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TELOPEA TRUNCATA — THE TASMANIAN WARATAH

TASMANIAN WARATAH

Telopea truncata (Labill.) R.Br. by A. M. Gray

The Tasmanian Waratah differs from the Mainland counterparts, but resembles both *T. mangaensis* and *T. oreades*. It is perhaps a little more compact than *T. oreades* and somewhat larger and more brilliant in colour than *T. mangaensis*.

The N.S.W. Waratah, *Telopea speciosissima* is a more spectacular flower, but in the Tasmanian rainforests and sub-alpine shrubberies nothing makes such a fine display as the Tasmanian Waratah. It grows to a large spreading shrub, with deep green entire leaves which may be ovate-lanceolate to obovate in shape and usually with a blunt apex. The young branches and unopened flowerheads are usually covered with soft brownish hairs.

A freely flowering specimen has no rival in our bushlands. Picked out from the deep green foliage the crimson or scarlet flowers standing stiffly upright on long stems make a magnificent sight. The flowers may be from 2"-4" across and with the densely packed individual flowers possessing long curved stigmas and secreting copious amounts of nectar. The Tasmanian waratah does not possess the bracts as in *T. speciosissima*. The flowers are followed by woody follicles which, after ripening, open to release numerous winged seeds.

The specific name "*truncata*", meaning cut off or shortened, alludes to the flowerhead (which is really a much compacted raceme) appearing as if it had originally been similar to the "cone" shaped head of *T. speciosissima*, but had been cut off about $\frac{1}{2}$ "- $\frac{3}{4}$ " from the base of the raceme.

Although scarlet or crimson are the normal colours, rare plants displaying yellow or creamy flowers have been found. One with fine yellow flowers is growing in a beautiful garden, carefully tended by Miss E. Huxley at Longley, 12 miles south of Hobart. This shrub was found in the mountains behind her home by her father and brought back to a safe plot in the garden. Each year, at flowering time, visitors are treated to a wonderful display of bright yellow waratahs. The leaves differ quite a lot from the normal red flower type and the downy hairs are always greenish, without the brownish tinge.

Previous issues of "Australian Plants" have given clear directions on the propagation of the Waratahs so I need not go further. A warning however, that the seedlings are very prone to damping off, would be pertinent at this stage. Remember not to sow the seed too thickly; place the seed tray in a light and well ventilated position and do not over-water—a spray with fungicide will not go amiss.

The Tasmanian Waratah will do well in a position that offers adequate root moisture and a fairly clayey soil, though well drained! It is quite hardy with respect to frost, sun or winds and makes a spectacular and very worthwhile specimen for any suitable garden.

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THE GENUS *RICHEA*

by A. M. Gray

Some of the most impressive plants of the Tasmanian forests and alpine scrubs and moors belong to the *Richea* genus, a member of the Epacridaceae. *Richea* comprises ten species, nine of which are confined to Tasmania; the other, *Richea continentis*, endemic to the highlands of Vic., N.S.W. and A.C.T. They are distributed from sea-level to the highest peaks throughout the Island, and range in size from small undershrubs to giant palm-like forest trees, with stems from 10' to 50' high and the leaves 1' to 4' in length, and not in the least resembling a "heath".

Botanically the *Richeas* are very interesting, due to the unusual formation of the flowers and to a degree the leaves. Whereas in a normal flower the petals, when present, separate, open and remain upon the receptacle for varying amounts of time (according to the species); in *Richea*, as in the *Eucalyptus* species, the petals do not open but remain joined together in the form of a "cap" or operculum, which is shed as the anthers mature and expand. In *Eucalyptus*, this cap, or operculum, is in all cases woody and does not have a petaloid texture, whereas in *Richea*, the operculum is at least petaloid in texture and colour until it is shed, in most cases, very early in the life of the flower.

The leaves of *Richea* species have broad sheathing bases, and are more or less closely appressed for varying extent of their length, then spreading, upright or reflexed and mostly confined to the ends of the branches. The venation, as in other Epacridaceous species, is parallel. After the leaves have fallen they leave raised scars on the stems, though not prominent in all species.

A very spectacular part of the Tasmanian flora is the huge *Richea pandanifolia* ('pandani'). Visitors travelling through our dense rainforests are surprised to see a plant, which in all respects resembles a tropical palm growing in sub-antarctic forests.

In summer, another of the species, *Richea scoparia*, blazes the alpine moors with a mass of colour, from white through scarlet and burgundy, and lacing the air with the aroma of burnt candy. Then there is the beautiful *Richea dracophylla*, with leaves and stems resembling a miniature of *Richea pandanifolia*, but with the flowers far more spectacular, in huge terminal 'spikes', closely arranged and resembling (before the 'petals' fall) a cluster of polished rice grains.

The following is a description of the genus, followed by a simple account of each species.

Unusual shrubs or medium sized trees, if as the latter, mostly unbranched and resembling certain palm species. Leaves hard and leathery in texture, base sheathing, the lower part imbricate, commonly crowded at the ends of the branches, reflexed, spreading or erect. Venation parallel, the margins with minute serrations, apex abrupt or tapering to a long point, hard or pungent.

Flowers in panicles or spikes, terminating the main branches or short laterals. Corolla not separating into lobes, but separating circumscissile at, or just above the base and falling early, the base persisting. Operculum conical, conical-truncate or ovoid. Calyx of five sepals, separating and persistent. Ovary five-celled, many seeds in each cell. Style embedded in a depression in the top of the ovary; stigma small. Stamens five, occasionally four, arising from the receptacle, persisting and prominent after the operculum has fallen. Anthers bilobed or entire, continuous with the filament or free at the lower portion. Some species possessing nectar secreting scales, nectar often copious.

Fruit a dehiscent 5-celled capsule, seeds numerous and very small. Nine species endemic in Tasmania, one in Victoria, N.S.W. and A.C.T.

The following descriptions of the species are simple and non-technical for the reasons of clarity and ease of identification in the field. Variations between the species are often small and detailed, the main diagnostic characteristics are described and should allow the careful observer to identify the plants.



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***Richea continentis* B. L. Burtt**

"Candle Heath"

A shrub usually 3 to 5 ft. or more in height, occasionally reduced to 12" in exposed situations; branches densely crowded, the bush compact. Leaves rigid, lanceolate, imbricate, sub-erect or recurved. Apex tapering to a pungent point. Base broad, sheathing, margins hyaline and minutely scaberrulous. Usually $\frac{1}{2}$ " to 1" long but often 2" to 3" long on the younger branches, especially in shaded situations. The leaves persistent on the older stems.

Inflorescence an interrupted, paniculate spike, occurring at the ends of the branches. Bracts much shorter than the foliage leaves, very broad, the base with membranous wings. Apex tapering suddenly to a long, soft point; caducous, falling before the corolla is shed. Flowers 3-5 together on a short peduncle, the axis of the main inflorescence elongated between the flower clusters. The flowers subtended by 2 or 3 narrow bracts which fall early. Sepals small and broadly ovate. Corolla ovoid-conical, the apex blunt, creamy-white to pale pink. Stamens equal to or slightly longer than the style. Nectaries present.



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Richea scoparia Hook. f.

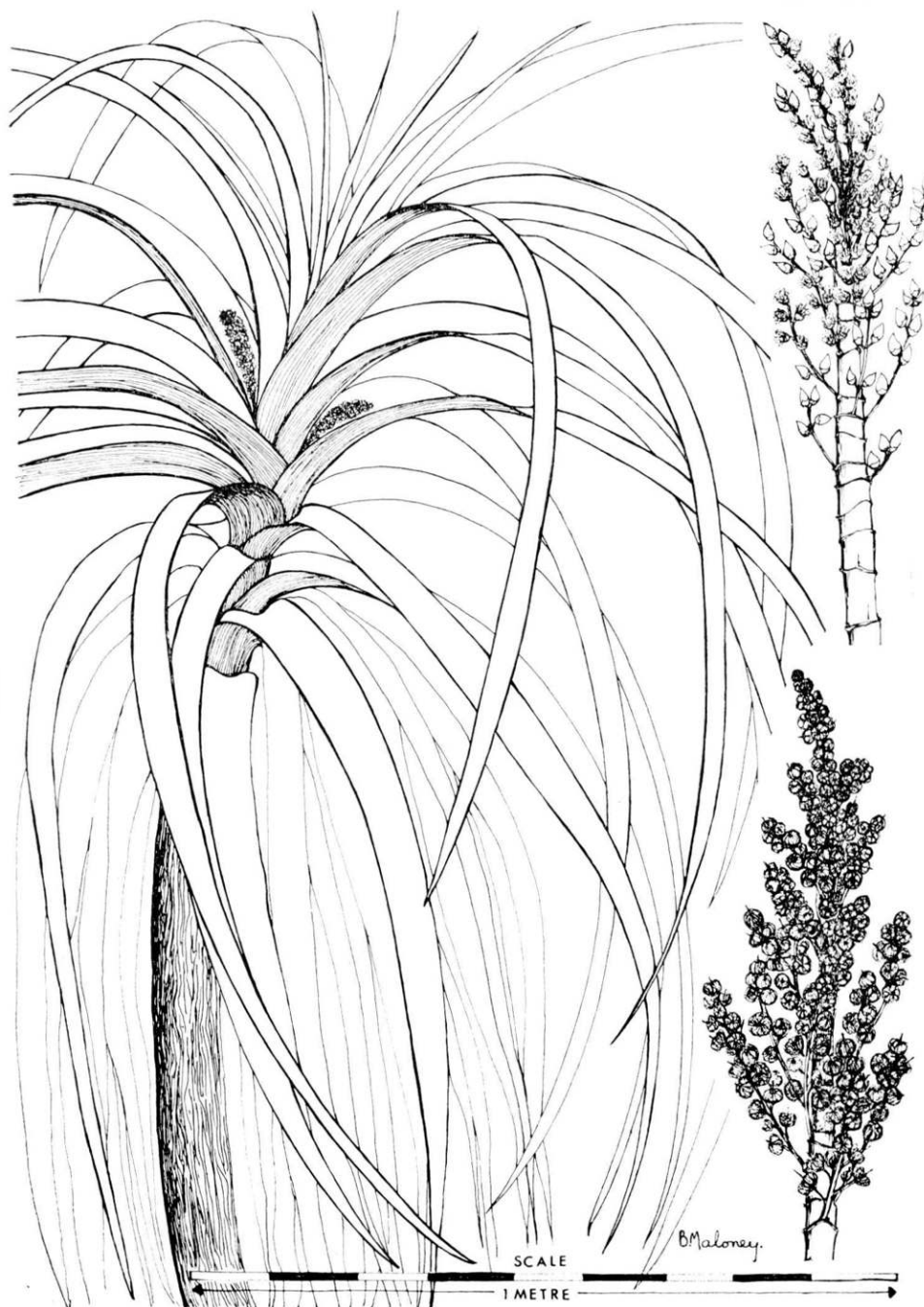
"Scoparia"

One of the most eye-catching of plants on the moors and ridges of Tasmania's high country, often forming extensive patches on scree slopes and the flanks of ridges, plants from 2'-6' high. Bushwalkers abhor this plant as its very rigid and pungent foliage makes it a nightmare to try and force one's way through, indeed there are very few bushwalkers who have not had some encounter with Tasmania's "infamous" Scoparia scrub.

The leaves of *R. scoparia* are from 1'-3" long, rigid, often very coarse and pungent, erect or semi-recurved, sometimes deep reddish in colour, persisting on the branches for two or three seasons after dying; base sheathing and somewhat imbricate. The bark is tan brown in colour and usually shed in large flakes, leaf-scars obscure.

Flowers in terminal spikes or panicles, somewhat similar to the inflorescence of *R. dracophylla*, though of course smaller and coloured from all shades of pink, orange and scarlet to the most exquisite 'burgundy' shades.

The bracts are small, and like the operculum, fall very early. Copious amounts of nectar are produced, the aroma of this nectar somewhat resembling burnt candy, and on a hot day in the mountains is almost overpowering.



RICHEA PANDANIFOLIA

The descriptions of all the species of *Richea* fully illustrated by sketches similar to that above, are continued on page 126, commencing with a simple key to the species. *Richea pandanifolia* is described under a photograph of plants with the author on page 111 where details of cultivation and propagation are given.

SENECIO

by A. M. Gray

Senecio brunonis (Hook. f.) J. H. Willis (1967) *compositae*. syn. *Senecio centropappus* F. Muell., *Centropappus brunonis* Hook. f.

I wish to discuss the above plant not so much because it is an endemic Tasmanian species but because of its peculiarity of form and the fact that it is a unique and rare plant.

Many people would have read of the giant Groundsels (and Lobelias) of the Ruenzori Mts. (or Mts. of the Moon) in Central S.W. Africa. The usual concept of "groundsels", is that of a small herbaceous weed or a shrubby plant. However in the upper reaches of the above Mts. the *Senecios* reach giant proportions, as much as 5'-50' high, and are soft (herbaceous) and $\pm$ brittle.

Here in Tasmania, in two very restricted localities there occurs a plant which grows into a medium size tree, is not as "brittle and herbaceous" as its African cousin but is nevertheless a member of the *Senecio* (Groundsel or rag-wart) genus.

Unfortunately over the past few years this plant, *Senecio brunonis*, has become exceedingly rare, mainly by devastation from bushfires. It occurred only on Mt. Wellington, near Hobart, and Mt. Dromedary, which rises to 3400' half way between Hobart and New Norfolk. Both mountains suffered extensively in February 1967 with the result that *Senecio brunonis* is possibly extinct on Mt. Dromedary and is hard to find on Mt. Wellington.

Although approaches have been made to Hobart City Council, who control the "Mountain Reserve", to preserve and protect the remaining trees, typically, nothing has been done.

A shrub or small tree, usually from 5'-10' but sometimes up to 20'.

Leaves 1"-4" long mostly clustered towards the end of the branchlets, spreading, broadly linear, the apex blunt, margins somewhat recurved, sessile and leaving raised scars on the stems after falling; glabrous, very sticky when crushed and emitting a strong sweet aroma.

Flowers numerous and borne in terminal "corymbose panicles". Ray florets with broad yellow petals. Disc florets twice as many as the rays. Achenes smooth, pappus bristles stiff, almost feathery at the ends.

Cuttings of this plant are hard to strike, seed being plentiful, is the best means of propagation. It should be scattered thinly in a good soil mixture containing ample humus. Drainage is important, as is adequate air circulation. Once germinated the seedlings should be pricked into small pots and hardened off. When planted into the garden, a cool position is most beneficial. *Senecio* is a fairly rapid grower and with adequate Summer watering, an attractive small tree of pyramidal shape, will be your reward.

No pruning or fertilizing is usually necessary. The newly formed Hobart group of the S.G.A.P. may soon be able to collect some seed of *Senecio brunonis*, this will be distributed among local groups in all States desirous of obtaining this plant. Any person able to germinate and grow it will be ensuring that this very rare and unusual plant does not become extinct.

GAY VALE

Growers and collectors of Tasmanian endemic plants. Limited numbers of plants and species available including seed and cuttings where practicable.

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PROF.: A. M. GRAY

105 Summerleas Road, Ferntree, Tas. 7101

SENECIO IN TASMANIA

by A. M. Gray

There are 22 species of *Senecio* in Tasmania. Of these five are endemic (*Senecio papillosus*, *S. spathulatus*, *S. brunonis*, *S. primulifolius* and *S. capillifolius*) and four are introduced.



Reproduced from paintings by Alison M. Ashby—Blocks by courtesy of the S.A. Museum

SENECIO PECTINATUS

Senecio pectinatus is found in Victoria as well as Tasmania from highland situations to sea-level. It is a perennial herb with mostly radial leaves, the leaves spathulate or oblong with the base narrowed into a petiole in the older leaves, green and shining, deeply pinnately divided, the lobes fine and blunt. The flowers are borne on stems 2'-6" long often with small leaves along its length. The "flower head" is broadly campanulate and solitary on the stem, 1'-2" in diameter, bright yellow or occasionally deep orange.

Senecio pectinatus var. *ochroleuca* Rodw. is very similar but differs by possessing leaves which are almost entire and narrow linear to spathulate in shape.

AUSTRALIAN DENDROBIUM

A series on species of *Dendrobium* by Ian Walters

SECTION LATAUREA — *Dendrobium bifalce* Lindl. and *Dendrobium bairdianum* F. M. Bail.

This section of *Dendrobium* is principally found in New Guinea and adjacent islands, with two representatives occurring in Australia. One of these, *Dendrobium bifalce* Lindl. is common throughout the above region, while the other, *Dendrobium bairdianum* F. M. Bail., is endemic to the high ranges of tropical North Queensland.



DENDROBIUM BAIRDIANUM F. M. Bail.

Editor's Note: Will readers please report on their experiences in growing these *Dendrobium* and the next species to be featured, *D. stuartii*. Reports indicate that *D. bairdianum* is quite successfully grown in Sydney without need for heat.

The section *Lataurea* is characterised by having medium sized, green, white, or yellowish flowers with varying amounts of brown, purple-brown, markings on the labellum and often on the sepals and petals. The labellum is usually large, smooth and with a large callus or crest, usually lobed, at the base of the mid-lobe, and extending to the base of the labellum.

Plants of this section usually consist of large fusiform pseudobulbs, with a few large leathery leaves at the apex, the young pseudobulbs clothed with large bracts.

***Dendrobium bifalce* Lindl.** The Australian form from Cape York is a robust species, producing large, fusiform pseudobulbs up to eighteen inches in height and about one inch in diameter. The leaves, two to three in number, are stiff, yellowish green, 5-6 inches long and 2-3 inches wide, oval.

The inflorescences are produced from the apical nodes, usually few flowered, the flowers being borne close together at the end of the spike.

Flowers about three quarters to one inch across, long lived, the sepals broadly triangular, petals narrow, acute. The labellum is three lobed, the lateral lobes small, falcate, acute, the midlobe large, curved, with the outer corners upturned. Labellum with a large callus, which is two-lobed.

The flower is green, yellowish-green in colour, with blotches of brown, purple-brown, on the labellum and smaller markings of the same colour on the sepals and petals. The labellum is lighter in colour than the sepals.

Dendrobium bifalce Lindl. is a robustly growing plant which seems to require abundant room for root establishment. It is grown successfully in a pot in peat and also on a large slab of treefern. The species is typically a tropical orchid and requires a warm sunny position with maximum moisture when growing. A rest after flowering, until the new lead appears, seems beneficial, as do applications of fertilizer when growing.

***Dendrobium bairdianum* F. M. Bail.** This is a small growing species, rarely exceeding eight inches in height, with almost cylindrical pseudobulbs, slightly swollen at the middle, up to about one half inch diameter. Leaves several, dark green, borne on the apical one third of the pseudobulb, often persisting on only the most recent growths, narrow, about three inches long and one half inch across, lanceolate.

Inflorescence short, about as long as the leaves, few flowered, produced from the apex. Flowers long lived, about three quarters to one inch across, the sepals broadly triangular, the lateral sepals reflexing somewhat. Petals much narrower, acute, as long as the sepals.

Labellum large, three lobed, the lateral lobes obtuse, rounded. Midlobe large, wider at the apex than at the base, the apex rounded with the outer corners upturned. Labellum with a large two lobed callus, white, at the base of the midlobe.

The flowers are a green to yellow-green in colour, with the large labellum a contrasting dark red-purple to light purple with the large white callus. This combination of colours makes this species one of the prettiest of the native *Dendrobiums*.

The species inhabits open forest of the North Queensland range tops. It is a scarce orchid, usually found growing in the tops of the "Bull oak" trees and on the branches of "Bottlebrush" trees in small creeks.

It requires cool, moist conditions, well sheltered, and should never be allowed to dry out completely for long. Branches of its native host offer the best possibilities for successful culture, although small pots using peat or bork could also be used. A short rest after flowering seems warranted, until the new growths appear.

GROW ORCHIDS

AUSTRALIAN NATIVE ORCHIDS FOR BUSH-HOUSE CULTURE IN TASMANIA

by B. J. Dudman

I will describe about 30 species which I think are easily cultivated in a bush-house here, and reward the grower with masses of blooms regularly but require little attention. Most epiphytes can be broadly described as "air-plants" and as such, in their native state, their food supplies are provided by nature through the agency of the sun, rain, dew, air and by the nature of the bark of the tree which harbours them, and what is often most important, by the insects and birds which frequent these trees. To my way of thinking, a bush-house with either shade cloth roof or slats, allows nature to continue to provide for the plants with the sun, rain, dew and air, while with careful attention, we provide the host whether it be pot or branch, and assist by providing that extra nourishment in the form of liquid fertiliser during the growing season, to only healthy established plants. We can then attempt to satisfy the plants climatic desires, whether it be a moist shaded gully, or an exposed tree top. With experimenting, we can find the best position, and our plants reward us with masses of blooms, many of which are delightfully perfumed, which is more than most *Cymbidium* or *Cattleya* hybrids offer.

Dendrobium kingianum Bidw. "The Pink Rock Orchid"

This very variable plant is found in New South Wales and Queensland where it grows on cliff faces and often in extensive colonies, where it thrives under very light shade given by open bushland, although sometimes found in very exposed places. Throughout its native habitat the average rainfall would be about 40 inches per annum and often has severe winter frosts and high summer temperatures. Many forms produce growths on top of parent growths, which can be removed when developed.

The plants are very variable in growth, sometimes with short, stout pseudo-bulbs, sometimes tall and slender only being bulbous at the base; height to 12 inches with 3 to 6 leaves. The flowers from 2 to 9 are usually $\frac{3}{4}$ " across and vary in form and in colour from a rare pure white through shades of pink to deep mauve. These flowers are carried above the foliage and appear in spring, some forms being perfumed. Some worthwhile varieties are: *var. album* which carries more flowers to a stem and is pure white—a rare form. *Var. silcockii*—Flowers are pure white with pink lip and fleshy. *Var. pulcherrimum* is rare. Pseudo bulbs rarely exceed 3" in height and the very richly coloured flowers are larger than the type. This form does not respond well to cultivation.

All forms of *Dendrobium kingianum* can be grown in pots in a compost consisting of pine-bark, leaf mould and little coarse sand and charcoal; good drainage is essential. They benefit from liberal feedings of fowl manure etc. during growing season and can be grown in bush house under 46% shade cloth. It is preferable to move them under permanent shelter when buds appear. I have over 15 different forms, all growing extremely well under above conditions. Nearly every orchid grower has a plant of *Dendrobium kingianum* in their collection but too often it is neglected, yet still flowers yearly. A large specimen plant in a 8" or 10" pot carries hundreds of blooms.

Previous issues have described many of the species mentioned in more detail, often illustrated with line drawings and full colour plates. This article is presented to assure readers that these orchids may be grown without a great deal of trouble as far south as Tasmania. The article is continued on page no. 133.

AGASTACHYS

by A. M. GRAY

Agastachys odorata R.Br. (Proteaceae) "White Waratah"

This beautiful plant is commonly known as "The White Waratah", and although it is in the same family as the true Waratahs, it is quite a different plant. *Agastachys* is one of the characteristic plants of the wet, acid Button-grass moors of the South, West and South-west, although it does occur fairly commonly in dense forests in these areas. It is an erect shrub, much branched and with light green, glossy leaves and reddish stems. In Summer it produces large, dense spikes of brilliant white flowers which are very small and crowded and with a strong, sweet perfume. A more detailed description is as follows:-



Photography by A. M. Gray

WHITE WARATAH?

A coarse, erect shrub 3' to 12' high. Leaves linear-oblong or somewhat spatulate, spreading and shortly stalked, the apex with a blunt and occasionally notched apex, margins entire. Leathery and light, shining green, 2" to 4" long. The flowers are borne in long, numerous terminal spikes, a number of these spikes making up one "flowering head", 2" to 6" long. The individual flowers are small, regular with 4 slightly recurving, linear lobes, $\frac{1}{8}$ " to $\frac{1}{4}$ " long and free at the base. White or creamy yellow in colour, each flower subtended by a small bract. Stamens inserted at the base of the petals, free from them and somewhat shorter. Ovary small and obscurely triangular in shape. Style longer than the ovary and with a flattened stigma. Fruit a leathery follicle containing a single seed, the seed with three wings.

Agastachys odorata is the only species in the genus and is confined to Tasmania. The propagation of this plant is somewhat difficult, seed being rather difficult to collect and germinate. Cuttings are rather chancy. Air layering or root divisions seem to be about the most successful methods of obtaining new plants. *Agastachys* spreads naturally by means of long adventitious roots which at various intervals give rise to small new plants. These, if dug up and carefully transplanted or potted will usually survive and develop into a strongly growing shrub.

Air layering can be done by cutting a ring of cambium about $\frac{1}{8}$ " to $\frac{1}{4}$ " wide from a Summer-hardened shoot and wrapping this in damp sphagnum moss and then a plastic bag. Roots form rather slowly, however once they have done so and the new plant is severed from the parent and potted, a vigorous shrub is soon the result. Acid soils with a high humus content and copious amounts of water best suit *Agastachys*. Although a lover of cool moist conditions, *Agastachys* may be grown in the absence of any shade.

GROWING WARATAH

by A. L. Hargrave, Melbourne

The "Tasmanian Waratah", *Telopea truncata* does well in the same conditions as the "N.S.W. Waratah", *Telopea speciosissima*. The best soil is the red mountain soil. It can be added to a good depth to whatever soil is already in the garden. Good drainage is essential but plenty of moisture gives best results particularly in dry periods.

From a foliage point of view the small tree formed by *Telopea truncata* makes it the best foliage Waratah for the garden.

PROPAGATION—I germinate seed of all wildflowers using the same method in an unheated glasshouse. I use terracotta pots for seed sowing being porous they allow plenty of air circulation which I consider important. The mixture is a good sandy loam and 2/3 peat moss put through a 16th sieve. The seed is placed on top of the soil and covered with a thin layer of coarse sand. Plants are pricked out on the showing of their first pair of adult leaves and potted into a mixture of red mountain soil with an addition of well rotted leaves.

For waratahs the seed must be fresh.

WARATAH

The true Waratah belong to the genus *Telopea* and the Tasmanian "Waratah" is shown on the front cover. Previous issues give adequate instruction on the cultivation of the N.S.W. Waratah, *Telopea speciosissima*. What is generally known as the Queensland "Waratah", *Oreocaulis pinnatum* is described in our No. 37 issue where the name is mistakenly associated with *O. wickhamii*, a similar plant however.

GROWING WILDFLOWERS

A Native Garden In Tasmania by A. M. Gray

The establishment of a native garden in Tasmania differs little in treatment to one in any similar area in S.E. Australia. In a small island such as Tasmania, local conditions can vary greatly, in a matter of five miles as much as 2000' in altitude. One can live in an area of erratic rainfall coupled with frosty conditions in winter and warm dry conditions in summer. Such a place would be commonly encountered on Hobart's eastern shore. On the other hand, to live at Ferntree or similar places higher up and closer to Wellington, one encounters wet winters, and summers which commonly experience periods of misty weather, sometimes caused by the local sea breezes. These misty periods are of enormous help when trying to establish a garden around a newly built house. Generally speaking, Tasmania enjoys a fairly regular and reliable rainfall, perhaps with the exception of the Midlands and lower East Coast. Thus making a native garden is quite straight-forward as long as a little commonsense is used.

Rain-forest plants can be successfully grown on Hobart's Eastern shore, one garden that comes to mind boasts some fine specimens of the Myrtle beech—*Nothofagus cunninghamii*, Leatherwood—*Eucryphia lucida* and the Native Laurel—*Anopterus glandulosa*. Of course watering must be regular and the hose left to soak the ground for long periods.

At Ferntree, in my garden, where the annual rainfall can be in excess of 50", I can successfully grow plants which prefer arid or semi-arid conditions, *Callitris tasmanica* is one which comes to mind; this plant is only found on the East Coast where the rainfall may be as low as 10"-15" p.a. The requirements for plants such as these are a well drained, light soil and not too frequent watering except during very dry summer conditions.

Soil plays an important part and except for some localities in the north-west and far south moist soils are poor and acid in nature. Generally little is needed for these soils as any number of interesting plants can be grown with complete success.

The usual precautions pertaining to too wet or too dry a soil, frosts and wind are just as applicable to Tasmanian gardens as any on the Mainland. A point for most Tasmanians wishing to grow natives is not to exclude some of the wonderful plants from W.A. and similar places as, with care and commonsense any plant can be made or encouraged to produce its fullest beauty and proliferation in any Tasmanian garden.

RICHEA IN THE GARDEN

Once established in pots, Richeas can go straight into the garden plot. About the only "don't" with Richeas, is don't let them get too dry! Exposure to sun, wind or frost is unimportant.

At Ferntree, in my garden, I have a specimen of each species. All are doing extremely well, especially *R. scoparia*, *R. procera* and *R. pandanifolia*. As mentioned above, no care is given to them except that they have adequate water.

All Richea prefer a heavy soil though not too much clay is desired. Soil which becomes waterlogged does not seem to worry Richea as long as there is reasonable aeration at various times. Sandy soils, lacking in humus are undesirable. No fertilizers are needed but a once yearly application of semi-rotted humus around the bush is beneficial. Be careful not to heap this mulch too close to the stem as collar rot could result. Growth is slow.

Richea from Seed

Seed can be germinated successfully if a couple of important factors are remembered. Firstly, seed must be collected whilst the capsules are still green, i.e. just prior to drying and opening. The "spike" of green capsules should then be placed in a brown paper bag and placed in a warm spot to dry out artificially. Once the seed has separated from the capsules it should be sown almost immediately, this is vital if some success in germination is to be obtained. *Richea* seed is very fine, so care must be exercised not to scatter it too thickly or too scarcely.

A good propagating mixture can be made up by mixing two parts of fine sand to one of finely shredded "peat moss" or well decayed forest humus. The seed need not be covered, and gentle watering is indicated. Do not be surprised if the seed takes two or three seasons to germinate as it can well do.

Seedlings are extremely small, but should be pricked into pots as soon as they are $\pm \frac{1}{8}$ " high as they form very long tap roots which may be damaged if an attempt is made to transplant at too large a size.

***Richea*
*pandanifolia***
in foreground

***Athrotaxis*
*cupressoides***
in rear.

For descriptions and detailed sketches of Australian conifers including all those from Tasmania, see "Australian Plants" No. 34.



***Richea pandanifolia* Hook. f.**

Grass-tree or Giant Heath, 'pandani'

A large shrub or tree, 3'-50' high, occasionally branched, usually stunted at high altitudes; trunk bare, without noticeable leaf-scars at least at the lower (proximal) end. Leaves densely crowded into a crown at the top of the trunk, 1'-4' long, strap-shaped, coarse, the margins serrate (often sharply so), the base sheathing, apex extended into a tapering point. Flowers in axillary panicles, almost hidden amongst the leaves and almost covered by large bracts which fall early. Flowers very numerous, white or pink, each flower also subtended by 2-3 small bracts, also falling early. Sepals broad, stamens opening by a single slit. Petals (operculum) broadly conical and the apex rather flattened, shedded early. Fruiting capsules becoming deep crimson-brown after maturing and persisting for two or three seasons. See page 102 for a detailed sketch.

Occurs in wet rainforests, gullies and sometimes extending to alpine moors and ridges where it usually becomes quite stunted.

THE WHITE CEDAR

A series on Street Trees by H. Oakman

WHITE CEDAR (*Melia azedarach*)

There are very few towns in Australia without an avenue or two of two of White Cedar trees. Along with the Kurrajong and Silky Oak, it is most plentiful in the smaller towns where upkeep presents a problem. Its popularity diminishes however as townships progress; concrete footpaths for instance direct attention to its habit of regularly producing an abundance of yellow fruits with hard pea-sized pits that make walking uncomfortable.

The reasons why this tree is such a favourite are fairly obvious. The seed is readily obtainable in large quantities and seedlings can be raised without difficulty. Growth is rapid even in places with low rainfall and it appears to do equally well in raw sand or heavy clay. It thrives in a hot situation, can stand light frosts and is wind tolerant but not to the extent of being suitable for full exposure to coastal winds. Under city conditions, the White Cedar does remarkably well as evidenced by the many excellent avenues in Adelaide.

As a rule, maintenance is minimal as it naturally develops a single stem and a well formed rather open, sparse foliated, umbrageous crown. When in rich soil, however, it is inclined to send out vigorous shoots that have to be reduced in length during its formative stage in order to produce a compact crown.

The White Cedar is quite an attractive tree for most of the year. It is one of the very few native trees that is deciduous; it is also one of the small number of trees that can be relied on to provide a display of autumn foliage in the warmer regions. In early Spring, it produces a crop of fragrant, pale lilac flowers which completely cover the tree. These are in 6 to 8 inch panicles, the individual blooms are about $\frac{3}{4}$ " across with narrow recurved lilac coloured petals; the stamens are contained in a small erect tube. Flowering time is during mid-Spring and seldom extends over more than two weeks. The leaves are bipinnate, about 14 inches long. The leaflets are one to two inches long, pointed, almost oval and coarsely toothed. The young leaves, shoots and inflorescences are covered for a short period with a mealy stellate down. The flowers are generally followed by a profuse crop of yellow drupes about $\frac{1}{2}$ " in diameter. These remain on the tree until about mid-winter during which time they are quite decorative. The fruits are claimed to be poisonous and in view of the often extensive plantings in country districts, this point is worth noting. J. H. Maiden cites many instances of pigs having died from eating the fruits. Farmers have also alleged that cattle and horses show ill affects from eating them.

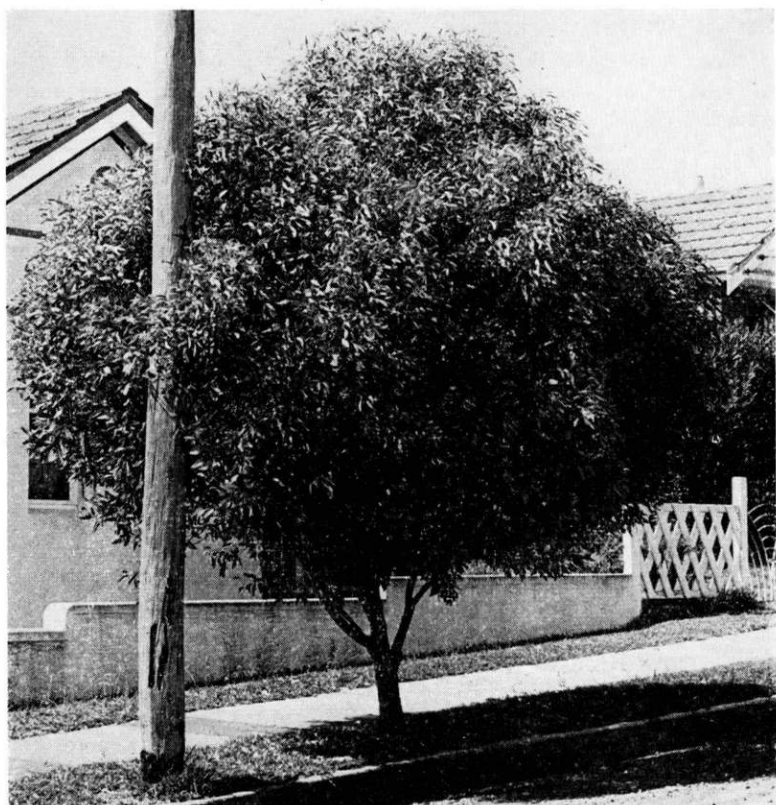
The White Cedar is widely naturalised throughout the world. The Australian plant is sometimes described as *Melia azedarach* var. *australasica* or *Melia composita*, although the latter name is regarded as a synonym for *M. dubia*. Its habitat is from just north of Sydney to the Burdekin River in Queensland. Benthham says that the Australian tree appears to be identical to *Melia composita* of East India, except for its more abundant tomentum and a larger drupe. In its native habitat it is found growing in association with Silky Oak (*Grevillea robusta*), Australian Red Cedar (*Cedrela australis*) and White Beech (*Gmelina leichhardtii*).

Average height is 35' but under forest conditions it varies from 70' up to as high as 150'. Stem diameter is from 20" to 30".

The White Cedar is a good example of the confusion often caused by common names. Some of these are: China Berry Tree which is the name most used in America. In Europe it was known as Paternosterbaum because of the general use made of its seeds as rosary beads after the pulp had been stewed off. In other places, the names include Pride of India, Pride of China, Pride of Persia, Persian Lilac, Wild Lilac, Texan Umbrella Tree, Bead Tree, Holy Tree.

In the Australian timber trade, it is generally referred to as White Cedar, but it is also fairly well known as Bastard Cedar and Tulip Cedar. The wood is not white but a streaky bacon, light red; it is soft, light and easily worked and has been used in cabinet work, for handles and as panelling. It is brittle and not durable outdoors.

Interesting points about this tree are that its bark can be used to stupify fish and that in Malaya, it is regarded as sacred, the flowers being used in religious ceremonies. In India, the leaves are considered edible. Its seeds are oily and inflammable.



Eucalyptus stricklandii

A member, J. Haywood, planted this tree in the footpath of Howard Road, Canterbury, Sydney, in the poor brick-clay to yellow loam area. It is five years old and has formed this ideal shape without pruning.

GUM TREES FROM SEED

by A. M. GRAY

PROPAGATION AND CULTIVATION OF TASMANIAN EUCALYPTS

All of the Tasmanian Eucalypts germinate easily and are simple to cultivate, no difficulties should be encountered as long as a few simple rules are observed. They are:

1. The best seed is that collected from capsules which are at least two to three seasons old. Although the capsules may be fully formed at the end of the first season the seed will require at least another one or two seasons to fully mature.
2. If the capsules are picked whilst still green, they are best left in the umbels, still attached to a section of twig until they are sufficiently ripe.
3. Plant the seed in light porous materials and never more than 1/8" in depth of soil covering them.
4. Water only sparingly, otherwise damping-off may be a problem.
5. Prick out into tubes or small pots as soon as the seedlings have "hardened off".
6. The use of manures or fertilizers in the seed or potting soil is unnecessary.
7. Sterilize the soil (by heat) if possible.

I have gained consistent results by using the following mediums:

- a. For sowing seed, equal parts by volume of coarse bush sand and light, natural compost or forest humus. Scatter the seed fairly thickly (especially the seed of the *Macrantherous* types) and cover with sand or mixture to no more than 1/8". In normal circumstances, good seed should germinate within 2-4 weeks. Water sparingly before and after germination; if damping-off occurs, sprinkle thinly with "Thiram 80", "Zebtox", Bordeaux or any reputable fungicide; repeat the application in about 7 days if the condition still exists. Seedlings should be left in a sheltered position outdoors (protect from frost, heavy rain or hot sun) to harden, this should take about a fortnight according to conditions.
- b. Potting: According to the natural habitat of the particular species, the potting soil should be either acid or neutral in reaction. Mix equal parts by volume of "peaty" loam, compost and sand for acid preferring species, and for those which do not require this type of soil, equal parts of sand (coarse), light compost and topsoil from a mudstone area. Carefully lift the seedlings with a clump of soil adhering to the roots and place into a pot or tube, do not over tighten the soil, water sparingly and keep under shelter until the plants become established. When planting into a permanent position probably the most important thing is to stake the young tree firmly, as Eucalypts dislike being blown about and loosened. Make sure the plant has adequate water, especially during the drier months.

Lopping or pollarding can be carried out on Eucalyptus trees, it is best done when the tree has reached about 12'. These procedures cause the tree to halt its upward growth and spread out and become more compact, it also prevents a tall growing species from getting out of hand and growing too tall. As mentioned earlier, some types are susceptible to sawfly or scale insect attack. A close watch should be kept, especially on the juvenile foliage and the appropriate control methods carried out.

Editor's Note: Readers interested in the garden care of Eucalypts especially in cold climates are recommended to refer to an excellent series of articles commencing in "Australian Plants" Issue No. 30 of Vol. 4.

Tasmanian Eucalypts

by A. M. GRAY

Tasmania possesses 25 distinct species of the genus *Eucalyptus*. Whilst this is very few when compared with the total number of known species (± 450), half of them are endemic to this state. Many hybrids exist, however but it would be irrelevant to include any descriptions of these in this article, not only because of the large numbers involved, but also because no two hybrids are quite the same. All of the endemic *Eucalypts* adapt very readily to cultivation and all make very attractive garden specimens, whether it be the tiny *E. vernicosa*—"Varnished Gum"—which seldom ever exceeds 5-10', or the lofty *E. johnstonii*—"Yellow Gum"—which often grows to 150' or even 200'. Seed is the only practical method of propagation.

There are eight sections of the genus *Eucalyptus*, only two of which are represented in Tasmania, they are:

(a) *Macrantherae* and (b) *Renantherae*. The *Macrantherae* include those trees usually called the "Gums"; whilst the Ash and Peppermint groups belong to the *Renantherae* section.

(a) *Macrantherae*—"Gums"

Anthers oblong to obovate, versatile, both lobes parallel. Connective having a large gland on the upper portion. The section is characterized (at least in the Tas. sp.) by having 1-3-7 flowers in the umbel, *E. globulus* and *E. vernicosa* contain 1; *E. globulus* very rarely has 3; *E. vernicosa* occasionally has 3 but usually two are aborted. *E. aggregata* and *E. ovata* usually possess 5-7 flowers, 7 being the commonest. Multi-flowered variants of the 3-flowered group are rare. The fertile seeds are few in number per capsule, flat, black and irregular in outline; infertile seeds very numerous, small and reddish brown in colour. The essential oils cineole (sold by chemists, etc. as "Eucalyptus oil") and phellandrine, an oil with a slightly sweet odour, are evident when the leaves are bruised or crushed. The seedlings have reniform (kidney shaped) cotyledons.

The *Macrantherous Eucalyptus* occurring in Tasmania are:-

1. *E. ovata*—also found in Vic., N.S.W. and S.A.;
2. *E. aggregata*—also found in N.S.W.
3. *E. viminalis*—also found in Vic., N.S.W. and S.A.;
4. *E. perrottiana*—also found in Vic. and N.S.W.
5. *E. bicostata*—also found in Flinders Island, Vic. and N.S.W.
6. *E. globulus*—also found at Wilson's Promontory, Vic.
7. *E. rubida*—also found in Vic., N.S.W., S.A. and Qld.
8. *E. dalrympleana*—the Tas. species is said to differ somewhat from that found in Vic. & N.S.W.
9. *E. morrisbyi*;
10. *E. gunnii*;
11. *E. urnigera*;
12. *E. johnstonii*;
13. *E. vernicosa*;
14. *E. cordata*. The last 6 species are endemic to Tasmania and are described below.

Eucalyptus gunnii Hook. f.

Cider-gum

(Includes *E. archeri* and *E. divaricata*)

A small tree up to 50' high. Bark deciduous, persistent at the base, scaly on the upper trunk and limbs, brownish-grey or green and orange in colour, twigs green or glaucous, rugulose or smooth. Adult leaves alternate, petiolate, ovate to lanceolate, green or glaucous, coriaceous, 2"-3½" long, apex acute, margins entire. Juvenile leaves opposite, sessile, broadly elliptical or almost orbicular, base cordate, apex rounded or emarginate, margin entire or subcrenulate, green to glaucous. Buds sessile or sub-sessile ½" long occasionally glaucous, receptacle cylindrical or $\pm$ urceolate, operculum shorter than the receptacle apex pointed. Umbels 3-flowered. Capsule cylindrical to ovoid-truncate about ½" long, disc sunken, valves 3-4 erect, enclosed. Seeds typical of the "gum" section. Occurs in stands on the central plateau at altitudes from 2000-3500' usually in poorly drained, boggy situations. Recorded hybrids, *E. gunnii* x *dalrympleana*; *E. gunnii* x *johnstonii*.

E. gunnii is similar to *E. morrisbyi* but as for Mainland species, any comparison would be misleading. The timber of this tree was used in making staves for cider casks—hence its common name—Cider gum. It is easily grown provided it is planted in a wet situation and makes a good garden specimen as it is only a small tree; the foliage is somewhat sparse.



Eucalyptus gunnii x 1/2

Leaves — mature fruits — buds —
juvenile leaves.

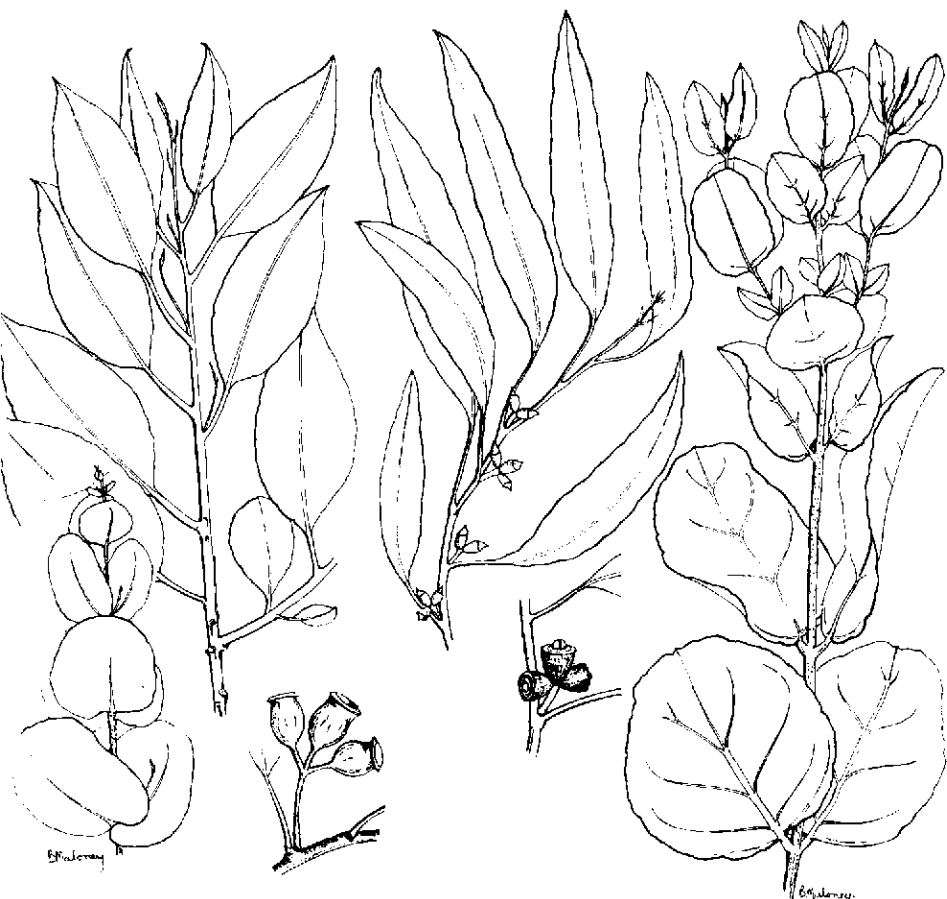
Eucalyptus morrisbyi x 1/2

Fruits — adult leaves — buds — juvenile
leaves.

Eucalyptus morrisbyi R. G. Brett.

Morrisby's Gum

A small tree 20'-50' high, all parts more or less glaucous. Bark deciduous, rough and scaly at the base, upper trunk and branches smooth, whitish grey to pink. Twigs smooth, glaucous, pappilose. Adult leaves alternate, petiolate lanceolate, glaucous, 3"-5" long, 1"-1 1/2" broad, margin thick, entire. Juvenile leaves opposite, glaucous, sessile, orbicular or broader than long, base cordate, apex rounded or emarginate, margin subcrenulate; 1/2"-1" long, 1/2"-1 1/2" wide. Buds sessile or with short pedicels approx. 1/2" long, glaucous operculum shorter than the receptacle, hemispherical and umbonate. Umbels 3-flowered on peduncles which are often flattened; 1/2" long. Capsules glaucous $\pm$ 1/2" long cylindrical-ovoid truncate disc rounded, sunken, valves erect or sometimes sunken and the tips exsert. Fertile seeds fairly numerous. No recorded hybrids. Morrisby's gum is a fairly rare species known only to occur in two localities in S.E. Tas. at about 50-500' altitudes and on poor, dry mudstones. It is somewhat similar in general appearance to *E. gunnii* as far as its likeness to other species is concerned. *E. gunnii* would be probably the nearest similar species. *E. morrisbyi* has only recently been described and because of the rarity of this species, little is known about it. As a garden specimen it would be admirably suited to a dry locality with poor soils, it is only a small to medium sized tree therefore it could suitably be planted in a small garden. It grows readily from seed. The juvenile foliage is rather susceptible to saw-fly attack. it would therefore be necessary to keep a close watch on the young tree.



Eucalyptus urnigera x $\frac{1}{2}$
Buds — adult leaves — fruits

Eucalyptus johnstonii x $\frac{1}{2}$
Adult leaves — fruits — juvenile leaves

***Eucalyptus urnigera* Hook. f.**

Urn-gum

A small or sometimes large tree, 10'-25' in exposed situations, but reaching 80'-100' in sheltered places. Bark deciduous, shedded in small flakes, trunk and branches smooth, light, grey with blotches of green and reddish-brown. The tree may be green or glaucous, usually according to altitude—the greater the altitude the more glaucous it becomes. Adult leaves alternate on long petioles, lanceolate to ovate-lanceolate. Very dark green, thick and glossy, the older leaves of a glaucous tree usually becoming quite green and shining; leaves 2"-6" long and $\frac{1}{2}$ "-1 $\frac{1}{2}$ " wide. Juvenile leaves opposite, sessile, broadly elliptical or orbicular, base cordate, apex rounded or mucronulate, margins obscurely crenate, 1"-2" long and sometimes as broad, bright green or very glaucous. Buds sometimes on peduncles which are longer than the leaf petioles, brownish-green or glaucous $\frac{1}{2}$ " long receptacle urceolate the operculum shorter than the receptacle, usually a little wider, margin rounded with apex umbonate. Umbels 3-flowered, capsules urceolate or rarely $\pm$ pyriform $\frac{1}{2}$ "- $\frac{3}{4}$ " long, $\frac{1}{4}$ " in dia. Staminal ring narrow, disc sunken with deeply enclosed valves. Hybrids known: *E. urnigera* x *johnstonii* x *globulus*. It has little similarity to any Mainland sp. however the capsules sometimes resemble smaller versions of those of *E. ficifolia*.

E. urnigera occurs abundantly on S. Tas. mountains at altitudes ranging from 2000-3500', usually on well drained dolerite soils or scree slopes. The urn-gum is a very easy tree to grow and makes one of the finest garden specimens, shapely and very graceful; careful pollarding enhances the shape.

Eucalyptus johnstonii Maiden.**Yellow-gum**

(Syn. *E. muellerii*); Includes *E. subcrenulata* Maiden & Blakely.

A tall tree up to 150' high but tending to become small and stunted at higher altitudes, passing gradually into forms resembling *E. vernicosa*. Bark smooth though scaly at the base, trunk smooth, streaked reddish orange or green yellow where freshly exposed and especially when wet. Adult leaves alternate, stalked, falcate-lanceolate to ovate 2'-6" long and $\frac{3}{4}$ "-1" wide, apex acute. On trees at higher altitudes, broadly elliptical-ovate with apex apiculate or rounded, margins subcrenulate; green, glossy and coriaceous. Juvenile leaves opposite, shortly petiolate or sessile ovate-orbicular, apex rounded and blunt or apiculate 1"-2" long, glossy-green, the margins subcrenulate. Buds sessile $\frac{3}{4}$ "-1" long, rugulose, brownish-grey, receptacle flattened at the base, sometimes angular; operculum shorter than the receptacle, bluntly conical or flattened with apex umbonate. Umbels 2-flowered on short thick flattened peduncles. Capsule hemispherical, turbinate or campanulate 1"-1" in dia. greenish-brown, rugulose with 2 prominent ribs, disc flat, prominent, margins rounded 3-4 valves, exsert, erect. Few fertile seeds per capsule.

Occurs on mountains from 2,000'-4,000' in the S.W. and central plateau mostly on wet, poorly drained sandstones. Hybrids recorded *E. johnstonii* x *globulus*, *E. johnstonii* x *urnigera*. No definite similarities to any Mainland Eucalypt. Some botanists believe *E. johnstonii* and *E. vernicosa* to be connected by a number of cline forms, these being *E. johnstonii*—*E. subcrenulata*—*E. columnaris*—*E. parvula*—*E. vernicosa*. *E. johnstonii* being found at lower altitudes, ranging through the other three to *E. vernicosa* at the highest. The 3 connecting forms possessing characters intermediate between *E. johnstonii* and *E. vernicosa* according to aspect and altitude. *E. johnstonii* makes a fine specimen tree for a wet situation, is easily grown and flowers when quite young. It is however susceptible to saw-fly and scale-insect attack, however proper spraying procedures would counteract this. The timber of *E. johnstonii* is occasionally used in cabinet making etc. being soft and easily worked and of a light pink-tan colour. In sub-alpine rainforests, the Yellow-gum is easily recognised by its bright trunk colours, when it has been raining (as it usually always is in these districts) the trunks, tall, branchless and straight, glow with greens and yellows almost as if they had been freshly painted with enamel, whilst the crown of leaves is deep, glossy green.

Eucalyptus vernicosa Hook. f.**Varnished-gum**

A shrub of mallee habit, usually not much exceeding 12' high. Bark light brown, deciduous. Adult and juvenile leaves very similar in form, sessile or shortly stalked, opposite though the upper ones may be slightly alternate, oblong to broadly elliptical, apex rounded or apiculate, base rounded; $\frac{1}{2}$ "- $\frac{3}{4}$ " broad, green, very glossy, coriaceous, margins obscurely crenate. Buds about $\frac{1}{2}$ " long brownish, rugulose, operculum shorter than the receptacle, conical with a pointed apex. Umbels with a solitary capsule or with 3-fruit, sessile. Capsule hemispherical to sub-cylindrical or campanulate, $\frac{1}{2}$ " long, disc flat valves level or slightly exsert. Very few fertile seeds per capsule. This is an alpine species usually occurring from 2000' in the S.W. to 5000' on mountains of the West and central plateau on well drained slopes and ridges, preferably on slightly acid soils. No known hybrids.

E. vernicosa is another species possessing no marked differences between adult and juvenile leaf forms. It is a species with little resemblance to any Mainland sp. The leaves are very glossy and appear almost as if they had been polished with wax. The most common appearance of the plant is a low, straggling specimen, pruned by prevailing winds and growing bushy and compact, often hard to distinguish as a Eucalypt when among other low growing alpine shrubs. Its worth in the garden is rather doubtful as it is very slow-growing. It would most likely do well in a shaded, damp rockery in a cool district. I have seen a plant of *E. vernicosa* in a garden at least 10 years old and only 18" high but flowering. Although seeds are hard to get, it grows readily and is not so susceptible to "damping-off" as a lot of other Eucalypts can be.

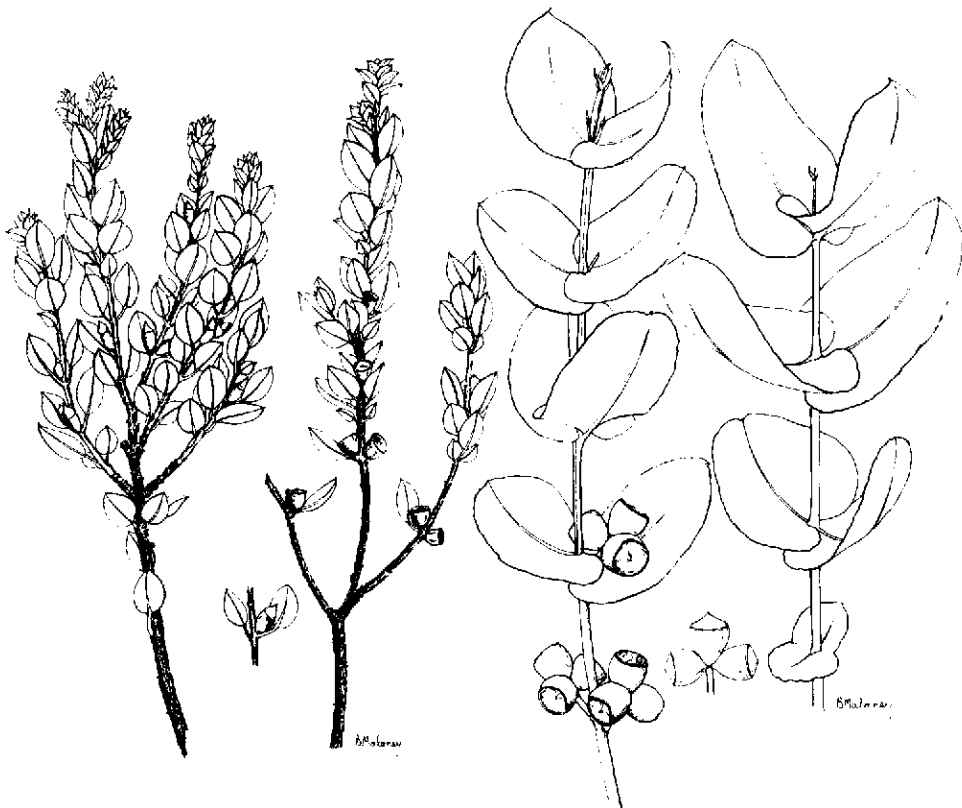
Eucalyptus cordata Labill.**Silver-gum**

A shrub with mallee habit or a tall tree in favourable situations up to 70' high. The whole tree very glaucous. Bark deciduous, trunk smooth, white, blotched with green and purple or grey and greenish yellow. Adult and juvenile leaves similar in form, 1"-3" long, sometimes as broad or broader than long. Orbicular to ovate-cordate, apex rounded, apiculate or emarginate; very glaucous, sessile, stem-clasping, opposite. Margins obscurely crenate. Buds sessile approx. $\frac{1}{2}$ " long, operculum hemispherical with a small projection at the apex, shorter than the receptacle. Umbels 3 flowered, peduncles $\frac{1}{2}$ "- $\frac{3}{4}$ " long. Capsules hemispherical

to turbinate, glaucous, approx. $\frac{1}{4}$ " long disc sunken with deeply enclosed valves. Fertile seeds flat, black and irregular in shape, infertile seeds numerous, reddish-brown, small and elongated.

Eucalyptus cordata occurs in damp situations, 500'-2000' in S.E. Tasmania. It has known to have hybridized with *E. globulus* (blue gum).

E. cordata resembles *E. pulverulenta* or *E. cosmophylla*. It has the peculiarity of not having any clearly defined adult and juvenile foliage, both forms are so similar that no positive differences can be defined. When grown in the garden it makes a fine specimen, cone-shaped with dense, bluish-white tinged foliage. It grows readily and easily from seed. Quite a few specimens of this tree can be seen in Hobart gardens.



Eucalyptus vernicosa x $\frac{1}{2}$
Adult leaves and buds — adult leaves and fruit.

Eucalyptus cordata x $\frac{1}{2}$
Adult leaves and fruit and buds — juvenile leaves.

(b) Renantherae

Anthers reniform (kidney shaped) the lobes diverging at the base and joined at the apex, sub-versatile; small gland at the top of the connective. The umbels mostly contain more than 3 flowers, any number between 5-30 and usually not in any definite arrangement or number according to the species. Seeds usually similar in form, wedge-shaped, the fertile ones mostly rather larger than the infertile ones and darker in colour; both usually occur in roughly equal numbers. The essential oil in this section is chiefly piperitone; phellandrene and pinene also may be present with phellandrine usually more abundant in the "Ash" group. Seedlings with cotyledons broadly obovate, entire or emarginate.

The Renantherous Eucalypts occurring in Tasmania are:

- (a) "Ash" group
 1. *E. regnans*—also found in Vic.
 2. *E. obliqua*—also found in Vic., N.S.W. and S.A.
 3. *E. delegatensis* (syn. *E. gigantea*)—also found in Vic. and N.S.W.
- (b) "Peppermint" group
 4. *E. pauciflora*—also found in Vic., N.S.W. and S.A.
 5. *E. sieberiana*—also found in Vic. and N.S.W.
 6. *E. linearis*; 7. *E. coccifera*; 8. *E. amygdalina* (syn. *E. salicifolia*); 9. *E. risdoni*; 10. *E. tasmanica*; 11. *E. simmondsii*.

The last six species are endemic to Tasmania and are described as follows:



Eucalyptus linearis x $\frac{1}{3}$
 Adult leaves — fruit — buds — juvenile leaves.

Eucalyptus coccifera x $\frac{1}{3}$
 Juvenile leaves — buds showing multi-fruited and three-fruited forms — three-fruited forms — adult leaves.

Eucalyptus linearis Dehn.

"White" or "narrow-leaved" Peppermint

A tree 20'-50'. Bark deciduous, trunk smooth, white with streaks and blotches of light and dark grey. Adult and juvenile leaves similar in form, though the juvenile leaves smaller and opposite for 4-5 pairs. Adult leaves alternate, narrow-linear to linear-lanceolate, sometimes falcate, shortly stalked 2'-5' long, $\frac{1}{4}$ "- $\frac{1}{2}$ " wide (juvenile leaves 1"-1 $\frac{1}{2}$ " long $\pm$ $\frac{1}{4}$ " wide) green, occasionally slightly glaucous. Buds on short pedicels about $\frac{1}{4}$ " long, club-shaped, operculum shorter than the receptacle, hemispherical. Umbels with $\pm$ 5-15 flowers on flattened peduncles about $\frac{1}{2}$ " long. Capsules almost hemispherical or pyriform-truncate $\frac{1}{4}$ " in dia., disc flat, sometimes slightly sunken, valves level or enclosed. Brownish-grey. Fertile and abortive seeds similar in form and in more or less equal numbers. It has been known to have hybridized with *E. amygdalina*. Vaguely resembles *E. amygdalina*. *E. linearis* is quite common in the S.E. of state mostly around Hobart. Prefers soils of dolerite origin at altitudes 500'-1500' with fairly low rainfall. Easily the most graceful of Tasmanian Eucalypts, with its fine foliage and symmetrical form; an excellent garden specimen. Very easy to propagate and a rapid grower, can be kept pruned to form a low, compact bush.

Eucalyptus coccifera* Hook. f.*"Tasmanian Snow Gum"**

A tall tree up to 100' or a stunted shrub at high altitudes. Bark deciduous, trunk smooth, white, streaked with grey and blotched with light pink or yellow. All parts glaucous to green; young twigs, especially those on the juvenile parts pappilose and crimson in colour. Adult leaves alternate, petiolate, elliptical to elliptical-ovate, 2"-4" long, $\frac{1}{2}$ "- $\frac{3}{4}$ " wide $\pm$ glaucous. Apex acute or acuminate, often recurved to form a small "hook". Juvenile leaves opposite, sessile, broadly elliptical to cordate, apex acute or acuminate, 1"-1 $\frac{1}{2}$ " long, $\frac{1}{2}$ "-1" wide. Leaves with characteristics intermediate between adult and juvenile often occur. Buds sessile or on short pedicels, club-shaped with longitudinal ridges $\pm$ rugulose, $\frac{1}{2}$ "- $\frac{1}{4}$ " long, operculum shorter than the receptacle, hemispherical, apex sunken, rugulose. Umbels with 3, or 5-10 flowers. The trees occurring on Mt. Wellington possess 3-flowered umbels, resembling the umbel of a *Macrantherous* species, however in all other localities the umbels are multi-flowered. Capsule hemispherical or broadly turbinate-truncate smooth or with 2 small ribs. Size very variable $\frac{1}{2}$ "- $\frac{3}{4}$ " in diameter. Disc broad and flat, valves level. Seeds numerous, dark brown. On the mainland *E. pauciflora* occupies the ecological position filled in Tasmania by *E. coccifera* and is also known as "Snow Gum".

Recorded hybrid: *E. coccifera* x *amygdalina*. *E. coccifera* occurs on most Tasmanian mountains at altitudes from 2000-5000'. Sometimes forming pure stands on well drained, rocky soils. Along with *E. vernicosa*, this *Eucalypt* is truly an alpine species, withstanding extreme cold and exposure; trees on the tops of high ridges in the path of the S.W. gales bent and twisted and growing almost horizontally. Easily grown and suitable for planting in colder districts with good rainfall.



Eucalyptus amygdalina x $\frac{1}{2}$
Buds — adult leaves — fruits — juvenile
leaves.

Eucalyptus risdoni x $\frac{1}{2}$
Juvenile leaves — fruits (below) — adult
leaves.

Eucalyptus amygdalina* Labill.*"Black Peppermint"**(Syn. *E. salicifolia*)

A tree up to 50' or shrubby and with mallee habit. Bark persistent over all the tree, but occasionally deciduous on the extreme upper trunk and branches; dark-grey, rough and finely fibrous. Adult leaves alternate, shortly petiolate, lanceolate-falcate, lanceolate or almost linear, 2"-4" long and $\frac{1}{2}$ "- $\frac{3}{4}$ " wide. The leaf size in *E. amygdalina* is very variable, some trees in the N.E. of the state having broader leaves than the size quoted above; on the E. Coast some trees possess leaves which are almost identical with those of *E. linearis*, i.e. very narrow. Juvenile leaves somewhat similar in form to the adult leaves but smaller, opposite and tending to be more glaucous than the adult forms and occasionally the bases $\pm$ stem-clasping. Buds club-shaped on short pedicels, operculum hemispherical, shorter than the receptacle. Umbels with $\pm$ 5-20 flowers, peduncles terete about $\frac{1}{2}$ "- $\frac{3}{4}$ " long. Capsule $\pm$ hemispherical or pyriform-truncate, about $\frac{1}{2}$ " in dia., disc level or slightly sunken; valves level or the tips exsert. A large number of seeds per capsule, all very similar in form.

Quite a considerable number of hybrids have been recorded, these are *E. amygdalina* x *coccifera* and with *E. simmondsii*, *E. linearis*, *E. risdoni* (*E. tenuiramis*), *E. pauciflora* (resembles *E. vitrea*), *E. sieberiana* (*E. taeniola*). *Eucalyptus amygdalina* is similar to the Mainland species *E. nitida* or *E. radiata*. *E. amygdalina* occurs mainly in the eastern half of Tasmania, mostly on poor, acid, peat-soils. In the West and S.W. it is replaced by *E. simmondsii*.

The timber of *E. amygdalina* makes excellent firewood, but perhaps its most useful property is that it is very long lasting and rot-resisting, therefore being extensively used for fence posts and other jobs which bring the timber into contact with the ground. Though not the most attractive of garden specimens, it can never-the-less be planted in a large garden where it has plenty of room to expand, as it is a tree with a rather large, spreading crown when grown on its own. With careful attention it can be formed into a pleasingly, graceful tree.

Eucalyptus risdoni* Hook. f.*"Risdon Peppermint"**

A tree 15-50' high, very glaucous in all parts. Bark deciduous, trunk smooth, retaining the circular leaf-scars until the first bark is shed. Light grey to creamish-white, sometimes with pale pink blotches. Adult and juvenile leaves similar in form, opposite perfoliate, ovate-lanceolate, apex acute or apiculate; very glaucous, the complete adult pair 2"-5" long, 1"-2" wide. The whole tree has a bluish-white appearance. Buds sessile or on short pedicels, club-shaped $\frac{1}{2}$ "- $\frac{3}{4}$ " long, glaucous; operculum shorter than the receptacle, hemispherical. Umbels with 7-20 flowers, peduncle about $\frac{1}{2}$ " long, terete. Capsule nearly hemispherical or pyriform-truncate; about $\frac{1}{2}$ " in diameter. Disc level or slightly sunken, valves level or enclosed. Hybrid recorded: *E. risdoni* x *E. amygdalina*. Seeds light in colour, fertile seeds not very numerous. *E. risdoni* occurs on very dry, poor mudstones at sea level to 500' in a restricted locality in S.E. Tas.

This species is in some circumstances variable, some seedlings not coming true to type. Whether this is due to hybridization or a throw-back to some obscure, ancient parent type, is not certain. *E. risdoni* resembles a juvenile tree of *E. tasmanica* or at a distance, juvenile *E. perriniana* ("spinning gum"). It is a very worthwhile tree for the garden as it never grows too large; it is in many respects superior to *E. perriniana* as it needs no pruning to retain the unusual perfoliate foliage. Rather susceptible to scale-insect attack!

Eucalyptus simmondsii* Maiden.*"Smithton Peppermint"**

A tree 30-50' high. Bark persistent on the trunk deciduous on the branches and extreme upper trunk coarse, fibrous, tan to dark grey. The exposed trunk and branches yellowish-green. Adult leaves alternate, petiolate, narrow elliptical to elliptical sometimes falcate, narrowed at the base, apex acute; 2"-4" long, $\frac{1}{2}$ "-1" wide, coriaceous. Juvenile leaves opposite sessile or shortly petiolate; base rounded or cordate, apex acute or acuminate. Glaucous to green. The margins smooth, sometimes tinged with red, as also the midrib. Buds shortly pedicellate, clavate, $\frac{1}{2}$ "- $\frac{3}{4}$ " long; operculum hemispherical, shorter than the receptacle. Umbels with 10-25 flowers, peduncles terete or $\pm$ flattened, about $\frac{1}{2}$ " long. Capsule almost hemispherical or turbinate-truncate about $\frac{1}{2}$ " in diameter, disc flat or convex; valves level. Seeds numerous, the fertile ones larger and darker than the abortive ones. The only known hybrid is *E. simmondsii* x *E. amygdalina*. Its similarity to any Mainland sp. is too obscure to submit any record.

E. simmondsii is found in the West, N.W. and S.W. of the state, often on very acid soils in localities of very high rainfall. It is characteristic of the

"button-grass" (*Gymnoschoenus sphaerocephalus*) moors, where it mostly occurs on the banks of creeks and small lakes, there being better drainage in these places. Occasionally *E. simmondsii* may occur in a typical "mallee" form, usually in places of great exposure or subject to the ravages of bush-fires. It ranges from sea-level to about 2000', replacing *E. amygdalina* in the wetter, more acid areas. Little is known of its worth in the garden, it would be most suitable for a very wet district with sour soils. It is a graceful tree, so making it worth trying in the garden.



Eucalyptus simmondsii x $\frac{1}{3}$
Fruits — adult leaves — juvenile leaves —
buds.

Eucalyptus tasmanica x $\frac{1}{3}$
Adult leaves — fruits (below) — buds —
intermediate leaves — juvenile leaves.

Eucalyptus tasmanica Blakely.

"Silver Peppermint"

A tree 40'-80' high, very glaucous throughout, the degree of glaucousness variable. Bark deciduous, trunk smooth, white or light grey with patches of pale yellow. Adult leaves alternate, petiolate, elliptical to lanceolate, falcate, apex acuminate or blunt 2"-5" long, $\frac{1}{4}$ "-1" broad. Juvenile leaves opposite, sessile, perfoliate, ovate-lanceolate, occasionally followed by an intermediate form broadly ovate, lanceolate, the base $\pm$ cordate; 1"-4" long, $\frac{1}{4}$ "-2" broad or broader and larger. Buds on short pedicels, club-shaped about $\frac{1}{4}$ " long. Operculum shorter than the receptacle, flattened or $\pm$ conical. Umbels containing 7-25 flowers on short thick peduncles. Capsule pyriform-truncate to hemispherical about $\frac{1}{4}$ " long, $\frac{1}{4}$ " broad, disc slightly sunken or flat; valves level or enclosed. Seeds light in colour, fertile and abortive in same numbers and $\pm$ equal in size. *E. tasmanica* may hybridize with *E. amygdalina* but no definite records are known. It occurs on very poor, dry mudstones in the S. and S.E. sometimes forming fairly extensive pure stands. In some isolated trees, the branches may be pendulous and a branch no more than $\frac{1}{2}$ "-1" thick may hang down vertically for 10'-20'.

E. tasmanica is similar, in the juvenile form to the closely related *E. risdoni*. There is no close likeness to any particular mainland sp. An excellent garden specimen, easy to grow and very graceful, especially the pendulous form. It will stand dry soils which would discourage many other species.

RICHEA R.Br.

by Betsy R. Jackes (Townsville University College)

Richea, together with *Dracophyllum* and *Sphenotoma*, is at present included in the tribe Epacrideae, although various moves have been made to place these three genera in a separate tribe. They have several features in common, which serve to distinguish them from other members of the tribe. The three main characteristics are; the annular leaf scars left on the branches; the placentas suspended from an ascending recurved column; stomata paracytic as against stomata anomocytic as in the other genera.

Richea continentis is the only Australian species found outside Tasmania.

The distinctive feature of the genus is the corolla, which circumscissis near the base, so that the upper portion falls off leaving a persistent basal ring. The flowers form a dense terminal head, or a compound spike-like or branched panicle.

KEY TO THE SPECIES

- | | |
|---|-----------------------------|
| A. Spikes simple or contracted into short heads | B |
| Elongated compound spike or panicles | E |
| B. Hypogynous disc absent: leaves broad | C |
| Hypogynous disc present: leaves narrow | D |
| C. Leaves shortly acuminate: anthers entire | 1. <i>R. sprengelioides</i> |
| Leaves with long points: anthers deeply 2-lobed | 2. <i>R. procera</i> |
| D. Leaves usually less than 1.5 cm. long. Stamens scarcely exceeding the calyx | 3. <i>R. acerosa</i> |
| Leaves 2-4 cm. long. Stamens 2-3 times length of calyx | 4. <i>R. milliganii</i> |
| E. Narrow spike-like panicle: leaves usually less than 15 cm. | F |
| Much branched panicle, sometimes dense and with conspicuous white flowers. Leaves more than 15 cm. long | I |
| F. Leaves fall off early leaving the stem with prominent annular scars ... | 5. <i>R. gunnii</i> |
| Leaves persistent on older stems and decaying in position | G |
| G. Inflorescence interrupted, mainland Australia | 6. <i>R. continentis</i> |
| Inflorescence dense, not interrupted: Tasmania | H |
| H. Leaves ± spreading, often somewhat recurved: broad leaf sheath remains intact or falls with the leaf | 7. <i>R. scoparia</i> |
| Leaves erect, appressed: margins of leaf sheath decay leaving narrow central portion which eventually falls with the leaf | 8. <i>R. angustifolia</i> |
| I. Leaves 15-30 cm. long: flowers white | 9. <i>R. dracophylla</i> |
| Leaves 60-120 cm. long, flowers often reddish | 10. <i>R. pandanifolia</i> |

NOTES ON THE SPECIES

1. *Richea sprengelioides* (R.Br.) F. Muell. A small bushy shrub. The cream operculum is much longer than the calyx, it falls off leaving a persistent annular base about half the length of the calyx. The filaments are smooth and filiform. Tasmanian mountains.

2. *Richea procera* (F. Muell.) F. Muell. A tall shrub usually exceeding 2 m. high. The floral characteristics are similar to *R. sprengelioides* except for the stamens. The filaments are thickened and usually minutely pubescent above the middle, whilst the anthers are divided into two lobes above the point of attachment to the filament. Tasmania to 2,500 feet.

3. *Richea acerosa* (Lindl.) F. Muell. The erect or spreading, narrow leaves taper into a pungent point: lanceolate-subulate they are about 1.5 cm. long, however, they get progressively smaller as they pass into the short floral leaves. The hypogynous scales around the ovary are usually bifid, the long points frequently projecting above the ovary. This species occurs in Tasmania on the mountains of the central plateau and west.

4. *Richea milliganii* (Hook. f.) F. Muell. An erect shrub, 1.5-2m. high, the lanceolate leaves are crowded at the ends of the branches. The apex of the yellowish-cream operculum opens to form five very short teeth. Occurs in Tasmania on the west coast mountains and in Mount Field National Park.

5. *Richea gunnii* Hook. f. "Mountain Heath". Originally this species was thought to occur in the Southern Alps of Victoria and N.S.W., however, re-examination led to the recognition of the mainland specimens as a new species *R. continentis*. *R. gunnii* is found on mountains often associated



Richea angustifolia x $\frac{1}{2}$
 Top—Erect-foliaged form
 Bottom—Recurved form

Richea acerosa x $\frac{1}{2}$
 (See page 130 for descriptions of these species).

with *Sphognum* in wet montane and subalpine heaths. An erect shrub up to 1m. high with lanceolate leaves frequently recurved. The white waxy flowers occur in clusters or short spikes. This species is relatively easy to grow in suitable localities: it requires a cold, moist elevated position.

6. *Richea continentis* B. L. Burt. This species is found in alpine bogs of the southern Alps of N.S.W. and Victoria. The flowers are larger than the preceding species and the apex of the bracts are hooded. The cream flowers are crowded at the apex of the stem which is usually dark red.

7. *Richea scoparia* Hook. f. A rigid shrub up to 3m. high, the leaves are linear-lanceolate. The inflorescence of this species, which is widespread in the mountainous areas of Tasmania, appears uninterrupted as the internodal length between clusters is uniform. The corolla varies in colour, it may be pink, orange, dark red, and even occasionally white. **ERRATA**—Colour Plate (P. 101)—Incorrect colour.

8. *Richea angustifolia* B. L. Burt. Found on mountains of the Tasmanian west coast, this species is very similar to *R. scoparia*, but as well as leaf variations, the flowers are smaller.

9. *Richea dracophylla* R.Br. "Dragon Heath". Varies in height according to locality, in protected areas, may be 5m., on Tasmanian mountain peaks may be only 1m. high. The white flowers, which are borne on slender pedicels, are grouped into terminal panicles up to 25 cm. long.

10. *Richea pandanifolia* Hook. f. "Giant Grass Tree—Pandani". A tall shrub or tree 2-12m. high with long tapering leaves. The axillary panicles up to 25 cm. long are somewhat hidden by the long (1-1.5m), tapering leaves. The corolla is white or red. This plant is frequent in wet mountain forests and gullies of Tasmania, extending to an altitude of 4000 feet.

THE GENUS RICHEA—continued from page 102

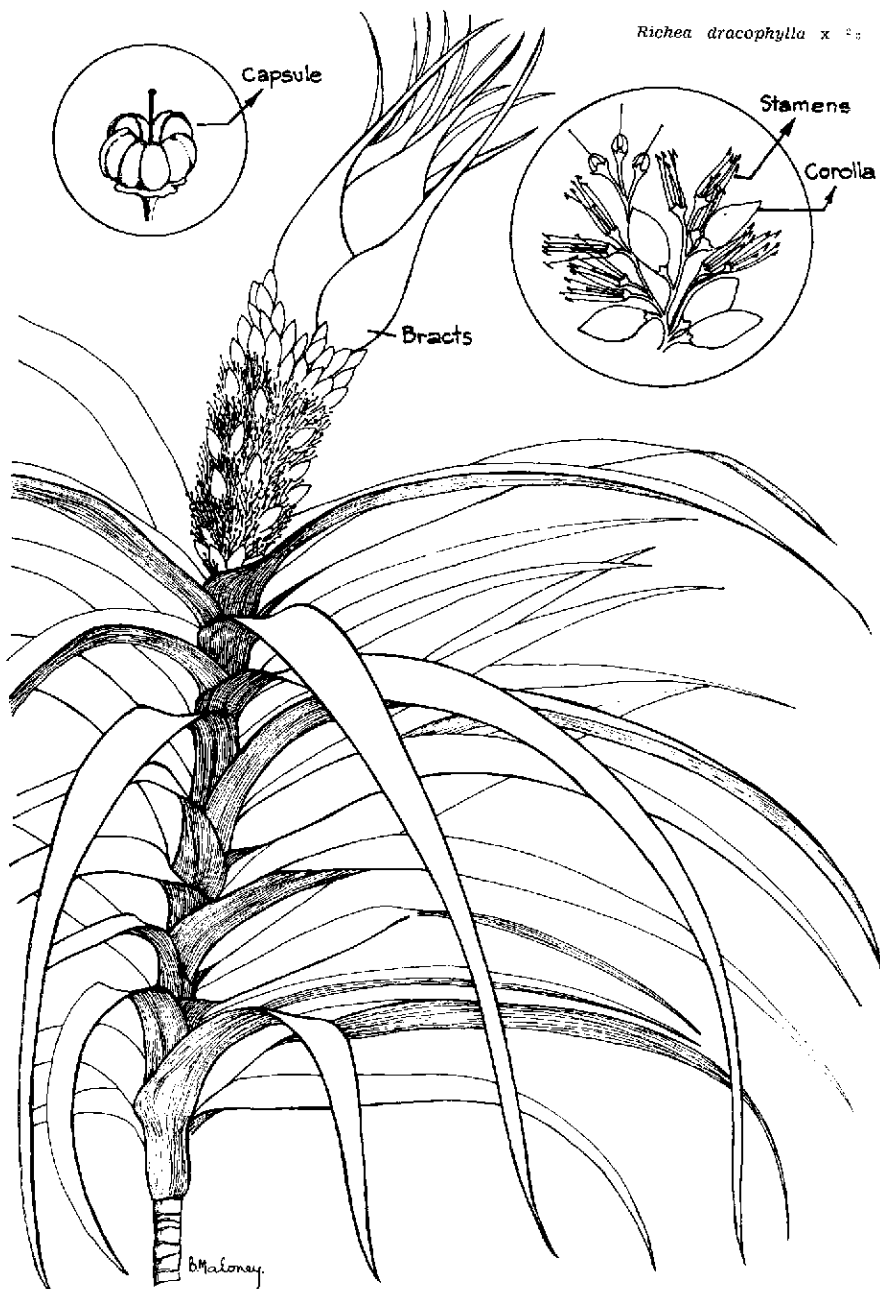
A KEY TO THE RICHEA SPECIES

The following key is merely a precis of the chief diagnostic features of each species and is not a "key" in the accepted sense. Some discrepancies may be noted but if used carefully it will enable the amateur observer to distinguish between the species.

1. Leaves 1" to 5" long, stunted shrub or tall tree. flowers axillary *R. pandanifolia*
2. Leaves 3" to 9" long, confined to the ends of the branches. Large shrub, flowers terminal, white, very conspicuous *R. dracophylla*
3. Leaves 3" to 6" long, persistent on all the branches. Medium shrub, in sheltered situations. Flowers terminal, pink to orange in colour *R. species nova*
4. Leaves 1" to 3", persistent, erect or $\pm$ recurved, rigid, apex pungent. Shrub 2 to 6' high. Flowers terminal, pinkish to deep crimson in erect, conspicuous "spikes" *R. scoparia*
5. Leaves $\frac{1}{2}$ " to 1", persistent, very erect and closely appressed or $\pm$ recurved, rigid, sharply pointed. Small shrub, 6" to 3' high. Flowers terminal, pink to crimson, spike very short. Western mountains *R. angustifolia*
6. Leaves $\frac{1}{4}$ " to $\frac{3}{4}$ " long, confined to the ends of the branches, erect, somewhat spreading, *not usually recurved*, narrow, apex hard. Small shrub 1' to 3' high. Flowers in small, dense terminal heads, white *R. acerosa*
7. Leaves 1" to 2" long, erect soft or $\pm$ rigid, confined to the ends of the branches. Shrub 1' to 6' high. Flowers terminal in fairly dense drooping heads, white or creamish. Operculum short, or long and narrow *R. milligantii*
8. Leaves $\frac{1}{2}$ " to $\frac{3}{4}$ " long, erect, $\pm$ closely appressed, broad the apex somewhat spreading, pungent. Leaves mostly at the ends of the branches but sometimes clothing the stems for at least $\frac{2}{3}$ of their length. Leaf scars prominent. Small shrub, 6" to 2' high and confined to alpine situations. Flowers in dense terminal heads *R. sprengeloides*
9. Leaves $\frac{1}{2}$ " to 1" long, erect, bases appressed, spreading and recurved toward the apex. The leaf softer and the apex scarce as pungent as in the former species, more or less persistent or confined to the upper branches. Medium shrub, 2 to 5' high. Flowers in dense terminal heads, similar to the former species. Occurring at lower altitudes and in much drier situations than *R. sprengeloides* *R. procera*
10. Leaves 1" to 2" long, base broad, recurved or spreading, scarcely rigid or pungent, somewhat flexuous, occurring only at the ends of the branches, leaf scars prominent. Plant 1' to 2' high, straggling in wet alpine situations. Flowers in terminal spikes, the rachis elongated between the flowers at the base of the inflorescence, flowers crowded toward the apex. Flowers creamy white *R. gunnii*
11. Leaves $\frac{1}{2}$ " to 1" long, sometimes up to 3", rigid, recurved and spreading. Persistent on all the stems. Shrub 1' to 3-5' high. branches crowded. Flowers at the ends of the branches. The spike interrupted and elongated at the base, crowded toward the apex. Spike much longer than that of *R. gunnii*. Flowers creamy white. Confined to highland areas in Victoria, N.S.W. and the A.C.T. *R. continentis*

Richea dracophylla* R.Br.*"Dragon Heath"**

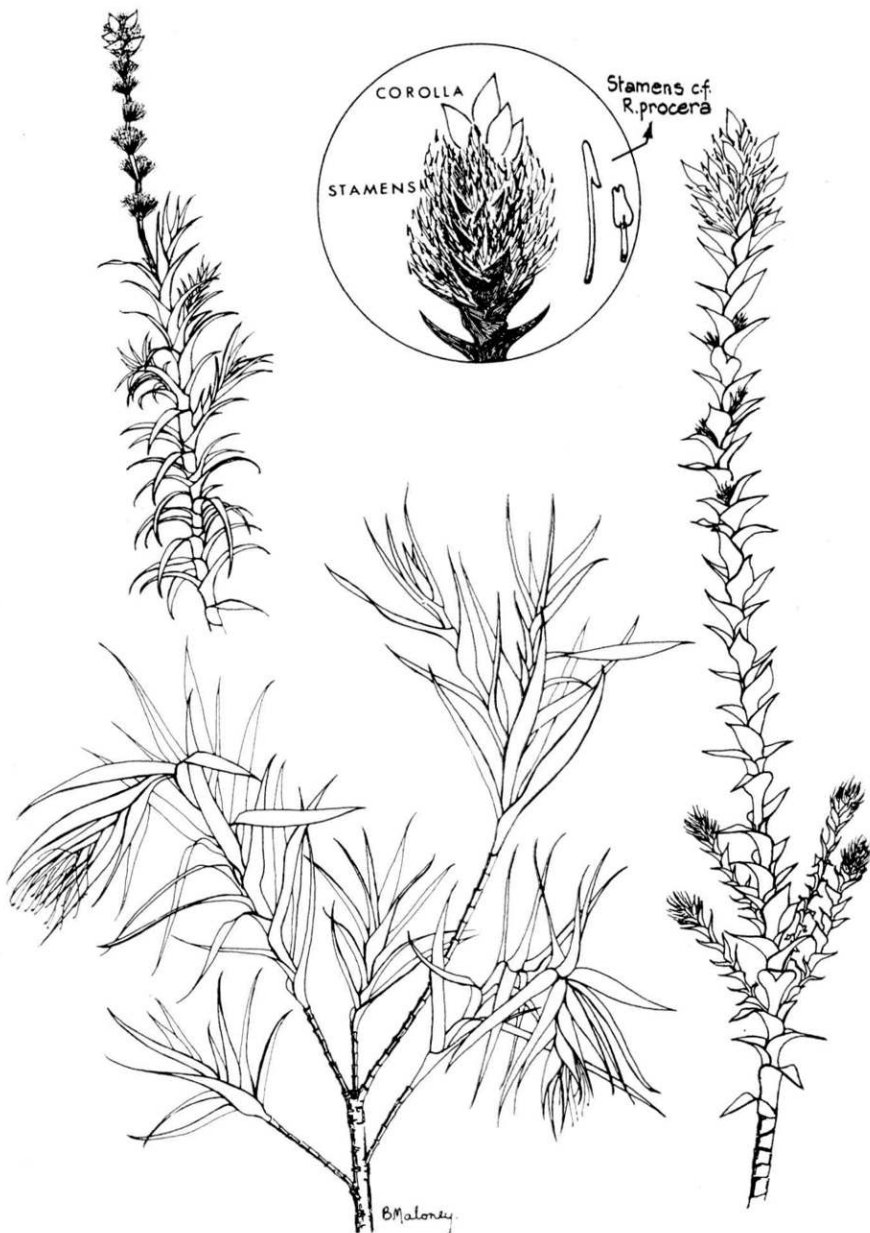
A large, somewhat straggling shrub, 3'-12' high, the branches bare, marked by prominent leaf-scars, the leaves crowded at the ends of the branches. Somewhat resembling a small version of *R. pandanifolia*. Leaves 3'-12" long, broadly sheathing at the base, tapering to a long point. Margins finely serrate with hard teeth. Flowers in terminal or occasionally axillary panicles, enclosed at first by the leaves, and bracts, which are leaf-like but with an expanded cup-shaped portion near the base, falling from the lower end of the inflorescence as the flowers mature and the corolla is shed. Corolla pearly white or pinkish, falling from the flowers at the lower portion of the inflorescence first. The unopened 'spike' of this species is most attractive; much nectar is produced in the opened flower and is sought after by honey-eating birds. *R. dracophylla* makes an exceptional garden plant. Common in scattered localities throughout the higher rainfall areas of the State.

Richea dracophylla x 20

***Richea sprengelioides* (R.Br.) F. Mueli.**

A compact, rigid shrub occasionally somewhat straggling in sheltered situations. Plant 1'-3' high, leaves broad, ovate-lanceolate, rigid, erect, or slightly recurved, tapering to an abrupt, hard point, the base completely sheathing around the stem, imbricate. Margins with minute serrations. The flowers are borne in short terminal or lateral spikes, they are solitary and sessile in the axils of the upper leaves, and subtended by persisting bracts which resemble the foliage leaves, the two outer ones noticeably keeled.

Corolla creamy white, the operculum conical. Stamens without warty protuberances on the upper portion of the filament (c/f. *R. procera*). This species is very common, and found on the majority of mountains throughout the State.

*Richea continentis* x $\frac{1}{2}$ —see page 100*Richea sprengelioides* x $\frac{2}{3}$ including inset x $1\frac{1}{2}$ *Richea milliganii* x $\frac{2}{3}$ —see page 132

***Richea gunnii* Hook. f.**

A branched shrub occasionally straggling, resembling *R. continentis*, 2'-4' high, branches with prominent leaf scars. Leaves small and crowded at the ends of the branchlets, lanceolate, spreading, recurved and closely imbricate at the base which is broadly sheathing; apex tapering to a pungent point, margin minutely serrate. Inflorescence terminal, paniculate, crowded at the top, becoming more widely spaced towards the base. Bracts keeled, smaller than the foliage leaves, falling early. Flowers creamy white, operculum conical, slightly slit near the base.

R. gunnii is commonly found on mountain plateaux, mostly in poorly drained situations, often growing in "cushion plants" or sphagnum moss and occasionally with *R. scoparia*.

*Richea gunnii* x $\frac{2}{3}$ *Richea procera* x $\frac{2}{3}$ ***Richea procera* (F. Muell.) F. Muell. Syn. *Cystanthe procera* F. Muell.**

This shrub is very similar to the last described, though taller and less branched; it is often confused with *R. sprengeloides*, though the leaves are longer, narrower and less rigid. Spreading, recurved and imbricate, but not to the same extent as in *R. sprengeloides*.

the leaf apex is also not quite as pungent. The flowers are very similar, the major difference being that the filaments of the stamens possess warty swellings on the upper part, just below the anthers.

R. procera is not so widespread as *R. sprengeloides* and is more likely to be found at lower altitudes on most mountains, sometimes reaching 3000'.

***Richea acerosa* (Lindl.) F. Muell.**

Syn.: *Pilitis acerosa* Lindl.

A spreading, rigid shrub, 1-3' high, rarely prostrate at high altitudes, or wind-pruned. Leaves mostly spreading or semi-erect, linear lanceolate, elongated to a hard but usually not pungent point; base broad, sheathing and imbricate. The leaves are usually confined to the stems of the current summer's growth.—Sketch on page 125.

Flowers are borne in spikes or heads, the inflorescence bracteate; individual flowers solitary and sessile, surrounded by 2-3 bracts, the outer 2 markedly keeled. Corolla cream or pink, operculum conical-truncate, short. *Richea acerosa* is common on West Coast.

***Richea angustifolia* B. L. Burt**

A shrub very similar to *R. scoparia*, rare and often confused with *R. scoparia*; however the leaves are usually more erect, narrower, very closely imbricate and, according to 'Curtis' Students Flora of Tas., bk. 2, page 460 No. 7, "closely appressed at the base, the wings of the basal sheath decaying before the central portion causing the latter to tear irregularly." (See note on sketch). Flowers similar to *R. scoparia* but the spikes shorter. Found only on mountains of the West and S.W. coasts.—Sketch on page 125.

A new *Richea* species (*Richea species nova*)

In Tasmania, in very limited localities, there occurs a *Richea* which has not been scientifically described. It resembles *Richea dracophylla*, or a grossly enlarged form of *Richea scoparia* but differs from these as follows:

(a) From *R. scoparia* in that the leaves are very much larger, softer, scarcely pungent and usually more recurved, at least the lower ones. The flowers differ in that the lower pedicels of the flower spike are elongated and the distances between these lower pedicels are greater than those of the upper ones, which are more or less crowded together. The upper pedicels are almost sessile. The corolla is somewhat flattened and smaller than that of *R. scoparia*.

(b) From *R. dracophylla* primarily in the fact that the leaves, instead of being confined to the ends of the branches are persistent on all the stems, although they are dead and decaying on the lower to 2/3 or so. The leaves are similar in shape, size and carriage, though more rigid.

The flowers of *R. species nova* differ from those of *R. dracophylla* in that they are somewhat smaller, in respect of the individual flowers and the flower "spike" also the flowers are much less crowded and are spaced out at the base of the inflorescence, see note re this above. The corolla is coloured from pink to orange and is somewhat flattened, the corolla of *R. dracophylla* is always white or creamy and not flattened. *Richea species nova* differs markedly in habitat from *R. dracophylla*, i.e. the former is found at fairly high altitudes, in alpine and sub-alpine shrubberies, at the margins of tarns or creeks and always in very sheltered situations; the latter in rather more lowland localities (though not always) and in wet sclerophyll forests in gullies to sea-level, occasionally exposed situations.

It has been suggested that *R. species nova* could be a hybrid plant.

An erect, spreading or decumbent shrub 30 cm. to 1.5 m. high. Branches few, divaricate, clothed with the persistent leaves, those on the lower 2/3 of the stem dead and decaying. Leaves 10 to 20 cm. long, narrow-lanceolate to lanceolate, spreading, recurved or somewhat erect, flexuous; the base broad, sheathing and imbricate. Margins cartilaginous, minutely and sharply serrate. Apex tapering to a long acute point.

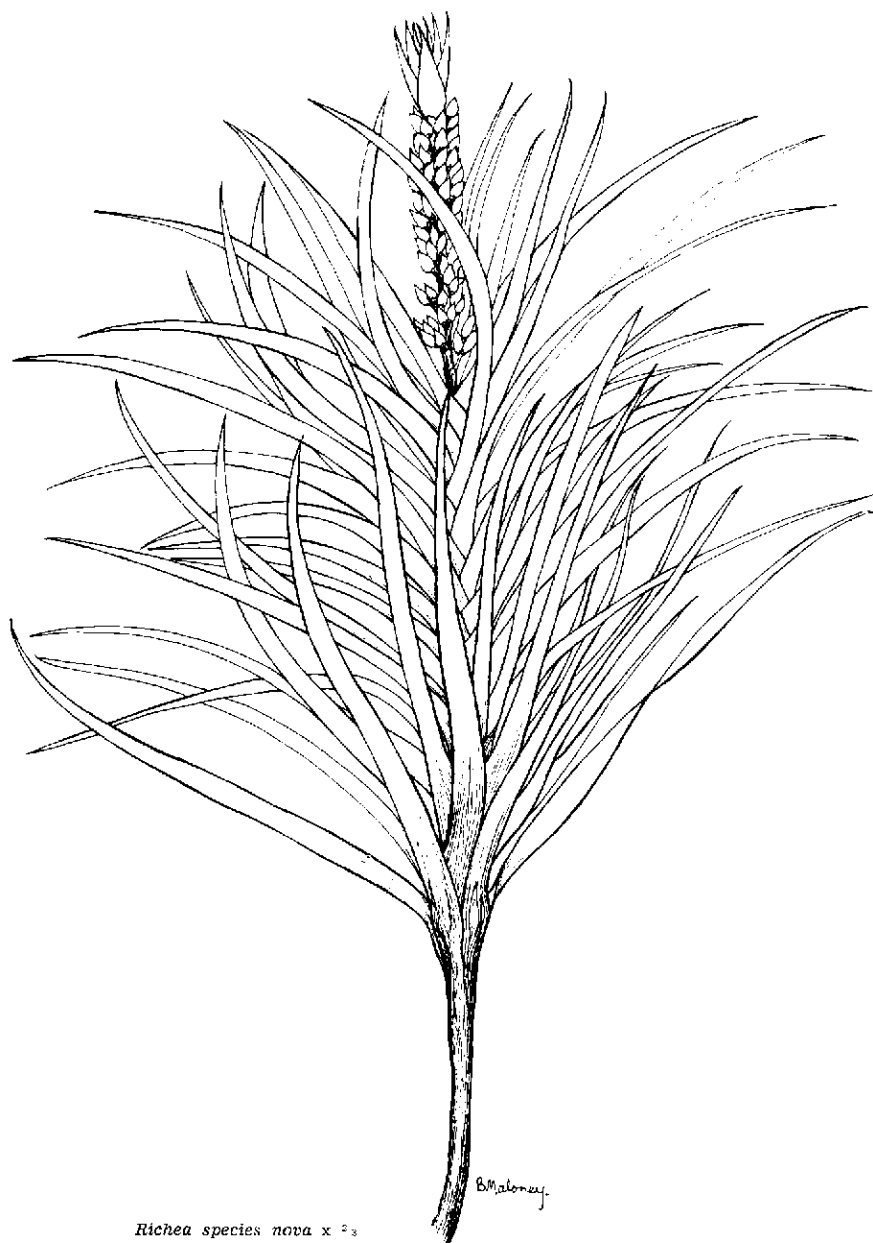
Outer bracts similar to the foliage leaves though usually somewhat smaller, the upper portion more erect and the base broadening widely with narrow membranous wings; apex tapering suddenly to an erect, acute point.

Inflorescence a terminal panicle, 10 to 20 cm. long, fertile flowers occurring only on the upper 2/3 of the floral axis, those on the lower 1/3 minute, vestigial and abortive; fertile and abortive flowers subtended by 3 to 4 small bracts, 6 to 9 mm. long, the outer ones with a broad base, the inner ones narrower and somewhat smaller, the apices of these bracts hooked.

Flowers 8 to 12, borne on short pedicels, 2 to 4 mm. long, longest at the base of the fertile portion of the inflorescence and becoming progressively shorter towards the apex. The internodes between the lower flowers lengthening slightly after the outer bracts have been shed. Each flower subtended by 2 to 3(4) small linear bracts or 1 or 2 larger ovate-lanceolate bracts, all of which are caducous, the base and middle of the larger bracts expanded and semi-enclosing the flower. The apices of these bracts minutely hooked.

Sepals broadly triangular and obtuse, 1 to 3 mm. long. Corolla pink to orange in colour, operculum 6 to 8 mm. long, narrowly obovoid to cylindrical-conical and somewhat flattened, the apex obtuse, with 5 minute, obscure teeth.

Stamens versatile, joined to the filament slightly below the middle and opening by a single longitudinal slit. Style $\frac{1}{2}$ as long as the stamens; stamens 3 to 4 mm. long. Nectar scales 5, broadly elliptical-oblong, truncate, $\frac{1}{2}$ as long as the ovary.



Richea species nova x 23

This *Richea*, is found as isolated specimens among populations of *R. scoparia* and *R. pandanifolia*, usually in the shelter of a protecting boulder or bush. It is known only from scattered localities within the Mt. Field Nat. Pk., i.e. Wherrett's Lookout and Lakes Fenton and Dabson; also from Carruther's Creek in the north of the Cradle Mt. Nat. Pk.

***Richea milliganii* (Hook. f.) F. Muell. Syn.: *Pilitis milliganii* Hook. f.**

An upright shrub, sparsely branched, 3'-6' high. Leaves more or less erect or spreading, rigid and with a sharp apex, base broad and sheathing, bunched at the ends of the branches and persistent. Inflorescence a short terminal head often drooping. Flowers solitary and sessile surrounded by bracts which are very similar to the foliage leaves, though slightly shorter. The individual flowers subtended by 2-3 small bracts, the outer ones keeled. Corolla light yellow or cream. Operculum short or long, narrow conical and falling early, the apex fractionally separated into five minute lobes. This species is found on some West Coast mountains and at Mt. Field National Park.

Richea scoparia x $\frac{2}{3}$.

(See page 101 for colour plate and description.)

(Flower detail by B. R. Jackes, see pp. 126)



B. Maloney

NATIVE ORCHIDS FOR BUSH-HOUSE CULTURE—cont. from page 107.

***Dendrobium speciosum* Sm. "Rock Lily"**

The largest of our epiphytes is found in Queensland, New South Wales and part of Victoria, and is a variable plant with stems over two feet in length and some squat forms only 6" high. This native likes to grow on rocks, cliff faces or on trees, where it forms very large plants, some would not fit into the back of a utility. Many plants carry over 100 spikes, with each carrying over 50 blooms which are perfumed, especially on warm days.

Each pseudo bulb carries from 3 to 6 stout, rigid, deep green leaves which are a foot or more in length; and flower spikes appear from nodes on new or older stems. The individual flowers are over 1" long and have narrow, incurved sepals and petals creamy white in colour, turning yellow with maturity. The flowers appear in spring.

The best variety is var. *hillii*, which is a larger free-flowering form; a strange habit of this form is that its roots grow upwards out of the ground. The flowers are white. This form is known as "Tarberi" by the aborigines.

D. speciosum can be grown in a large tub in a compost of chunks of pine bark and leaf mould in bush house under shade cloth, but would benefit if placed under permanent shelter for winter. The plant benefits from feeding during growing season.

***Dendrobium falcorostrum* Fitz. Beech Orchid**

This striking orchid is confined to fairly high altitudes in Queensland and New South Wales, where it grows chiefly on Beech trees (*Nothofagus moorei*) but is found also on tree-fern trunks. The grooved stems grow to about 1 ft. in length with 4 or 5 leaves to 5" long at the top. The flower stem comes from axils of the leaves and is about 10" long and carries up to 20 white or creamy blooms to 2" across. The lip is white, prettily marked with red or purple spots and blotches, the throat being yellow. The lip resembles a falcon's bill—hence its specific name. The flowers are sweetly scented during warmer days. Spring is the flowering season for this variety.

D. falcorostrum grows best if mounted on tree-fern slab or a piece of hardwood, but will grow happily in a wire basket hung up high, using a compost of pine bark chunks, leaf mould, charcoal and benefits by feeding during growing season.

***Dendrobium gracilicaule* F. Von. M. Yellow-speckled Orchid**

This is a very abundant plant around Brisbane, and it is found in most of the low hilly forest country of Southern Queensland and New South Wales along the coastal areas. The pseudo bulbs are slender to a height of 2' and carry about 4 dark green leaves at the top. The small flowers are yellowish-green, or yellow with brick-red blotches on outside of petals and sepals. These ½ inch flowers come on small stems, each bearing up to 10 per stem, and several stems coming from each growth. The flowers are sweetly scented and appear in late Spring.

D. gracilicaule is not as striking as some other natives, but a specimen plant is quite charming. It can be grown in a mixture of pine bark, leaf mould, coarse sand and charcoal in pots, and likes feeding during growing season. This is probably the easiest to grow and should be represented in every collection.

A variety *howeianum* Maiden has cream coloured flowers with pink tongue markings and is found only on Lord Howe Island.

***Dendrobium tetragonum* (Cunn.) Tree Spider Orchid**

A native of Queensland and New South Wales where it grows on the trunks of trees. This is a strange species with long stems which are slender

at the base and 4 angled, with two or three persistent leaves. The flowers are small in most forms and appear in short clusters from top of stem or at the joints along the stems. The colour is yellowish-green with red-brown markings; or wholly cream and the segments are long and acutely pointed. The northern variety is more brightly coloured. The flowers are faintly fragrant at mid-day. Flowering season is Spring and Summer.

D. tetragonum can be grown on a tree fern slab or a branch, where it sometimes is slow to become established, but is worthwhile if only for its unique characteristic growth. When established it will grow quickly and flower freely.

***Dendrobium monophyllum* F. Von. M. "Lily of the Valley"**

This creeping plant grows on trees and rocks in Queensland and New South Wales, and forms large masses. The conical furrowed stems reach a height of 4" with one leaf (occasionally 2) to length of 4". The racemes carry up to 15 small bell-like flowers which are yellow in colour and fragrant. These flowers closely resemble the "Lily of the Valley" and appear in Spring; but my plant blooms in Autumn mainly, and Spring.

D. monophyllum can be grown on a hardwood branch or in a shallow pot of pine bark and leaf mould with a little coarse sand. Established plants benefit by feeding during growing season.

***Dendrobium aemulum* R.Br. "White Feather Orchid"**

This is a native of Queensland and New South Wales, where it grows on Ironbark Eucalypts and the Brush Box. The stems are slender and reach a length of 9", although generally shorter. The pair of leaves are ovate, fleshy and a dark green colour, with racemes appearing from axis of the leaves and carrying up to 15 fragrant, white, spider-like flowers with yellowish tips, tongue markings, pink. These flowers appear in Spring.

D. aemulum is rather hard to cultivate, but can be grown on paper bark limbs and given plenty of light. When plants are firmly established they can be given fertilisers during growing period. This plant is very appealing and well worth the extra attention to get it started off.

***Dendrobium delicatum* n.m. *kestevenii* (Rupp) Leoney**

Natural hybrids between *D. speciosum* and *D. kingianum* and are found in Queensland and New South Wales. The plants resemble a robust *D. kingianum*. The dainty flowers which appear in Spring range in colour from white to cream, and pink, or pale mauve; many are creamy with delicate pink tints. These grow into beautiful specimen plants and culture is as for *D. kingianum*. I have about 10 different plants of this all growing very well. Refer "Aust. Plants" No. 4 issue pp. 19 for correct name.

***Dendrobium gracilimum* Bailey**

Native of South Queensland and New South Wales, is a natural hybrid between *D. speciosum* and *D. gracilicaule*. The growth here resembles that of *D. gracilicaule*, but is much longer and stouter. Flowers are twice as big as *D. gracilicaule* and come on an 8" stem and are wholly deep cream in colour. They are strongly scented. Culture is as for *D. gracilicaule*.

Terete or cylindrical leaf species of *Dendrobiums*.

***Dendrobium striolatum* Reihb. "Streaked Rock Orchid"**

This native has special appeal to us as it is Tasmania's only native *Dendrobium* and grows plentifully on granite rock outcrops on the East Coast. It can also be found in Victoria and New South Wales but here in Tasmania it is more robust in growth and bears larger flowers, in Spring and early Summer. The $\frac{3}{4}$ " flowers are mustard-yellow colour (pale green at

yellow on mainland) with a white tongue which has crisped margins; and flowers are perfumed on warm days.

My plant has been growing for 9 years in a wire basket in compost of leaf mould, coarse sand and charcoal. The container is now hidden as the plant has grown out the sides and bottom, and seems quite happy to grow hanging under a tree and benefit by feedings of fowl manure etc. during growing season. Flowers always open for me the first week in October and last over one month.

***Dendrobium teretifolium* R.Br. "Clematis Orchid" or "Rat-tail Orchid"**

Another native from New South Wales and Queensland where it grows usually on trees. The plant has long pendulous branched stems with thin (or thick) smooth cylindrical leaves which are often a yard in length. This variable orchid carries flowers which are white, cream or yellowish with brown spits or lines. The lip has crisped margins, and is finely tapered, being cream in colour with throat markings of brown. The flowers appear in late Winter or early Spring.

***Dendrobium cucumerinum* Macleay "Cucumber Orchid"**

A now rare native from New South Wales and Queensland, which grows on rocks and trees. The leaves resemble in shape, the small gherkins which we see in our delicatessen store, and are about 2" long, coming from a branching, creeping rhizome. The Autumn or Spring flowers are fragrant and are a creamy-white colour streaked with red-brown.

I have my plant growing on a branch, but this is slow to establish itself, but worth a place in your collection, if only for its unique growth.

CYMBIDIUM

In Australia, we have three native *Cymbidium* which are classed as miniature *Cymbidiums* because of their small blooms. All Australian species were fully described with colour plates in the No. 27 issue.

Cymbidium maddidum

Plant growth large like hybrid *Cymbidiums* with leaves thicker but flowers come on a drooping spike in spring and summertime and are golden-brown colour. My plant is growing the same as ordinary *Cymbidiums*, but can be grown in a hollow branch or in a wire basket and hung up.

***Cymbidium suave* R.Br.**

This plant does not form pseudo bulbs like other *Cymbidiums*, but has a stem to about 1 ft. in height with grass-like deep green leaves. The small flowers come in colours from old gold shade through a brownish green, to a delicate bright green, and are perfumed, coming in Summer. This plant likes to grow on tree branch which is hollow and it sends its roots down inside for moisture.

My plant is mounted on a tree-fern block which in turn is sitting on a 6" pot and the plant is not watered too often and is growing very well, having shown over 8 new growths in the past 12 months.

LIPARIS

***Liparis reflexa* Lhl. and *Liparis coelogynoides* F. Von. M.**

Both are natives of Queensland and New South Wales and form pseudo bulbs and have bright green leaves. *L. reflexa* blooms in Autumn; the flowers which are yellowish-green diffuse an unpleasant sickly odour. *L. coelogynoides* is a smaller plant and its flowers are more dainty in pale green shades, turning orange in maturity. This one quickly grows into specimen plant and flowers during summer months. My plants of both are growing very well in pots in a *Cymbidium* compost, but can be grown on fibre blocks, or on a branch if desired.

SARCOCHILUS

Sarcochilus hartmannii F. von M. Waxy *Sarcochilus*

This native of Queensland and New South Wales is rather rare, and grows on trees or rocks, often exposed to full sun and in most inaccessible places. The growth is like a *Vanda* in that it continues growing and flowering from same lead year after year. The thick, waxy, white flowers have few deep maroon spots and flower here for me in Summertime. Most of the *Sarcochilus* do not respond to cultivation, but *S. hartmannii* does. My plant has been growing in a 9" wire basket for 8 years, in a compost of coarse sand and leaf mould, and hangs on a frame in the bush-house and is fed during summer. Last year it gave me 15 spikes, each carrying from 10 to 20 blooms which last over a month.

Sarcochilus falcatus R.Br. Orange Blossom Orchid

A very attractive species inhabiting moist gullies in Queensland, New South Wales and East Victoria. The growth is *Vanda*-like, but not near as robust or fleshy as above, and white blooms with attractive lip markings last well in their Spring season. Strongly perfumed variety like the Orange Blossom. Unfortunately this is rather difficult to keep in cultivation; my plants are mounted on a limb and on man-fern slab.

Sarcochilus fitzgeraldii F. Von M. Ravine Orchid

A native from Queensland and New South Wales, this variety favours mossy rocks etc. in deep ravines. The growth is similar to *S. hartmannii* and flowers are white prettily marked with reddish blotches around an orange-coloured lip. My plant is growing in a pot in rough *Cymbidium* mixture in a shady spot.

HOW TO CARE FOR YOUR ORCHIDS

To conclude this paper, I would like to list some points to remember when mounting natives to blocks, branches, etc.

1. Carefully select a suitable host, and a branch etc. that offers the plant anchorage, by a rough surface, to attach itself to, or even drill a few holes into the branch.
2. Attach piece of wire to branch etc. to hang it in appropriate location.
3. Tie plant very firmly to its host with cat-gut (nylon fishing line) putting a small pad of sphagnum moss between plant and host, to retain moisture and to encourage root growth.
4. A plant that is attached loosely will move in the breeze and any new roots will be damaged by this rubbing action and plant subsequently weakened and probably lost. This is extremely important to plant becoming established.
5. Only fertilise established plants during their growing periods.
6. About two or three times annually I crush up She-Oak leaf mould and sprinkle it around plants in pots, and finer material is sprinkled onto plants on blocks etc., where it gathers over roots and in forks of branches. This would occur in their natural habitat and plants benefit by it.
7. These natives are free from most pests and diseases, but should be checked regularly for scale, snails and slugs; rot caused by excess water in new growth (especially during weather changes). Aphids should be controlled as they cause untold damage to new growths and new flower spikes and buds.
8. Experiment with best location in your nursery and when the ideal spot is found, leave your plant there. Remember, every grower's conditions differ and climatic conditions vary in the one town or even suburb.

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A NEW PTEROSTYLIS

by LEO CADY

Pterostylis plumosa Cady Nov. Sp. (Colour plate on page 140).

Holotype: Road to Abercrombie Caves, Brinsley, 10-61.

Isotype: In herbarium Cady No. 1614.

Type in Herbarium of Royal Botanic Gardens, Sydney.

P. barbata Lindl. affinis, differt; sepala non caudiforma: ad basem sepali dorsalis minus gibbosa; folia magis ut rosetta ad basem.

A slender but often robust plant to 30 cm. high. Leaves lanceolate usually crowded into a basal rosette or tuft, sessile or shortly stalked, numerous. Stem bracts several, closely sheathing the stem. Flower one very rarely two; green with a bright yellow labellum; 2.75 cm. x 1 cm.; the segments conspicuously veined (flowers can be larger than above but size quoted is average). Galea erect for most of its length or slightly recurved. Lateral sepals deflexed, united at the base only, the free section linear up to 2.5 cm. long. Dorsal sepal with very short upturned tip, rarely longer than 4 mm. Labellum up to 2 cm. long, terete and filiform, not irritable, densely covered with long yellow hairs and ending in a brown appendage; labellum as long as the column. Column wings upper lobe is filiform, lower lobe narrow with dense cilia. Stigma obovate broader than the column.

This species occurs in Tas., Vic., South Aust., N.S.W. and New Zealand. Flowers September to October.

Some specimens examined now in Herb. Cady, *P. barbata* Nos. 2060, 2148, 590, 767, 1564, 1506, 1537, 1293. *P. plumosa* N.S.W. 2541, 1614, 1689, South Aust. 1088, Vic. 732, 1231c, 2295 Tas. 2431 (doubled flowered) 1435. Also examined photo and drawings of the New Zealand form.

A long known plant that has been for years placed under the name of *P. barbata*. Recently Western Australian botanist Alex George* discovered that the plant described by Endlicher as *P. turfosa* was in truth Lindley's *P. barbata*. He also suggested that the Western Australian plant and the Eastern States plant could be conspecific. These two plants are readily separated both geographically and in general appearance. *P. barbata* being generally more robust in flower size and shape. The dorsal sepal normally extending into a long filiform and is much more gibbose at the base than *P. plumosa*. These two taxon have been separated for many years by different noted botanists and it is the present writer's opinion that this position should remain.

In 1853, J. D. Hooker described a New Zealand plant in his *Flora Nov. Zeal.* 1:249 (1853), as what he took to be R. Brown's *P. squamata*. Hooker was mistaken for the plant was the species now described, *P. plumosa*. *P. squamata* does not occur in New Zealand.

SECTION 2

Also illustrated is the column of a *Thelymitra* sp. received from Bega a number of years ago. This plant does not appear to agree to any described Australian plant but is extremely close to the New Zealand species *T. decora* Cheesmn. Further material would probably clear up this question.

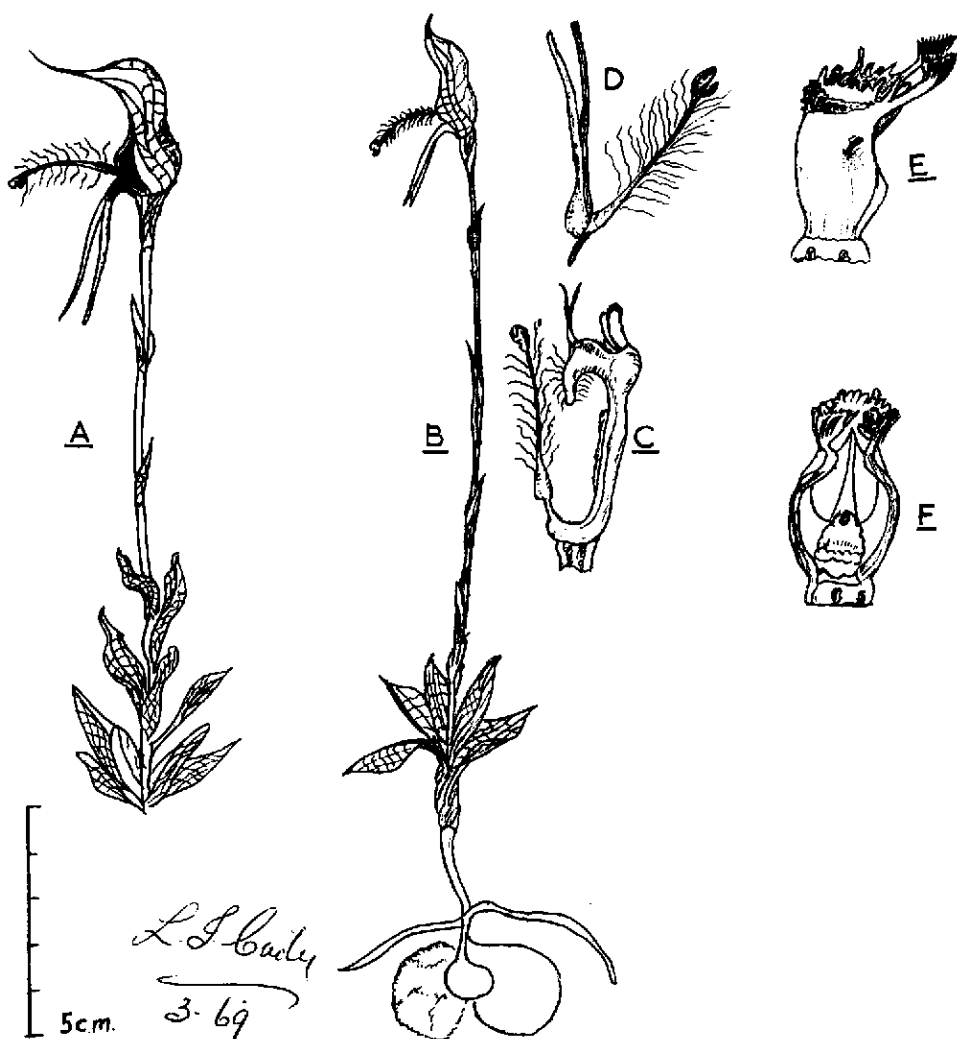
A brief description of the plant is appended; *Thelymitra* sp. allied *P. decora*.

A slender plant up to 37 cm. high. Leaf to 26 cm. recurved, concave with exterior ridges, linear acuminate. Flowers 1 to 9 dark blue the lateral petals irregularly spotted with brown segments 12 mm. long. Column inclined

* George, Western Australian Naturalists, Vol. 8, No. 2, Oct. 1961, 38-41.

THE GENUS *PTEROSTYLIS*

Seventy-six species and many varieties of *Pterostylis* are listed and illustrated by Leo Cady in the previous issue. There are many articles on their cultivation in previous issues. A colour plate of this new species is shown on the next page.



A. *P. barbata* Lindl.

B. *P. plumosa*.

C. *P. plumosa* column and labellum side.

D. *P. plumosa*. Lateral sepals and labellum side.

E. & F. Column *Thelymitra* sp.

Fig. A and B natural size to scale. All other figures greatly enlarged.

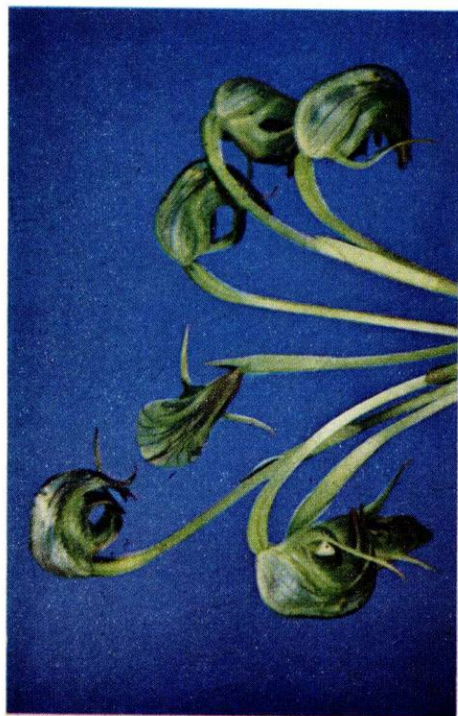
backwards, blue with paler margins. Midlobe higher than the anthers, slightly cucullate, almost black with finely denticulate margins, the back with very dark conspicuous tubercles. Lateral lobes secondary, short, horizontal, with thick erect tufts of white cilia.

Bega area 1. Matthais, Summer, 1963

Top: *Pterostylis plumosa*; Bottom: *P. longifolia*



Top: *Pterostylis nutans*; Bottom: *Pterostylis pedunculata*



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BOOKS ON WILDFLOWERS

The number of books that have been produced on wildflowers must frustrate many enthusiasts who would probably prefer to spend their money on plants. In the editor's opinion there is little doubt that the periodical "Australian Plants" adequately meets the needs of most wildflower growers, students and admirers. Printed since 1959, and now in 38 issues, all but three may be obtained from the editor:

VOLUME No. 1, issues 1-12, no longer available bound but all issues available separately at 40c each except nos. 2, 3 & 11, i.e. \$3.80 incl. postage.

VOLUME No. 2, issues 13-20, all available only fully bound at \$6.00 plus 20c postage. Bound in this volume is also "A Descriptive Catalogue of Western Australian Plants" itself priced at \$3.00 when again available separately in December 1969.

VOLUME No. 3, issues 21-28, all available only fully bound at \$6.00 plus 20c postage, including also "Catalogue of Cultivated Australian Native Plants" valued at \$3.00.

VOLUME No. 4, issues 29-36, all available only fully bound at \$6.00 plus 20c postage, including "Western Australian Plants for Horticulture—Part 1" valued at \$3.00—see below.

VOLUME No. 5, issues commencing No. 37. Past issues are 40c each plus 5c postage.

Climbing on the bandwagon most publishers have produced books on wildflowers. Many cover the same range of subjects, which have already been introduced in "Australian Plants" but most have either of the following disadvantages. They either have a large number of beautiful colour plates with inadequate descriptions and practically nothing on cultivation, or they attempt to deal with cultivation and skimp on colour plates leaving it to the readers experience or imagination as to what the plant and flower really looks like. If you bought most of the books available you would have less than half of the range of material available in past issues of "Australian Plants". There are exceptions.

FLOWERS AND PLANTS OF VICTORIA available through the editor at \$9.95 plus 50c postage is one exception. Produced in association with some members of this Society this book shows, in 543 colour plates, the widest range of wildflowers of Victoria ever produced. It does not deal with the cultivation aspects.

WEST AUSTRALIAN PLANTS FOR HORTICULTURE is the latest book by this Society available from the editor for \$3.00 plus 20c postage. The format of the book generally is to have simple but adequate descriptions (using simple features that anyone can distinguish) of three species in one genus with a full colour plate of one of them on the opposite page. Directions as to cultivation are given for each species. Hundreds of West Australian wildflowers are also described. This is the style of book we recommend and is excellent value at this low price. It is proposed to produce more in this series on wildflowers from other states if readers will support us by buying the first one, providing the money to produce the next one.

ORCHID CULTURE AT COOLER LATITUDES—(continued from page 144)

A glasshouse gives added warmth and widens the field considerably and if heating costs can be met. For those who have only a bush-house or cool glasshouse some pointers may be of assistance. Where a species has an extensive range try to obtain plants from its southern habitats. Some species are very adaptable and plants from all over their range seem to do well, e.g. *Dendrobium speciosum* from northern Queensland will grow quite well in a Melbourne bush-house. Variation in climate and altitude play an important part in selection of suitable plants. For Queensland species particularly from the north bear in mind that coastal localities are often warmer and more humid than inland areas. Many species extend to high coastal ranges or tablelands where conditions are often as cold and miserable as a Melbourne winter. Try to obtain plants from such areas.

If a grower obtains a plant requiring warmth during winter and does not have the best facilities for its culture he can often ensure its survival over winter by keeping it bone dry until new growths appear in the spring. The best way is to hang the plant near the glass and forget about it. Such a species is *Dendrobium canaliculatum*. I have overwintered five seasons, but thrive and flower it needs heat in the winter.

In addition to the epiphytic orchids listed by Mr. Dudman on page 107, I have found the following species suitable for bush-house culture in Melbourne *Dendrobium mortii*, *D. beckeri*, *D. pugioniforme*, *D. agrostophyllum*, *D. lichenastrum*, *D. rigidum*, *Bulbophyllum crassulifolium*, *B. exiguum*, *B. aurantiacum*.

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Photography by R. F. Leaney

CYMBIDIUM CANALICULATUM

With the World Orchid Conference to be held in Sydney in September 1969, our attention is drawn to our native orchids. The above species have been fully described in our No. 26 issue together with our other native Cymbidiums. However the adaptability of many of our orchids to cooler conditions is not widely known and the following article and that on page 107 may serve as a guide to our overseas visitors.

Orchid Culture at Cooler Latitudes

by David L. Jones, Melbourne

It is a commonly held belief that one must live in a warm climate to be able to grow orchids. However some orchids can be more easily grown in the south. The orchid family is a large group of plants adapted to a wide range of conditions. In Australia we have about 750 species of orchid both terrestrial and epiphytic favouring the more reliable rainfall of coastal areas.

The Australian epiphytic orchids reach a peak in the well watered forests and jungles of the tropics while the terrestrials are prevalent in the open forests and heathlands of the south.

(Continued on page 143)