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Photography by J. Joshua

THRYPTOMENE CALYCINA

A wildflower found only in the Grampians of western Victoria. The spray of bloom on page 52 is a little smaller than natural size and the flower has been magnified almost four times above. This flower is characteristic of the genus the smooth bell-shaped green torus ("calyx-tube"), five orbicular (round and pink in the photograph above) and petaloid sepals, five similar (round white) petals and five incurved globular anthers (golden "nuts" in the centre of the flower in the photograph) on very short filaments.

These flowers are typical of the wildflowers described in this issue with a full guide as to their propagation and cultivation—tiny flowers produced in profusion.

**THRYPTOMENE — BAECKEA — MICROMYRTUS, SMALL OFTEN TINY
FLOWERED TEA TREE LIKE PLANTS FOR THE GARDEN.**

CONTENTS OF THIS ISSUE

As with each issue of "Australian Plants" we are primarily concerned with providing the home gardener with adequate information on the propagation and cultivation of our Australian wildflowers. If you are interested only in this aspect and do not wish to be bothered over problems related to the identification of the plants, please proceed directly to the section below headed "Growing Wildflowers" for references to the many articles on this aspect.

- THE PLANT FAMILY MYRTACEAE—End of index—Vol. 3. Previous issues have dealt with hundreds of species from this great family of special horticultural interest. The reason for listing the genera in the family is to provide a ready reference for the reader.
- THE THEME OF THIS ISSUE is three genera in the family *Myrtaceae*, those plants which are small twiggy shrubs that have small, often white, flowers, the petals of which are prominent or the showy part of the flower.
- BAECKEA—MICROMYRTUS—THRYPTOMENE—"A Few Comparable Genera in the Family Myrtaceae" by Ross Garnet—page 78. An article for the keen type who wishes to identify their plants. A special feature of this article is the trouble the writer has gone to to enable the amateur to do this by checking the flowers against clear sketches and a simple key.

GROWING WILDFLOWERS

The objective of this publication is to assist people to grow our wildflowers and to assure their preservation and cultivation in home gardens, public reserves and national parks. As there are many thousands of species, each issue has as a theme a group of plants that may have common features. The theme to this issue is the "Heath Myrtles". Sections on the cultivation of wildflowers are included in each of the following articles.

- A WILDFLOWER GARDEN—3—Soil Treatment for the Smaller Native Plants by E. M. M. Boddy—page 67. The method given here will give considerable success with all small natives.
- FROST RESISTANT, WIND RESISTANT AND ALPINE PLANTS—These are all subjects that receive special mention in various issues. In this issue we give special attention to Eucalypts from this aspect on page 69. See also ALPINE GARDENING—page 59 & 68.
- SEASIDE PLANTING—Previous issues have dealt with this aspect which receives special attention on page 55.
- PROPAGATION OF WILDFLOWERS—The plants dealt with in this issue have not given unskilled but careful propagators any trouble growing their own plants. The method on page 63 is suitable.
- PROPAGATION AND CULTIVATION OF EPIPHYTES—page 66. This problem has given trouble to growers and competent experiments are welcomed.
- THE HEATH MYRTLES—BAECKEA, MICROMYRTUS, THRYPTOMENE by Ross Garnet—page 51. Masses of tiny flowers often white when first displayed, mellowing to pink and red. The principal eastern species are described.
- FRINGED HEATH MYRTLES FOR THE GARDEN by E. M. M. Boddy—page 54.
- MYRTACEAE FOR SOUTH AUSTRALIAN GARDENS by I. G. Holliday—page 56. Recommended species of *Baeckea*, *Hypocalymma*, *Leptospermum* and *Thryptomene* are described.
- TASMANIAN MYRTLES by A. M. Gray—page 59. The species of *Baeckea*, *Thryptomene* and "Tea Trees", *Leptospermum* are described.
- TEA TREES FOR SOUTH AUSTRALIAN GARDENS by I. G. Holliday—page 60.
- TASMANIAN TEA TREES by A. M. Gray—page 61.
- BAECKEA—pages 56, 57, 58, 59.
- CALYTRIX—page 81.
- DARWINIA—page 82.
- HYPOCALYMMA—page 56.
- LHOTZKYA—page 81.
- MICROMYRTUS—pages 53, 54.
- THRYPTOMENE—page 51.
- THRYPTOMENE FOR THE GARDEN—page 74.
- HOWITTIA, THE GENUS, by A. M. Blombery—page 63. Sixth in our series of Hibiscus-like flowering plants of the plant family Malvaceae describes a little known or grown gem.
- PRIONOTES by B. R. Jackes—page 64. Fourth in our series on the heath family Epacridaceae describes one of the most famous of Tasmania's wildflowers *Prionotes cerinthoides*.
- PRIONOTES CERINTHOIDES by A. M. Gray—page 65. Propagation and cultivation.
- PIMELEA—The Pink Rice Flowers—page 84-85. An outstanding garden plant is described.
- TASMANIAN PIMELEA by A. M. Gray—page 85. Two species of special horticultural interest are described followed by a key of all the species found in Tasmania.
- EUCALYPTUS MANNIFERA—A Street Tree by R. W. Boden—page 73.
- SOME GARDEN EUCALYPTS by R. C. Barnard—page 69. A very competent report on the cultivation of Eucalypts in cold climates based on experiences in England.
- ORCHIDS—THE GENUS CRYPTOSTYLIS IN AUSTRALIA by Leo Cady—page 75.
- ORCHIDS—Cultivation of *Cryptostylis* by R. C. Nash—page 91.
- INDEX—We include an index to the issues of Volume No. 3. Your No. 21 issue includes an index to the issues in Vols. No. 1 and 2.
- CHORICARPA OR SYNCARPIA—A correction for our No. 28 issue—End of Index for Vol. 3.

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AUSTRALIAN PLANTS

Volume No. 1, issues 1-12 has now sold out but except for issues 2 & 12 the remaining 10 issues are available at 40 cents each + 5c postage or \$4.00 + 20c postage for the Vol. 1 set. Supplies of Volume No. 2 (issues 13-20) at \$6.00 + 20c postage are still available, many of the issues being no longer available singly. Volume No. 3 (issues 21-28) will be available in April, 1967 fully bound at \$6.00 + plus 20c postage. Issues prior to this and latter than No. 29 are available singly at 40c + 5c postage.

WEST AUSTRALIAN PLANTS

This book lists all the wildflowers indigenous to Western Australia, giving for each species, kind of plant, general size, flower colour, flowering months, localities of occurrence and type of soil and/or vegetative type.

Price \$1.20 + 15c post & pack

HEATH MYRTLES

THRYPTOMENE, MICROMYRTUS AND BAECKEA

by J. Ros. Garnet

The very large, almost world-wide Myrtle family of plants is well represented in Australia by more than fifty genera which, between them, include something like 1,000 species. Eucalyptus and Melaleuca of course, account for a goodly proportion of this number but just as a matter of interest it may be mentioned that ten other genera in the family are each represented by more than 20 species, namely *Baeckea*, *Calytrix*, *Verticordia*, *Leptospermum*, *Eugenia*, *Darwinia*, *Thryptomene*, *Kunzea*, *Callistemon* and *Calothamnus*.

Having this in mind, it will be appreciated that the restriction of these notes to just three of the genera—those which include the Heath Myrtles—is going to leave the reader with a very limited appreciation of the amazing variety of form and beauty discoverable within the *Myrtaceae*. Most of us can recognise a Eucalypt, a Bottlebrush or *Verticordia*, perhaps a *Calytrix* and several others but there are some which are likely to be troublesome because their distinguishing features are not easily detectable by casual inspection. The Heath Myrtles are in this category and this is why they have been included among the several genera for which a simplified "key" has been provided. See "The Heath Myrtles"—page 78.

In the three genera, *Thryptomene*, *Micromyrtus* and *Baeckea*, there are many species which have captured the fancy of growers of Australian plants and thus they merit some description on their own account. The following is an attempt to do this:

THRYPTOMENE

Thryptomene is a purely Australian genus of about 30 recognised species. At least four-fifths of them occur in the west where all but two—*T. micrantha* Hook.f. (which grows also in the other States) and *T. oligandra* F. Muell.—are endemic. Possibly the best known Western Australian endemic is the floribund, pink flowered Rock *Thryptomene*, *T. saxicola* which has been described under a number of names such as *Baeckea saxicola*, *Astraea saxicola*, *Eremopyxis camphorata*, and *Scholtzia decandra*—all of which suggests that *Thryptomene* has presented something of a problem in classification to botanists of bygone days. It still does!

Thryptomene calycina is well known simply as "Thryptomene" to people of Victoria where it is endemic. The plant grows by the acre in the sandstone ranges of The Grampians.

Thryptomene micrantha, the only other Victorian species (for so long known to most of us as *T. miqueliana*), although occurring in the south-east of the State in the vicinity of the Ninety Mile Beach and in Lakes National Park, grows also in every other State. The localisation of the two Victorian species at places more than 350 miles apart provides a good example of one of the curiosities of plant distribution but even more curious is the fact that, although *T. micrantha* is widely dispersed, *T. calycina* has evolved in isolation in its chosen habitat in spite of its ability to thrive in many other situations far removed from The Grampians.

Along the shores of Port Phillip Bay it has been introduced and there flourishes like a weed. In fact, it is actually cultivated for the market where, in springtime, it is sold in enormous quantity as a "cut flower" for indoor decoration. Some private landholders in The Grampians make a fair living by merely harvesting their stands of *Thryptomene*.



Photography by H. Alan Morrison

Photographed in the Grampians

THRYPTOMENE CALYCINA — See front cover for a close up of the flower.

In States where there is protective legislation, as in Victoria, *Thryptomene* is classed as a protected wildflower which means that it may not be picked or damaged anywhere except on private property and, even there, only with the property owner's permission. Some folk with an eye to a quick and easy dollar have no compunction about raiding Crown Lands or somebody else's property to gather a truck load of the plant, even about pulling it up by the roots to save time. Some years back their depredations were so intense that the residents of the district rose in wrath and demanded that the Native Plants Protection Act be enforced if only to preserve the beauty of a popular tourist resort. Since that time, out of respect for the heavy penalties imposed on those caught, the practice has declined. It is far more economical to cultivate the shrub.

Ros. Garnet continues with further notes on *Thryptomene* on page 74.

MICROMYRTUS

by J. Ros. Garnet

Micromyrtus, too, is an entirely Australian genus, of 15 or 16 species all but four of which are native to West Australia. Of them all, perhaps the best known is the "Fringed Heath Myrtle", *M. ciliata* of South Australia, Victoria, New South Wales and Queensland.



Photography by H. Alan Morrison

MICROMYRTUS CILIATA

Micromyrtus ciliata is of very variable habit, in some places seen as a low sprawling shrub and in others erect but either spreading or compact. The erect compact form, a particularly handsome shrub, is a picturesque feature of the arid sandhill country of mallee lands where it can be seen, often in profusion, ranging in height from two or three inches to about eighteen inches. The erect spreading form which grows on less mineral deficient soils may be up to three feet high and as much in diameter. Because a sandhill plant happens to be only a couple of inches high, one should not be misled into thinking that it is necessarily a seedling which can be transplanted successfully to the home garden. It is likely to have a root system penetrating deeply into the sand and extending laterally for three or

four feet. The plant needs that kind of root system in order to glean the extraordinarily scant amount of nutrients in the sand.

The flowers of most of the *Micromyrtus* are very small but arranged so densely on the ends of the branchlets as to almost hide the tiny leaves. In bud those of *M. ciliata* are red but the inner surface of the petals is white so that, as the flowering season advances, the colour of the flowers appears to change from red to white and then to red again as the flowers wither. Because there are so many flowers and because they do not all open at the same time, a *Micromyrtus* shrub can be a very colourful and pleasing blend of white and the various shades of red—unless it happens to be the yellow flowered *M. flaviflora* or *M. sulphurea* of West Australia, South Australia and the Northern Territory.

Most of the species are Spring-flowering shrubs and, in cultivation, they make admirable rock plants. Those seen in gardens include, as well as the already mentioned *M. ciliata*, the West Australian *M. rosea* and *M. hymenonema*. The genus is so closely related to *Thryptomene* that one has to look very carefully to find the differentiating characters which led to them being segregated into separate genera. Although in the simplified key on page 83, I have drawn particular attention to one of the differences—that the stamens of *Micromyrtus* are opposite the petals and those of *Thryptomene* alternate with the petals—a more constant and apparently more significant difference lies in the disposition of the ovules in the ovary. In *Micromyrtus* the few ovules within the single cell are attached near the summit of the placenta whereas in *Thryptomene*, the two or more ovules in the single cell are attached at or near the base of the placenta.

HEATH MYRTLES FOR THE GARDEN

Notes by E. M. M. Boddy describing some special garden forms.

MICROMYRTUS (Fringed Heath Myrtle)

These small myrtles may be found on sandy slopes throughout the Victorian Wimmera and Mallee where moisture is trapped in the light soil providing a cool root system during the heat of summer.

In these areas they often produce large quantities of seedlings which vary quite considerably in density of foliage, flower and habit.

Areas containing these plants are regularly inspected and cuttings have been selected from plants of special merit.

Ideal conditions prevail when the root system is over shadowed by other plants.

These plants are easily grown in gardens and rockeries where the soil is light and friable with good drainage and cool root systems.

The foliage is minute and dark green, the buds are bright red, the white petalled flowers are dense and from 1/8"-3/16" in diam.; on fading, the flowers darken producing a deep red calyx. The buds open from the base of the stems upwards which produces a variation of colour from red to white over the whole bush.

None of these plants are garden hybrids, but genuine native plants which have been selected in their own natural habitat.

aurea. Qld. form with long graceful arching branches, yellow fls. 4 ft. *ciliata* (syn. *Baeckea plicata*) (Fringed Heath Myrtle). Small fine,

dark green fol. Red buds, masses of white fl. 1-2 ft.

ciliata (Summer Flowering form). Pink and white flowers in summer. 2 ft.

ciliata (Boddy's Cascade). An open shrub with long arching branches that will cascade over and down rockeries. 18"-24".

ciliata (Boddy's Heather) develops into a compact upright bush 12-18" with dense flowers.

ciliata (Boddy's Jewel) is an outstanding prostrate form, having the appearance of an expensive piece of jewellery; it may be layered, flowers tightly massed along stems.

ciliata (Boddy's Little Heather) is compact and of upright habit. The flowers are smaller, very dense, producing a mass of white flowers, gradually turning from pink to red.

ciliata (Boddy's Lowan) and (Boddy's Dadswell) have both been named after the area in which they have been found; both of these plants are of vigorous and compact growth. Profuse flowering.

ciliata (Boddy's Starwheel) is semi-prostrate, producing regular radial branches from the centre; the flowers are very dense.

hymenomena. Pink fls. 2 ft.

rosea. Erect shrub white flowers changing to bright pink. 3 ft.

stricta is a slim upright shrub which will grow to 2 ft. with a diameter of approx. 6-8". Growth is very compact and it should be planted in a position where there is some movement of air in order to avoid trapping of excess moisture in the dense foliage which could cause rotting during humid conditions. Flowering profuse.

SEASIDE GARDENS

by J. L. Freeman, "Garamina" Nursery, Collins St., Merimbula, N.S.W.

I have been asked by the Editor to conduct a nation-wide survey of native plants for the seaside garden.

It is considered the information gathered will be of vital importance to members who live on our vast coastline. We intend to specify for Zone 1—harsh conditions, and Zone 2—general seaside and to further qualify these two Zones for cold and temperate climates. Personally I consider this survey will go far in removing many doubts as to the adaptability of many lovely natives to seaside conditions.

The full co-operation of local groups in such areas is sought by devoting a meeting to discuss this article and requesting their members to fill in, and return to me personally answers to questionnaire below. Lone members can also render invaluable assistance.

MY GARDEN NEAR THE SEA

My garden is within one hundred yards of a huge salt inlet and within half a mile of the ocean in all directions. It is free from spray of course, but every wind is salt laden as proved by the rapid rusting of all ironwork. The prevailing wind is south westerly direct from the inlet and westerly winds are from snow covered ranges some fifty miles away. It is some sixty feet above sea level but is frost free though heavy frosts occur on the lake front below and on the promontory behind. Winter and summer climate is considered temperate, neither being considered severe; soil is mediumly poor and stony with rock outcrops.

Over the twelve months since planting growth has been amazing. Plants from all States, from Queensland to Tasmania and Western Australia and from mountain to desert habitats, thrive side by side. I do not consider my garden would come under either Zone 1 or 2 of this survey but will serve as a guide to which plants are worthy of trial under more vigorous conditions.

WIND-SURVIVAL FACTORS FOR GARDENS IN WINDY SITUATIONS

My own losses have been from the prevailing south westerly killer wind, but erection of non solid wind breaks is gradually overcoming this. Members who have gardens on cliff top open heath lands should give much thought to the use of such wind breaks in conjunction with solid staking, to allow initial establishment of strongly growing windbreak shrubs—once these take hold their main troubles are over. An essentially related factor in wind resistance and the survey may serve as a guide to further research into this factor.

Finally, this survey will entail many months of detailed card indexing and a worthwhile final result can only be accomplished with the full co-operation of all our readers. Please.

QUESTIONNAIRE

1. Name and address, giving District and State.
2. Distance from sea or salt estuary.
3. Height above sea level.
4. If reached by spray during storms.
5. Frequency of wind direct from sea; e.g. Prevailing wind is cold south westerly.
6. Natural barriers between garden and sea.
7. Frost prevalence.
8. Temperature range summer and winter.
9. Nature of soil, and water supply.
10. List of successful shrubs, trees and plants with full information of rare species.
11. List of failures stressing repeated failures and probable cause.
12. A rough map showing garden in relation to coast would be invaluable. Compass points, distances, etc.

MYRTACEAE FOR S.A. GARDENS

SOME PROMINENT PETALLED MYRTACEAE by I. G. Holliday

The genera *Baeckea*, *Hypocalymma*, *Leptospermum*, *Micromyrtus*, and *Thryptomene*, contain a number of species which are cultivated in South Australia, mainly by native plant enthusiasts.

Except for a few species such as *Leptospermum laevigatum*, there is no evidence to my knowledge to indicate that any of these plants can be considered reliable garden subjects in the Adelaide area. Usually they require some special preparation for success.

Generally those in cultivation appear to need good surface drainage and a neutral to acid soil. Given a specially prepared bed of acid, sandy loam, quite a number of desirable species can be successfully grown in Metropolitan Adelaide. See "A Wildflower Garden" on page 67.

1. BAECKEA

Baeckea behrii known as "Broombush", is native to the drier areas of temperate Australia, and is common in the Murray Mallee in South Australia. It is a handsome shrub 6'-8' high, and deserves more consideration from gardeners. The wispy, rather erect foliage is attractive at all times, and is massed in early spring with dainty, white, open-petalled flowers. It grows well on limestone and tolerates most soils.

Baeckea crassifolia and *B. ramosissima* are both dwarf plants common in sandy heathlands of parts of temperate S.E. Australia. Given a foot or so of surface sand in the garden, they both grow very easily, and make delightful little rock garden plants, especially if planted several together. Flowers vary from white to various shades of pink, and bloom through winter and spring.

Baeckea ericacea, the other South Australian species, is very similar to *B. crassifolia* but with smaller flowers.

Baeckea virgata and *B. crenatifolia* from the Eastern States, are to my knowledge the only other species grown in South Australia. *B. virgata* is a dainty, slender shrub to 8 ft. high which is fairly reliable in gardens, but *B. crenatifolia*, a lovely fern-leaved shrub, needs the cool, moist conditions of the hills districts. Both have small white flowers.

2. HYPOCALYMMMA

These are natives of Western Australia, 3 species of which are occasionally grown in South Australia.

Hypocalymma cordifolium is a swamp lover from the south-west, which will tolerate much drier conditions in gardens, but responds to copious summer watering. It forms a lovely, dense, small shrub with attractive roundish leaves and small white flowers. Worth a place in the garden for foliage alone.

Hypocalymma angustifolium (white flowers) and *H. robustum* (deep pink flowers) are both sand lovers which carry masses of flowers in spring. They both respond well to nitrogenous fertilisers.

Hypocalymma speciosum, from the Stirling Range, is a particularly handsome pink flowered dwarf shrub. I do not know of it in cultivation.

Editor's Note: This introduces those very showy shrubs *Hypocalymma*. A future issue will describe them more fully. Will readers please advise their experiences in growing *Hypocalymma*.

(Continued on page 60 under the heading TEA TREES FOR SOUTH AUSTRALIA)

BAECKEA

by J. Ros. Garnet

Baeckea is a quite large genus with species occurring throughout Australia and extending into the northern islands and beyond into China.

There are about 70 Australian species. Over fifty of them are West Australian; four occur in South Australia, two in the Northern Territory, six in Queensland, sixteen in New South Wales, eight in Victoria and two in Tasmania.

Two of the Western species, *B. behrii* (Broombush) and *B. crassifolia* (Desert Heath-myrtle) grow in all the mainland States but the rest are Westralian endemics. Tasmania has one endemic, *B. leptocaulis*, South



Photography by J. Joshua

BAECKEA RAMOSISSIMA — ROSY HEATH MYRTLE

This plant is shown here full size. It goes unnoticed until the bright flowers provide a flash of colour. It grows in N.S.W., Vic., S.A. and J. Simmons reports on a form in Tasmania—*Baeckea ramosissima* forms a carpet over most of this country and is a lovely sight with its deep pink flowers. It grows very well in cultivation making a delightful rockery plant or border.

Australia one, *B. corynophylla* and Victoria one, the highland species, *B. crenatifolia*. New South Wales shares all its species with Queensland.

Baeckea virgata (the "Twiggy Heath-myrtle") extends into all three eastern mainland States as well as the Northern Territory, where it is recognised as a tall shrub or small tree with, for a *Baeckea*, unusually large leaves. It grows mostly in creek gullies and moist places. For example, very large stands of it grow in places along the banks of the lower reaches of the Tambo River in East Gippsland (Victoria). Despite its preference for this kind of habitat, it responds well to cultivation in a wide variety of soils and situations.

Baeckea intratropica appears to be confined to the Northern Territory.

Baeckea linifolia is another commonly grown species which also has relatively large flat leaves and prefers to grow in rather boggy places in eastern Victoria as well as in New South Wales and Queensland. It has much the same habit as *B. virgata* but is perhaps rather more shapely.

Baeckea ramosissima "Rosy Heath-myrtle", is another well known species being a small heathy shrub with very small leaves. In some forms, it is an almost prostrate plant.

Baeckea crassifolia, "The Desert *Baeckea*", is a gem of the sandhill country. It is a small heathy shrub with very small leaves also. For undoubted beauty it rivals the desert form of *Micromyrtus ciliata* although it is not so erect and shapely. Its flowers may be either white or pink and about half the diameter of those of *B. ramosissima*—that is, about quarter of an inch across. But what they lack in size they gain by their abundance.

Baeckea gunniana, the highland counterpart to *B. crassifolia* is found in alpine and sub-alpine localities where, quite often, it will be seen covering the surface of granite boulders near the alpine meadows and rivulets. It extends also to lower altitudes on the tablelands and slopes.

PROPAGATION AND CULTIVATION OF BAECKEA

Most of the *Baeckea*s seem to root readily from cuttings and grow easily from fresh seed and when once established they can be easily controlled by pruning. In their natural habitat, the heathy type manage to survive a total pruning brought about by fire. After a bushfire the plants generally renew themselves quickly from the dormant buds on the subterranean lignotuber in the manner of the Honey Myrtles.

What more can be said about Heath-myrtles other than to enter into a tedious botanical description of the plants species by species or to give readers a florid pen picture of a few selected species in a vain attempt at describing their beauty? For those who wish to tell a Heath Myrtle from a Fringe Myrtle (*Calytrix*), a Scent Myrtle (*Darwinia*) or a Tea Tree (*Leptospermum*) there is the key on page 83. For those who are interested simply in getting to know the wildflowers of the land they live in, one can recommend the satisfaction to be had from growing them or, better still from leaving them unspoiled in the places where they grow naturally. The Heath-myrtles are but one group in thousands of Australian plants which enhance the beauty of the countryside—beauty which now is apt to vanish uncommonly fast before the blade of a bulldozer. How many of us will have paused to consider what magnificent trees, shrubs and herbs, must once have grown in those places where now the good earth is sealed beneath a layer of concrete or bitumen, where now perchance, a city stands?

TASMANIAN MYRTLES

Seventh article in a series on "Wildflowers of Tasmania" by A. M. Gray

The "prominent petalled" flowered species of shrubby Myrtaceae that occur in Tasmania are described briefly.

Thryptomene micrantha Hook. f. "Heath Myrtle"

This dainty little shrub has quite a restricted distribution in Tasmania, being found only on Freycinet peninsula on the East Coast. A slender, spreading shrub 1-3' high; leaves small, opposite, obovate with conspicuous oil glands. Flowers rather small, petals orbicular and only slightly larger than the sepals, white, persistent. *T. micrantha* is very easily propagated especially from cuttings, a good shrub for sandy conditions, the flowers are useful for cutting and using in bouquets, etc.

Baeckea leptocaulis Hook. f.

A rather untidy shrub, 1'-4' high or sometimes 6' in sheltered situations. Leaves narrow linear and cylindrical $\frac{1}{4}$ "- $\frac{1}{2}$ " long. Flowers are rather small, solitary in the axils of the upper leaves; petals twice as long as the sepals, orbicular and white or pale pink in colour. *B. leptocaulis* is widespread and common on wet acid heaths in the north-west, west and south coasts; it has limited use in a garden, being somewhat difficult to propagate and is rather untidy in appearance. It is found only in Tasmania.

Baeckea ramosissima (B. *diffusa* & *B. thymifolia*).

A straggling, untidy little shrub with dainty pink flowers, very noticeable in heaths on a warm sunny day; very common in Tasmania as well as in Victoria, New South Wales and South Australia.

Baeckea gunniana

A shrub of the sub-alpine plateau, fairly abundant in Tasmania as well as the mainland. It forms compact, densely branched shrubs and has quite small, rather inconspicuous flowers. The leaves are small, thick and have a pleasant sweet smell when crushed.

(Continued on page 61 under the heading "TASMANIAN TEA TREES")

ALPINE GARDENING

The above plants are recommended especially the last. For those who want trees in a cold, exposed, windy position, see "Some Garden Eucalypts" on page 69.

BOOK REVIEW

These books are not available from the Editor or the Society, but from your bookseller.

VICTORIAN NATIVE ORCHIDS—Vol. 1 by C. E. Gray Price \$3.50

A small 80 page book beautifully presented in art paper with a hard cover and gloss jacket. Seventy-one species of the terrestrial orchids found in Victoria are described with an accompanying full colour or a black and white plate of each species. The species native to the State but not illustrated, a total of 102, are listed and it is hoped to cover these in a subsequent volume. The colour plate of *Cryptostylis leptochila* on page 77 of this issue is reprinted from the book and is typical of the other thirty colour plates. *Cryptostylis subulata* is illustrated by a black and white photograph and the other Victorian *Cryptostylis*, *C. erecta* and *C. hunteriana* listed. A page is devoted to each species giving its name, botanical and common, a simple description for the amateur, its habitat and its flowering season.

1967 WILD AUSTRALIA COLOUR FOLIO Price \$1.75

Price includes postage from M. K. Morcombe, P.O. Box 54, Armadale, Western Australia. Readers will remember the beautiful colour plate of *Regelia velutina* that appeared on the front cover of our No. 28 issue and is a reproduction of a colour plate from this folio. Other colour plates of the finest quality are as large as 11½" x 9½". I have now seen a copy of the 1967 folio and it maintains the high standard of the 1966 folio, essentially a collection of full colour plates of Australian flora and fauna.

The 1967 issue has a greater wildflower representation and the main theme is the evolution of the flower for its most important function of effective cross-pollination, an aspect which seems rather neglected, though the entire form of the flower depends on the type of pollinator. Perhaps this is because most botanists tend to see the flower but not the bird or insect; the zoologist on the other hand considers too much the animal but not the flower which is essential for its survival. In folio 2 the author has tried to show the precision of the relationship between honeyeaters and the western wildflowers

TEA TREES FOR SOUTH AUSTRALIA

MYRTACEAE FOR S.A. GARDENS by I. G. Holliday—Continued from page 56

3. LEPTOSPERMUM

Several of the Tea Trees are well known in gardens.

Leptospermum laevigatum and *L. coriaceum* are small trees which are easily grown and particularly useful for alkaline soils. *L. laevigatum* is noted as a fine species for exposed coastal situations. It differs from *L. coriaceum* by its larger, grey-green leaves.

Leptospermum pubescens is a lovely small tree from South and Eastern Australia. It grows in the Torrens Gorge near Adelaide and generally inhabits the banks of streams or cool, moist situations. The tree has graceful, silvery grey foliage and white flowers.

Leptospermum juniperinum and *L. myrsinoides*, two of the smaller species found in South Australia, are delightful heathland plants with a long flowering period during late winter and spring. To my knowledge neither has been grown with any success in garden conditions.

Leptospermum persiciflorum from New South Wales does quite well in cultivation here, whilst the large white flowered species from the Grampians in Victoria, *L. nitidum*, is occasionally grown.

Leptospermum rotundifolium, which has lovely large "apple blossom" pink flowers, is generally unreliable in Adelaide's soils, although it should do well in the Hills.

Leptospermum sericeum from granite rocks near Esperance has been a recent addition to gardens of certain S.G.A.P. members living in the Mt. Lofty Ranges. This plant with its numerous large pale pink flowers, has been described as the most beautiful of the species with its large pink flowers, and seems destined to become a very popular garden shrub when better known.

The Western Australian species *L. roei* (small pink flowers) and *L. firmum* (large cream flowers) are known in a few Hills gardens.



Block donated by N. B. Thomson

LEPTOSPERMUM EREBESCENS

This is a West Australian Tea Tree. It is similar to quite a lot of other species including selected forms of *Leptospermum scoparium* marketed in various colour forms of pink to red as the exotic hybrid tea trees. A future issue will more fully describe our various tea trees and the recommended species and to assist this readers are invited to submit their comments.

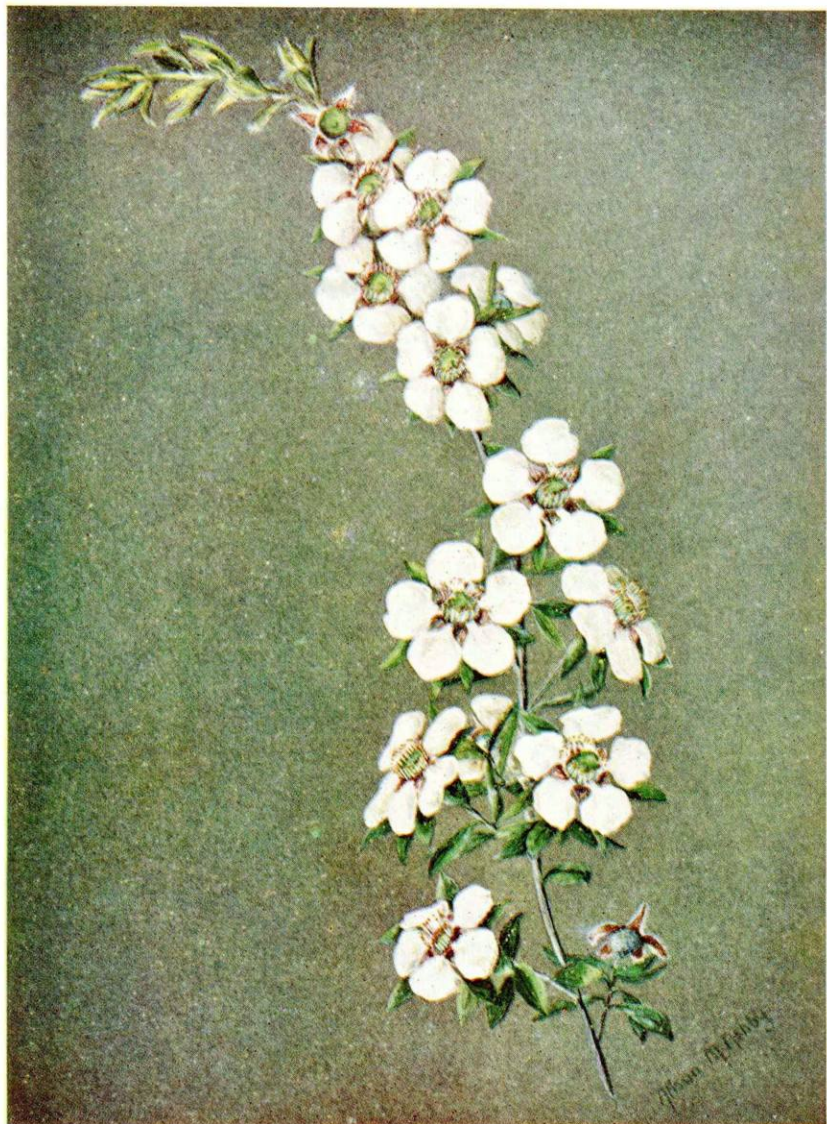
TASMANIAN TEA TREES

This article is a continuation of "TASMANIAN MYRTLES" by A. M. Gray on page 59

The two tea trees endemic to Tasmania are described first followed by a brief reference to other species also found on the mainland.

Leptospermum humifusum (syn. *L. rupestre*) "Creeping Tea Tree"

A very interesting tea tree from the Tasmanian highlands and one



Blocks loaned by the South Australian Museum with the permission of Miss A. M. Ashby

LEPTOSPERMUM NITIDUM

The plant is shown three-fifths natural size. A fairly common shrub in Tasmania and Victoria, selected forms are especially suitable for wet situations in the garden. *Leptospermum persiciflorum* is very similar to the colour plate above except that the flowers are closer to the stem. In wet situations it is very floriferous with colour blending from white to red.

with many possibilities as a rockery or ground cover plant. *L. humifusum* is a woody shrub, prostrate and the branches spreading up and over rocks and closely pressed against them; very rarely in sheltered situations a low compact shrub up to 18" high. Leaves $\frac{1}{4}$ "– $\frac{1}{2}$ " long, rather small (1" in dia.) and terminating short lateral branches or in the axils of the upper leaves; petals white. Very conspicuous when in flower due to the number of flowers and the fact that although the plant is creeping it is nevertheless very compact. In late summer an area of 3'–10' in diameter, covered with this tea tree, may be a carpet of dazzling white flowers. The capsule, when young, is covered with a scaly outer coat which soon separates; apart from this the capsule, in shape, resembles that of *L. scoparium*, though it is smaller in size.

An ideal plant for an "alpine" garden or low "shrubby"; quite fast growing, flowers prolifically and may be pruned to any size. Frost hardy and cannot be overwatered provided drainage is sufficient. Seed is available.

***Leptospermum lanigerum* (L. grandifolium) "Woolly Tea Tree"**

Another very common shrub or small tree, occurring in Tas., Vic., S.A., N.S.W. It grows from sea level to 3,000' and prefers to be in a wet position e.g. on the shores of small pools or tarns in the highlands or along the banks of rivers, etc. When young, the capsules are thickly covered with densely packed, long, fine hairs.

Leptospermum nitidum

A fairly common shrub in Tasmania and Victoria. In Tasmania it most commonly occurs in wet, acid heaths from sea level to sub-alpine situations. The capsules are rather large and scaly.

***Leptospermum sericeum* Labill. (vice *L. flavescens* and *L. myrtifolium* of Rodway's "Tasmanian Flora").**

A very variable shrub, or sometimes a medium sized tree up to 50' high, the branches erect, drooping or spreading. The leaves are usually oblong or oblanceolate, apex rounded from $\frac{1}{4}$ to 1" long usually glabrous and slightly glaucous, occasionally with a covering of very fine hairs. Flowers small and solitary in the axils of the upper leaves or a few together at the ends of short lateral branches, petals small, white. The capsule of this species is quite attractive, unlike most other species it does not become dry and woody but remains fleshy or of a leathery texture and usually a conspicuous dark red colour until it withers and releases the seeds. *L. sericeum* is abundant on wet, acid heaths throughout Tasmania except in the East. It makes an attractive compact bush for a damp spot if well pruned.

Leptospermum laevigatum

A shrub or small tree, common in the N.E. and N.W. of the State as well as in Vic., S.A., N.S.W. and Qld. Usually occurs in sandy lowland heaths.

Leptospermum grandiflorum

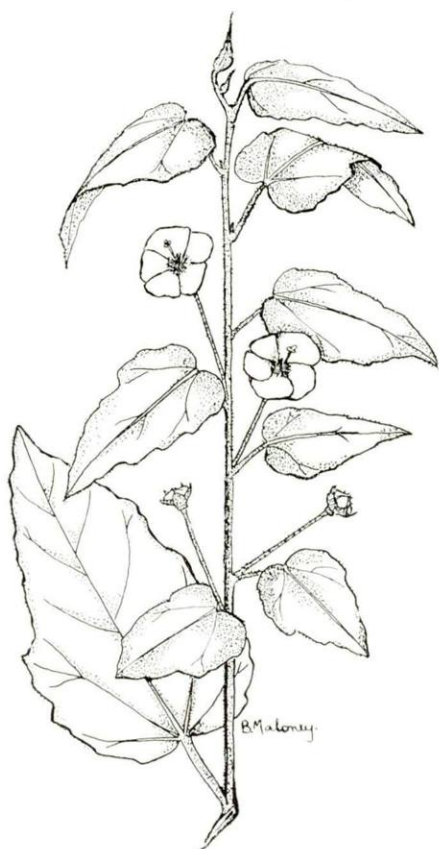
A rather attractive shrub with large showy flowers and light greyish foliage. Found on granite rocks at 1000' on Freycinet Peninsula, on the East Coast of Tasmania; it is also found in Vic. and N.S.W.

***Leptospermum scoparium* — "Manuka"**

This very common shrub is abundant in a variety of habitats throughout Tas., Vic. and New Zealand. Many colour forms of this plant have been extensively sold and planted throughout Aust. and N.Z. A variety *L. scoparium* var. *eximium* occurs in the S. and S.W. of Tasmania. It differs in having leaves which are broadly obovate or almost orbicular but pungent.

The Genus *Howittia*

by Alec Blombery



The genus *Howittia* is one of the lesser known of the family Malvaceae and is endemic to Australia. The genus is monotypic with the one species *H. trilocularis* being found chiefly in well drained soil in moist coastal gullies in New South Wales and Victoria. The species is reported to have been collected in South Australia some years ago but apparently does not now occur naturally in that state. *H. trilocularis* is an erect shrub with soft hairy leaves and branches. The leaves vary in shape from ovate cordate to ovate lanceolate to broadly lanceolate, depending upon conditions of growth; the leaves are often lobed, clearly shown in Betty Maloney's drawing. The flowers are violet coloured and are borne singly on a slender peduncle in the leaf axils, chiefly from July until January. They are an inch or more in diameter and resemble very small *Hibiscus* flowers but are readily separated from that genus by the 3-lobed stigma, the absence of an epicalyx (i.e. the outer ring of bracteoles resembling a second calyx) and the 3-celled fruit. The seed capsule opens when ripe, re-

leasing several seeds, chiefly from late November to January.

See page 92 for a guide to cultivation and a colour plate.

PROPAGATION OF WILDFLOWERS

Mr. Blombery prepared the following advice for the propagation of *Howittia* above. However the method is also applicable to the heath myrtles that represent the principal subject of this issue with the possible exception that in some cases such as *Baeckea* it is necessary to use cuttings of a smaller length, the foliage being often very tiny.

The species is readily propagated from seed or cutting. Seeds may be sown in a seed box, pot, tin, or other type of container filled with light sandy soil or other friable material. Germination takes place in 3 to 4 weeks and seedlings should be pricked out and potted when one to two inches high in a good friable sandy soil. Cuttings 4 to 5 inches in length of lateral or leading shoots taken in spring and autumn strike readily in such mediums as coarse river sand, river sand and peat, vermiculite or similar material, placed in a pot or other well drained container. The container with the cuttings should be placed in a cutting frame, or be protected with a glass jar, plastic bag or other means in a half-shaded position. When the cuttings are well rooted (two to three months after setting) they should be potted into a good friable sandy soil; both cuttings and seedlings should be allowed to become well rooted in their container before being planted.

PRIONOTES R.Br.

by Betsy R. Jackes (Townsville University College)

Prionotes cerinthoides R.Br. is usually regarded as the only species in the genus, however an epacridaceus species from South America is sometimes placed in this genus. This climbing or epiphytic shrub is endemic to Tasmania particularly to the west and south-western rain forest areas. It is commonly known as the "climbing heath", because of the straggling branches which may climb over other vegetation to a height of 6-10 m.



Photography by A. M. Gray

PRIONOTES CERINTHOIDES

The margins of the thick, oblong leaves are somewhat serrated. In the upper axils are the pendulous crimson flowers, which may be more than 2 cms. long. In both this genus and *Archeria*, the subtending bracts are at the base of the pedicels distinct from the sepals, however the stamens in *Prionotes* are free whereas in the latter they are epipetalous.

This shrub is suitable for growing in cool moist gardens, preferably in an area where it may climb and suitably display the mass of crimson flowers appearing in late February and March.



Flower spike shown full size

Leaf 2.5 x full size and flower section 3.5 x full size

PRIONOTES CERINTHOIDES (LABILL.) R.BR.

Eighth article in a series on "Wildflowers of Tasmania" by A. M. Gray

In Tasmania there occurs a very interesting and beautiful plant which many botanists believe to be a link between the *Ericaceae* and the *Epacridaceae*, some see it as a link between the *Rhododendrons* of the Himalaya and our *Epacridaceous* plants. The plant about which I am speaking is *Prionotes cerinthoides* or "climbing heath", a woody, evergreen climbing plant, bearing in summer magnificent displays of rich crimson tubular flowers. An inconspicuous plant when not in flower, it occurs in the wet rain-forests of the west, south and south-west, straggling over damp, mossy banks or climbing up the trunks of forest trees to a height of fifty feet or more.

Prionotes contains but one species, endemic in Tasmania. Its nearest related genus is a South American plant, *Lebetanthus*, which has one species endemic in Patagonia and Fuegia. *Prionotes* and *Lebetanthus* differ in the characters of the ovary and to a lesser extent the flower.

Prionotes differs from the usual *Epacridaceous* plant in that the leaves are not veined whereas in other *Epacridaceae*, they are normally parallel

veined. The climbing habit of *Prionotes* is also of interest. Whilst using a tree for its support, the branchlets of *Prionotes* penetrate the loose outer layers of the bark and take on the function of roots, obtaining nutrients from the dead organic matter contained therein and rendered useful by an associated mycorrhiza. In many respects *Prionotes* may well be called an epiphyte. The following is a detailed description of *Prionotes* followed by the description of a successful experiment on the propagation of this plant.

Prionotes cerinthoides (Labill.) R.Br. "Climbing heath" (*Epacris cerinthoides* Labill.) A slender, straggling shrub, usually climbing, epiphytic. Branches slender; leaves shortly stalked, narrow-oblong or elliptical, apex rounded or truncate, flat, margins with a few blunt teeth, when young tipped with a fine, glandular hair; venation reticulate $\frac{1}{2}$ "-1" long, $\frac{1}{4}$ " broad. Flowers solitary in the axils of the upper leaves, pendulous on slender pedicels about $\frac{1}{2}$ " long. Bracts few very small, bracteoles closely embracing the calyx tube. Sepals ovate, acute, ciliate, $\frac{1}{8}$ " long. Corolla bright crimson, cylindrical $\frac{1}{2}$ "-1" long, broadest at the middle, contracted at the throat, lobes 5, small, broad, recurved. Stamens 5 free from the corolla, inserted on the receptacle, filaments as long as the corolla. Anthers joined to the filament except at the base, bilocular but opening by a single longitudinal slit. Style in a deep depression in the ovary, stigma small, exserted. Ovary hirsute, fruit a capsule about $\frac{1}{8}$ " long.

A fairly common plant in rain-forests of the W., S. & S.W., from sea level to 3000 ft.

PROPAGATION & CULTIVATION OF EPIPHYTES

As *Prionotes* is an epiphytic plant, little success can be obtained by growing these plants without some special attention. Although cuttings may be struck in the usual manner, or seedlings raised, these soon sicken and die without proper conditions. The following experiment was carried out early in 1966, all plants are still healthy and growing vigorously.

Fifty cuttings collected 12/12/65, second year laterals and hardened green tips were used, none with heels and the cut in relation to a node did not have any significance. The cuttings were struck in a medium of half coarse sand and half vermiculite (by volume) mist conditions for 6 hours per day—9 a.m. - 3 p.m., 3 minutes on, 2 minutes off. No rooting hormone was used. On inspecting the cuttings in May 1966, 48 were sufficiently rooted as to warrant potting, the two remaining had callused and were replaced in a small pot. It can be seen that by using the above method, virtually 100% strike was obtained. The rooted cuttings were potted into 3" earthenware pots, using $\frac{1}{2}$ " of fine gravel chips as the drainage medium, the soil was made up as follows, all parts by volume.

One-third light, well decayed humus, gathered from the floor of a "Myrtle"—sassafras forest with *Euc. delegatensis* overstory; one-third coarse sand from a creek bank; one-third finely crumbled, well decayed Eucalypt wood, taken from a very old decayed log lying in a forest in the vicinity of *Prionotes* plants.

On top of the pot, heaped up around the plant stem was placed a layer of the last ingredient, finely crumbled. This is the vital factor in keeping the plant supplied with its vital nutrient, for as mentioned earlier *Prionotes* requires the activities of a mycorrhizal agent for its subsequent well being. Since potting, all plants appear vigorous and healthy "branches" have penetrated the decayed wood mass and new shoots and leaves have appeared.

When planting out, *Prionotes* would require a shaded damp position free from direct sun and drying winds. An old decayed log or branch should be provided for it to climb upon and allow it to ramify its "branches" into the substance, large amounts of decayed wood chips and moss should be heaped around the plant and kept permanently damp.

At the present time work is being done to determine whether seedlings will benefit from this treatment. It is also proposed to try grafting scions of *Prionates* onto various species of other *Epacridaceous* plants to determine whether or not it would grow without its associated fungal organisms.

A WILDFLOWER GARDEN — 3

SOIL TREATMENT FOR THE SMALLER NATIVE PLANTS

The third article in a series by E. M. M. Boddy on this subject, the first two articles "A Wildflower Garden" and "Showy Wildflowers", appearing in our No. 22 issue.

Many of the larger native species such as the tall *Eucalypts*, *Acacias*, *Melaleucas*, *Grevilleas*, and *Hakeas* etc. will thrive in average heavy soils and eventually develop their root systems deep into stiff clay where they obtain stability and much of their sustenance.

The majority of the smaller plants thrive in the sandy soils of the heath lands where they grow en-masse and with the aid of falling vegetation, the shaded top soils are protected from excessive summer heat, the delicate root systems do not suffer and the friable nature of the soil aids in the admission and retention of moisture, which in short, is the principle of dry farming.

Soil treatment would be necessary in many home gardens in order to grow many species successfully.

In March, 1965 a large collection of plant material (vegetative cuttings) was collected in Western Australia from areas adjacent to Perth and from Gin Gin, Moora, Dandaragan, Eneabba, Geraldton and beyond the Murchison River to approx. 450 miles north of Perth. The plants from which cuttings were selected were all growing in coarse sandy soils with no great evidence of nutriment. Nevertheless, these were in areas of wheat lands with limestone outcrops evident in many places and field pH tests over a large range of country showed a neutral reaction.

A good proportion of the plant material was successfully propagated, grown on in containers and planted in a specially prepared raised bed in March of this year, 1966.

SOIL PREPARATION, ETC.

1. A 6" high brick wall with a minimum of cement mortar was constructed over heavy loam to the north of a white wall. Sunlight owing to surrounding trees approx. 50%.

2. The basic soil was very acid sandy loam from Anglesea, similar to Cranbourne loam and was neutralised with lime to just under neutral.

3. Additives were approx. 10% peat moss (composte as an alternative), 10% mountain soil from the Dandenongs and 50% coarse sand to $\frac{1}{8}$ " grit.

4. The soil mixture was tamped and watered until reasonably firm and the plants selected were of medium size grown in parallel sided containers. After planting the bed was mulched with $\frac{3}{8}$ " blue metal screenings and brick dust; crushed brick would have been used if available at the time.

REWARDING RESULTS—

Verticardia huegeli, *V. picta*, *V. grandiflora*, *V. roei*, *V. mitchelliana*, *V. acerosa*, *V. nitens*, *V. insignis*, *V. monodelpha* and *V. grandis* are all thriving to an extent not previously achieved.

Nematalepis phebalioides, *Pileanthus filifolius* and *P. peduncularis*, *Darwinia meeboldi* and *D. carnea*, *Banksia septrum*, *Pityrodia verbascina*, *Hemiandra pungens* (pink), *H. longistylus*, and *H. gardneri*, *Baeckea camphorosmae*, *Boronia gracilipes*, *Hypocalymma xanthopetalum*, *Micromyrtus* and *Calytrix* from the Eastern States together with many unidentified species from Eneabba continuing in growth quite beyond anticipation.

THRIVING LESCHENAULTIA—

On occasions I have been informed by clients, "I had a *Leschenaultia* and it died." *Leschenaultias* may be found growing in W.A. in what would appear the most adverse conditions, in sandy table drains to be shorn off by a grader, and sprouting out with tremendous vigour. *Leschenaultias* are now responding to the soil mixture as previously described with the vigour that they once did before soils in the nursery were encouraged in acidity and became compacted through the absence of sufficient sand.

An extension to this bed was planted at the end of May into June which was in very much cooler weather. The plants have put on growth but not to the extent of those that experienced some very warm days in March.

NEUTRAL SOIL?

It is my impression that many native and exotic plants will exist in highly acid soils, others in alkaline soils, but possibly all plant life may prefer nearer neutral soils. This is a matter for further experiment for those with time on their hands.

We have always achieved the best results in planting into the ground during the warmer periods of the year which should not be difficult wherever there is a garden tap. The periods in a planting programme that I would avoid are mid-winter and windy days, but of course, hot weather demands additional initial watering in.

FROST HARDY NATIVES — PART III

by Toss Frazier, Armidale, N.S.W.

Part 1 appeared in *Australian Plants* Vol. 3, No. 25.

Mr. Frazier is investigating frost hardness of Australian plants and other reports are requested to be forwarded c/- the Editor.

The winter of 1966 was severe, even lower temperatures than those in 1965 were recorded. In addition a heavy snowfall in late May completely covered and weighed down our plants for a period up to six hours before the thaw set in. The lowest ground temperature of 7 deg. F. was recorded in mid July and during the period from mid June to late August several readings from 10 deg. to 16 deg. were taken. Due to the extreme dryness of the soil from continued drought it would appear that it was a probable factor in minimising the effect of the low temperatures as the resultant damage to plants was not as severe as might be expected.

The plants listed in Part 1 in Groups 1 and 2 were confirmed with one exception. Two plants of *Pimelea ligustrina* (3 ft.) were not damaged and could perhaps be transferred to Group 1. A further fifty species will be added in my next report as all survived the above conditions. Many were only small however, and next winter will confirm the frost hardness.

FLOWERING SOME SPECIAL PLANTS

As a matter of interest to growers I have a rocked up bed in front of the glasshouse wall with a northern aspect and sun all day. In this bed are *Verticordia* species, several forms of *Leschenaultia biloba* and *L. formosa*, *Calytrix* species from W.A. and *Tetratheca* species among others. On frosty nights a hessian cover was drawn over the bed and these plants wintered without any damage. I am now rewarded with (early October) mass bloom from the *Leschenaultias* and *Tetrathecas* and two *Verticordias* and a *Calytrix* just coming into bloom. The little extra effort to grow these gems is more than worthwhile.

Among the plants set out this spring are several dwarf eucalypts, *Dryandra*, *Hakea*, *Acacias*, several *Phebalium*, *Zieria* and *Asterolasia*. These will be the subject of a later report.

SOME GARDEN EUCALYPTS

by Richard C. Barnard, M.A. (Forestry)

Reprinted from the Vol. XCI, Part 5 issue of the "Journal of the Royal Horticultural Society", England, with permission.

There is "something about" the eucalypts which fascinates and intrigues peoples of all countries where they occur naturally or have been introduced. Their outstanding beauty and variety as trees and shrubs compel attention and invite enquiries. Interest is soon aroused by the adaptability, very fast growth and usefulness of the genus for timber for all purposes from heavy construction to paper pulp, for honey, for medicinal and other volatile oils of delightful fragrance and for amenity planting for the beauty of their bark, tree form, foliage and in a few cases flowers.

FROST—

Frost resistance is the first characteristic to consider in many situations and this cannot be assessed by species alone. Evolution in Australia, following the Ice Age, was interrupted by a period of intense drought and heat which killed off most of the flora except for small pockets of survivors. As the Continent cooled and a better climate developed, vegetation began to spread from these pockets of tropical and sub-tropical plants. In time frost-resistant strains (ecotypes) evolved which spread up the mountains into colder localities. For these reasons, the natural occurrence of most of the 650 described species and varieties of eucalyptus is very localised but in the locality of natural occurrence of a species there may be a great range in altitude, over 4,000 feet in a few cases, showing great adaptability. Trees at the lower elevation may rarely be subjected to frost but those at the highest elevations will have survived frequent and severe frosts. For example, the lowest screen temperatures recorded at some Meteorological Stations are:—8°F. at Charlotte Pass (5,800 feet), 5°F. at Kiandra (4,578 feet), 6°F. at Mt. Kosciusko (5,018 feet) all in New South Wales; 0°F. at Mt. Hotham (6,100 feet) in Victoria and 9°F. at Oatlands (1,418 feet) in Tasmania (Foley, 1945). Therefore, in selecting eucalypts for frost hardiness it is essential to know seed provenance, i.e. locality of seed collection. Commercial seed collection in Australia and Tasmania is done mostly for commercial forestry purposes at the altitudes of optimum development of the species where timber felling is being done. Collection at the highest altitudes of natural occurrence has rarely been done, fruit is seldom plentiful and pollen may have come from a tree at a considerably lower altitude with less frost resistance. In every country where eucalypts have been introduced and fruited, their progeny have shown greater vigour, better tree form and more reliable frost resistance than imported seed. Geneticists consider this to be the effects of mass selection and not adaptation to the new environment but seed from local trees is always preferable to imported seed.

FROST & COLD WINDS—

The damaging and lethal effects of frosts and freezing winds are extremely complex and variable. Minimum temperature is a poor guide, but the only readily available one, and varies greatly from site to site and from ground level upwards. Five inexpensive but "zero-ed" minimum thermometers (unscreened) placed in the open on my small holding have recorded as much as 6°F. difference between 6 inches and 3 feet above ground level and up to 9°F. difference (at 3 feet) between the upper and lower end of my small holding, a distance of almost 200 yards and 25 feet difference in altitude, during radiation frosts. The popular idea that Devon enjoys a sub-

tropical climate applies only to very restricted coastal localities. The site on which I grow eucalypts, about 235 feet elevation with a north-east aspect, is by no means favourable to tender plants nor is it protected from the freezing north-east winds which usually accompany periods of exceptionally severe weather. After the winter of 1962/63 with its exceptionally low temperatures and freezing winds, several of my trees were quite undamaged, many only slightly damaged, and eucalypts in counties where the minimum temperature went much lower than on my holding also survived.

An important factor affecting frost resistance in the eucalypts is the age of the plant. From successive annual plantings of the same species and provenance, it appears fairly certain that an older plant will survive more severe cold than young ones. The basal bark of the less hardy species and provenances is a vulnerable spot while the bark is young, and some protection is recommended for the first one or two winters. Damage of this type may not become apparent until well into the following summer when leaves start dying. If the bark is cut into, a ring of bark, perhaps only an inch wide, just above ground level will be found brown and dead. If the bark is alive below ground level shoots will be pushing up by the end of May at the latest. The survival of many *E. globulus*, of which no really hardy provenances are known, may have been due to a few mild winters following the years of planting, during which time the basal bark thickened, giving sufficient protection to the cambium to enable it to survive frosts subsequently. Mild winters are a matter of chance, and a wise gardener does not trust to luck if the means are known whereby risks can be eliminated or greatly reduced.

WIND RESISTANCE—

Of all the adverse factors of the environment responsible for failures of hardy eucalypts, wind is probably the most important. Eucalypts "rocked" by winds or gales when young may never attain full vigour or become windfast. Rocking not only causes root damage, to which eucalypts are particularly sensitive, but puddles the soil and makes an opening around the base of the plant in which water collects and into which frost penetrates, both with harmful results. To ensure steadiness in gales, really strong staking and secure tying is necessary from the start, and on sites with a fertile soil and heavy rainfall, such as mine is, this is quite a problem. In my conditions, it has been found necessary to stake almost everything, willows, Leyland and Lawson Cypress, even brussels-sprouts in a sheltered vegetable garden, and *C. macrocarpa* and *C. lawsoniana* 'Allumii' between twenty years old or more have been blown over or broken in gales. Eucalypts develop larger and more leafy crowns in my soil than on drier and less fertile sites but *E. niphophila*, *E. dalympleana* and some *E. gunnii*, *E. perriniana*, *E. parvifolia* and *E. urnigera* grown as trees and adequately staked for the first four or five years have been windfast since. Wind resistance also is closely related to the type of planting stock used, which will be discussed later.

Given seed of a reliably hardy provenance, the successful establishment of eucalyptus, or their failure, is almost entirely dependent upon treatment during the first six months after germination. As mentioned earlier, seed collected from trees growing in this country can be expected to produce hardier and more vigorous planting stock on average than imported seed, so a brief note on flowering, fruiting and seed collection is needed at this point.

FLOWER TO SEED—

Some eucalypts will start producing flower buds at two or three years from sowing and many species before they are six years old. The genus

AUSTRALIAN PLANTS

A publication by The Society for Growing Australian Plants

This is the third volume comprising issues 21-28 inclusive. Volume No. 1 comprises issues 1-12 and is now out of print (most issues still available singly) and Volume No. 2 comprises issues 13-20. These are still available from the Editor, 860 Henry Lawson Drive, Picnic Point, N.S.W. Each volume sells at \$6.00 plus 20c postage.

Although each volume contains issues of a continuing periodical, each in itself is a valuable reference and the possession of previous volumes is not essential to its use as a guide to the cultivation of wildflowers in the garden.

VOLUME III INDEX

An index to Volumes 1 & 2 is contained in the No. 21 issue, the first of Volume No. 3. A further index to all wildflowers already used in garden cultivation appears in the publication in the back of volume No. 3 (bound), "A Catalogue of Cultivated Australian Plants".

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CORRECTION—

CHORICARPIA OR SYNCARPIA

A correction submitted by K. Mair, Director and Chief Botanist, Royal Botanic Garden and National Herbarium, Sydney

Members of my staff and I view with some concern the article "The problem of *Suncarpia*" by C. N. Debenham in "Australian Plants" Vol. 3, pages 362-365, September 1966. The author has failed to refer to three recent publications highly relevant to *Suncarpia* and *Choricarpia*, and his last paragraph is likely to give a quite misleading impression that his statements are based on a full discussion of the matter with members of my staff.

In our view the union of *Choricarpia* and *Suncarpia* is not justified and the replacement of the name *S. glomulifera* by *S. procera* is quite wrong. The relevant specimens and notes made available in this Herbarium included the information leading to these conclusions.

Johnson (Contrib. N.S.W. Nat. Herb. 3: 93-102, 1962) transferred *S. subargentea* to *Choricarpia*, as *C. subargentea* (C. T. White) L. Johnson. This treatment was based on general morphology as well as anatomical characters of the wood (Ingle and Dadswell, Aust. Journ. Bot. 1: 353-401 1953) and the bark (Bamber, Aust. Journ. Bot. 10: 25-54 1962). There are marked differences in these features between the two genera, but within each the species are in close agreement.

Choricarpia includes two species, i.e. *C. leptopetala* (F. Muell.) Domin. and *C. subargentea* (C. T. White) L. Johnson. The features used Mr. Debenham's key to separate species 1 and 2 from 3 and 4 serve to separate the genera and the further key divisions are also adequate. SYNCARPIA GLOMULIFERA not *S. procera*.

The original description of *Metrosideros procera* Salisb. (Prodr. Stirp. Hort. Chapel Allerton 351, 1796) is very brief and was based on vegetative and probably juvenile material but it mentions features which are quite inconsistent with those of the "Turpentine." No Type Specimen exists and the name must be regarded as altogether dubious in application. Consequently the correct name of the species remains *S. glomulifera* (Sm.) Niedenzu. Incidentally, the original author was the famous English botanist Sir James Edward Smith, not John Smith as stated by Mr. Debenham.

FROM THE AUTHOR

The author of the paper on *Suncarpia* has also forwarded a note to the Editor indicating that his acknowledgement to the Herbarium staff was in appreciation for the material made available for study and for discussion on the floral features of *Choricarpia leptopetala*. It was not intended to imply that the article itself had been approved by any member of the staff of the National Herbarium.

THE FAMILY MYRTACEAE

The large family of Myrtaceae are of special horticultural interest and the following is intended to review our progress in properly presenting these plants. The Australian genera in the family are arranged in tribes and sub-tribes in a manner adopted from Bentham's account in the *Flora Australiense*. The number of species given are the species native to Australia.

TRIBE LEPTOSPERMEAE

Sub-Tribe *Bachousiinae*

Bachousia with 6 species and *Osbornia* with one species all confirmed to the east coast or Nth. Qld. We have not described these yet.

Sub-Tribe *Metrosiderinae*

"Australian Plants" has dealt only with *Syncarpia* (a classification by C. N. Debenham, Vol. 3, page 362) and a correction to reinstate *Choricarpia* as stated on the page previous to this.

Syncarpia—4 species. See Vol. 3, page 362.

Choricarpia—2 species. See correction to *Syncarpia* on rear of this page.

Lysicarpus—1 species. S.E. Qld.

Metrosideros—2 species. North Qld.

Xanthostemon—5 species.

Sub-Tribe *Eucalyptinae*

Eucalyptus—A very large genus of our "gum tree" with about 500 species. Articles appear in many issues as indexed.

Angophora—The eight species are fully described in Vol. 1, issue No. 7, page 19.

Sub-Tribe *Leptosperminae*

All genera in this sub-tribe have been introduced briefly in our No. 10 issue where a sketch shows the difficult flower characters. They are again mentioned in our No. 20 issue.

Agonis, 12 species confined to W.A.; *Callistemon*, about 25 species many mentioned in various issues; *Conothamnus*, 3 species confined to W.A.; *Kunzea*, 25-30 species; *Lamarchea*, 1 species in W.A.; *Leptospermum*, 40 species approx.; *Melaleuca*, 140 species approx.; *Sinoga*, 1 species.

Sub-Tribe *Calothamminae*

All the genera in this sub-tribe have been mentioned principally in our No. 20 & 28 issues. *Beaufortia*, 16 species in W.A.; *Calothamnus*, 24 species in W.A.; *Eretnia*, 6-7 species in W.A.; *Phymatocarpus*, 2 species in W.A.; *Regelia*, 3-4 species in W.A.

Sub-Tribe *Baeckebinae*

These are all species where the petals are the prominent feature of the flower and are first mentioned in our No. 30 issue of Vol. 4.

Astartea, 5 species in W.A.; *Baeckea*, approx. 70 species; *Balaustion*, 2 species in W.A.; *Hypocalymma*, 13 species in W.A.; *Scholtzia*, 13 species in W.A.

TRIBE CHAMELAUCIEAE

As with the sub-tribe *Baeckebinae* above these are also principally twiggy shrubs with small flowers in which the petals are prominent. The No. 20 issue first introduces them, with the exception of *Fileanthus* that appears in No. 23 issue.

Actinodium, 1 species only from W.A.; *Calythropsis*, 1 species in W.A.; *Calytrix*, 40-50 species; *Chamelaucium*, 12 species from W.A.; *Darwinia*, 35 species; *Homoranthus*, 3-4 species; *Homalocalyx*, 3-5 species in W.A.; *Lhotskya*, 10 species; *Pileanthus*, 3 species in W.A.; *Thryptomene*, 35-40 species; *Verticordia*, 50 species; *Wehelia*, included in *Homalocalyx*.

Sub-Tribe *Calythriceae*

It is likely that some of the above genera can be placed in a sub-tribe. They are *Calytrix*, *Calythropsis*, *Lhotskya* and *Homalocalyx*.

TRIBE MYRTEAE

None of these mostly from the east coast of Australia, have been presented in *Australian Plants* yet.

Acmena, approx. 10 species; *Astromyrtus*, 9 species; *Decaspermum*, 2 species; *Eugenia*, the species placed under *Acmena* and *Syzygium* are sometimes referred here; *Fenzlia*, 3-4 species; *Ptilidistigma*, 4 species; *Rhodamnia*, 7 species; *Rhodomyrtus*, 7 species; *Syzygium*, approx. 30 species.

is unusual in that flower buds do not usually open until a year after formation and the fruits are not mature for another year. On vigorous young trees the blossoms on the main shoots will be a long way down the stem when they open and ripe fruit double this distance but, on the slow-growing side shoots of trees five or more years old, a mass of blossom makes a very pretty sight for several weeks. In all the hardier montane species, the flower buds form in the axils of the leaves at various times during the growing season according to species and the clusters (umbels) of usually three, seven or fifteen flowers develop to full size quickly but do not usually open until the following year. The individual flowers are interesting, being made up of two parts separated by a distinct line. The upper part is in the form of a cap (operculum) which is a fusion of the petals and varies in shape from species to species, and the lower part a hollow tube (receptacle) in which the ovary is immersed and fused. Eventually the cap separates and falls off, revealing a mass of stamens with long stalks (filaments) which unfurl to form the blossom. The colour of eucalyptus flowers depends upon the colour of the filaments, which is white or cream in all species except a few tender species with pink, red or yellow filaments. Pollen is usually shed within twenty-four hours but the stigma is not receptive until a few days after the operculum has fallen. Pollination is carried out by bees and flies. Self-pollination is therefore unusual and few fruits set seed until a tree bears a good crop of flowers which open successively over several weeks. Provided at least one ovule has been fertilised, the receptacle develops in a few weeks into a full-sized woody fruit, the size and shape of which is a useful aid in identification, popularly known as a "Gum-nut" though botanically a capsule. If no seed has been set, the receptacle shrivels, dies and falls off. Within a few months of flowering the young fruits are almost indistinguishable from previous years' fruits but, if collected before they are ripe, may not open or will shrink, imprisoning the seed. The best time to collect fruit is at flowering time when all the fruit will be one or more years old. Unless there is no objection to cutting off branches bearing fruit and flowers, so losing some fruit in the future, collection is done by hand, twisting off individual fruit or the clusters. As each capsule rarely contains more than three fertile seeds, the collection of any quantity of seed takes a long time. As long as the branch to which the fruit is attached remains alive they do not appear to open on the tree in this country. Fruits broken off during gales, and fallen fruit, may be the only way of collection from large trees.

TREATMENT OF SEED—

The fruits, spread out thinly on a tray in a dry room, open the valves in the flat end of the capsules in a few days and the fertile seed and "chaff" (unfertilised and imperfect ovules) falls out with stirring and shaking. The fruits are easily separated from the seed and chaff by shaking on a perforated zinc sieve and, with small quantities, it is worth putting the dried fruit into a screw-topped jar and shaking them energetically which often dislodges an appreciable percentage of more fertile seed. The seeds of the hardy species are very small, black or dark brown and distinguishable from the chaff which is smaller, light brown or reddish brown. It is not necessary to separate seed from chaff and both may be sown together. Seed kept in paper packets or stoppered bottles in a dry place will retain its viability for several years. Heat should not be used during seed extraction as it may induce secondary dormancy and seed should not be stored in a hot place.

When purchasing seed of "hardy" eucalyptus (or plants), never buy unless the seed provenance is known and stated, for the specific name alone cannot define frost-hardiness. In the case of seed imported from Australasia, altitude is the most important locality factor and, as an approximate guide, 4,000 feet for New South Wales and Victoria and 3,000 feet for Tasmania are the lowest limits for reasonable frost resistance.

Eucalypts are commonly considered "difficult plants." The use of the word "difficult" in this context appears to me to be incorrect. Plants do their own growing and any plant will flourish given the right environment and correct management or culture. Eucalypts have quite difficult growth habits to the common British trees and shrubs and, therefore, need somewhat different culture for reliable results. It is no more difficult to raise eucalyptus seedlings than the small-seeded half-hardy annuals but rather more attention is necessary.

No worthwhile method of vegetative propagation has yet been discovered. Cuttings very rarely produce roots and only very young basal shoots are known to have developed roots and there are no records of trees established from cuttings. Air-layering, bottle-grafting and approach-grafting have been achieved with a few species. (See details in No. 14 issue—Ed.).

PROPAGATION FROM SEED—

Throughout the world, eucalypts are raised from seed and it is doubtful if any other single genus of trees has been the subject of such intensive scientific research during the last two decades as the eucalypts. The prescriptions and recommendations which follow are based on these research results and on the writer's experience and experiments with tropical species in Malaya from 1932 to 1956 and with alpine and sub-alpine species in Devon since, including discussions and correspondence with other experienced eucalyptus growers in this and other countries.

The seed of alpine and montane species is very erratic in germination which may start in ten to fourteen days and be complete in a further similar period or may continue over a period of a year. Rapid and complete germination is particularly desirable and cold, moist storage at about 35°F. (bottom of a domestic refrigerator) for six to eight weeks before sowing has been found a satisfactory method of breaking dormancy. This does not appear necessary for *E. gunni* and the less hardy species.

TREATING THE SEED—

Cold wet storage, recommended to me by Dr. R. D. Johnston in 1964, has greatly improved the germination of several species which I have tried, both imported and freshly collected local seed. The seed is placed in a small glass or clear plastic bottle or polythene bag, distilled water added to about half-full, sealed, then well shaken to wet and sink the seed as far as possible, as it seems waterproof. Regular inspection is advisable as germination may start after four weeks and at the first sign of any small white radicle appearing the seed should be sown. Even if no radicle is showing the seed should be sown after four to eight weeks. The seed is washed out onto absorbent paper, allowed to drain, then gently mixed with dry, fine sand, moving over to a dry part of the paper, until the mixed seed and sand are in a suitable condition for sowing evenly. It must then be sown immediately. With seed collected from my trees, I have sometimes obtained better germination from seed stored for six months or longer than from fresh collected seed. Possibly ripening overcomes one type of dormancy.

EUCALYPTUS MANNIFERA — "RED SPOTTED GUM"

by R. W. Boden, Research Officer, Parks & Gardens Section,
Department of Interior, Canberra.

This species is more widely known by its later synonym *E. maculosa*, however as interpreted by L. A. Johnson (Contrib. from N.S.W. National Herbarium Vol. 3, No. 3, 1962), *E. mannifera* comprises a number of ecological and geographical races for which taxonomic distinction as a subspecies is desirable. One of these is *E. mannifera* ssp. *maculosa* which occurs widely throughout the Central and Southern Tablelands of N.S.W. and A.C.T. and has been used extensively as a street tree in Canberra.



Eucalyptus mannifera ssp. *maculosa*
Hopetoun Circuit, A.C.T. The trees are 8 years old and have been pruned up to allow access to the lawn area beneath and to improve site lines. There has been some thinning of the crown which will be continued to maintain a single leading stem.

"Red Spotted Gum" is commonly raised from seed and planted out when 12-18" in height. Trees for street planting may be grown on in the nursery to 3-4' in large drums but care must be taken that root system does not become pot bound. Plants with a pot bound root system will seldom develop well when planted out, often failing to become wind firm. Grafting of selected forms has been carried out in a small way, and shows great promise for the future.

E. mannifera grows to a height of fifty feet and should only be planted in wide streets without overhead power lines, or in parkland settings.

Maintenance is relatively light consisting of early pruning to establish a strong leading stem, followed by thinning of the crown to induce shapely branching as the tree grows.

"Red Spotted Gum" *E. mannifera* ssp. *maculosa* should not be confused with "Spotted Gum" *E. maculata*, for although they bear a resemblance in bark colour they occur naturally in widely different ecological situations, the former confined to tableland areas the latter to coastal regions of eastern Australia.

E. mannifera ssp. *maculosa* differs from other subspecies in having narrow, usually drooping foliage, giving it a very attractive appearance. The white bark is most striking and in early autumn peels off to reveal the new bark which is bright yellow. Flowers are small and white appearing in autumn; seed takes about six months to ripen.

This species has many of the graceful characteristics of *E. citriodora* "Lemon Scented Gum" with the added advantage of frost hardiness which enables it to be planted in regions where *E. citriodora* would not survive.

Staking is not necessary if young sturdy trees are planted, unless to provide protection from damage.

Watering at planting time, and during the following summer, is necessary to ensure successful establishment. The species is native to regions with annual rainfall of 23-28 inches, and if grown in areas of lower rainfall regular summer watering is necessary.

This tree will grow in a wide range of soil types but requires good drainage and is intolerant of boggy conditions. There is a marked response to the application of 2-3 ozs. of an N.P. fertiliser at planting time.

In some seasons *Eriococcus* scale can be a serious problem. Scale insects cluster along young stems and exude a white coral-like protective covering making control difficult with contact insecticides. Scale insects exude a sticky substance on which a black sooty mould grows causing an unsightly appearance on the leaves and sometimes the soil beneath the tree.

Leaf galls may also give an unsightly appearance at times.

Nevertheless *E. mannifera* is one of the most attractive and graceful Eucalyptus for planting in streets and parks in temperate regions of N.S.W., Victoria, Tasmania and South Australia.

THRYPTOMENE FOR FLOWERS

THRYPTOMENE by J. Ros Garnet -continued from page 52

Like so many of the shrubby *Myrtaceae*, *Thryptomene* withstands vigorous pruning; consequently the bushes can be cut freely without detriment to the plant. A well pruned shrub will carry far more flowers in the following season and thus the cultivation and harvesting of *Thryptomene* has proved to be a very successful minor industry.

Several other species have become popular as garden subjects, notably the West Australian *T. baeckeacea*, *T. hyporhytis*, *T. mucronulata*, *T. elliottii* (usually the variety *decandra*) and, of course, *T. saxicola* and the hybrid widely known as Payne's *Thryptomene*. All are graceful, free-flowering shrubs which may grow to a height of three or four feet and which have rather pendulous branches carrying the white or delicate pink-hued flowers on an abundance of short branchlets. Most of them are Spring flowering plants but some are at their best in the late winter. Others, like *T. saxicola* and its hybrid seem to be able to carry a few flowers in most months of the year.

Those who happen to have grown the two more common eastern species, *T. calycina* and *T. micrantha*, or to have seen them in the field will have had little trouble in recognising that they are distinct species but they might find it less easy to define the difference in a few words. They could be forgiven for thinking that one could well be considered a geographical variety of the other but botanists, at any rate, do not because the somewhat bell-shaped calyx tube of the former is scarcely ribbed at all and it extends well above the enclosed ovary while the cylindrical or somewhat bell-shaped calyx tube of *T. micrantha* has ten longitudinal ribs and it does not extend above the enclosed ovary.

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THE GENUS *CRYPTOSTYLIS* IN AUSTRALIA

by Leo Cady, Kiama

"Tongue Orchids" is the quaint name given to this genus in Australia. The name describes the genus well for the flowers in all species consist mainly of a conspicuous labellum or tongue with very narrow sepals and petals.

One of the most interesting points of the genus *Cryptostylis* is their extremely unusual method of pollination; one could almost say that these plants had "Sex-appeal" and if it hadn't been first described by such an eminent person as Mrs. E. Coalman (Vict. Nat. XLIV (1927), 20, 333), it would have been well doubted by the botanical students. The plant apparently issues an odour that is irresistible to the male Ichneumon Wasp (*Lissopimpla semipunctata*, in fact it has more attraction than the female wasp) tricking the wasp into pseudocopulation with the plant and while this act is occurring deposits the pollina onto the abdomen of the insect.

The genus consists of 5 species in Australia, but extends north to Formosa, the Philippines, Malay Archipelago, New Guinea, New Caledonia and the Polynesia where it numbers around 20 species.

The majority of the Australian species adapt well to culture, in fact they seem to revel in the easier way of life, producing much larger and brightly coloured flowers. These plants do not form a tuber like most other terrestrials but have a much swollen root system from which the single leaf arises although at times two or three can be found. The method of propagation is by underground stolons but these plants can also be grown from root cuttings.

A suitable compost isn't hard to come by as the plants will grow in most soils, they do prefer a light loamy soil with plenty of water in their growing period and just damp in their dormancy. Unlike most other ground orchids they usually retain their leaf and don't lose it except in very dry times.

The usual habitat for most species is open swamp heathlands, or Eucalyptus forest areas with a preference for sandstone country.

DESCRIPTION OF SPECIES

1. *Cryptostylis subulata* (Labill.) Reichb. f.

A slender to robust plant up to 80 cm. high; leaves 1-3 from broad to narrow lanceolate on a rigid stem; which is variable in length, leaf often purple beneath. Flowers to 15 fairly large with a conspicuous red-brown labellum. Sepals and petals all narrow and inconspicuous the petals being the shorter. Labellum along decurved to 3.5 cm. long, approx. 1 cm. broad margins depressed or reflexed along the middle portion making the upper surface narrow and convex, lamina transversed for more than half its length anteriorly by two thick beaded ridges and two parallel finer ones all ending in a conspicuous dark bilobed glandular process at apex. Column shortly winged.

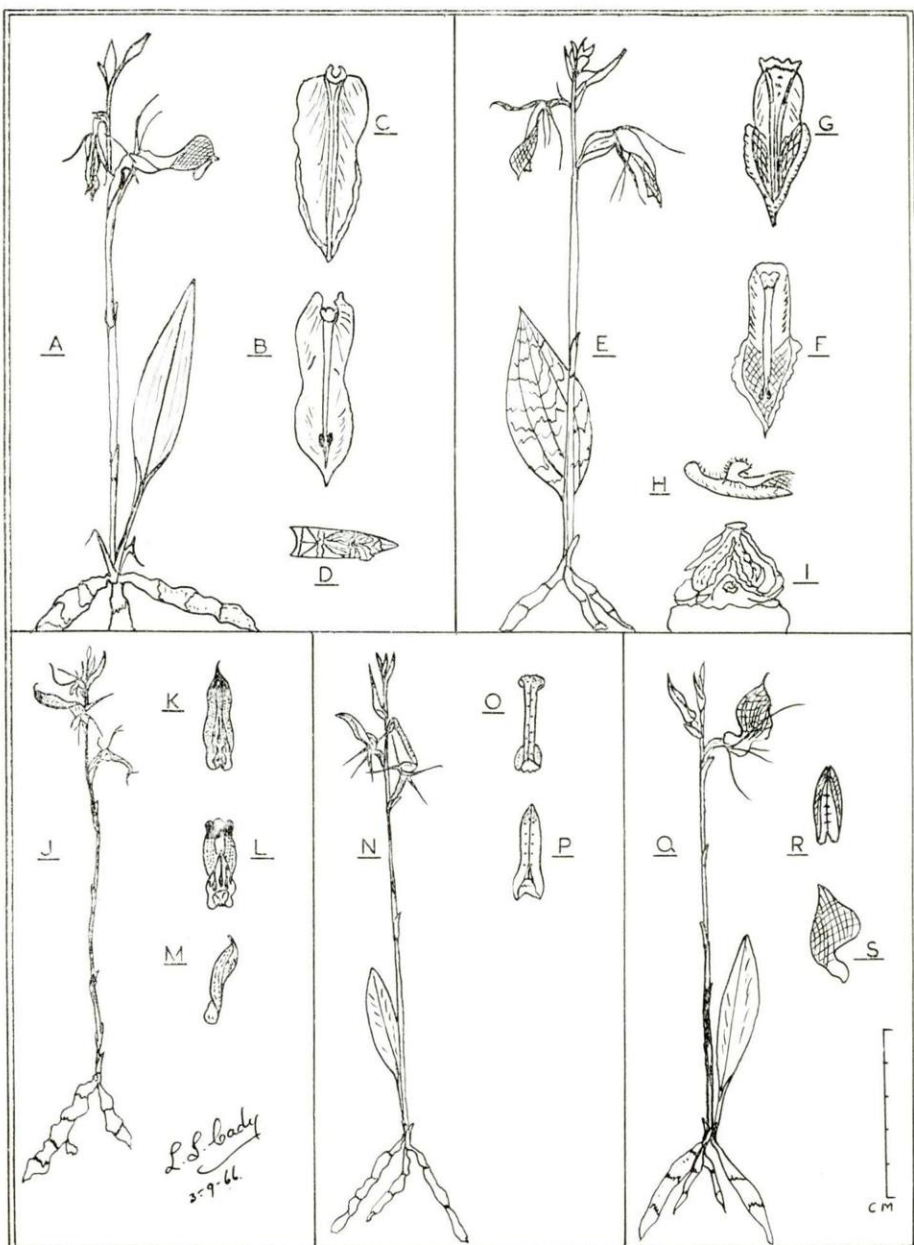
Flowers: October to March.

Distribution: Queensland to Tasmania, South Australia.

Remarks: The commonest plant of the 5 species, unmistakable and easy to identify.

2. *Cryptostylis ovata* R.Br.

A plant of slender growth up to 60 cm. high. The leaf is very distinct in this species being broadly ovate to broadly ovate-acute, heavily reticulated with veins; on short or long stems. The flowers are very similar to *C. subulata*, but are of a lighter red-brown and the labellum lamina decurved and



KEY TO PLATE

- | | |
|--|---------------------------|
| A. <i>C. subulata</i> . | J. <i>C. hunteriana</i> . |
| B. & C. Labellum of A. | K. Top labellum of J. |
| D. Abdomen of wasp showing pollina. | N. <i>C. leptochila</i> . |
| E. <i>C. ovata</i> . | O. Top labellum of N. |
| F. & G. Labellum of E. | Q. <i>C. erecta</i> . |
| H. Apex of labellum showing glandular process. | R. & S. Labellum of Q. |
| I. Column of E, this is typical of the genus. | |
- A, E, J, N, Q are all half natural size to scale. All other figures much enlarged.

Cryptostylis leptochila

Reproduced from "Victorian Native Orchids" by permission of Longmans of Australia Pty. Ltd. See Book Review on page 59.

Photography by C. E. Gray.



heavily reticulated with reddish veins, the apex of lamina very velvety with short red pubescent hairs. Column short.

Flowers: October to February.

Distribution: Western Australia only. The only West Australian species.

3. *Cryptostylis hunterianum* Nicholais.

A slender plant up to 45 cm. high, apparently leafless. Flowers to 10 largest, sessile, reversed, the labellum conspicuous, erect; narrow oblong convex, very glandular, margins recurved, about 3.5 cm. long, the lower half yellowish green with red markings upper portion light red merging into the black "furred" centre, 5 conspicuous interrupted black lines arising from the concave base extending upwards where it merges into a raised central ridge which resembles closely woven black wool; this extends to the tip, apex recurved acute. Sepals and petals as other species. Column short.

Flowers: December to January.

Distribution: Victoria and N.S.W.

Remarks: A most interesting species apparently leafless in nature but produces a small leaf if treated with hormones in culture. A very rare species.

4. *Cryptostylis leptochila* F. Muell. ex Benth.

Plant similar in growth to the prescribed, up to 40 cm. high, leaf ovate to lanceolate, at times absent. Flowers smaller than other species. Sepals and petals inconspicuous. Labellum erect, oblong, linear, fleshy, channelled, lamina to 1.8 cm. long, very pubescent; recurved in front margins depressed, a row of 6 to 9 black sessile calli on each side of the middle vein. Column very short.

Flowers: November to March.

Distribution: Victoria and New South Wales.

Remarks: A similar plant to No. 3 but labellum much narrower and the calli are more conspicuous, and more often collected.

(Continued on page 91)

THE HEATH MYRTLES

A FEW COMPARABLE GENERA IN THE FAMILY "MYRTACEAE"

by J. Ros. Garnet

INTRODUCTION

The purpose of this present article is to record on paper the substance of a talk to a group of growers of Australian plants who wanted to be able to distinguish between *Baeckea*, *Thryptomene*, *Calytrix* and *Micromyrtus*—all plants whose flowers have a good deal in common.

In the process of preparing the talk it became evident that, by restricting the subject matter to these four genera, a lot of problems would be left hanging in the air as it were. To leave out *Darwinia*, *Lhotskya* and *Leptospermum* would scarcely simplify the task, consequently they were included.

SOME DIFFICULTIES IN IDENTIFICATION OF MYRTACEAE

The reader may skip this section if it tends to confuse.

The identification of plants by the use of "keys" of the kind used in Floras and other botanical reference works can be a frustrating business for the amateur botanist. Generally, these keys are devised for use by those who have facilities for dissecting flowers and fruits and, quite often, the amateur is stumped at the outset because he lacks the means of determining the nature of the placentation, the arrangement of ovules on the placenta, the size, the shape and number of seeds and even the morphology of the embryo within the seed.

Such features often are of fundamental significance when attempting to trace the natural order or family to which a plant belongs but they are not the kind one can use for "spot" determinations. For such a purpose one needs to rely upon the obvious characters and they are the ones that can be very misleading.

Careful as one may be in choosing distinguishing features for a "do-it-yourself" key it is easy enough to fall unwittingly into the error of overlooking the innate variability of plants within a single species or of neglecting to take into account the transitional forms which seem to link the species of one genus with those of another.

The existence of such forms makes it hard to select exclusive characters which can be relied upon to separate absolutely one genus from another, and, for that matter, one species from another. When one becomes involved in a large family like the Myrtaceae the task of producing a simplified key becomes really formidable. Even its individual genera have given systematic botanists and taxonomists brain fag. None of them are satisfied about the classification of *Eucalypts* while many are still worrying about *Callistemon*, *Baeckea*, *Leptospermum*, *Lhotskya* and *Eugenia*—to mention only a few. Each revisionist has his own opinion about whether Benthams' sub-tribe *Calythriceae* of the tribe *Chamaelauceae* should be grouped as a single genus, *Calythrix*, or split into three or four—*Calytrix*, *Lhotskya*, *Homalocalyx* and *Calythropsis* or, if there should be the three (or four) genera, how the species within them should be disposed.

The tribe *Leptospermeae* has four sub-tribes, including *Eucalypteae* and *Baeckeeae* and, in the latter sub-tribe the genus *Baeckea* has given taxonomists

as much bother as any other. It is a large genus which Bentham grouped in six sections. Some botanists are inclined to give some of the sections generic rank and others believe a better systematic approach is to take certain species out of *Baeckea* and put them into some other existing genus within the sub-tribe. Some of the species have been transferred into an altogether different tribe—the *Chamaelaucaceae*. As a result of the multiplicity of decisions by revisionists the synonymy of *Baeckea* is almost intimidating. As a consequence, one cannot be certain just how many valid species it contains nor how many there are in the allied genera. One might easily make the mistake of listing the one plant under different specific names in more than one genus. Even the appearance of a plant under two different specific names in a genus is not altogether unknown. With this in mind, such figures as may be quoted hereafter should be accepted with reservations.

IDENTIFICATION OF SPECIES

Because the seven genera which are about to be discussed contain between them upwards of 200 species it will be impracticable to extend the key to permit of the determination of species. For this refinement the enquirer will have to rely on his own resources of experience in the recognition of familiar species, on the good nature of someone else or on one or other of the already available keys which will be found in a State Flora or in Bentham's *Flora Australiensis*. In many respects most of these sources of information are out of date but there is little else under one cover which can serve the purpose. However, the placing of a plant in its correct genus is a useful exercise and it should be possible to do it by following the procedure given below.

HOW A BEGINNER MAY IDENTIFY THESE MYRTLES

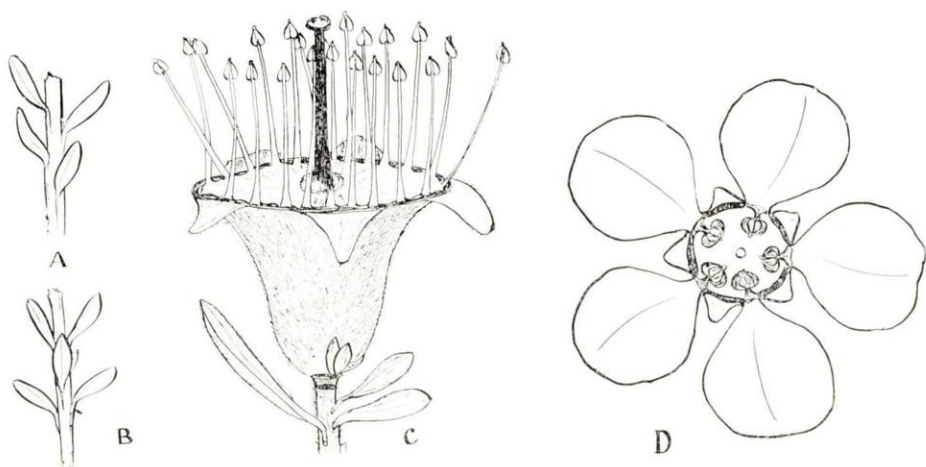
The first step is to assure oneself that the specimen is in fact a plant belonging to one or other of the several genera about which one is interested. There are a number of characters common to all the species within the genera. Thus, they all have bisexual flowers, that is, each flower possesses male stamens and a female style. They have no more and no less than five sepals and five petals (Fig. D) and these floral segments are attached to or near the periphery of the circular summit of the torus (variously called the *thalamus*, *receptacle* or *calyx tube*)—the organ which eventually becomes recognizable as the fruit or seed box. The five petals always overlap in the bud but spread apart as the flower matures.

The ovary or seed box is inferior, that is, set below the level of the plane of attachment of the sepals and petals. The single, central style is erect, short and hairless (except in *Darwinia* where it is relatively long and bearded below the stigma). The stigma is a small, sticky button situated on the top of the style. The anthers are usually five or arranged in multiples of five but in many of the species, where the number of stamens exceed five, a number of them are abortive—reduced to staminodes—and in some cases these are so small as to be difficult to see except under magnification.

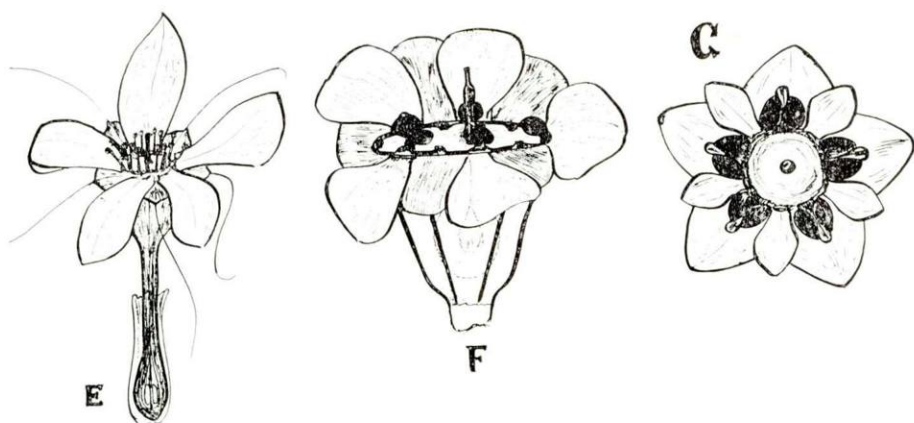
The fruit is a capsule attached to the receptacle and, where there is more than one seed chamber, it opens to release the ripe seed by splitting across the lid-like top of the fruit in wheel spoke fashion from the edge to the centre where the style protrudes. Most of the species within

these several genera (except a number of the *Baeckea* and *Leptospermum*) are heathy shrubs with simple, undivided, mostly small and often tiny and relatively thick leaves which, when crushed or bruised, are aromatic.

Although *Boronia* and *Eriostemon*, in the unrelated family, *Rutaceae* bear some resemblance to the smaller shrubby *Myrtaceae* (to which family the seven genera belong) their floral structure is sufficiently distinctive to give no cause for confusion in recognising their identity. The divided ovary of the *Rutaceae* will immediately distinguish its component species



- A. Portion of a branchlet showing alternate arrangement of leaves.
 B. Portion of branchlet showing opposite arrangement of leaves.
 C. *Leptospermum myrsinoides* flower, showing numerous stamens arising separately in a single row within the ring of the persistent sepals. The petals have dropped off, as they usually do in *Leptospermum*.
 D. Flower showing the disposition of five stamens opposite five petals (or alternating with the tiny sepals).



- E. A *Calytrix* flower showing awned sepals and erect, numerous stamens.
 F. A *Micromyrtus* flower showing a disposition of the five stamens opposite the petals and the ribbed, single-celled ovary.
 G. *Thryptomene calycina* showing the relatively large sepals, small petals and the single row of very short stamens alternating with the petals (and, consequently) opposite the sepals.

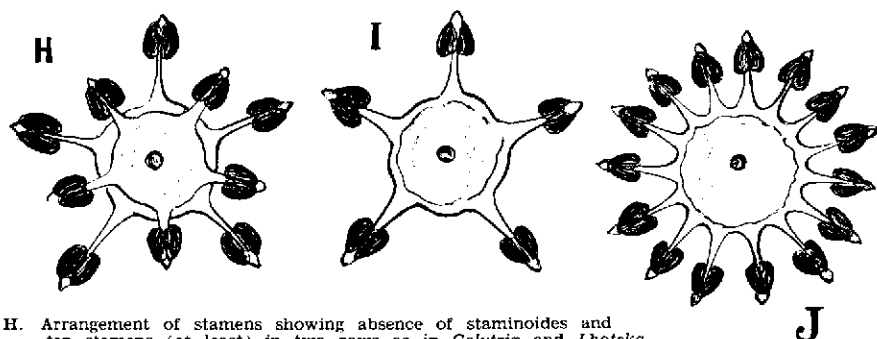
from any of the Myrtaceae in which the stigma is like a button perched on the top of an undivided style (Fig. C).

The accompanying figures illustrate the several common characters which must be present if the specimen is to be accepted as belonging to one or other of the seven genera. Of them only one—*Calytrix*—can be recognised without having to examine a flower under magnification, provided it measures up to the specifications demanded by the aforementioned several common characters. Every one of about 40 species in the genus has the midrib of the five sepals extended beyond the margin as a fine hair or thread or awn. (Fig. E). In some of the species the awn is very short, little more than a point but, however short it may be, it invariably extends beyond the edge of the sepal.

The five petals of the species may wither soon after expanding and then drop off, leaving the thalamus with its ring of five awned sepals clearly visible. If no awn is present but in other respects the plant looks like a *Calytrix* it will most likely be found to be a *Lhotskya* although it could belong to *Homalocalyx* or *Calythropsis* (with which we are not going to concern ourselves because they are purely Westralian species and genera and not likely to be seen by plant cultivators anyhow). A close look at the length, number and arrangement of the stamens will soon distinguish *Lhotskya* from the others. If practicable, use a freshly opened and undamaged flower. Both *Calytrix* and *Lhotskya* have 10 or more stamens—usually 20 or so, arranged in more than one row and there are never any staminodes present. All of the filaments carry anthers. The stamens are always relatively long. In some cases those in the outer ring are about as long as the petals. The stamens in the inner row or rows are always shorter than those in the outermost row. (Fig. H).

CHECK IF THE PLANT IS *LHOTZKA* OR *BAECKEA*

Some of the species of *Baeckea* have numerous stamens although most have only 5 or 10 but, regardless of number they are always rather short and arranged in a single row and each one arises from the ring of



- H. Arrangement of stamens showing absence of staminodes and ten stamens (at least) in two rows as in *Calytrix* and *Lhotskya*.
 I. Arrangement of stamens in a single row of five as in *Thryptomene* and *Micromyrtus*.
 J. Arrangement of stamens in a single row of at least ten erect filaments as in *Leptospermum*.
 the thalamus as a separate filament. (Fig. J). To make certain it is a *Lhotskya* and not a *Baeckea* (or anything else), glance at a ripe or maturing fruit if one is present. If it has only a single cell it will be *Lhotskya*. *Baeckea*, like *Leptospermum*, has several chambers and the wheel-spoke valves on the surface of the top of their fruits are easily recognised even though the valves may be still unopened.

The identification may be clinched by looking at the manner in which the leaves are arranged on the stem. In *Baeckea* they occur in pairs, one leaf distinctly opposite the other, but in *Lhotskya* they are not opposite one another except in the case of the Westralian *L. ciliata*. In the W.A. *L. violacea* they actually alternate but in the majority of species their arrangement is generally described as "scattered, crowded, linear, keeled or angled in cross section often triangular but NOT regularly opposite." Furthermore, in *Baeckea*, the flowers although sometimes solitary in the axils of the leaves, are more often in groups of 2 or more on a common peduncle which gives the groups the appearance of an umbel. The flowers of *Calytrix* and *Lhotskya* almost invariably appear singly in the axils of the leaves.

A BAECKEA OR LEPTOSPERMUM?

Having thus disposed of *Calytrix* and *Lhotskya* it remains to distinguish *Baeckea* from *Leptospermum* and both of them from *Darwinia*, *Thryptomene* and *Micromyrtus* and these latter from one another.

There is nothing for it but to study the stamens and anthers and perhaps to have a close look at the arrangement of the flowers, leaves and some other quite small details which one usually neglects to note.

The first thing to do is to look at the top of a ripe or ripening seed box and observe the number of cells in the ovary. If it is single-celled it will be any of them except *Baeckea* and *Leptospermum* both of which have more than one chamber detectable by the splits or partitions visible at the top surface of the fruit. If there is more than one chamber and the stem leaves are opposite (Fig. B), it belongs to *Baeckea*.

If there is more than one chamber and the stem leaves are alternate then it must belong to *Leptospermum* (Fig. A and Fig. C).

IS IT A DARWINIA?

Darwinia, *Thryptomene* or *Micromyrtus*? *Darwinia*, as well as having exactly 10 stamens which alternate with an equal number of minute staminodes in the single ring, has a style which protrudes so much above the level of the top of the anthers, stamens and other floral parts as to be quite conspicuous. Furthermore, it will be seen to be bearded below the stigma. The styles of *Thryptomene* and *Micromyrtus*, as well as being quite short, are smooth and free of hairs. Their styles always terminate at a level below that of the anthers and thus are not easy to detect without close examination.

THRYPTOMENE OR MICROMYRTUS?

Assuming that the other five genera have been by now eliminated, only *Thryptomene* and *Micromyrtus* remain to be distinguished one from the other. Again, the anthers have to be examined. In *Thryptomene* there are only 5 stamens (Fig. I) and they alternate with the petals. That is, they arise from a point on the inner edge of the calyx tube at a position midway along the line of attachment of each of the persistent sepals (Fig. G). In *Micromyrtus* also there are only 5 stamens (Fig. I), but they arise at a point on the inner edge of the calyx tube at a position near the junctions of the lines of attachment of each of the persistent sepals (Fig. F).

This long explanation of how to distinguish these seven well known genera of species greatly favoured by growers of Australian plants, can be condensed into a key which, without the foregoing explanation, might be much less useful than it looks.

FEATURES COMMON TO THE SEVEN GENERA—*CALYTRIX*, *LHOTZKYA*, *DARWINIA*,
THRYPTOMENE, *MICROMYRTUS*, *BAECKEA* AND *LEPTOSPERMUM*

Flowers bisexual

Sepals 5 (in some species small and inconspicuous).

Petals 5, overlapping in the bud; in some species they are deciduous after the flower has opened and reached maturity.

Petals and sepals arranged alternately in rings, one inside the other on the upper edge of a conical or hemispherical or cup-shaped thalamus, torus or calyx tube and having the general appearance of a tiny gum nut.

Ovary or seed box within the nut is inferior, that is, set below the plane of the line of attachment of the sepals, petals and anthers.

The single, undivided and centrally-placed style is erect, short and hairless (except in the species of *Darwinia* where it is relatively long and bearded).

The anthers are arranged around the periphery of the top of the thalamus in one or more rings of 5 filaments or in multiples of 5, sometimes alternating with staminodes (which are stamens without anther cells). In some species the staminodes occupy a ring on their own; in others they are so small as to be difficult to see except under magnification.

The fruit is a tough, almost woody little capsule which encloses 1 or more chambers containing the ovules or seed. Where there is only one chamber the whole capsule falls as a single fruit when the seed is ripe. Where there are two or more chambers the top of the capsule splits open along valves corresponding to the number of chambers, the splits extending from the edge of the top of the calyx tube to the centre where the style protrudes.

The leaves are simple and undivided and, when crushed or bruised, emit an aroma due to the release of resin or oil from minute glands embedded within the tissues of the leaves. Only one leaf occurs at a node but the nodes may be opposite or alternate on the stem or even irregularly disposed.

The flowers emerge singly (or, in a few species, in 2's or 3's) from the axils of the leaves and generally from the axils of the upper leaves. In *Baeckea* one or two pedicels, each carrying two or more pedunculate flowers, may emerge from a leaf axil giving the inflorescence the appearance of an umbel.

The majority of the species in the several genera (except *Leptospermum*) are heathy shrubs, with rather thick, small and, in many species, even tiny, leaves.

Should the specimen to be examined fulfil these general requirements it can be placed readily in its correct genus by applying the following sequence of observations:—

KEY TO THE SEVEN GENERA

Calytrix, *Lhotzkyia*, *Darwinia*, *Thryptomene*, *Micromyrtus*, *Baeckea* and *Leptospermum*

- A1. The sepals are awned *Calytrix*.
 A2. The sepals are not awned B.
 B1. The style is long and bearded below the stigma. (It extends as a single filament above the level of the anthers) *Darwinia*.
 B2. The style is not bearded C.
 C1. The stamens are long (as they are also in *Calytrix*), 10 or more of them arranged in more than 1 ring. No staminodes are present. Leaves not opposite (except in the W.A. species *L. ciliata*) *Lhotzkyia*.
 C2. The stamens are variously arranged, with or without staminodes D.
 D1. Stamens (in Eastern species) 5, in a single ring, alternating with the petals but, in most Western species there are 10. The petals are persistent and curve inwards to produce a cup-shaped flower. Capsule 1-chambered. Leaves opposite *Thryptomene*.
 D2. Stamens 5, in a single ring, each one opposite a petal but, if there are 10 (as in most Western species), they are arranged in 2 rings and are alternate with the petals or opposite the sepals. The petals, if not deciduous (which they are in Southern and Eastern species) curve inwards and produce a cup-shaped flower *Micromyrtus*.
 D3. Stamens 5 or more, often numerous, in a single ring, inflexed. No staminodes present. Petals spreading to form an open flower. Capsule with 2 or 3 chambers. Leaves opposite *Baeckea*.
 D4. Stamens numerous, 10 or more in a single ring, erect. No staminodes present. Petals spreading to form an open flat flower. Capsule with 3 or more chambers, usually 5. Leaves alternate *Leptospermum*.

PHOTOGRAPHERS

I am not getting the support I need to ensure that the colour plates used are of the highest standard. Over the next flowering season please photograph all species of the following genera—*Phebalium*, *Pultenaea*, *Boronia* and genera listed in this issue of the family *Myrtaceae*. This applies more especially to the western species of the genera listed, *Hypocalyma*, *Astartea*, *Calytrix*, *Homalocalyx* etc. I also need slides of all species in the family *Epacridaceae* with the exception of those already described. In particular I want any slides of species of *Lysinema* forwarded immediately for the next issue.

PINK PIMELEA

PIMELEA FERRUGINEA from V. McHaffie, Park Orchids, Victoria—

My plant of *Pimelea ferruginea* has done so well under very adverse conditions that it is worthy of comment. It was grown from a cutting put in a tin in November, 1960, without any special growing medium, and left in the open. It was planted out at the beginning of April, 1961 and has since received no special care or attention. The plant is growing in a very exposed position, in full sun, without protection from wind, in a heavy clay area with poor drainage and has stood up to some very severe frosts. In its first year (1961), it produced a few flowers. In 1962, it flowered well and last year (spring, 1964), having grown into a shapely little bush it was covered with pink flowers. With its bright green foliage, it always looks very attractive.

FROM J. HAMMERSLEY, E. Guildford, W.A.

Pimelea ferruginea is the *Pimelea* grown almost exclusively in West Australian gardens. It has a good shape and is easily grown in all soils. It is easy to propagate from cuttings.

(Continued from page 91 with notes from the Editor)

Pimelea rosea

See colour plate on opposite page. For references to this plant and its cultivation refer to issue no. 24.



Pimelea ferruginea

The photograph is a little out of focus but it serves to show the character of the shrub. It is quite likely that this is *P. rosea* as the leaves of *P. ferruginea* are wider and grow more compactly. However the bush always grows compactly and flowers profusely as shown.



TASMANIAN PIMELEA

Forms of two species of special horticultural interest followed by a key to all species of *Pimelea* found in Tasmania, by A. M. Gray.



Colour photography by Frank Hurley

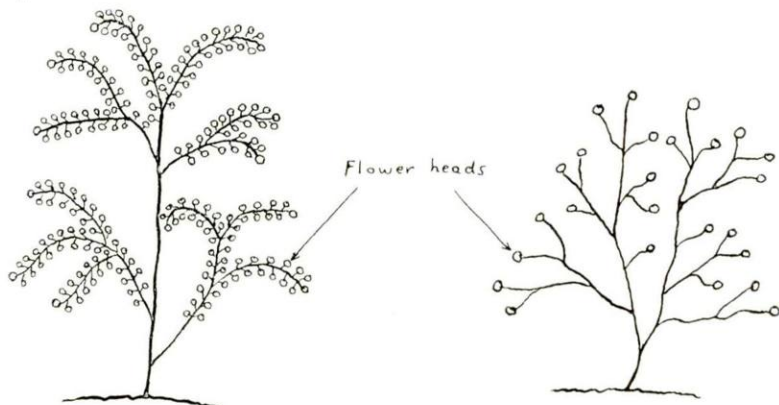
Blocks by courtesy of John Sands Pty. Ltd.

PIMELEA LINIFOLIA OR PIMELEA ROSEA

This colour plate has been labelled only "Pink *Pimelea*." The species is not certain. It resembles *Pimelea linifolia* and *Pimelea spathulata* mentioned over the page, very closely. The leaves of *P. linifolia* are usually a little larger. The colour is right for pink forms of the Tasmanian species described and also for *Pimelea rosea*. The colour plate shows the characteristic flowers of the genus that vary from white to red in the eastern states with yellow forms fully described in our no. 24 issue.

Pimelea nivea

In the Hobart district there occurs a very attractive variety of *Pimelea nivea* (white cotton bush). In the magazine issued in September 1965, information was given that a pink variety of *P. nivea* was to be found in the vicinity of Launceston. This pink variety is also fairly common around the Hobart district and indeed wherever *P. nivea* occurs the pink form can also usually be found. However the particular form about which I wish to describe is not the pink form of the species but a very floriferous variety which instead of having the flower heads borne singly at the ends of long secondary branches, has them borne the whole length of shorter secondary branches, giving the appearance of long densely flowered racemes. Its description is as follows.

***P. nivea* Labill. (var. *multiflora*)**

Shrubs identical to *P. nivea* except for the arrangement of the flower heads which instead of being borne singly at the ends of the secondary branches, are borne on very short lateral branches which arise from the secondary branches. These lateral branches vary in length from $\frac{1}{2}$ " to $1\frac{1}{2}$ " long and bear leaves on the upper half, the leaves being somewhat more crowded and smaller than the usual stem leaves. The individual flowers and the flower heads are also somewhat smaller than those of *P. nivea*. The flower heads are very compact and appear as long, densely flowered racemes. *P. nivea* (var. *multiflora*?) is found as scattered plants among populations of *P. nivea*.

Pimelea spathulata

Pimelea spathulata is included in the key below in place of *P. linifolia* which is now believed not to occur in this State. Although differences between the two are slight, and some botanists name *P. spathulata* as a variety of *P. linifolia*, here in Tasmania the two forms are regarded as distinct by some botanists, the Tasmanian form (which also occurs in some mainland states), being named *P. spathulata* and the form which is limited to mainland distribution *P. linifolia*.

P. spathulata, in the Hobart area and most likely elsewhere as well, exhibits an heterostylic characteristic. Some flowers appear to be functionally unisexual, usually by the incomplete development of the male or female organs.

A pink form, though rare, occurs near Hobart.

Another species of *Pimelea*, *P. lindleyana* Meissn., occurs in Tasmania usually on wet, acid heaths etc. Morphologically it is very similar to the

P. spathulata-*P. linifolia* complex. However it differs in cytological characteristics. Studies which were carried out demonstrated that *P. lindleyana* possesses $2n =$ chromosomes whereas *P. spathulata* has $2n = 18$. As yet the work required to differentiate these two on taxonomical grounds has not yet been carried out, therefore it has not been included in the foregoing key. A minor characteristic on which the two may be separated is that *P. spathulata*, on drying turns pale green or light brownish, whereas *P. lindleyana* dries a bright conspicuous green colour, indicating a difference in some chemical constituents between the two species.

KEY TO THE TASMANIAN SPECIES OF *PIMELEA*

1. Floral bracts differing from the leaves in size, shape or colour 2
 Floral bracts apparently absent or barely differing from the leaves 6
2. Flower heads quite erect 3
 Flower heads sub-erect or drooping 4
3. Flowers yellow, leaves small, broad, branches almost glabrous *P. flava*
 Flowers white, bracts only slightly larger than the leaves obscurely silky on the inner midrib, branches more or less tomentose, plant widespread and common *P. humilis*
 Flowers white, bracts noticeably larger than the leaves, branches usually glabrous, plant common about the coasts *P. glauca*
4. Stamens with conspicuous filaments, flower-heads conspicuously drooping 5
 Anthers almost sessile at the throat of the floral tube, cells remaining parallel after maturity and not turned back to back after dehiscing; bracts silky on the inner surface; flower heads sub-erect or drooping *P. stricta*
5. Leaves oblanceolate-spathulate, $\frac{1}{2}$ "- $\frac{3}{4}$ " long, anthers turning back to back after dehiscence; bracts glabrous *P. spathulata* (including some forms similar to *P. linifolia*).
 Leaves broadly oblanceolate to oblong-ovate 1"-2" long, glabrous; bracts silky on margins and inner surface *P. ligustrina*
6. Plants small, densely tufted or prostrate 7
 Plants erect, spreading, often straggling 8
7. Flower solitary in the upper axils, dioecious; leaves C. $\frac{1}{8}$ " long *P. phamaea*
 Flowers in dense terminal heads, leaves C. $\frac{1}{2}$ " long *P. filiformis*
8. Leaves more or less glabrous 9
 Leaves hairy on one or both surfaces 11
9. Flowers in terminal heads or on well-developed axillary branches 10
 Flowers axillary; leaves 1"-3" long *P. axiflora*
10. Leaves minute c. $\frac{1}{8}$ " long *P. serpyllifolia*
 Leaves $\frac{1}{2}$ "-1" long; flowers yellowish-cream, few in a head; fruit slightly fleshy *P. pauciflora*
11. Leaves hairy on both surfaces 13
 Leaves hairy only on undersurfaces of leaves; branches sometimes quite hairy 12
12. Hairs inconspicuous on older leaves, scattered and closely appressed; leaves 1"-2 $\frac{1}{2}$ " long, petiolate, elliptic-oblanceolate; fruit black, fleshy *P. drupacea*
 Hairs conspicuous, leaves erect, crowded and sometimes loosely appressed $\frac{1}{4}$ "- $\frac{1}{2}$ " long, elliptical to broadly ovate, apex acute or obtuse margins flat, upper surface light green, under surfaces covered with long, silky, silvery hairs which extend beyond the margins; younger branches pubescent. Plant fairly common at altitudes above C. 3000' *P. sericea*
 Hairs conspicuous, leaves spreading or slightly reflexed, not crowded $\frac{1}{4}$ "- $\frac{1}{2}$ " long, orbicular to broadly ovate, apex rounded or slightly emarginate, margins somewhat revolute. Upper surface dark glossy green, younger branches and under surfaces of the leaves densely covered with short cottony hairs, not silvery *P. nivea*
13. Flowers white, leaves opposite 14
 Flowers yellow, the outer ones often curved strongly outwards; leaves silky on both surfaces $\frac{3}{4}$ "-2" long, alternate *P. curviflora*
14. Branches leafy throughout, leaves sparsely hairy on both surfaces, although the under surface more densely hairy; tall shrub common in hilly locations in the S. and W. *P. cinerea*
 Leaves crowded at the ends of the branches; both surfaces densely hairy. Small, diffuse; prostrate in exposed situations, local on Western Mts. *P. milliganii*

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THE GENUS *CRYPTOSTYLIS* IN AUSTRALIA—continued from page 77

5. *Cryptostylis erecta* R.Br.

Slender to 80 cm. high. Leaf as in *C. subulata*. Flowers up to 10. Sepals and petals inconspicuous. Labellum large, erect, forming a very conspicuous hood which is heavily veined, a broad ridge forms the medium ridge, a number of calli extend the length of the ridge. Column short.

Flowers: November to April.

Distribution: Queensland, New South Wales, Victoria.

Remarks: A species easily identified by the hood like labellum.

GROWING CRYPTOSTYLIS

by R. C. Nash

Cryptostylis subulata is the only member of the genus *Cryptostylis* found in South Australia. It is found in the swamps in the southern Mt. Lofty Ranges and in similar country in the south-east of S.A. This species flowers during late December, January and early February. Many of the areas where this plant grew are now cleared.

I have grown this species successfully but only by collecting the plants in a large clod of swamp soil. The clod with the plants in it was placed in a large shallow pond with high protecting walls. The water level was kept at an average depth of 3 inches. This gave a clearance from water level to the crown of the plants of about 3 inches.

While I was away in the Eastern States a friend living in Colomandel Valley has been carrying on with experiments in growing *Cryptostylis* and has successfully grown *C. subulata* and *C. leptochila*. The *C. subulata* are growing in the clod of swamp soil placed in an 8 inch pot. The *C. leptochila* are growing in a coarse sand and sawdust compost in a 5 inch pot.

The pots are standing in water contained in a small shallow tank. The smaller pot stands upon a slab of stone so that the crown of the plant is held at the correct distance above the water level. A hole in the side of the tank at the desired water level ensures that it is not inadvertently overfilled.

Both species are showing very good growth and flowered well during the last season. The plants are kept in a shade house. The pests that must be watched for when growing *Cryptostylis* are snails, slugs and a grub that eats into the flowers.

PINK PIMELEA—continued from page 84

The full colour plate of this species in our No. 24 issue does not do this beautiful plant full justice. Here is a native of exceptional horticultural potential. In my lighter soil I find that the bush becomes so heavy with flowers that it tends to fall over. Let it rest its main trunk on the ground or a rock. It will soon bend upward and the leaf cover will disguise this.

A warning from Perce Parry . . . "do not prune too severely, or you will loose the plant." This seems to apply to all *Pimelea*. To keep the bush cut back to the size that suits the position in my garden, heavy pruning is often necessary with this species. I find that the plant will not mind heavy pruning and will leaf up and form a good compact shape quickly after heavy pruning, but I do part of the plant at a time allowing it to recover between each onslaught.

HOWITTIA



Colour photography by C. Hubner

HOWITTIA TRILOCULARIS

The flowers of this plant of the "Hibiscus" family are shown here full size although they may grow up to one inch across. Found in moist coastal gullies of N.S.W. and Victoria it is surprising that this plant is not more widely grown. The most striking feature is the unusual violet colour of the flowers. It prefers reasonable moisture and protection by other shrubs but survives and grows readily over a wide range of conditions. I feel that with selective propagation or even with regular tip pruning and shaping, that this could become one of the prizes in your garden. It is more fully described on page 63—Editor.