spectacle that will contribute to our culture for many years to come. ■

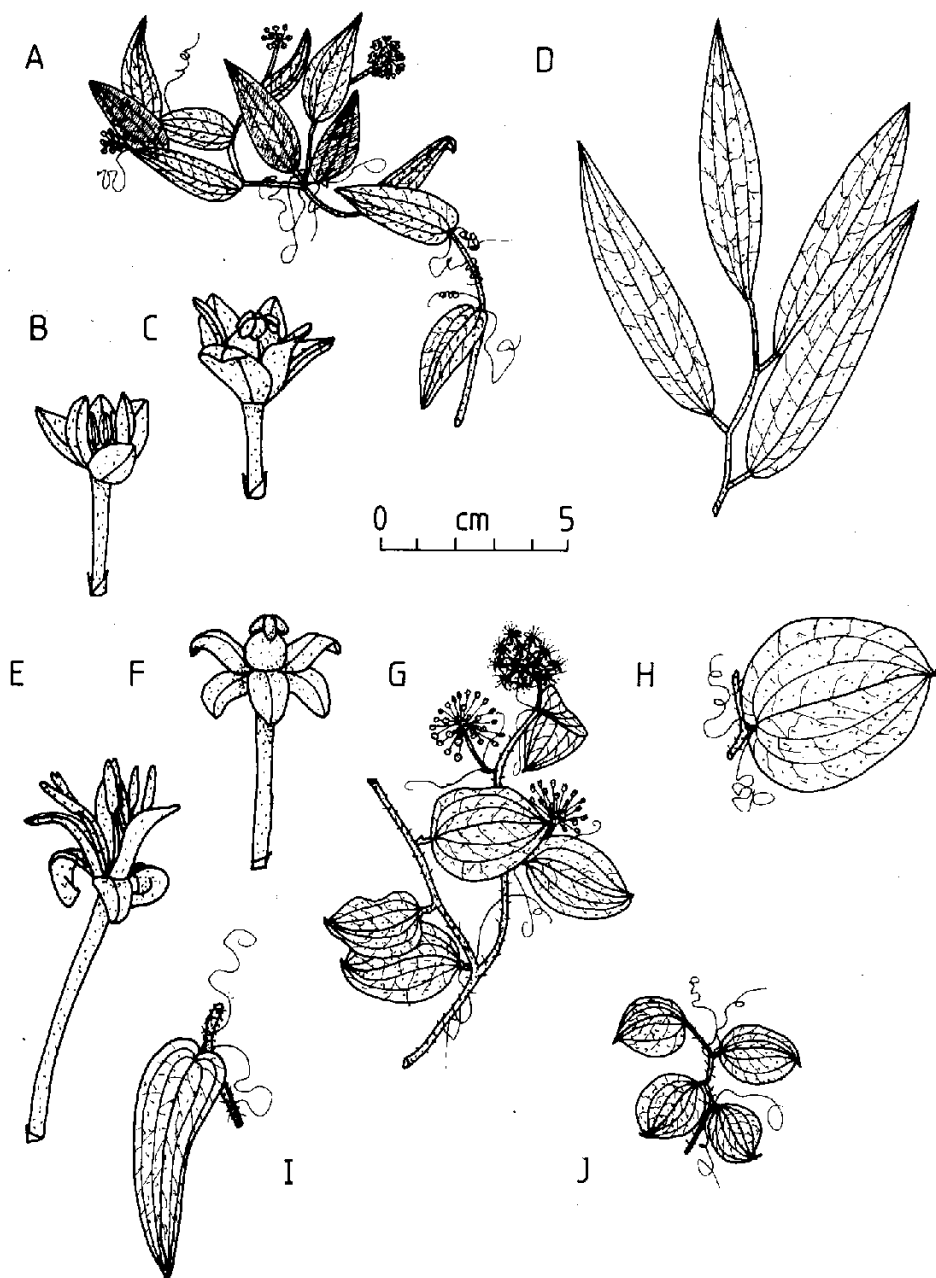


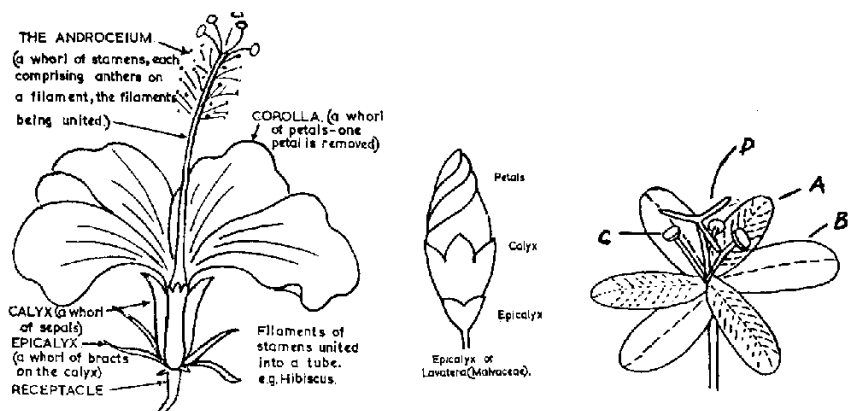
Figure 4: *Smilax* spp. cont'd.: *S. glycyphylla* A: shoot x1; B: male flower x12; C: female flower x12; D: *S. kaniensis* shoot x1; *S. australis* E: male flower x8; F: female flower x8; G: flowering shoot x1; H-J: variation in leaf size and shape x1. All to indicated scale.

The Flower — Part 1

Original article by Helen Purnell
Supplemented by Peter Bailey
and W. H. Payne*

Flowers contain the organs concerned with sexual reproduction and the formation of seeds. Flowers are extremely variable. Some are large and brightly coloured, while others are so small they may easily be overlooked. The bottle-brush "flower" head of *Banksia* is composed of 200 to 3 000 individual flowers, each capable of producing seed.

We shall first look at a solitary, symmetrical flower such as *Hibiscus*. The parts are arranged in a series of whorls or rings upon a structure known as the receptacle, as shown below. The left hand sketch shows a *Hibiscus* flower with one of its petals removed to more easily see into the flower centre. The sketch of the bud shows how the non-fertile flower parts are arranged in successive whorls or rings supported on the flower stalk. The left hand sketch is typical of an Australian iris as described in this issue, see page 198.



Let us first ignore the "male" and "female" parts of the flower in the centre. With *Hibiscus* the five overlapping petals comprise the inner whorl and are known collectively as the corolla. The next outer whorl is known as the calyx, comprises five sepals which are small, although, in other plants, they can be large and resemble the petals of the inner whorl. In some cases one of these whorls may be missing or reduced to the extent that it is not visible. The term "perianth" is often used in plant descriptions and refers to the corolla and calyx together, especially where the two are similar.

The outermost whorl comprises the bracts which often subtend (placed below) the flower, they are usually small and leaf-like but in some cases, large and conspicuous as with the colourful sheath enclosing the many flowered head of *Telopea* (Waratah). There may even be small bracts called, bracteoles, as shown for *Pultenaea* below.

After a great deal of study we have decided we cannot afford the \$10,000 needed to reprint Volumes 1 and 2 of Australian Plants. In a new policy we will update and reprint those articles of lasting value. The series on botany for beginners is the first to be dealt with. Despite a lot of effort by the author, I personally found the series still a little difficult to follow. The revision will be undertaken by a number of people including myself. If I can follow the revised articles, any mug can. Follow this series and learn anew with me.

The centrepiece of the flower, called the Androceium, comprises the "female" parts that, when fertilized, matures to form seed. Surrounding this is a whorl of stamens, the "male" part of the flower, each fertile stamen having pollen on the end ready for transference to the "female" part of this or another flower, by a small creature seeking a tasty meal.

As an example let us take the ti-tree group of plants, called *Leptospermum*, that have a simple flower as shown in the photograph on page 225 and in Fig. 3 below. The petals have dropped off as they usually do in *Leptospermum*. The sketch shows numerous stamens arising separately in a single row within the ring of the five sepals that usually remain when the petals drop off. The single central style is erect, short and hairless with a small sticky button-like stigma on top. The ovary or what will become the seed box, is inferior, that is, set below the level of the plane of attachment of the sepals and petals.

This specification of five petals, five sepals, a single central style with a button-like stigma on top and an inferior ovary is common to a large group of myrtles including *Micromyrtus*, *Thryptomena*, *Paryphanthe*, *Malleostemon* and *Corynanthera* as sketched on page 161 of our last issue. They differ one from another by the number and shape of the stamens and on the next page we describe *Rinzia*.

Rinzia, what is distinctive about this group of plants? Let us look at the arrangement of petals, sepals, stamens and the all important style in the centre.

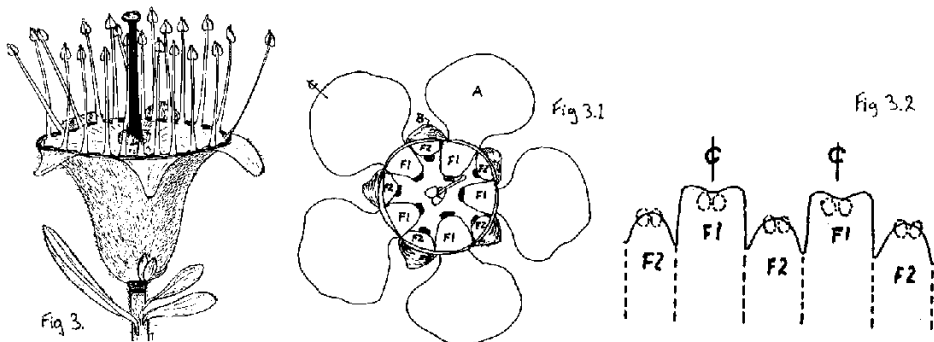


Fig. 3.1. Plan view of the flower of *Rinzia* with its five petals (A) alternating with the much smaller five sepals (B). There are 10 stamens the five opposite the petals (F1) being larger than the five opposite the sepals.

Fig. 3.2. Shows details of stamens of *Rinzia* as is they were all opened out 'flat', showing the centre line of the petals. It will be noted that they have parallel or tapering sides (see view of flower from above), partially or fully united along the sides. The filaments opposite the petals, always one per petal, are taller and broader, the apices truncate, rounded or emarginate (as shown). The filaments opposite the sepals are smaller, usually one per sepal but sometimes one or all are missing (rarely two per sepal), the apices usually being pointed. The botanists tend to confuse the general picture by quoting 5-12 stamens where we see above that the norm is to have 10 stamens. This is because some of the smaller stamens do not develop. In *Rinzia*, species with stamens opposite sepals that are sometimes missing are *R. scholleriifolia* with rarely up to 3 missing and *R. fumana* sometimes up to all (5) missing. Species sometimes having one or two extra stamens opposite sepals are *R. longifolia* and *R. carnosa*.

Having learnt a little about the parts of a flower let us turn to flowers that are described in this issue and apply our newly developed knowledge. The description of *Faradaya albertisii* pronounced Far-a-day-a albert-is-e-i on page 260 can be understood with a little trouble. The botanical language is strange. I would suggest you obtain a copy of our "Language of Botany," a book used as a reference to botanical terms at most colleges and universities in Australia by students who are just beginning to learn the language also. The first hard word "glabrescent" or "glabrous" means without hairs. The description of the leaves is easy as the sketch shows the leaves opposite each other and alternately at right angles along the stem.

Rinzia

by Greg Keighery ¹ Bob Dixon ²,

The genus *Rinzia* was originally described by Schauer in 1843. It was reduced by Benthham in *Flora Australiensis* into the genus *Baeckea*. All species previously listed as *Baeckea* sect. *Rinzia*, that had 10 stamens, are now returned to a separate genus, *Rinzia*. The 12 species are all found in south-west of Western Australia.

Rinzia affinis Trudgen

A rounded or erect open shrub to 70 cm with long slender branches. The leaves are narrowly oblong or rarely elliptic to oblanceolate, $2.4-4.3 \times 0.7-0.9$ mm. The flowers are white or occasionally pale pink, 8.5-10.3 mm across. It was named because of its close affinity with *R. dimorphandra*. Flowering occurs between August and October, growing on sand (yellow or lateritic) in the Roe district.

Rinzia carnosa (S. Moore) Trudgen

A woody subshrub to 1.3 m, much branched with slender (often long) branchlets. The leaves are sub-orbicular to elliptic and obtuse, $0.5-2.5 \times 0.5-1.0$ mm. The flowers are white to rose pink, 5.5-7.5 mm across. Flowering occurs between September and November, occurring on loam or granite, in the Coolgardie and Roe districts.

Rinzia communis Trudgen

A subshrub to 30 cm by 40 cm across, rounded to rather spreading and straggly. The leaves are linear to narrow oblong or rarely lanceolate or oblanceolate obtuse $0.5-5.3 \times 0.5-0.9$ mm. The flowers are white to pink 5.8-9.0 mm across. It was named because of its widespread and common occurrences. Flowering occurs between August and October, on sand (lateritic, brown, orange or yellow) or laterite, in the Eyre and Roe districts.

Rinzia crassifolia Turcz

A prostrate or spreading to erect subshrub to 20 cm by 40 cm across. The leaves are linear to narrow-oblong, occasionally oblong to narrow elliptic, obtuse, $2.0-9.5 \times 0.5-1.5$ mm. The flowers are white, sometimes pink, 7.5-11.0 mm across. Flowering occurs between September and November on lateritic sand or caly, in the Avon and Dale districts.

¹ (CALM, Wildlife Research, Ocean Reef Road, Woodvale, Western Australia 6026)

² (Kings Park and Botanic Garden, West Perth, Western Australia 6005)

Continuing the restructuring of the current generic limits of the Myrtaceae, Malcolm Trudgen is studying the genus *Baeckea*, and found that the genus is artificial as currently conceived. He has recently published the first revision of one of these segregate genera (Trudgen, M. E. 1986) "Reinstatement and Revision of *Rinzia* Schauer (Myrtaceae, Leptospermeae, Baeckeeinae)". Nuytsia 5:3, 415-439.

We have failed to find a good colour slide of a *Rinzia* species. Unless examined carefully for the especially shaped stamens, see page 220, they resemble *Baeckea* species so we have illustrated species of closely related genera. What is the correct name of the plant opposite? Editor.

Leptospermum rotundifolia (see page 225)

Photography by Neil Marriott

A myrtle with five petals, see the sketch on page 219, this magnificent plant has flowers to 3 cm across. We are preparing an issue on the ti-trees and I need notes from people who have grown them, reports of special forms and good colour slides. – Editor.



What Is This? ▲
Photography by John Simmons

▼ *Baeckea robusta*
Photography by Alan Gibb



***Rinzia dimorphandra* (F. Muell. ex Benth.) Trudgen**

A subshrub to 25 cm by 30 cm across, fairly open, branches long, very slender. The leaves are narrow-elliptic to elliptic or rarely obovate, acute to obtuse, $1.5-3.9 \times 0.5-0.8$ mm. The flowers are pink or rarely pale pink to white, 6.0-9.0 mm across. Flowering occurs between August and October, on sand (white, grey or yellow) in the Eyre district.

***Rinzia fumana* Schauer**

A prostrate or sprawling subshrub, occasionally erect to 25 cm by 60 cm across. The leaves are narrowly oblong to narrowly elliptic, $2.0-8.2 \times 0.5-1.0$ mm. The flowers are pink, rarely white, 6.0-7.5 mm across. Flowering Aug. to Nov. on lateritic clay, loam or granitic clay in the Dale, Menzies, Avon and Eyre dist.

***Rinzia longifolia* Turcz**

A subshrub to 40 or perhaps 80 cm across with long, prostrate stems and with short (to 8 cm) erect branchlets. The leaves are linear to oblong or oblong lanceolate, acute $2.5-9.0$ mm $\times$ $1.0-2.1$ mm. The flowers are pale pink or white, 9.5-13.2 mm across. Flowering occurs between August and November, on clay in the Roe district.

***Rinzia morrisonii* Trudgen**

A perennial subshrub to 60 cm across with scrambling or prostrate stems or with the lower branches prostrate and others scrambling or spreading. The leaves are narrow oblong to oblong-lanceolate or lanceolate, acute, $4.0-9.4 \times 1.0-2.3$ mm. The flowers are pink to white, 8.0-10.8 mm across. It was named after Alexander Morrison (1849-1913). Flowering occurs between September and November, on sandy clay on the Stirling Range.

***Rinzia oxycoccoides* Turcz**

A perennial subshrub to 60 cm across, stems sprawling or procumbent. The leaves are sub-orbicular, ovate or broad to narrow oblong, obtuse, $2.8 \times 1.3-3.0$ mm. The flowers are pale to deep rose pink, 9.0-19.0 mm across. Flowering occurs between August and October, on stony sand clay in the Eyre district (found in the Barren Ranges in thickets, Fitzgerald River area).

***Rinzia rubra* Trudgen**

A shrub to 70 cm by 1 m across with stems erect when young but sprawling and open when mature with numerous densely leaved small branchlets from the main stems. The leaves are narrow-oblong to narrow-obovate, or orbicular when very small, obtuse, $0.7-4.3 \times 0.6-1.3$ mm. The flowers are white, 7.5-11 mm across. It was named because of the dull reddish colour on the calyx tube and calyx lobes. Flowering occurs between September and November, on sand or sand over clay, in the Coolgardie and Roe districts.

***Rinzia schoilerifolia* (Lehm.) Trudgen**

A subshrub to 20 cm by 80 cm across. The stems spreading to procumbent, or scrambling, or at times, the lower ones or all stems are prostrate. The leaves are lanceolate, acute, $3-10 \times 1.2-5$ mm. The flowers are bright deep pink to white 5-8 mm across. Flowering occurs between August and November, on sand, sandy clay, peaty sand or laterite, Warren, Menzies and Eyre dist.

***Rinzia sessilis* Trudgen**

A low, spreading or rounded subshrub to 50 cm by 60 cm across with slender to thick woody branchlets. The leaves are oblong to elliptic or sub-orbicular, rarely lanceolate, obtuse or rarely acute, $0.6-3.2 \times 0.4-0.8$ mm. The flowers are light pink to almost white, 5.0-9.0 mm across. It was named because of the sessile leaves which are unique in the genus. Flowering occurs between September and November, on sand (white, granitic) laterite or loam, in the Coolgardie and Roe districts.

CULTIVATION

All the species of *Rinzia* have attractive flowers and are therefore worthy of cultivation. However, there is wide variation in flower colour and flower and leaf size, within most species and a selection programme would be necessary to develop the better forms for cultivation. Whilst most species make ideal filler shrubs and ground covers others are suitable rock garden plants. *Rinzia*, to our knowledge, has not been widely grown in Western Australia or in other Australian States. Only *Rinzia fumana* has been cultivated in Kings Park. At present there are no plants in the botanic garden but some are being grown in containers in Kings Park Nursery. The other large garden specializing in Western Australian native plants, the State Herbarium, George Street, South Perth, Western Australia is also devoid of *Rinzia*. No *Rinzia* are being offered for sale (or in stock gardens) by any of the large native plant nurseries in Perth and the only species raised in the past appears to be *R. fumana*. Now we have established only *R. fumana* has been grown, unless others under different names have got through the system, we will outline some details of its culture.

Propagation

Rinzia fumana is fairly easy to propagate from softwood or semi-hardwood cuttings taken from autumn to early summer. Strike rates from cultivated plants (upright pink form) are in the region of 70% and under ideal conditions take six weeks to strike. Cuttings taken from wild material in 1985 (upright white form) and set in Kings Park nursery mist unit gave a strike rate of about 25%. The cuttings form a good fibrous root system but tend to be slow growing in tubes (small pots). Unfortunately we have no records of plants being grown from seed. However, viable seed should be fairly easy to germinate when compared to similar plants. e.g. *Baeckea*, *Scholtzia*. In Western Australia the preferred sowing time would be autumn while the weather is still warm, or failing this, early spring. In cooler districts spring may be the best time to sow. Use a free draining preferably sandy seed mix, which may be best sterilized or drench with a suitable fungicide to prevent damping off disease.

Cultural notes

Plants can be put in their final growing positions when small, as long as they receive some tender loving care, or grown on in containers for a year then planted out. They also make good container plants and tend to flower over a longer period than those grown in harsher conditions. Use a free draining container mix, e.g. pine bark, with a general slow release fertilizer or use a commercial mix for native plants.

Rinzia fumana requires a full sun but not exposed position and regular summer watering until the plant is established. In loamy, free draining sandy soils near Perth it is drought tolerant, however, it may require an occasional summer watering in poorer sandy soils. Plants are fairly slow growing and benefit from an occasional application of a general slow release fertilizer, although in gardens with organic mulches e.g. *Casuarina* needles, *Eucalyptus* leaves, which recycle nutrients as they break down, fertilizer is not required.

Rinzia fumana responds well to regular light pruning after flowering if necessary to make the plants bushy, they dislike hard pruning which can be fatal. Upright pink flowered forms, grown in an outer suburb of Perth, grew well for over six years in the open ground until overgrown by surrounding vegetation. The frost resistance of this plant has not been established. Plants seem to be fairly clear of pests with the exception of the occasional caterpillar, which can be picked off the plant.

Unfortunately, as we have no specific details on the culture of other species we can only suggest you treat them in a similar manner to *R. fumana*. Although beauty is in the eye of the beholder, after looking at many herbarium specimens, we suggest the following species are the most attractive – *R. dimorphandra*, *R. fumana*, *R. longifolia* and *R. oxycoccoides*. ■

Key to the species

1. Leaves flat or margin slightly to prominently recurved, occasionally arched from midrib, discolorous; anthopodia 4-27 mm long (greater than 7 mm except in some specimens of *R. schollertfolia*).
2. Ovules 4 or 5 per loculus; flowers 5-8 mm across corolla; petals usually not spreading widely; seeds 1.3-1.4 mm long 1. *R. schollertfolia*
2. Ovules 5-12 per loculus; flowers 8-19 mm across corolla; petals spreading; seeds 1.5-1.8 mm long.
3. Ovules 8-12 per loculus; leaf margins prominently recurved; seeds 1.7-1.8 mm long 4. *R. oxycoccoides*
3. Ovules 5-8 per loculus; leaves almost flat to margins recurved, or leaves arched from midrib; seeds 1.5-1.6 mm long.
4. Plants with main stems prostrate and branchlets erect, short, usually densely leaved; antepetalous stamens 1.9-2.4 mm long 3. *R. longifolia*
4. Plants variable in form (including prostrate) but otherwise not as above; antepetalous stamens 1.6-1.8 mm long 2. *R. morrissonii*
1. Leaves plano-convex or concavo-convex, concolorous; anthopodia 0.8-4 mm long except for *R. rubra* (2.5-5.5 mm) and *R. crassifolia* (1.2-6.5 mm).
5. Flowers in pairs in leaf axils.
6. Hypanthium obconical, smooth and chartaceous in fruit; leaves usually overlapping next pair by 1/5-1/2; flowers white less commonly pink; seeds 1.4-1.5 mm long 8. *R. affinis*
6. Hypanthium hemispherical to shortly cylindrical, rarely almost obconical, minutely pitted and fairly thick in fruit; leaves just overlapping next pair; flowers pink or rarely white; seeds 1.1-1.3 mm long 7. *R. dimorphandra*
5. Flowers solitary in leaf axils.
7. Ovules 4-9 per loculus; seeds not arillate.
8. Leaves spreading, plano-convex; flowers 7.5-11 mm across; seeds c.1.5-1.7 mm long 6. *R. rubra*
8. Leaves appressed, concavo-convex; flowers 5.5-7.5 mm across; seeds c. 1.4-1.5 mm long 5. *R. carnosia*
7. Ovules 2 per loculus; seeds arillate.
9. Flowers 1-12, not clustered near ends of branchlets; seeds verrucose or with ends somewhat pointed; leaves not regularly four ranked (i.e. not quadrifarious).
10. Seeds verrucose, ends rounded; corolla 7.5-11.0 mm across 12. *R. crassifolia*
10. Seeds smooth to colliculate, ends somewhat pointed; corolla 6.0-7.5 mm across 9. *R. fumana*
9. Flowers 1-5 clustered near ends of branchlets; seeds neither verrucose nor with ends pointed; leaves regularly four ranked (i.e. quadrifarious).
11. Hypanthium hemispherical; petiole absent or indistinct 11. *R. sessilis*
11. Hypanthium shortly cylindrical or rarely broadly hemispherical; leaves definitely petiolate 10. *R. communis*



Baeckea species, Mt. Barren ▲

See caption, page 220

▼ *Leptospermum rotundifolia*



Australian *Faradaya*

by Dr A. A. Munir,
Botanic Gardens of Adelaide

Faradaya is a genus of the plant family Verbenaceae named after Michael Faraday (1791-1867), world famous English chemist and physicist, a pioneer in electromagnetic research. The genus is known to occur in the north-eastern tropics of Australia, East Malaysia (Sabah), Indonesia, Papua New Guinea and Polynesia. Of 23 species in the genus two are found in the northern tropics of Queensland. The genus *Faradaya* was described by Baron von Mueller with one species, *Faradaya splendida*, which is based on J. Dallachy's plant collection from Rockingham Bay, Queensland. The genus is closely allied to *Clerodendrum* and *Vitex*, differing chiefly in the spathaceous two-lobed calyx and lobed ovary. By habit, most species of the genus are climbing woody shrubs of Bignoniaceous aspect. Several species are cultivated for ornament, one of them *Faradaya splendida*, very widely so, in tropical regions of both hemispheres and in greenhouses elsewhere.

Key to Species

- 1a. Inflorescence only axillary, dense, shorter than the subtending leaves *F. albertisii*
- b. Inflorescence only terminal or both axillary and terminal, loose, longer than the subtending leaves *F. splendida*

Faradaya albertisii F.Muell. (Fig. 1)

A tall climbing shrub or shrubby vine, 3-15 m tall, the young parts at first sparingly hairy, later glabrescent. The stem is cylindrical, 2-5 cm diam. The leaves as shown in the sketch opposite, alternately at right angles, ovate-oblong to ovate elliptic, glabrous, dull, with papery or semi-leathery texture, 8-30 cm long, 4-18 cm wide. The inflorescence (group of flowers) is a dense axillary thyse, shorter than the subtending leaves. The flowers are stalked (pedicellate) and are shown in cross-section (B). The calyx (C) is yellowish-green, 1.5-2.5 cm long during the expansion of the flower, glabrous, apically pointed in horn-like fashion in bud. The flower corolla (floral envelope of petals) is white, tube funnel-shaped with lobes broader at the distal end. The stamens protrude beyond the corolla. The ovary (D) is globular, 4-lobed, hairy and produces fruit (F) that are ellipsoid, glabrous and up to 6 cm long.

This species is based on an unnumbered plant collection made by a well-known Italian explorer in the Pacific region, Count Luigi Maria d'Albertis (1841-1901), in whose honour it is named. The collection was made in 1876 on the Fly River in Papua New Guinea.

Faradaya albertisii is closely related to *F. splendida*; the leaf-stalks are, however, thicker, the leaf-blades of a firmer texture with stronger nervation and venation and also with a longer and more pointed terminal protraction, and they are not shiny. The stalks of the flowers are shorter, by which means the inflorescence becomes very contracted, and the bud of the calyx is longer and acutely pointed. It is found in north-eastern Australia, Papua New Guinea and Irian Jaya (Indonesia). Flowering is in May to November.

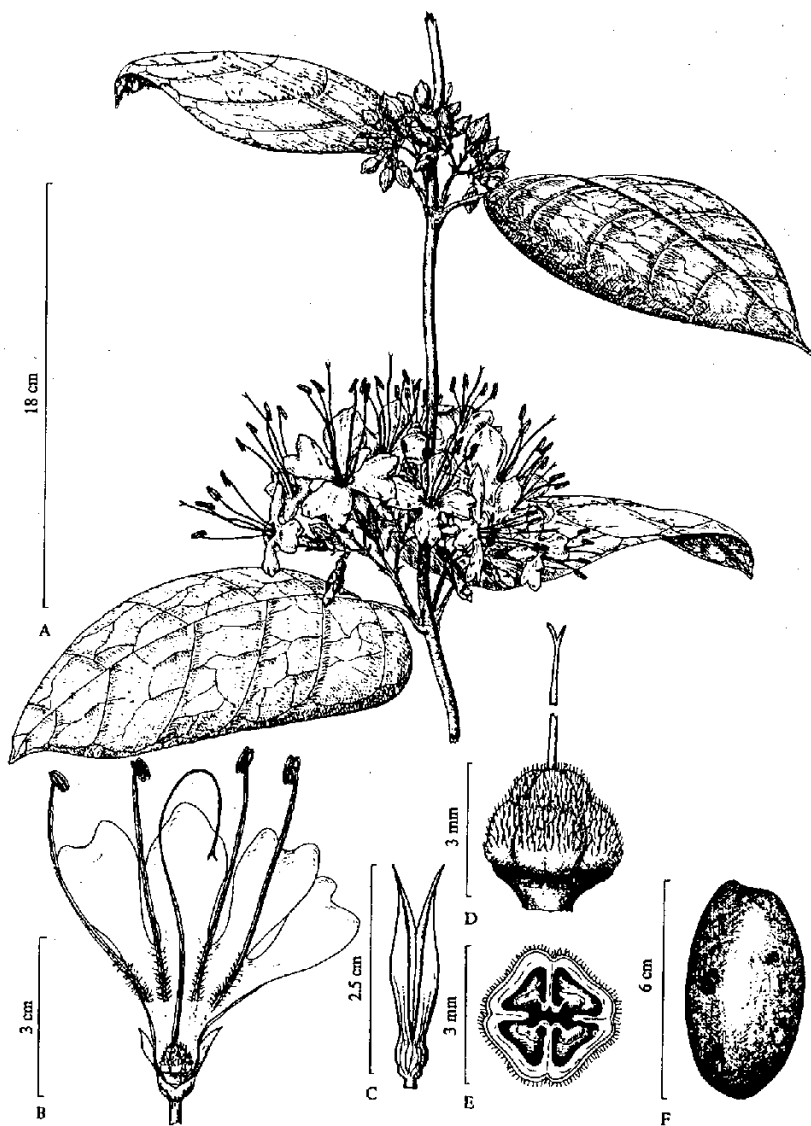


Fig. 1. *Faradaya albertsii*. (A) A flowering branch showing the flowers in groups or compact pyramidal clusters (thyrses) growing from the point where the leaves meet the stem and hence the thyrses cluster of flowers is axillary.

(B) Flower cut open and opened out without removing any part. The corolla (envelope of petals) comprises four fused petals which are free above and fused into a tube below. Each of the four corolla lobes is deeply notched (bilobed) at the top. The filaments of the four stamens are fused or attached to the corolla-tube (i.e. epipetalous), just above the middle of the corolla tube.

(C) The calyx is basically of four fused sepals that during anthesis (opening of flowers) split into two (rarely 4) lobes.

(D) The ovary with the style on top being the female or seed forming section of the flower. The ovary is cut across, horizontally, in detail (E) showing the four compartments, that on fertilization, can each form a fruit as in detail (F).

***Faradaya splendida* F. Muell. (Fig. 2)**

A strong-growing or rambling ornamental woody climber, to 20 m long. The stem is pale-brown or pale greenish-brown with branchlets at first minutely hairy but eventually glabrous. The leaves are opposite, alternately at right angles; leaf-blades mostly ovate or oblong-elliptic, or sometimes almost rounded, papery or semi-leathery in texture, pale- or dark-green and glossy above, rounded or notched at the base, 8-41 cm long, 3-15 cm wide. The head of flowers is a loose terminal thyrse, much longer than the subtending leaves. The flowers are stalked, showy and fragrant, with the calyx green or pale-green, 1.5-2.5 cm long, usually bilobed to about the middle, the lobes apically acute. The corolla (floral envelope) is snow-white or greenish-white, tube funnel-shaped, 2-4 cm long, lobes elliptic-oblong or oblong-ovate, deeply notched or somewhat bilobed at the top. The stamens as shown, protrude above the corolla-tube and have white filaments, slightly hairy below the middle, 3.5-6.5 cm long with yellow anthers, oblong-ellipsoid, 3-4 mm long. The ovary globose, 4-furrowed or broadly 4-lobed, covered with soft hairs, 4-celled; cells 1-ovuled; style white, much protruded above the corolla, glabrous, bifid at the top, 5-7.8 cm long. Fruit creamish-white drupes, about the size, shape and colour of a hen's egg, ovoid-ellipsoid, 5-7 cm long, 3-5.5 cm diam., glabrous, glossy and containing a very acrid seed (kernel).

Faradaya splendida is named after its glittering large showy flowers. This is the type species of the genus and is widely cultivated outdoors for ornament in tropical portions of both hemispheres and greenhouses elsewhere. The first collection of this species was made before 1865 by Mr John Dallachy from Rockingham Bay, Queensland, and has since been found much further north in the Cape York Peninsula. Sometimes specimens of *F. splendida* have been misidentified as *F. papuana*.

The acrid fruit of *Faradaya splendida* is said to be edible. The middle layer of bark in the stem is a powerful fish-poison effective and rapid in killing fish and other aquatic animals even when used in great dilution, the active principle being a saponin. The roots have been found to contain an alkaloid substance. The species is the host food plant of the common oak blue butterfly (*Narathura milcale amphis*).

In Australia, *Faradaya splendida* is known to occur in the northern tropics of Queensland, where the major distribution is on the Atherton Tableland and its surrounding areas, chiefly between Cairns and Ingham. Distribution on Cape York Peninsula has been recorded from between Claudie River and Morehead River. The overseas distribution has been reported from Papua New Guinea, Irian Jaya and Celebes (Indonesia), Sabah (East Malaysia), Japan Island and Aroe Island.

The flowering period seems to be from July to December. It has been cultivated in the Botanic Gardens or nurseries at Brisbane, Cairns and Sydney. Overseas cultivations are reported from Botanic Gardens at Singapore, Lae (Papua New Guinea), Kew (England), India, Dominica and Puerto Rico.

Reference

Munir, A. A., 1987. A taxonomic revision of the genus *Faradaya* F. Muell. (Verbenaceae) in Australia. *J. Adelaide Bot. Gard.* 102(2): 165-77.



Faradaya splendida above and below. Photography by Garry Sankowsky.



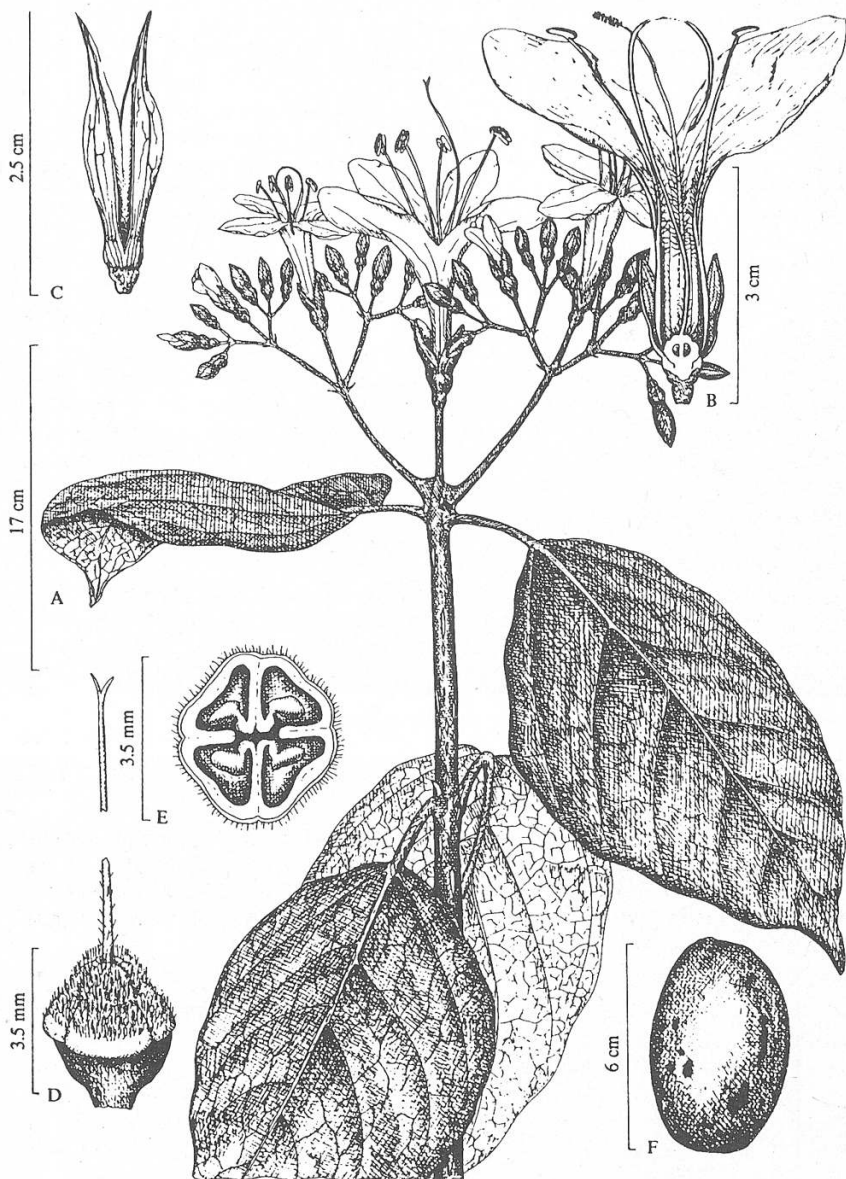


Fig. 2. *Faradaya splendia* (A) A flowering branch showing the flowers in groups or compact pyramidal clusters (thyse), at the end of the branch, i.e. terminal.

(B) A vertical section of the flower, i.e. one half of the flower has been removed and two of the four petals (free at the top, the lower point fused in a tube) remain. The stamens are attached to the corolla tube.

(C) The calyx of four fused sepals splits into two distinct lobes each of which comprises of two fused sepals.

(D) The ovary, cut across in detail (E) to show four compartments, each of which on maturity, may form a fruit, detail (F).

EAST COASTAL — 6

A Series by
Brian Walters

Epacris and its relatives are often thought of as difficult to propagate. No doubt some are, but it's always worth "having a go". For example, *Dracophyllum secundum* is a particularly difficult species to strike from cuttings but a couple of years ago I managed a 50% strike . . . which is not wonderful but it's a lot better than the zeros I'd achieved previously (and since!).

Playing around with root stimulating hormones can be useful; a good combination seems to be a liquid preparation of 1000 mg/l IBA/ 500 mg/l NAA. Note that the roots of the *Epacrids* are very fine and easily damaged so individual small tubes are the way to go.

Dracophyllum secundum, by the way, is a very beautiful and dramatic plant with its sheathing leaves and racemes of pink, tubular flowers. It inhabits moist cliff faces in the Blue Mountains and sandstone areas around Sydney. I haven't been game to put any of my plants into the garden, preferring to keep them in pots . . . they are doing well but, so far, no flowers. See the colour photograph on page 236.

Which brings us to potting mixes.

In recent issues of "Australian Plants" there have been some excellent articles on growing media for container plants and anyone contemplating growing a few pot plants would do well to take a second look. The CSIRO's booklet "Potting Mixes", in the Discovering Soils series, is also a goldmine of information.

Most small scale growers, however, probably don't feel inclined to go to the trouble of designing a scientifically based mix. So, is there a short cut?

Well, yes and no.

Bagged commercial mixes are not the complete answer as these seem to be designed for Azaleas, Camellias and the like and tend to hold too much moisture for my liking. But they can be modified, remembering that we are dealing here with general purpose mixes, usually comprised of sawdust, pine bark and sand in various combinations.

To improve drainage it is necessary to add coarse particles. But the old principle of "add coarse sand" is fraught with danger since most coarse sands contain a high fraction of fines . . . and the end result can be disastrous. Great for wetland species but not much else (I speak here from painful experience!). So, how do we measure drainage? The simplest method is the "air-filled porosity" (AFP) procedure described in the CSIRO booklet. Basically, the AFP is the ratio of the volume of air in a mix to the total volume of the mix after it has stopped draining.

My variation on the CSIRO method involves a couple of short cuts and, consequently, introduces some errors. However, as it is less important to know the exact AFP than to be able to do a quick, *repeatable* test, I can live with the errors.

- (a) Select a suitable pot (I use 80 mm dia. $\times$ 150 mm deep). The size is not critical but you *must* use the same size for all tests as AFP depends on the depth of the container.

- (b) Work out the volume of the pot.
- (c) Compact the mix into the pot to completely fill it.
- (d) Place the filled pot in a bucket and carefully fill the bucket with water to the level of the top of the pot and leave for a few hours.
- (e) Quickly lift the pot from the bucket and place in an empty container to collect the drainage water (the pot should be supported so the drainage holes are clear of the drained water).
- (f) After drainage has finished (leave for at least an hour) measure the volume of drained water (this is the volume of air that has now entered the mix).
- (g) Calculate AFP as follows:-

$$\text{AFP (per cent)} = \frac{\text{Volume of drained water}}{\text{Total volume of pot}} \times 100$$

My experience is that, for most container grown plants, the AFP value as calculated by the above method should not be less than 20%.

So, what do you do if your selected mix has too low a value of AFP? Simple. Add coarse material and check again.

Probably the best coarse material to add is "horticultural grade" pinebark, which is in the 5 to 10 mm range (pinebark should be stored (moist) for about six weeks before use to ensure toxins are leached out). If you must use coarse sand make sure it really is coarse.

Drainage, of course, is not the only critical factor in a mix. However, it is fair to say that more plants are killed by overwatering than by any other cause. The aim of the above method is to produce a mix that is as near as possible to being immune to overwatering.

It may be necessary to vary the components of a mix to suit the needs of particular plants. For example, I have found that some (not all) *Banksia* species don't like the sawdust/pinebark based mix. Accordingly, I've found it necessary to prepare a new mix based on peat/coarse gravel, but still maintaining the desirable AFP characteristics.

Finally, if you've never worried too much about the potting mix you use, measure the AFP. Like me, you could be in for a nasty surprise! ■

The Dwarf Eucalypt Project .

by Mrs M. Bowyer, Warrnambool, Victoria.

I became interested in eucalypts when my husband and I started planting trees and shrubs on a 10-acre block near Stawell in the western district of Victoria in 1978. The ground has only the slightest slope, the soil is gravel over clay which rapidly becomes waterlogged and dries out to a hard pan. The pH is between 5 and 6. Rainfall is about 530 mm per year, mainly in winter, and there can be four months or more without any rain. Winter temperatures can be as low as -8°C, with frequent frosts, and summer 38°C or more.

With conditions like that we had many losses, chiefly through waterlogging, but there have been surprises too and we now have over 100 different species flourishing, including several dwarf varieties. Planting is done in spring or autumn, the plants are watered in and given one further watering if there is no follow-on rain. No fertilizers are used. The spring plantings are given a mulch of the grass cuttings from the area planted. I should mention that the block was planted with introduced grasses and grazed for many years. It is also infested with onion weed and capeweed. If a plant appears to be struggling I do some hand weeding around it, otherwise they are left to compete. The whole operation is different from garden cultivation.



Eucalyptus lansdowneana

Photography by Ilma Dunn

A tree in full flower only two metres high was shown in colour on page 89 of our No. 110 issue. This series is to advise readers of our Dwarf *Eucalyptus* Project, a project to select those species of *Eucalyptus* that are small when mature and have some outstanding horticultural value. The project has suffered a delay while the society takes a full year to decide whether to support it. Hopefully all will be approved and we can get propagation material to the six microculture laboratories who are waiting to start. – Editor.

Dwarf eucalypts which have performed well include *Eucalyptus caesia* and *E. caesia* ssp. *magna*, *E. forrestiana* ssp. *dolichorhyncha*, *E. lansdowneana* ssp. *albopurpurea*, *E. erythronema*, *E. formanii*, *E. foecunda*, *E. goniantha*, *E. kruseana*, *E. macrocarpa*, *E. calycagona*, *E. angulosa*, *E. oxymitra*, *E. tetragona*, *E. preissiana*, *E. nutans* and *E. orbifolia*, several of which are outstanding for profusion of flowers and good shape. There is one plant of either *E. stricklandii* or *E. stricklandii* × *erythronema* (I planted both but the labels were lost and one plant died) – it flowered for the first time this year, over several months, and already this season's buds are forming. The stamens are red. We have one plant of *E. dwyeri* but it is too soon to judge how big it will grow. Planted in April 1982 it is 3 m tall and will flower for the first time this year.

I grew many of the plants from seed I collected. For the study project I am growing *E. nutans* from seed off our own tree – a most attractive rounded shape which is always covered with flowers, buds or fruit – and also *E. forrestiana* from seed I collected from street trees in South Australia.

Wildflowers of South-Eastern Australia by Elizabeth Conabere and J. Ross Garnet

This large 180 page book comprises, on all its right hand pages, reproductions of water colour paintings of mostly small herbaceous plants of the south-eastern corner of Australia. The colour plates are large and beautifully presented and one portion of one of them is reproduced page 192. I fear it does not do justice to the splendor of the book. On the page opposite the colour plate is a description of the plants illustrated, by J. Ross Garnet. Ross is well known and widely respected for his knowledge on the Australian flora and his description of the Australian "iris" family of plants is on page 191.

Available from N.S.W. Book Service at \$32.00.

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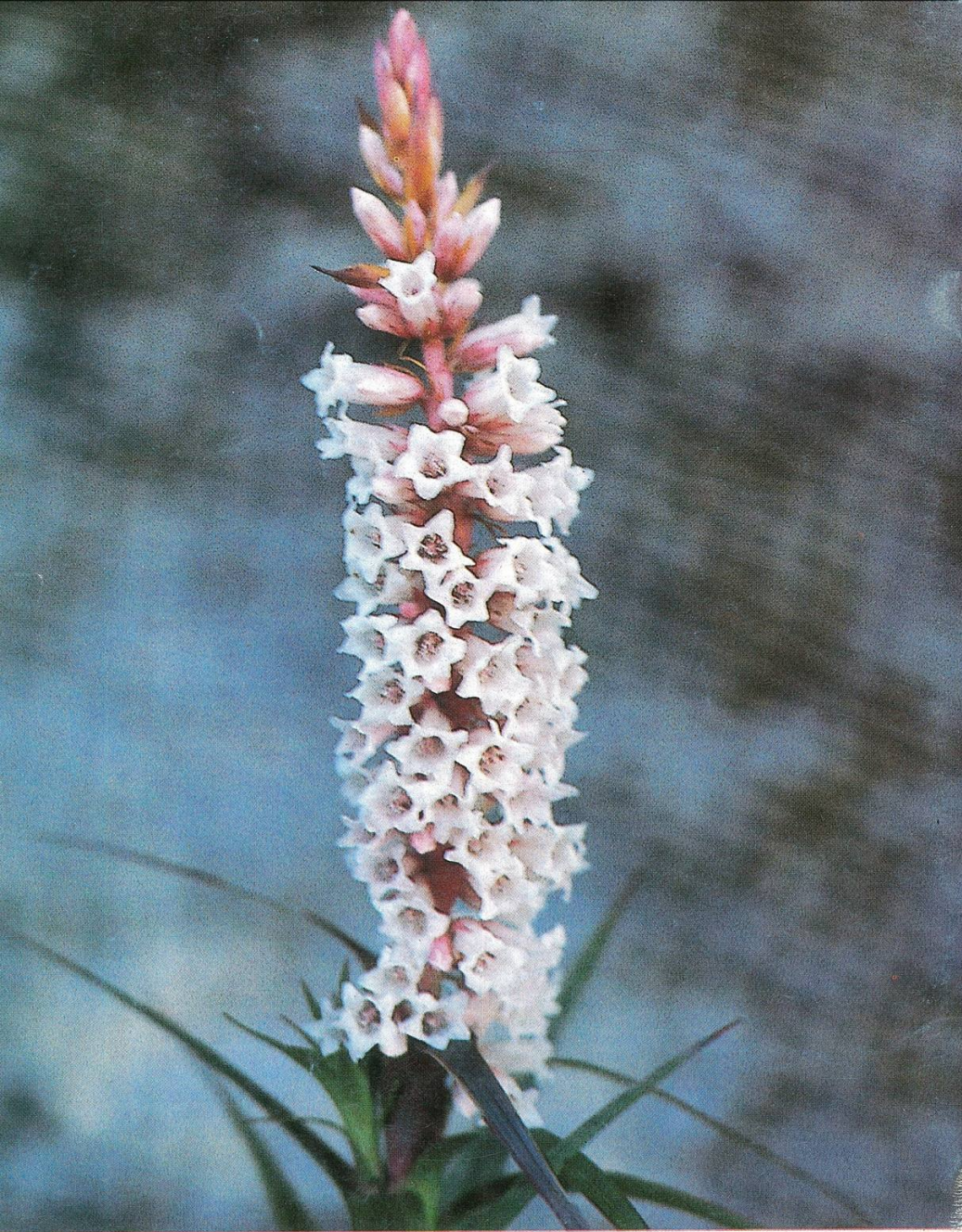
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Dracophyllum secundum

Photography by Brian Walters

Found on cliff faces in the blue mountains, this beautiful dramatic plant is ideal for a pot specimen to adorn your home. The article on page 231 describes how you can do this.