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Growing Wildflowers

The cultivation of Australia's wildflowers in home gardens, parks and reserves is not difficult. They are beautiful horticultural subjects, certainly spectacular and with infinite variety. Most are evergreen shrubs requiring little attention. — The Editor.

What a smug, misleading statement this can be. I made it and I will stand by it — but!!

This is the second issue in Volume No. 9. For 18 years I have been trying to prise information out of experienced growers to present a balanced issue for you. If you check through the last 69 issues you will find I have been quite successful with this. We have had articles from all the competent wildflower growers from all parts of Australia, but are we growing wildflowers more successfully?

Readers may forgive me for at last bursting out and saying it my way. I shall not say anything new so the experts would be advised to flip over to articles from more competent writers.

It is to the beginner, or the new reader who would like to grow wildflowers that I am writing. This will make you smile — it is also the experienced growers who, like me, are having trouble, that I hope to involve. Having thus blown my credentials as an expert let us now look at the problem from the beginning.

It really seems simple. You need good healthy plants suitable for the position in which you want to grow them. You need a garden bed with surroundings suitable for the plant, and you need to supply the care and conditions for the continued prosperity of the plant.

It is at this point that many writers stop, leaving the rest to the reader. What gets me are the writers who go on to say . . . "observe how the plants grow in the wild and emulate these conditions."

Possibly my effort opposite is the biggest joke of all but give it a try.

GETTING TO KNOW THE PLANTS AND HUMBLE BOTANY

I feel that it is not sufficient to quote scientific names to beginners and expect them to acquire your enthusiasm instantly. Rather they should be encouraged to get to know them. Nature is really fascinating. Unfortunately the way the botanists have grouped the plants into the family *Myrtaceae* is not very simple though Nuri Mass has explained it as best she can. My method of grouping the plants is no doubt crude (some would say irresponsible) but in this issue I want to present the "five petalled *Myrtaceae*".

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COVER PLATE

Verticordia grandis, photographed by G. Chapman.

A beautiful shrub from Western Australia to one metre, being probably the most difficult plant of those recommended in this issue, to cultivate.

Wildflowers for Horticulture

by the Editor

The growing of wildflowers is easy

This sort of statement has often been made coupled with statements of how they need little attention as they are native to Australia and have evolved over the centuries to survive in our conditions. The significant word here is "survive". We do not want a plant to just survive but to prosper and grace our garden. The above statement has caused much disappointment.

The growing of wildflowers is easy if you select suitable species

I hope to encourage you to prove that this statement is correct. The obvious reaction is to regard the statement "if you select suitable species" as a let-off; how can a beginner or even an experienced grower confidently choose "suitable species". The objective of this series of articles is to assist you in the selection of suitable species. One approach to this problem is to widen the range of wildflowers that will grow in your garden by, if necessary, changing your garden.

The growing of wildflowers is easy in good garden conditions if you select suitable species

I have added "good garden conditions" to this statement as it will enable you to grow a wide range of wildflowers. I will refer to "good garden conditions" later in the article. If you cannot provide good garden conditions the range of plants is limited but still includes many hundreds of natives. Our last issue was devoted to plants that will grow in less than "good" garden conditions", especially if they are damp — not waterlogged. We also include in this issue such plants as *Acacia* (Wattles) and *Eucalyptus*.

The growing of wildflowers . . .

Having worked myself into a corner with extravagant claims let us look at each part of this rash statement. The immediate difficulty is that this periodical goes to all parts of Australia (and the world). How can such a broad claim be made? Well "good garden conditions" are the same whether in Cairns, Brisbane, or Hobart. To "select suitable species" I have chosen a family of plants for this issue that has species native to all parts of Australia and are surprisingly adaptable. Even so, there are problems peculiar to most localities. These will be developed in future issues with advice on such subjects as "Rain Forest Plants", "Growing Wildflowers Near The Sea", "Frost Hardy Wildflowers", etc. Meanwhile refer to previous issues and in particular:

- For Gardens In The Dry Tropics — Refer to Issues 62 and 63.
- For Gardens In The Dry Inland — Refer to Issues 38, 58, 59, 64.
- For Gardens At High Elevations — Refer to Issue 60.
- For Gardening In Western Australia — Refer to Issue 46.
- For Gardening In South Australia — Refer to issues 43, 51 and 66.
- For Gardening In Queensland — Refer to issue 37.
- For Gardening In Victoria — Refer to Issue 48.
- For Gardening In Tasmania — Refer to Issue 39.
- For Gardening In Sydney Area — Refer to Issues 40 and 55.
- For Gardening In Frost-Prone Areas — See publication on page no. 75.

Myrtaceae For Hot and Tropical Areas

While most plants mentioned in our issues are more suitable for temperate areas people in the northern areas of Australia are fortunate with *Myrtaceae*. As well as bottle brushes (*Callistemon*), tea-trees (*Leptospermum*) from the last issue, and their many rain forest plants which will be a subject of a future issue, they have the beautiful *Eucalyptus* below, *Homalanthus* and *Calyptrix*, and *Fenzlia* described in this issue.



TOP: The orange flowers of *Eucalyptus phoenicea* from the Nouriangie area east of Darwin. Not a great deal different from *E. miniata* growing in the north with a beautiful stand west of Townsville.

BOTTOM: Pink flowers of *Eucalyptus ptychocarpa*, an attractive small tree that can be found along creeks in the Darwin area. Especially suited to wet places, this tree should be in every northern garden.

Myrtaceae For Inland Areas

People in inland areas often feel at a disadvantage reading of plants recommended for town gardens. Many *Myrtaceae* have evolved in dry conditions provided they get some soaking rain once or twice a year. These include *Verticordia* and *Wehelia*.



Photography by F. W. Humphreys.

VERTICORDIA INSIGNIS

A beautiful little shrub to 30 cm. Before I go any further in this crusade to grow our wildflowers in your garden, it is necessary to get in before the critics and warn that some species recommended in this issue are not easy to grow. Who is game enough to form a study group on these plants?

It is time we made a special effort with shrubs.

The growing of selected wildflowers . . .

I have sneaked in another word: "selected".

"Let Us Only Grow The Best" was one aspect expanded last issue. Some readers took this to mean only the best species of wildflower. I mean the best form of a huge range of species, whether it be for abundance of flower, colour, shape, to encourage birds and other wildlife, or whatever. It could also mean the best form for a certain set of conditions whether it be soil, aspect, cold, etc.

Good Garden Conditions?

You must pardon me for plugging this "good garden conditions". Over the centuries man has come to appreciate the value of plants for survival and for his environment. He has found that certain conditions of soil texture, composition and moisture provides the best crops. Our wildflowers are just a portion of the world's store of plants and should not be regarded as horticultural beggars. Just as the farmer selects a strain of wheat for his locality — to suit low rainfall, general climate, soil of the district — and just as he prepares his soil such as it is to the best of his circumstances, so too must we provide a garden bed to the best of our circumstances and choose suitable proven plants for these conditions. With a garden we have the opportunity to change the texture of the soil if we wish, to alter its depth and to water artificially. For those people who wish to go to the trouble to provide good garden conditions, the reward is greater. What a beautiful sight a carefully selected plant of *Callistemon* is in flower, covered with large, red bottlebrush flowers, the spikes being up to 20 cm long. I should add also "well cared-for and nourished", this being largely dependent on pruning and fertilizing, but I will leave this for a later issue.

I should also qualify what are "good garden conditions". We will do this in a later issue. The plants recommended to date will tolerate a wide range of conditions, so provide what you regard as good garden conditions — deep, well-drained, open-textured garden loam; or a heavy black or red soil with the texture improved by composting, kitchen or garden waste; or a light loam with composted material added.

There have been incredible results from gardeners who have had a load of sandy soil just dumped on top of their ground, flattened a little, but with mounds retained, and sometimes a few rocks dumped on top. One very interesting experiment had a load of sand and blue metal, roughly in equal parts, delivered and used for a garden with no other attention than spreading to created a large lumpy mound. The productive life of these light soil heaps is yet to be determined but it is clear that more watering is needed and in the longer term, careful fertilizing. Will readers from all over the country try this method and report results. With many of the small, more difficult plants, the results are quite spectacular. We will have an issue on this form of garden in the next volume.

Meanwhile, back to good garden conditions. There is much to be learned about conditions below the soil surface. Conditions are so good that many natural pests also prosper and this could be one reason the sand-pile mentioned above has been so successful. We have all suddenly lost well-established plants, particularly after a rainy period. This problem of below ground conditions will be examined more fully in an issue planned for 1977 where it seems we can offer solutions to these problems. Meanwhile I shall continue this series by assuming that you have prepared you garden as best you can in the circumstances and will recommend plants that will give you good results in these conditions that are less than ideal.

SELECT SUITABLE SPECIES — USE FIVE PETALLED FLOWERS?

I recommend here wildflowers with five petals, usually nicely rounded petals on open flowers such as on a tea-tree (*Leptospermum*). For those botanically minded page 61 will define more clearly the plants recommended but this series is aimed to help the beginner. Such a vague general description is sure to encourage comment but what are the commonly grown shrubby wildflowers with five petals?

Eriostemon (and allies, *Crowea*, etc.) have five petals. Excellent garden shrubs for good conditions, favouring more sheltered positions. These will be described in an issue shortly although they have been very well presented in Volume No. 1. The plants should rarely be confused with the next group as the leaves are usually thicker with oil glands often visible.

THE FIVE PETALLED MYRTACEAE

Well I guess I cannot stall any longer. You will want to know which plants to buy and will assure a good display of flowers.

Last issue I recommended those genera in the family *Myrtaceae* that produced pom-pom or bottle brush flower heads formed by a cluster of flowers where the colourful stamens were the dominant part of the flower, the petals being insignificant. These are ideal also for good garden conditions.

This issue I refer to those species in the family *Myrtaceae* where the five, usually rounded, petals are well displayed. For those to whom the botanical section on page 61 is hard going, I would recommend that you refer to Issue No. 30 of Volume 4 where Ross Garnet does an excellent job of providing a very clear description of how to define one genus from another.

The plants recommended are: *Astartea*, *Baeckea*, *Calythropsis* (a genus of one species *C. aurea* of which I cannot obtain details. It has four petals to spoil a good story.), *Calytrix* (see the article on page 55), *Chamaelaucium*, *Darwinia*, *Homalocalyx*, *Homoranthus*, *Hypocalymma*, *Lhotzkya*, *Leptospermum* (especially small shrubby forms), *Micromyrtus*, *Pileanthus*, *Thryptomene*, *Verticordia* and *Wehilia* (description of all species on page 65).

The group of *Myrtaceae* chosen this time and described below are, however, a little more fussy about their garden bed and of their environment and care. They are mostly undershrubs which means that they prefer to grow in association with other plants or structures but like sun. They like water in season but will not normally tolerate wet feet. Presumably the larger trees and shrubs with deeper roots suck up any excess water.

The preferred conditions appear to be good garden conditions with a preference to lighter rather than heavier soils, fresh water (water regularly applied in their growing period that passes through the open soil structure) and fresh air (not steamy, stagnant or humid — after all not many humans like this so why should other living creatures above ground like it either?). All will give good results grown in large pots, sheltered from wind, but in the open, provided they are kept moist. I suspect the preference for fresh water and fresh air is related to the reduction of conditions preferred by lower forms of life that could attack them, which include pests, fungi and bacteria.

As mentioned above, if you depart from good garden conditions, then favour lighter soils. However, it is especially interesting to note that the article "Wildflowers in Clay Areas" on page 195, Issue No. 4 of Volume 5, includes under "Recommended Plants", many species in this group. For the more difficult species, my comments on each genera are given below, but I call your attention to my comments under *Chamaelaucium* and the "Geraldton Wax".



Homoranthus flavescens — see page 54.

Photography O. Hockings.



Top: *W. coarctata*.
For descriptions see page 65.

Bottom: *Wehlia thryptomenoides*.
Photography by C. F. Davies.

Baeckea, Lhotskya, Leptospermum, Micromyrtus and Thryptomene

I could not improve on the excellent articles on plant descriptions and cultivation in our No. 30 Issue of Vol. 4.

Hypocalymma

Fully described, illustrated in colour with cultivation Issue No. 31, Vol. 4, Grow *H. angustifolium* and *H. cordifolium*.

Chamaelaucium

The best-known species is the "Geraldton Wax", *Chamaelaucium uncinatum* and could give us a key to the cultivation of this group of plants. "Geraldton Wax" has been widely grown for years and has proved a hardy garden shrub given reasonable garden conditions. For cultivation in gardens in Sydney it appears to like to grow against a wall. Mine is against a western wall in a hot position during the afternoon. Strangely enough (or not so strange now), nearby is the first successful plant I have grown of *Verticordia*. All 12 species are from W.A. and are described in our No. 32 Issue of Volume 4, well illustrated with colour plates. Copies of this issue are available separately at 50c plus 20c postage.

Darwinia

There are 35 species, most from the south-west. They are such unique shrubs I propose to prepare a whole issue on them in Volume 10. Will readers please send notes on cultivation and colour slides? Meanwhile, my index gives the following references in past issues:

Darwinia carnea 30:69, *D. citriodora* 23:116, 41:213, 55:130, *D. collina* 22:52, *D. fascicularis* 23:116, 40:167, 176, 180P, 55:130, *D. hypericifolia* 22:52, *D. leiostyla* (*D. meissnerii*) 22:52, 58, V3C54, *D. leptantha* 44:359, *D. macrostegia* 22:52P, V3C72, *D. meeboldii* 22:52, V3C33, 71, *D. micropetala* 12:2, 14, V3C54, *D. nieliana* V3C54, *D. oldfieldii* 46:45P, 65, *D. pinifolia* V3C54, *D. rhadinophylla* 22:50, 55:130, V3C54, *D. sanguinea* V3C72, *D. squarrosa* 22:52, V3C54, *D. thymoides* V3C54, *D. virescens* V3C72, Propagation & Cultivation 30:63, 67, For the Seaside 23:116, Frost Hardy 25:208.

Homalocalyx

The two species from the north are unknown to me. Will readers please send details and slides? Very beautiful, similar to *Calytrix*.

Homoranthus

The four species are found on the east coast. They are excellent rockery and low-growing ground cover subjects.

Homoranthus flavesens is a semi-prostrate plant rarely reaching ½ metre but spreading to 1 metre across. The attraction is the fine, short, light grey-green foliage on symmetrical spreading branches. The small yellow and white flowers are not striking but are unique, being similar to *Darwinia fascicularis*, as shown in colour on page 180 of Vol. 5. *Homoranthus virgatus* is similar, but some forms are larger.

Pileanthus

Really beautiful shrubs, well described and illustrated in Issue No. 23 of Vol. 3.

Verticordia

Possibly the most beautiful shrubs of all as shown by the front cover plate. An issue on this genus is planned for Vol. 10, so will readers send in reports

Wehlia

See page 65 for a description of all species.

Calytrix

by Joan Doney,

Leader Calytrix Study Group.

Calytrix is a group of about 40 species of beautiful ornamental small to medium shrubs growing naturally in all States of Australia. They vary in height from one third to 2 metres. They are heath-like in their foliage and are inclined to be woody.

The word *Calytrix* comes from the Greek *kalyx*, a cup and *trix*, *trikos*, a hair — the sepals end in long hairs or awns. These awns are very important in the wind distribution and germination of the seed. At the end of each seed is a small helical or spiral point and when the seed floats to the ground, the heat and cold of night and day operates on the awns and literally screws the seed into the ground, assisting germination. The fact that this flower has awns makes it easy to identify. In Western Australia whence the greatest variety of *Calytrix* come, they are commonly known as Star Flowers or Fringe Myrtle and the petals give this beautiful starry appearance.

Cutting material for striking is not easy to come by on this woody gem, but should be looked for about three months after flowering, low down on the plant. Seed can be difficult to germinate as borne out by the *Calytrix* Study Group and either takes a long time to germinate or its viability is suspect.

In its natural habitat *Calytrix* can be found growing in conditions from gravel beds to almost plain sand; which suggests it should be easy. However, I would advise the grower to raise his beds but not allow them to dry out.

As *Calytrix* is a terminal flowering plant prune lightly after flowering to encourage the terminal shoots for a good flowering the following year. Leaf mould or compost can be beneficial when placed around the plants to within 2 inches of the stem to conserve moisture, inhibit weed growth but to not assist collar rot. A few grains of 9 month slow release Osmacote can be sprinkled at the perimeter of the leaves in Autumn to encourage good budding.

Calytrix tetragona appears to be the only one spreading across from the East to the West and is usually smothered in white flowers in New South Wales. This is followed by awned maroon sepals giving the appearance of twice flowering. In Victoria and Western Australia it is quite often pink flowered.

Calytrix flowers in late Spring and Summer. Many different colours are available: three that are yellow are *C. angulata*, grows to only one third to ½ metre in sand; *C. aurea* and *C. depressa*, both one third metre.

The greater number are pink or mauve or a variation of those two colours. *C. brevifolia* grows to one metre in height with minute foliage and massed with almost blue flowers. *C. fraseri* often grows a little higher with small leaves, small flowers of a deep pink with anthers of a good yellow.

C. strigosa is a slender erect shrub which flowers for a long period from August to January and like *C. sullivanii* is a good clear pink. *C. longiflora* is amongst the bigger plants growing to 2 metres and is a beautiful pinky-purple. *C. oldfieldii* is slender in growth and pinky-violet in colour. Also *C. tenuifolia* is among the pinky-purple range of colour.

A number of species in this genera have flowers bordering on the reds. *C. interstans*, only one third to half metre has pinky-red flowers. *C. stipulosa* is a slender erect shrub often over one metre with orange-red flowers in September.

C. exstipulata is one of the most spectacular native plants of North Queensland and may be seen at the Burra Range; about 1 metre in height. small leaved with mauve-pink flowers and golden anthers. in the Northern Territory is a larger form, deep pink to 3 metres tall.



Top: *Calytrix fraseri*.
Bottom: *Calytrix longiflora*.

Photography by R. G. Cooke.
Photography by L. Cockburn.



Photography by Frank Hatfield.

CALYTRIX BREVIFOLIA

What makes it a Myrtaceae?

A Series for the young in spirit — Wildflower Magic — by Nuri Mass

MYRTACEAE — that's the name of one of the most beautiful flower families in the Australian bush. One of the largest, too. It's the family that all the Eucalypts belong to, also the Bottlebrushes, Lilly-pillies, Geraldton Wax and Tea-trees, the Native Apples and Melaleucas, to mention only a few of them.

And already, by looking back over those few, we have learnt several things about the members of family Myrtaceae: that they are either trees or shrubs, that their leaves can be all manner of different shapes and sizes, from broad and flat to narrow and heath-like, and that their fruits can be either juicy berries or dry woody little things.

Then, since juicy berries couldn't very well grow in hot dry places, we also realize that Myrtaceae plants can be found where it's moist and shady as well as where it's dry and open — actually in all the heat of the Northern Territory, and in the icy temperatures of the Snowy Mountains.

Now, what does a flower have to do to belong to this family? It has, in fact, quite a lot of choices. It can grow singly in the axils of leaves, or in large or small groups called "inflorescences". (These inflorescences can be long and brush-like, or round like pompoms.)

It can have four or five sepals, or none at all — and when it does have them, it can keep them long after its petals and stamens have fallen. If it's a *Calytrix*, it can grow a long wiry "hair" from the tip of each sepal; and if it's a *Verticordia*, its fringed and colourful sepals can look very much like feathers. But whatever flower it is, its sepals join together down below into what is known as the "calyx tube".

Again, it needn't have any petals, or else it can have four or five of them — mostly pretty little roundish ones — which often drop very quickly.

Next come the stamens, and again a flower belonging to family Myrtaceae has several choices. It can have any amount of them — and usually does have, especially if it's something like a Eucalypt, Bottlebrush, or *Melaleuca*. Or else it might have only ten, sometimes arranged neatly between the same number of make-believe stamens (or "staminodes"). If it's a *Melaleuca*, its stamens are joined together in five bundles, whereas if it's a Bottlebrush (*Callistemon*), Native Apple, Eucalypt or *Kunzea*, for instance, they are all free and separate.

Usually, the ovary of a Myrtaceae flower — which will later be its seed-box — is placed well down, with all of the sepals, petals and stamens arranged above it. Yet also, there are cases where it's only half-and-half below all of the other parts.

Then finally, as we have seen, a member of this family can have either a soft fruit, or a hard dry one. And if it's dry, it can either be a capsule (splitting open when its seeds are ripe) or a nut (*not* splitting open).

So, with such a number of choices open to them, it isn't any wonder that Myrtaceae plants do not always show immediate family likenesses. Certainly, by looking even casually at their flowers, anyone could guess that Eucalypts and Native Apples belong to the same family. But what about Eucalypts and the Geraldton Wax Plant — or Tea-trees and *Darwinia* or *Calytrix*?

Whereas a cluster of Gum-blossoms looks something like a powder-puff, a cluster of *Darwinias* looks rather like a pin-cushion. This is because the fuzz of stamens is what you notice chiefly about a Gum-blossom, whilst its upstanding long, thin styles, set into the "cushion" of its petals, is what you first notice about a group of *Darwinia* flowers.

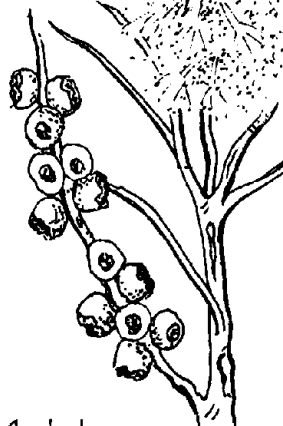


A
"pincushiony"
Darwinia



A
Calytrix, with
sepal "hairs"

A puffball
Kunzea



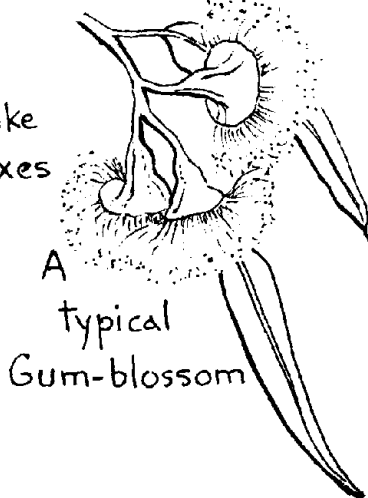
A Melaleuca,
with cup-like
seed-boxes



A "petally"
Tea-tree



A Verti-
cordia,
with its
feathery sepals



A
typical
Gum-blossom

Very quaint little flowers they are, too, with their five petals joined into a tube, and curving in at the top so that the flowers themselves look closed. And the fact is that, for most of the time, they *are* closed. The tips of their petals roll back just long enough to allow the styles to push their way out into the air, then they fold inward again. But while each flower is open for that brief time, you can see its stamens like ten beady black eyes peeping out at the world, with ten little staminodes between them.

We have already mentioned that each sepal of a *Calytrix* flower tapers off into a long fine "hair". This, of course, gives the whole plant a daintily fuzzy appearance while it is in flower, and often quite a tangled appearance afterwards — for it is after the petals and stamens have fallen off that the sepals really come into their own, their colour strengthening, and their "hairs" growing longer and wirier.

And you would certainly never guess that either a *Calytrix* or a *Darwinia* belonged to the same family as the Eucalypts unless you carefully examined the numbers and arrangements of their parts: The ovary below or partly below everything else — the crowds of stamens, or only ten — the four or five petals and sepals, or none at all — and the little cup-like calyx-tube.

So too with the beautiful showery masses of white or pink that *Micromyrtus* and *Thryptomene* bushes produce when they are in bloom. Look closely at their tiny individual flowers, however, and you will feel reminded of Tea-trees and Geraldton Wax.

Although in a different, quieter way, it often happens that a plant's seed-boxes are as attractive as its flowers — and this is certainly true of family Myrtaceae. In a "cherry" sort of way, bunches of Lilly-pillies are beautiful to look at, but my own favourites are those crowded clusters of little woody "cups" that you find on the stems of Bottlebrushes and Melaleucas, the little brown "buttons" on Tea-tree branches — and a "gumnut" is surely one of the most enchanting things in Australia's bushlands.

THE PLANT FAMILY MYRTACEAE — PART 2

Part 2 by C. N. Debenham with introduction by The Editor with full apologies for reducing an accurate, scientific work to ambiguous, inaccurate generalities.

In Part 1, Cliff Debenham described in botanical terms the features that have led the botanists to group such a wide range of plants into the plant family Myrtaceae.

Group I. Fruit succulent. Trees or shrubs essentially of the rainforest. We propose an issue on this group. Reports and colour slides needed.

Group II. Fruit dry. Trees and shrubs which he has further subdivided into —

A. Fruit indehiscent (i.e. the seed capsule does not split open to release the seed). Usually 2 seeds per fruit which together with other features, groups four genera of the north.

B. Fruit comprising a capsule that splits open to release the numerous seeds, these hardy plants being the subject of the last issue.

Group III. Fruit dry, usually one seed per fruit: plants of this issue—Editor.

I. FRUIT BERRY — Enclosed by a soft or hard textured wall. Floral receptacle narrowed rather abruptly and not produced above the ovary (*Rhodamnia*, *Ptillostigma*, *Rhodomyrtus*, *Austromyrtus* and *Decaspermum*).

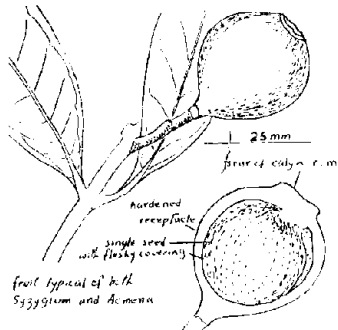
Floral receptacle tapered gradually below and produced above the ovary (e.g. Lillypillie *Acmena smithii*), *Cleistocalyx*, *Syzygium* and *Acmena*.

II. FRUIT DRY — Generalised to show RECEPTACLE (R) usually hard textured, enclosing the true fruit which never is succulent. Stamens (some remaining as St.) arise from the margin of a disc (D) lining the inner rim of the receptacle. Sepals (Se) sometimes are persistent. O is the summit of the inferior ovary often splitting into valves to release the seed (usually numerous in the group). Sty. is the simple style.

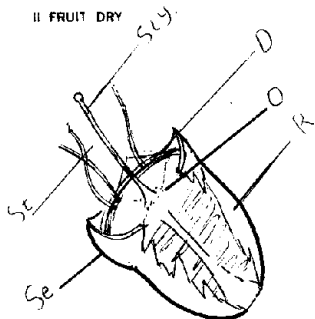
A. Fruit 2 — locular, not capsular — *Choricarpia*, *Backhousia*, *Osbornia* and *Fenzlia* (colour plate, on page 82).

B. Fruit, a 3 or more locular capsule. Shown are the capsules of *Eucalyptus* with valves exerted (a) and enclosed (b); of *Leptospermum* (c); of *Callistemon* (b) the united capsules of *Agonis* (e) and *Kunzea* (f).

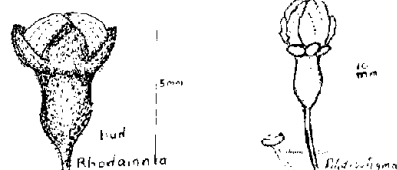
I FRUIT A BERRY



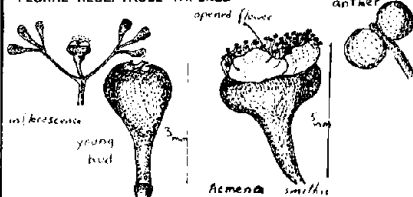
II FRUIT DRY



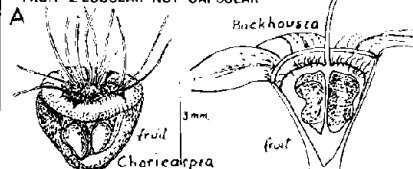
FLORAL RECEPTACLE NARROWED



FLORAL RECEPTACLE TAPERED



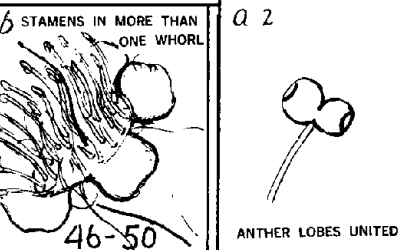
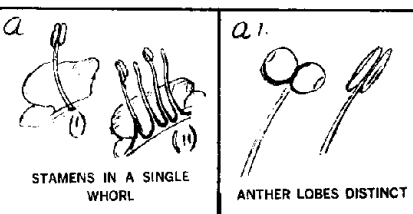
FRUIT 2-LOCULAR NOT CAPSULAR



B



FRUIT A 3 OR MORE LOCULAR CAPSULE



III FRUIT DRY 1-LOCULAR



III. FRUIT DRY, 1-locular, usually 1-seeded. Represented by that of *Darwinia* (a), *Calytrix* (b) and *Chamaelaucium* (c). In (c) sepals are partly cut away to show exertion of style from the non-septate ovary summit and an outline of the single seed.

(a) Stamens in a single whorl, definite in number.

(i) a single stamen opposite each petal as in *Micromyrtus*;

(ii) stamens slightly united basally alternating with anther-less filaments (staminodes) as in *Chamaelaucium*.

SUB GROUP

1-5

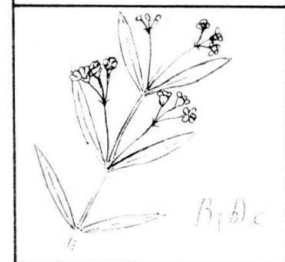
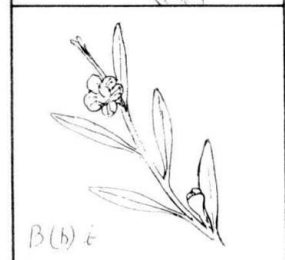
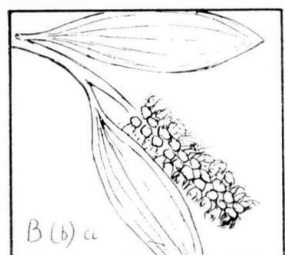
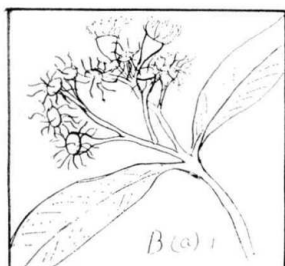
6-8

9-12

13-37

38-43

(41)
44-45



SUB-GROUP 13-37

B (a) Inflorescence Cymose — Leaves Broad, Leathery and Flexible.

B (a) 1. *Angophora* with corymbose inflorescence or flowerhead.

2. *Tristania* with dichasial inflorescence.

Eucalyptus. A section features the corymbose type (i.e. the bloodwoods). The majority feature dichasial inflorescences.

Exceptions to sub-group 13-19

Syncarpia with flowers in pedunculate heads.

Lysicarpus with leaves narrow and revolute.

B (b) Inflorescence Racemose — Leaves Narrow (or Small), Stiff, Longitudinally veined, especially when broad.

B (b) a. The spike, e.g. of *Melaleuca* or *Callistemon*,
b. Solitary and axillary flowered of *Leptospermum* or,

(c) Umbellate type as in *Baeckea*.

B (b) i Stamens free (sometimes in clusters)

ii Stamens united in bundles or clusters opposite and longer than the petals.

(a) stamens just a little longer than petals in *M. quinquenervia*.

(b) stamens forming a definite claw as in most *Melaleuca*.

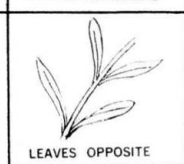
(c) stamens forming a definite tube as in *Lamarchea*.

SUB
GROUP

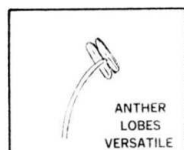
20-
24



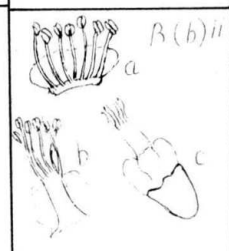
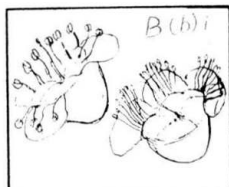
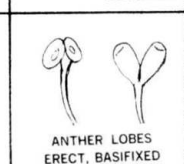
25-
29



30-
32



33-
38



III. Fruit dry, 1 (rarely 2) seeded and indehiscent, formed from a 1 (rarely 2) locular ovary with a single placenta, usually enclosed by a somewhat hardened but rarely enlarged receptacle, and often surmounted by persistent sepals. Inflorescences of most axillary, solitary or few-flowered, or a terminal head. Stamens free at least for the greater part of their length, the anthers either globular and opening by pores or short slits, or of two distinct lobes parallel and opening longitudinally. Leaves opposite or irregularly positioned. Mostly shrubs with small sclerophyllous leaves, particularly abundant in heath communities and greatest distribution in the west.

(a) Stamens in a single whorl, definite in number.

1. Stamens free, all complete, either 5 or 10, and then 1 opposite each sepal and petal. Anther-lobes distinct, globular, opening by pores (most *Thryptomene*) or short parallel or divergent slits (*Micromyrtus*). Flowers solitary and axillary, or sometimes crowded, sessile or shortly pedicellate at the tips of the branches. Sepals and petals 5, the sepals often petaloid or reduced, persistent. Receptacle not extended beyond the ovary, often angled, ribbed, or pitted. Leaves opposite.

2. Stamens, when 5, alternate with the petals. Ovules few, at first horizontal or ascending on a lateral placenta, later becoming pendulous. Petals persistent. 38. *Thryptomene*.

2. Stamens, when 5, opposite the petals. Ovules few, collaterally attached at the summit of a placenta extended from the base of the locule. Petals usually deciduous. 39. *Micromyrtus*.

1. Stamens slightly united basally, either double the number of petals and (in most) alternating with as many antherless filaments (staminodes), or 4 times as many and all complete. Ovules 2 or more from an erect basal placenta.

3. Anther-lobes distinct, parallel, opening longitudinally, adnate to a thickened connective (or in some *Pileanthus*, divergent and then the connective forked). Ovules 6 to 10 in 2 rows from a basal placenta. Style not or rarely exserted. Leaves mostly opposite.

Stamens 20, all complete. Sepals entire, 10, broad and petaloid. Petals 5, shortly ciliate, longer than the sepals and stamens. Flowers pedicellate at the tips of the branches forming leafy corymbs. 40. *Pileanthus*.

Stamens 10, alternating with as many staminodes.

Sepals 5 or 10, deeply divided into plumose or hair-like segments, often with accessory sepals. Stamens sometimes united for a third of their length in a continuous tube. Flowers axillary and solitary, or forming spikes, corymbs, or racemes. 41. *Verticordia*.

Sepals 5, entire, rounded. Flowers axillary and solitary or forming short racemes. 42. *Chamaelaucium*.

Stamens 8, without staminodes.

Flowers 4-merous, crowded in a terminal head within an involucre of coloured bracts. Ovules 1. 43. *Actinodium*.

3. Anther-lobes united, forming a globular 2-pored unit, joined at the base to the filament. Ovules 2 (rarely 1) to 4 from a short basal placenta. Style exserted (not or only slightly in *Verticordia*). Leaves opposite or without definite order.

Stamens 10, with as many staminodes. Flowers 5-merous, the receptacle 5 or 10-ribbed. Style usually bearded close to the stigma (only in some *Verticordia*), exerted above the petals.

Sepals deeply divided.

41. *Verticordia*.

Sepals entire. Flowers paired or few together at the ends of the branches, which often continue as vegetative shoots. Sepals produced into a single plumose bristle or (1 species) into 5 bristles. Eastern-confined.

44. *Homoranthus*.

Sepals petaloid or somewhat hardened, not produced as a bristle.

45. *Darwinia*.

- (b) Stamens in more than 1 whorl, free, numerous (more than 20); anthers versatile or the lobes parallel, dehiscing longitudinally, the connective of the filament extended as a globular gland-like appendage. Ovules 2, collaterally developed from a placenta extending from the base of the locule. Flowers in clusters or heads terminal on an axis continuing growth or (*Lhotskya*) solitary and axillary, sessile or almost so. Leaves rarely regularly opposite.

In some *Homalocalyx* the stamens are fewer (as also a single species of *Calytrix*) and the placentation is basal.

1. Sepals absent; petals 4. Receptacle 4-ribbed. 46. *Calythropsis*.

1. Sepals and petals 5, the sepals usually persistent, but deciduous in *Homalocalyx*.

2. Receptacle hemispherical or campanulate, the sepals obtuse.

47. *Wehilla*.

2. Receptacle cylindrical or narrow and dilated, often ribbed (10, or 5 in some *Lhotskya*), extended beyond the ovary.

3. Sepals petaloid, entire, deciduous. 48. *Homalocalyx*.

3. Sepals not petaloid, persistent.

Sepals ending in a long filiform awn.

49. *Calytrix*.

Sepals obtuse, not awned.

50. *Lhotskya*.



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Wehlia

The Genus *WEHLIA* F. Mueller
by R. J. Hubbard

Wehlia is a Western Australian-confined genus of the family *Myrtaceae*, tribe *Chamaelaucieae*, sub-tribe *Calythriceae*. It is comprised of seven species and is very closely allied to *Lhotzkya*, *Calytrix* and *Homalocalyx*.

The genus was named in 1876 after Dr. Eduardo Wehl, a German physician. Since it was unknown at the time of publication of Benthams *Flora Australiensis* (1867), no readily available writing has been published on the genus, other than Mueller's original description in Latin.

The *Wehlias* are at present little-known to non-botanists, due to their occurrence in the Coolgardie and Austin districts, with only two species extending into the upper part of the South-west Province. All species occur in comparatively dry sandy areas.

They are low to medium woody shrubs with small heath-like foliage and very showy clusters of small star-like flowers, 5-petalled as in *Calytrix* and *Lhotzkya*, but differing from those genera in the calyx tube which, instead of being elongated, is concealed by the bracteoles and calyx lobes. It is also related to *Calythropsis*, with the main distinguishing feature being the 4-petalled flowers in the latter genus.

Wehlia was incorrectly listed in the index of Vol. 4 of *Australian Plants* (1967) as having been transferred to *Homalocalyx* F. Muell. No transfer has been effected to date (1977), though there is indeed a possibility that the two genera may not be distinct, since the generic descriptions are very similar. Should a future investigation find no valid grounds for retaining two distinct genera, then the name *Homalocalyx* F. Muell. would have priority since it is the earlier name (1857).

Two species, *W. pedicellata* and *W. pulcherrima*, are known only from the original collections, indicating probable restricted occurrence. They were apparently overlooked by C. A. Gardner in the compiling of his *Enumeratio Plantarum* (1930) and were also omitted from the King's Park *Descriptive Catalogue*, but both are currently included in the species lists at the Western Australian Herbarium.

The original description of one species, *W. staminosa* F. Muell. appears to have been lost and this may necessitate redescription by another botanist. The plant is known both in the field and from herbarium specimens, but until such time as the original description is found, or a redescription is made, doubt must be cast on the validity of its name.

Generic Characteristics: (after F. Mueller, with amendment by A. J. Ewart & B. Rees). **Leaves:** scattered, small, heath-like. **Flowers:** sessile or shortly pedicellate, closely packed in terminal globular clusters or with the central axis growing on. **Bracteoles:** persistent, glabrous. **Calyx tube:** campanulate, glabrous, concealed or nearly so by investing bracts; lobes entire, scarious, persistent, shortly superior. **Petals:** 5, acute or obtuse, deciduous. **Stamens:** numerous, usually 20-40, free, shortly exerted, deciduous; filaments very fine. **Anthers** versatile, cells parallel, erect, opening in longitudinal slits. **Style:** very slender; stigma minute. **Ovary:** 1-celled; ovules 2, collaterally affixed. **Fruit:** formed in scarcely enlarged calyx; capsule open; calyx tube completely concealed. **Seed:** erect, basifixed, small, ovoid or globular.

WEHLIA SPECIES

The following brief notes are intended to be a simplified digest of growth habits, flowering and distribution. Practically all botanical details have been omitted. Full descriptions are contained in the works listed in the Bibliography.

W. aurea C. A. Gardn. (1964): An erect, slender-branched, compact shrub, 30-45 cm. Leaves appressed, glaucous, broadly obovate, 2 mm. Flowers small, golden yellow, stamens 35-40, style long; borne in dense leafy globular spikes $\pm$ 5-6 mm long, either terminal or with the axis growing out during flowering, during spring. Sandy soils in the Irwin and Austin Districts. Attractive.

W. coarctata F. Muell. (1876): An erect, bushy, slender-branched, ovoid shrub, 30-60 cm, the branchlets scarcely angular. Leaves scattered, crowded, linear, dark green to grey-green, 3-8 mm (usually $\pm$ 6 mm). Flowers 1 cm diam., purple/red to brilliant red or crimson with quite prominent yellow anthers, stamens numerous, style quite prominent; borne on axillary pedicels forming terminal globular to ovoid clusters 1.5-2 cm diam., throughout spring, the axis soon growing out. Profuse flowering. Dry sandy soils, usually in heath, sometimes in *Acacia* thicket, in the Avon, Irwin, Austin and Coolgardie Districts. Beautiful.

W. grandiflora C. A. Gardn. (1964): An erect, slender-branched, bushy shrub, 1.2-2 metres. Leaves widely spreading, cuneate-oblong, 6 mm or longer, tips mucronate and recurved. Flowers rose purple, about 2 cm diam., largest of genus, stamens 35-40, style long and exerted; borne axillary, singly or in shortly pedunculate pairs, during late spring and probably longer. Profuse flowering. Sandy soils in the area bordering the Coolgardie and Austin Districts. Very beautiful.

W. pedicellata Ewart & Rees (1912): A small, erect, slender-branched shrub, 30-60 cm, with the branches nearly right-angled to the stem. Leaves crowded, similar to those of *W. thryptomenoides*, but blunt-tipped and $\pm$ 4-6 mm. Flowers similar to those of *W. thryptomenoides*, but with broader petals and 25 or more stamens, borne on axillary pedicels forming terminal globular clusters $\pm$ 1.5 cm diam., during early summer and probably longer. Sandy soils in vicinity of Mount Mocre N.E. of Merredin in Coolgardie District. Very attractive.

W. pulcherrima Ewart & Rees (1912): A branching shrub, probably exceeding 90 cm., the branches quite long. Leaves crowded, linear-ovate, 4-6 mm, with a bluntly pointed tip. Flowers purple, larger than those of *W. thryptomenoides*, stamens 30 or indefinite; axillary, forming dense terminal clusters. Flowering period unrecorded. The type-collection was made towards Coolgardie, presumably in sandy soils. Apparently a beautiful species.

W. staminosa F. Muell. (1884): A low, scrubby shrub, 45 cm. or compact and erect to 1.2 metres, with numerous slender branches and short, very fine branchlets. Leaves opposite, decussate, closely packed, broadly ovate to ovate-lanceolate, up to 3 x 1 mm. Flowers small, deep rose-pink, stamens up to 40, styles long; borne in terminal globular heads $\pm$ 1 cm diam., during early and mid-winter and possibly longer. Stony hills in the Austin District. Beautiful.

W. thryptomenoides F. Muell. (1876): A bushy, erect, slender-branched shrub, 45-90 cm, with similar spread. Leaves fairly closely packed, ovate-oblong, minutely mucronate, $\pm$ 2-3 mm or up to 6 mm. Flowers quite small, purple-red or magenta, stamens 20 with quite prominent yellow anthers, styles long; borne on axillary pedicels forming small terminal globular clusters up to 1 cm diam., from mid-winter to mid-spring or sometimes longer. Flowers numerous. Sandy soils (sometimes yellow with lateritic pebbles), sometimes in scrub heath, sometimes in *Acacia* or woodland thickets, in the Irwin, Avon, Austin and Coolgardie Districts. A beautiful species. Mueller and Tate recorded a narrow-leaved variety to 90 cm height near Gnarlbine. Ewart and Rees described a var. *microphylla* with leaves up to 2 mm long but comparatively wider than in the typical form, from the Avon and Coolgardie Districts.

HORTICULTURAL POTENTIAL

All species are potentially very suitable for cultivation in dry areas, so it is unfortunate that their horticultural potential has not been further explored to date. All are very attractive plants which should be very suitable for sunny well-drained positions in borders, rockeries and low shrubberies, under similar conditions of cultivation to most *Calytrix* and *Lhotskya* species.

As in the case of most dry area plants, persistence will probably be required in propagating some of them from seed or cuttings, but they will probably respond to similar treatment to the above genera.

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ACKNOWLEDGEMENT

The above notes have been condensed from a work soon to be submitted for publication, covering the whole of the family *Myrtaceae* in Western Australia. My warmest thanks to Mr. R. Royce for allowing me full access to the collections at the Perth Herbarium and to Messrs. P. Wilson and R. Altker for considerable help with identifications.

Grow from Seed

Part Two —

Notes from the Editor

The last issue described very simple methods of seed germination for plants in the family *Myrtaceae*. Some would be critical of me for making it appear too simple. I chose genera that are easy from seed such as the bottlebrushes (*Callistemon*), *Melaleuca*, etc. The experts were quick to point out that, by using normal nursery methods of keeping the seed moist in a sterile medium, these plants will germinate quite freely and provide better root growth than with (to them) the messy bog method.

I hope many readers tried the methods I described. Success is certain so if you have not, purchase some seed and watch them grow in a container on the kitchen shelf. As the seedlings grow lower the water in the tray below to encourage them to send down roots in search of moisture.

What of the remaining plants in the family *Myrtaceae* mentioned in this issue? Here the results are by no means encouraging. I feel one reason is the availability of viable seed, i.e. seed that will germinate. If you can get some try the same methods recommended but do not let the surface containing the seed get very wet for too long. Try dunking once a week only.

Alternating periods of hot moist and hot dry conditions may do the trick.

You may conclude that it did not take long for me to run out of steam in my "cannot fail" "do it yourself" advice on growing wildflowers from seed. I wanted to get you to pause and think with this issue. As with the plants recommended here, even the most inexperienced beginner can often be as successful as the professional if they will think about what they are doing. You may come up with a method that has baffled the experts for years. At least you will have fun trying and is this not what life is all about?

Back to growing from seed. There are hundreds of species of wildflower you can grow from seed without special equipment, by using just a little care. I shall describe these methods in our next issue as the plants recommended there are good examples to illustrate the points made and once again you may be assured that you will be successful.

With plants in this issue, the usual method of propagation is by cuttings. Many simple methods are given in previous issues and I will review procedures in a future issue. The next article is produced for the advice of the more experienced. It indicates how the latest scientific equipment can often be a drawback but also how astute observation produced a result. Misting equipment and bottom heat are not essential for good results. In fact latest reports indicate that the igloo (which can be easily constructed) gives better results. More of this later.

Verticordia grandis Drumm. from Cuttings

by J. A. Koppman

Canberra Botanic Gardens

Verticordia grandis Drumm. has proved very difficult to propagate from cuttings at the Canberra Botanic Gardens. Several collections of cutting material have been processed and no plants have resulted.

In August 1974, cutting material was received from Western Australia. There was both soft and semi-hardwood material in good condition in full flower.

The cuttings were prepared by removing all flowers and flower buds, and cutting the leaves off (not stripping). Soft cuttings were treated with Seradix (R) 1 powder and harder cuttings with Seradix (R) 2. They were then placed in 4 in. square punnets of sand/peat/perlite (1:1:1) cutting mix.

The punnets were placed on the misting bench in the glasshouse receiving 2 sec. mist every 6 minutes, with a bottom heat of 27°C.

After about three days a fungal infection was observed attacking the leaves. This was sprayed with Captan. To obtain the maximum benefit from the fungicide, the punnets were moved to a minimum mist area (1 sec. every 12 minutes) with a bottom heat of 27°C.

After one week the fungus had been eliminated and the cuttings were thriving under the dry conditions. It was decided to continue with these dry conditions — the punnets were watered by hand at odd intervals to keep the medium just moist. The medium in the bottom of the punnet was virtually dry.

Twelve weeks after making the cuttings, four had rooted well and roots were appearing out the drainage holes. The remaining cuttings were well callused. The rooted cuttings were potted up and the remainder were returned to their punnets and placed back on the bench.

Three weeks later, three more were rooted and potted up.

The seven plants were kept under the low mist conditions for a couple of weeks and then hardened off.

From the 60 cuttings taken, seven rooted, several were lost due to the fungal attack, and some remain healthy and callused at the time of writing.

The results represent about 12 per cent success which is very encouraging. The main effect of the low mist and dry conditions appeared to have been to cut down fungal infection.

This method is being investigated for propagating other dry country species which have proved difficult to strike from cuttings. The low mist, barely moist medium and high bottom heat combination differs markedly from normal cutting propagation conditions, but may be suitable for plants which rot and are attacked by fungi on their leaves under normal mist.

A New Wattle from South Australia

by D. J. E. Whibley
(State Herbarium, Botanic
Garden, Adelaide)

Acacia araneosa Whibley Contrib. Herb. Aust. 14: 1-7, 1976.

The specific epithet refers to the cobwebby appearance of the tree because of the mesh of long fine branchlets and phyllodes.

This interesting Wattle was first discovered in the Flinders Ranges in 1966, ca. 15 km north-west of Balcanoona Homestead by Mr J. L. Johnson (formerly Chairman of the Pastoral Board) and Mr F. J. Vickery (now Chairman of the Pastoral Board), and on realising it was unusual sent a specimen into the State Herbarium, Adelaide, for identification. After preliminary investigation it was suggested that it had affinities with *Acacia juncifolia* and noted as an interesting find, representing a species not previously recorded for our State.

Since this time I have made a number of trips to the area to obtain fresh material with flowers and fruits, and to investigate the extent of the distribution. I found that this species grows on calcareous soils in dry open woodland, often in quite dense groves on hillsides and ridges in association with *Eucalyptus gillii* and *Triodia irritans* and is restricted to a small area of the Northern Flinders Ranges, from the Hills near Balcanoona, extending northward through to Arkaroola.

In the classification used by J. M. Black (Flora of South Australia edn. 2; 1948), *A. araneosa* would be placed in subsection 2. Uninerves, close to *A. calamifolia*. The following are the distinguishing characters of *A. araneosa* (see Fig. 2).

Habit:

A small, erect, slender tree, cobwebby in appearance, 3-8 m high. Trunk slender 4-7 cm diameter, occasionally dividing about 1 m or more above the ground into two main branches; bark smooth, grey, reddish brown on branchlets and juvenile plants; branchlets smooth, flexuose in appearance.

Phyllodes:

Pendulous, terete, glabrous, light green sometimes scurfy, usually 18-35 cm long, sometimes up to 69 cm long, 1-1.8 mm diameter, obscurely 4-nerved, becoming almost tetragonous when dry, tips tapering to a point often recurved, not pungent. A small gland where the base of the phyllode joins the petiole.

Flowers:

Racemose, axillary, paniculate when terminating a branch; raceme axis 3.5-9.5 cm long; peduncles 5-9 per raceme, 7-18 mm long, sparsely arranged. Flower heads compact, globose, 50-70 flowers per head, flowers 5-merous.

Pods:

Coriaceous, stipitate, linear, 6-14.5 cm long, 0.4-0.6 cm broad, straight or slightly curved with prominent nerve-like margins, somewhat contracted between the seeds, surface undulate, glabrous, olive green, becoming brown when mature. Seeds ovoid, black, shiny, minutely pitted, obliquely or longitudinally placed. Funicle extending $\frac{3}{4}$ of the distance around the seed, folded near the point of attachment and again in the middle, terminating in a clavate aril.

Flowering Time:

From May to October, and fruiting during October and November. Under cultivation this species flowers and fruits on and off throughout the year.

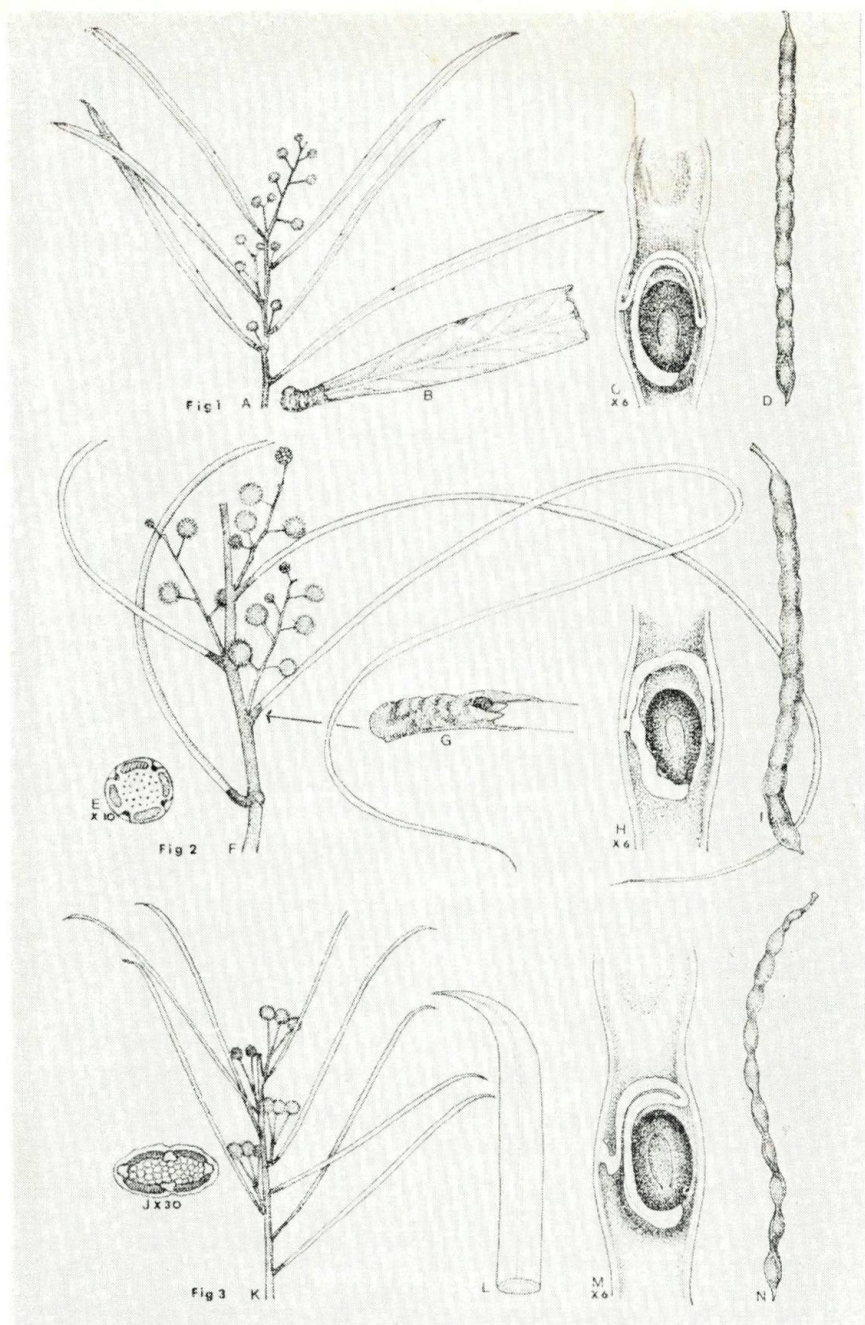


Fig. 1. *Acacia rivalis* — A. Flowering twig; B. Base of Phyllode showing position of gland; C. Seed and funicle; D. Pod.

Fig. 2. *Acacia araneosa* — E. Transverse section of phyllode; F. Flowering twig; G. Base of phyllode showing position of gland; H. Seed and funicle; I. Pod.

Fig. 3. *Acacia calamitolia* — J. Transverse section of phyllode; K. Flowering twig; L. Tip of phyllode; M. Seed and funicle; N. Pod.

Illustrations by L. Dutkiewicz, State Herbarium, Botanic Garden, Adelaide.

Related Species:

The following species are closely related to *A. araneosa* mainly by their flowers and pod characters; these are briefly described giving the main characters in which they differ.

1. *Acacia rivalis* J. M. Black (see Fig. 1):

Shrubby habit, 3-4 m high; phyllodes flattened, linear-lanceolate, curved, 4-12 cm long, 2-5 mm broad. Small, compact flower heads, solitary or in short pubescent racemes, flowers about 40 per head; small gland slightly below middle of the phyllodes. An endemic to the Flinders Ranges.

2. *Acacia calamifolia* Sweet ex Lindl. (see Fig. 3):

Shrubby habit, 2-3 m high; phyllodes, terete to slightly flattened, 3-12 cm long and about 1 mm broad, peduncles glabrous, solitary or shortly racemose, 30-40 flowers per head. Widespread from the Southern districts, Kangaroo Island, Murraylands, Eyre and Yorke Peninsula to the Flinders Range.

3. *Acacia chrysella* Maiden & Blakely:

Shrubby habit 2-3 m high; phyllodes flat, linear, curved, tapering into a curved point 4-7 cm long, and up to 3 mm broad. Glands sometimes more than one, when one usually close to the centre of the phyllode. Endemic to Western Australia in the Merredin area.

4. *Acacia harveyi* Benth.:

Shrubby habit; phyllodes flattened, 5-8 cm long, 2-3 mm broad, gland about one-third the length from the base of the phyllode flowers on short, slender racemes with 20-30 flowers per head. Endemic to Western Australia.

5. *Acacia juncifolia* Benth.:

A tall shrub, similar in habit and phyllode structure to *A. araneosa*, but differs in the flower heads being solitary or two together, and the funicle which is small and does not encircle the seed. This species occurs in New South Wales, Queensland and the Northern Territory.

Cultivation:

Acacia araneosa is doing well in the Mallee section at the Botanic Garden, Adelaide. Seeds were sown in October, 1973; seedlings were placed in tubes 19.XII.1973 and planted out on 13.XI.1974. Two plants have now reached a height of approximately 2.75 m in 18 months. This is a fast growing species which prefers neutral to slightly alkaline soil and good drainage. It can be recommended as an ornamental species, with unusual and interesting habit.

Fenzlia

by David Hockings

Fenzlia is one of the lesser known genera of Myrtaceae. It consists of three endemic species all of which occur in North Queensland. They are quite attractive small shrubs and one wonders why nothing is known of their response to cultivation.

Fenzlia obtusa is described and illustrated on page 92.

Fenzlia microphylla grows in much drier and hotter conditions. There are several roadside patches of this on the Clermont-Charters Towers road. It forms quite a dense low bush, ½ metre high. In flower it resembles, from a distance, one of the forms of *Boronia rosmarinifolia*. The leaves are little more than 1 cm long. The flowers are similar in shape and colour to those of *F. obtusa* but are smaller in size as are the hard fruit. Of the cuttings sent back in 1967 one plant is making slow progress in Mr. Hodge's garden, and has borne a few flowers.

F. retusa is recorded from the islands of the Gulf of Carpentaria. It resembles *F. obtusa*, but the leaves are usually smaller and narrower with a notch at the end.

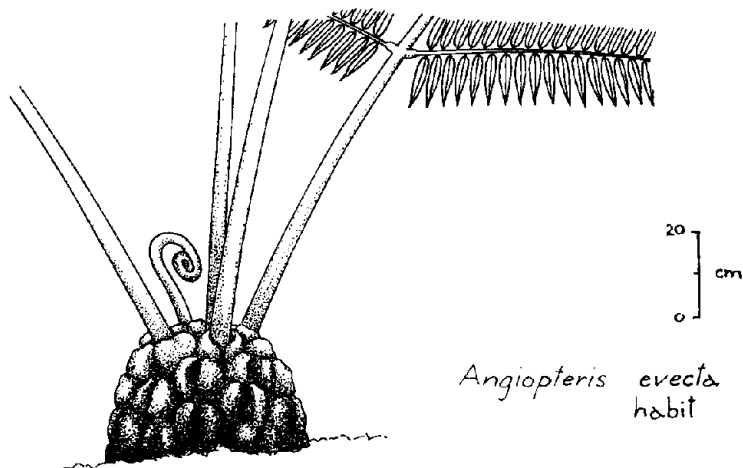
AUSTRALIAN FERNS

by I. Telford.
Canberra Botanic Garden.

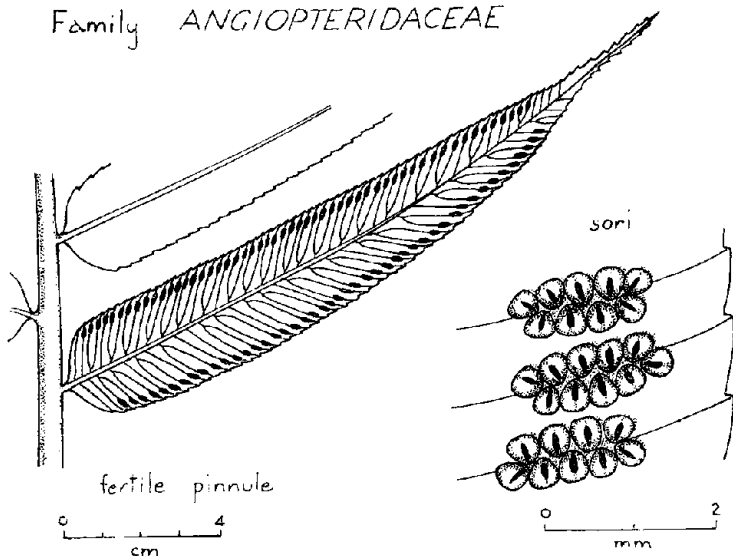
This, the second in a series of articles on native ferns, discusses two large primitive ferns of tropical and sub-tropical eastern Australia, *Angiopteris evecta* and *Marattia salicina*. Also included are further notes on the tree fern family Cyatheaceae.

Family ANGIOPTERIDACEAE

A family of very large terrestrial ferns of the tropics and sub-tropics which is represented in Australia by a single species.



Family ANGIOPTERIDACEAE



Angiopteris evecta (G.Forst.) Hoffm.

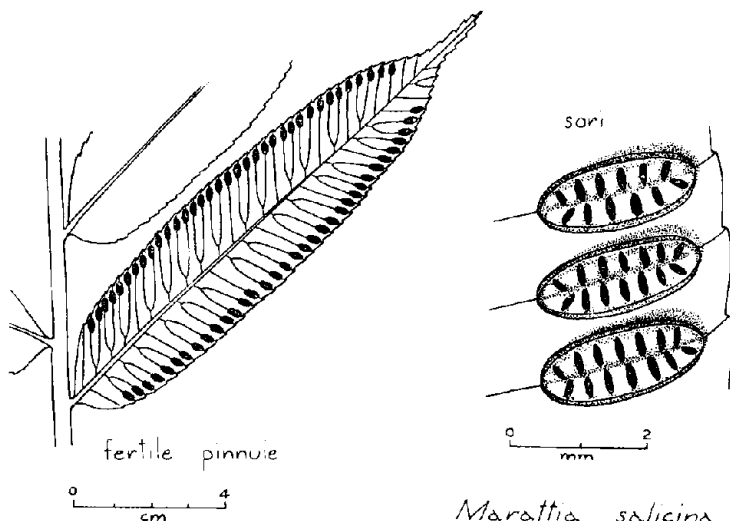
This giant fern occurs in Australia from north-eastern Queensland south to the Tweed Valley of north-eastern N.S.W. Preferring wet gullies or creek banks, the species inhabits coastal rain forests, reaching to an altitude of approximately 900 m in northern Queensland. A relic population occurs in the Carnarvon Gorge of central Queensland.

The rhizome is erect forming a massive trunk to 1 m tall and almost as thick. Fronds are 2-pinnate, to 5 m long, subtended at their bases by paired swollen stipule-like structures. Pinnules are lanceolate, 4 to 20 cm long, 15 to 25 mm wide, with long acuminate tips and serrate margins. Sporangia are grouped in two rows into oblong sori, almost touching in a continuous row close to the margin of fertile pinnules.

Family MARATTIACEAE

Another tropical and sub-tropical family of large terrestrial ferns closely related to the family Angiopteridaceae (order Marattiales). In Marattiaceae, sporangia are united; in Angiopteridaceae they are separate. One species of *Marattia* occurs in Australia.

Family MARATTIACEAE



Marattia salicina Sm. POTATO FERN, KING FERN

In mainland Australia, *Marattia salicina* is restricted to moist, deeply shaded gullies in the mountain rain forests of north-eastern Queensland. The species also occurs on Norfolk and Lord Howe Islands.

The erect rhizome forms a short bulbous trunk to 20 cm diameter. Fronds are 2-pinnate, up to 4 m long, with paired thick stipular structures at their bases. Pinnules are lanceolate, 4 to 20 cm long, 15 to 40 mm broad, with acuminate tips and serrate margins.

Sporangia are united into synangia, with 5 to 8 pairs fused into oblong sori in a continuous row close to the margins of fertile pinnules.

A population of *Marattia salicina* occurring on Lord Howe Island and differing from the mainland form in having shorter pinnules and 15 to 20 pairs of synangia per sori has been called *Marattia salicina* Sm. var. *howeana* W. R. B. Oliver.

Family CYATHEACEAE

In "Australian Plants" Vol. 7, No. 56, page 162, the Lord Howe Island tree fern referred to as *Cyathea dealbata* (Forst.f.) Swartz of New Zealand belongs to *Cyathea macarthurii* (F. Muell.) Baker, a Lord Howe Island endemic.

The tree fern floras of Lord Howe and Norfolk Islands with their several endemic species are of interest and are briefly described here.

Cyathea australis (R.Br.) Domin ssp. *norfolkensis* Holttum

This subspecies of the common tree fern occurs only on Norfolk Island. It is similar to the mainland *C. australis* ssp. *australis* but the scales of the costa are convex, scarcely bullate.

Cyathea brevipinna Baker

One of the four endemic *Cyathea* species of Lord Howe Island. Fronds are 3-pinnate, the pinnules close and overlapping. The stipe is warty; scales at the base of the stipe are dark brown and glossy.

Cyathea brownii Domin

This Norfolk Island endemic species was briefly noted in the previous tree fern paper. A robust species, its trunk reaches 16 m in height and is marked by oval leaf scars. Fronds are 3 m long, 3-pinnate. The stipe is finely warty with the scales at the base medium brown and shining.

Cyathea howeana Domin

An endemic of Lord Howe Island, this species reaches a height of 3 m. Fronds are 3-pinnate, the pinnules pinnatifid.

Cyathea macarthurii (F. Muell.) Baker

Another Lord Howe Island endemic which has been confused previously with *C. dealbata* of New Zealand. The trunk reaches a height of 4 m. Fronds are 3-pinnate, the pinnules minutely serrate and usually silvery-glaucous beneath.

Cyathea robusta (C. Moore) Holttum

This Lord Howe Island endemic bears a trunk reaching a height of 3 m, marked with the oval leaf scars of fallen fronds. Fronds are 3-pinnate, the pinnules crenulate and the scales at the base of the stipe pale brown.

Acknowledgement

In the preparation of these tree fern articles, I have drawn heavily from two Pteridophyte papers of Dr. M. Tindale, Senior Research Scientist, National Herbarium of New South Wales, Royal Botanic Gardens, Sydney. I wish to thank Dr. Tindale also for bringing certain points to my attention.

Corrections

It is necessary to make some corrections to the first article on Australian Native Ferns published in "Australian Plants" Vol. 7, No. 56.

p. 159, line 21: replace "Marrattia" by "Marattia"

p. 162, line 11: the Lord Howe Island tree fern referred to *Cyathea dealbata* (Forst.f.) Swartz belongs to *Cyathea macarthurii* (F. Muell.) Baker as noted above.

p. 163, line 30: replace "uncolled" by "young uncolling".

Dr. M. Tindale's Pteridophyte contribution to Flora of the Sydney Region was insufficiently cited; the full citation should read:

Tindale, M. D.: *Pteridophyta* in Beadle, Evans and Carroll: *Flora of the Sydney Region*, Sydney (1972).

Bibliography:

Bentham, G.: *Flora Australiensis* Vol. VII, London (1873).

Holttum, R. E.: *Cyathea in Australasia and the Pacific* in *Blumea* Vol. XII, No. 2, Leiden (1964).

FERN STUDY GROUP

The report on the King Fern of North Queensland was taken from the latest newsletter of the Fern Study Group. Another article of interest in this newsletter is "Ferns That Can Become Pests". If you would like to join this active group send \$1.00 to Stephen Clemsha, c/- Post Office, Moonee Beach, N.S.W., 2450. For those who cannot attend meetings in N.S.W. there is available a service to identify your ferns, advice on cultivation, fern spore from a well-stocked "bank" and regular issues of their newsletter.

A SELECTION OF AUSTRALIAN FERNS

The demand for this book has been so great that stocks quickly sold out. Orders will be accepted for delivery as soon as available.

The Genus *Lamarchea*

A Revision by A. S. George,
published in "Nuyssia" Vol. 1, No. 3.
Summarised by Editor.

Lamarchea differs from *Melaleuca* (to which most paperbarks belong) in the stamens which are united in a tube as in *Calothamnus* and which are hirsute in the upper part. The flowers are solitary and dull red. The trunk is up to 10 cm thick, never massive as in most other paperbarks.

This genus was formerly considered to comprise only one species *Lamarchea hakeifolia* with some variation. A new species from the west-central Australian deserts, *L. sulcata* is described together with a new variety *L. hakeifolia* var *brevifolia*.

KEY TO SPECIES

1. Leaves flat, 3 (5) — nerved
 2. Leaves mostly 3-5 cm long 1a. *L. hakeifolia* var *hakeifolia*
 2. Leaves mostly 1-2 cm long 1b. *L. hakeifolia* var *brevifolia*
1. Leaves terete, sulcate 2. *L. sulcata*.

Lamarchea hakeifolia Gaud:

A shrub to 5 metres, the older stems with bark decorticating in papery layers. This will confirm its place in the paperbark section of the plant family *Melaleuca*, for the amateurs. The plant does not appear to have much horticultural potential but it is very hardy. The development of a good form however would produce an excellent shelter plant or specimen for dry areas. It would be of value also as a hedge.

Characteristics of the plant are the flat, 3-nerved leaves 3-5 cm long and the solitary claw-like flowers which open greenish-pink and turn dull red.

The variety *hakeifolia* grows in red sand in tall scrub on the central west coast, just south of Shark Bay, Western Australia.

The variety *brevifolia* differs from the typical variety in having shorter leaves 1-2 cm long, 3-5 mm wide, and is found on the central west coast between the Murchison River and Shark Bay, in Western Australia, up to 50 miles inland.

Lamarchea sulcata A. S. George sp. nov.:

A spreading shrub to 2 metres tall with many stems, again with papery bark in layers on old stems. It is readily distinguished from *L. hakeifolia* by its lower, spreading habit and the remarkable terete, sulcate leaves.

Characteristics of the plant are the needle-like leaves and claw-like dull red flowers. Horticultural potential is low as the shrub is of open habit and flowers are usually sparse.

JOURNAL OF THE ADELAIDE BOTANIC GARDENS, Vol. 1 — Part 1, Sept./Oct., 1976
Available only from The Gardens, North Terrace, Adelaide, call or by mail — \$4.50 plus 40c postage.

This is the first of a new botanical journal to be produced at intervals (not fixed) to encourage work on the South Australian flora. It will also publish original articles on a wide range of aspects of descriptive botany, particularly those in the systematics of the Australian flora and on horticultural plants. One objective is to foster closer liaison between botanists and horticulturalists. The first issue is principally of a technical nature and includes:— "A Taxonomic Revision Of The Genus *Spartothammella*" — "Studies In Australian Lamiaceae. The Genus *Wrixonia* F. Muell" — "Morphological Variation and Taxonomy of *Isoetes muelleri* A. Br." — "A Summary Of The Family Lythraceae In The Northern Territory" — and a section entitled "Plant Portraits".

"Plant Portraits" will present the work of various artists (submissions invited) illustrating plants for a variety of reasons together with their full descriptions. The first issue illustrates 3 terrestrial orchids of New Guinea, *Bulbophyllum formosum*, *Diplocaulobium dichotropis* and *Ceratostylis acutifolia*.

MELALEUCA STUDY GROUP

The current address of the leader is, Ralph Campbell, 58 Lee-Steere Cres., Kambah, A.C.T. 2902.

EUCALYPTUS STUDY GROUP

Why not join this interesting group? Write to L. J. Daniels, Research Station, P.O. Box 201, Biloela, Qld. 4715.

Dendrobium toressae

By MERV. HODGE

Dendrobium toressae is a small northern species, unlikely to attract the attention of growers interested in spectacular plants, but native orchid enthusiasts regard it as a welcome addition to their collections.

The photograph is a larger than life-size shot to show the beauty of the flower and is not intended to deceive the viewer. The solitary flowers grow to about 5-7 mm in diameter and occur at odd times during the year. In Brisbane most growers fortunate enough to have plants of this species grow it with little difficulty, although there are occasional reports of plants dying.

I have not been fortunate enough to see it in nature, but it is reputed to cover large areas on rock faces. One enthusiast admitted standing on a large patch on a rock for some time before realising what was underfoot. It has received the common name of "Grain of Wheat" because of the similarity to its leaves. The grooved leaves grow to about 5 mm long. The photograph shows flower-buds in the grooves of the leaves.

"Australian Indigenous Orchids", by A. W. Dockrill, gives the distribution as limited to S.E. Cape York Peninsula, between the Tully River and the Bloomfield River, occurring at almost any altitude from near sea level to 3,500 feet.

In the past, growers have concentrated on growing this species on types of slabs, usually tree fern. However, the latest innovation is to establish epiphytic plants, particularly small species, on slabs of cork. Many native species appear to have taken quite well on this medium.

REFERENCE BOOKS ON WILDFLOWERS

Society publications are listed on page 91. The State Regions of the Society produce special publications such as that below for members living in Canberra who first join us. This will be of interest to all growers in inland areas. The Horticultural Guide series is a particularly fine effort by the Queensland Region that has now been extended to all States.

AUSTRALIAN PLANTS FOR CANBERRA GARDENS — Produced by Canberra Region SGAP — P.O. Box 207, Civic Square, A.C.T. 2608 for \$1.50 plus 40c postage.

This 60 page (25 cm x 17.5 cm) booklet is prepared for the benefit of new members, living in Canberra, who join the Society. It shares the experience gained by members in the cultivation of wildflowers in their gardens. The last 37 pages describe plants that have been successful in the rigorous conditions of Canberra's climate, especially their severe frosts. For this reason the booklet will be of wider interest.

Of special interest is the section on "Garden Management" which deals with topics under the headings of site preparation, drainage, plantings, mulching, cultivation, fertilizer, watering, pruning, insect control, disease control and weed control.

OSMOSIS AND TENSILE SOLVENT by Hammel & Scholander, published in U.S.A. Price \$11.30 — not from the Editor but your bookseller.

This technical monograph, 135 pages 24 cm x 16 cm, presents a description of the state of water in osmotic systems based on latest research.

A HORTICULTURAL GUIDE TO AUSTRALIAN PLANTS

"A Horticultural Guide to Australian Plants" is a series of loose sheets suitable for an A5 size 2-ring Binder (each Binder holds approx. 120 sheets).

Periodically, as funds become available, additional sets will be published with the intention of progressively covering native plants with horticultural potential.

Each sheet is devoted to a single species or hybrid. The front side has a good quality colour plate showing the most attractive part of the plant, i.e. the flower, the fruit, the foliage or the trunk. The reverse side gives information which is useful in determining the suitability of a plant to a district, but has not been directed at any specific locality.

Because each sheet covers only one species or hybrid, it can be filed in alphabetical order, thus making an Index unnecessary. Prices are:

Set 1 (16 sheets)	\$1.00	plus	30c	postage in Aust.
Set 2 (32 sheets)	\$2.00	"	40c	" " "
Sets 1 and 2	\$3.00	"	40c	" " "
Binder Separately	\$1.70	"	60c	" " "
Set 1 and Binder	\$2.70	"	60c	" " "
Set 2 and Binder	\$3.70	"	60c	" " "
Sets 1 and 2 and Binder	\$4.70	"	\$1.00	" " "

Requests for bulk supplies at wholesale rates are invited.

Please direct all correspondence to "A Horticultural Guide to Australian Plants", P.O. Box 809, Fortitude Valley, 4006 or phone Brisbane 48-5432. Sets may also be obtained from SGAP State Secretaries.

AN AUSTRALIAN ORCHID



Photography by Merv Hodge.

DENDROBIUM TORESSAE

If you have a slide of an orchid that has not been illustrated before, send it to the Editor.

PLANT CULTIVARS

Concern about their Registration,
by Bill Molyneux, Australia Nursery,
Belfast Road, Montrose, 3765.

Do you fully understand what constitutes a CULTIVAR?

I felt it necessary to acquaint as wide a range of members as possible with certain facts regarding what actually constitutes a cultivar plant, and the possible consequences it may have on the identity of many well-known and widely grown species of Australian plants.

The Australian Cultivar Registration Authority, based in Canberra, is new to Australia, and whilst Cultivar registration activities are well-established overseas they are relatively new to Australian plants. Our main experiences have been with the "Poorinda" and "Clearview" series of hybrid grevilleas, which have been marketed for some years; these being man-assisted hybrids obtained by cross-pollination of *separate species*.

This not the area of my concern, for hybridization has and will always be with us. The more horticulturalists become involved with growing Australian plants, in particular those with backgrounds of plant-breeding (often questionably labelled "improving") the more cross-breeding there will be.

My concern is with the registration as a cultivar of a selected form of a recognised species which, if it is to be submitted for consideration to the Registration Authority, must bear a "fancy name" (quote Article 27 (c) of the International Code of Nomenclature of Cultivated Plants 1969).

This might even be acceptable if a reasonable choice of name is made. But the danger lies in the fact that it is not obligatory to include the specific epithet (species) in the registration. For example, a form of *Eucalyptus caesia* is selected which is very pendulous in habit. One nursery with a feeling for the plant's identity may submit for registration *Eucalyptus caesia* 'pendulous'; another, with less regard for the identity of plants, may submit *Eucalyptus* 'Pendulous Pinky' which, in accordance with the code may be equally acceptable. Immediately the name *Eucalyptus caesia* disappears, as has the true identity of numerous other plants following registration as a cultivar. This could be due to:

1. the public's resistance of scientific names, and acceptance of "fancy names" and
2. the attitude of many in the general nursery trade of dispensing with specific names for promotional purposes, as is evidenced by national releases in recent years.

Among the many newcomers to growing Australian plants are those who have been brought up on the "fancy name" and are easily induced to fall for a colourful label emblazoned with a gaudy title. Only a few generations of this and *Eucalyptus caesia* would be forgotten and, as many more general nurseries (after many saying for 10 years that Australian plants are a passing phase) start stocking Australian plants we will face a similar situation to the exotic plant world, in which plants are known by a series of contrived names.

We realise that we, as a commercial nursery, will need for our own protection to submit many plants for registration, but none which is a selected form of a species will be included without the specific name. We intend (with support from concerned members and others) to submit a request for inclusion in the International Code a clause indicating the obligation to precede a cultivar name by the specific name, thereby protecting, at least in part, a scientific entity.

Concerned people may write to me, as it would take many signatures on a petition to create the situation where a change to the Code would be considered. Copies of the Code can be obtained by forwarding \$1.50 to The Secretary, Australian Cultivar Registration Authority, Canberra Botanic Gardens, CANBERRA, A.C.T.

Let Us Grow the Best

Let us propagate from the best forms, that not only exhibit the finest flowers but have also proved hardy and dependable. Join in the work of the Study Groups announced in the last issue. One objective on page 14 is worth restating.

"(c) Plants that have special horticultural value will be used to develop outstanding garden plants. These may not only be good forms of true species, but varieties or hybrids that will be named and registered as garden cultivars."

It is this comment that invited the statement opposite.

THE NATIVE PLANT NURSERY AND BILL MOLYNEUX'S CONCERN

We are fortunate to have specialist native plant nurserymen in all States now. These experts can be relied upon to produce the best forms and make available robust, hardened plants together with advice for their successful cultivation in your situation. We are also fortunate to have such as Bill Molyneux who has expressed deep concern at the direction mass speculative promotion of Australian wildflowers could head.

I agree with Bill Molyneux — let us use the species's name wherever the character of the true species is dominant. As a member of the Australian Cultivar Registration Authority I shall do everything I can to see that this principle is upheld. Reference to the cultivars already registered will show that this is followed. A recent meeting of the Authority has adopted this principle as a permanent guideline.

THE BEST FORMS OF THE SPECIES

My personal opinion goes even further than this. It is well known around Sydney to the extent of a friendly jibe. I consider that a good form of a true species is superior to any cultivar as yet created from Australian wildflowers. Even with that remarkable cultivar *Grevillea* 'Robyn Gordon' which is an outstanding long and free flowering shrub and graces my garden, it does not surpass a really good form of either of its magnificent parents, *Grevillea banksii* or *Grevillea bipinnatifida*. Unfortunately there are forms and forms of these species and I would be pleased to purchase in a nursery what I should be able to confidently expect as a good form, a plant registered as a cultivar, say *Grevillea bipinnatifida* 'Orange Glow'.

It is this quest for special or "good forms" of true species that I am most concerned with. Who else is? If you have an especially good form of a plant, or one that appears disease resistant, write and let me know.

This does not mean I do not appreciate good hybrids and you may be assured of my support for any sent forward for registration.

AUSTRALIAN WILDFLOWER CULTIVARS

The Australian Cultivar Registration Authority announces the official registration of seven more cultivars over the page. We regret that it has not been possible to illustrate all the plants in colour, suitable photographs not being available. The registration of the "Poorinda" and "Clearview" hybrids is being considered. Will any reader who can assist with good photographs of these plants, please contact the Editor.

Cultivar — This is a plant that exhibits some special features that make it of exceptional value for horticulture or for commercial cultivation.

The International Code of Nomenclature of Cultivated Plants. The International Body has appointed the —

Australian Cultivar Registration Authority to administer the code for Australian Plants other than a few exceptions such as *Leptospermum*, *Acacia* and *Orchidaceae*. This authority was formed at the instigation of the Society For Growing Australian Plants, and while the Society is represented on it and finances its operation, it is an independent authority. Members of the Authority include a representative from the major Botanic Gardens in Australia.

Plants for registration by the Authority may be forwarded by anyone to The Secretary of the Authority, c/- Botanic Gardens, Canberra, A.C.T. As many details of the plant to be registered should be included in the submission. The initial application need only consist of a flowering specimen, a statement of why it is considered to be of special value, and a suggested name.

Australian Plants. The Society is proud that our journal is being used for the official announcement of new cultivars. This is reviewed at each Federal Conference of the Society.

***Eucalyptus caesia* 'Silver Princess'**

A large shrub or tree 6-8 metres. This form is probably a tetraploid being larger and more vigorous in all respects than the normal form.

Fruit diameter is 30 mm compared to 15 mm for the normal fruit. Leaves 1½ to twice as long as the normal form.

Occurs naturally on Mt. Caroline (Kellerberrin) W.A.

Reference Specimen: Accession number 96, Canberra Botanic Gardens.

***Tristania conferta* 'Variegata'**

Origin:

Exact origin of original plant is not known. Specimen submitted for registration came from Burnley Horticultural College, Burnley, Victoria.

Diagnosis:

T. conferta 'Variegata' differs from other known forms of *Tristania conferta* R. Br. in the irregularly bordered variegation of its leaves. The inner portion of the leaves is yellow and covers irregularly, 25-75% of the leaf surface.

Leaf Colour Coding:

Border: yellow-green group, 147A (R.H.S. Colour Chart 1966 edition);

Inner portion: green-yellow group, 1D.

Reference Specimen:

Accession number 13, Canberra Botanic Gardens.

Comparative Specimen:

Coff's Harbour, N.S.W., edge of rainforest, C. Burgess, 1.11.1966 (C.B.G. 018289).

***Tristania conferta* 'Perth Gold'**

Origin:

As with the other registered variegated *Tristania*, *T. conferta* 'Variegata', the origin of this cultivar is not known. The specimen submitted for registration came from the Perth City Council Nursery.

Diagnosis:

T. conferta 'Perth Gold' differs from other known forms of *T. conferta* R. Br. in the irregular border variegation. The golden variegation covers from about 20-95% of the leaves. The green central portion of some leaves extends to the margin, whilst areas of variegation sometimes extends to the midrib. Isolated areas of variegation occasionally occur within the green areas.

Reference Specimen: Accession number 97, Canberra Botanic Gardens.

***Agonis flexuosa* 'Fairy Foliage'**

Origin:

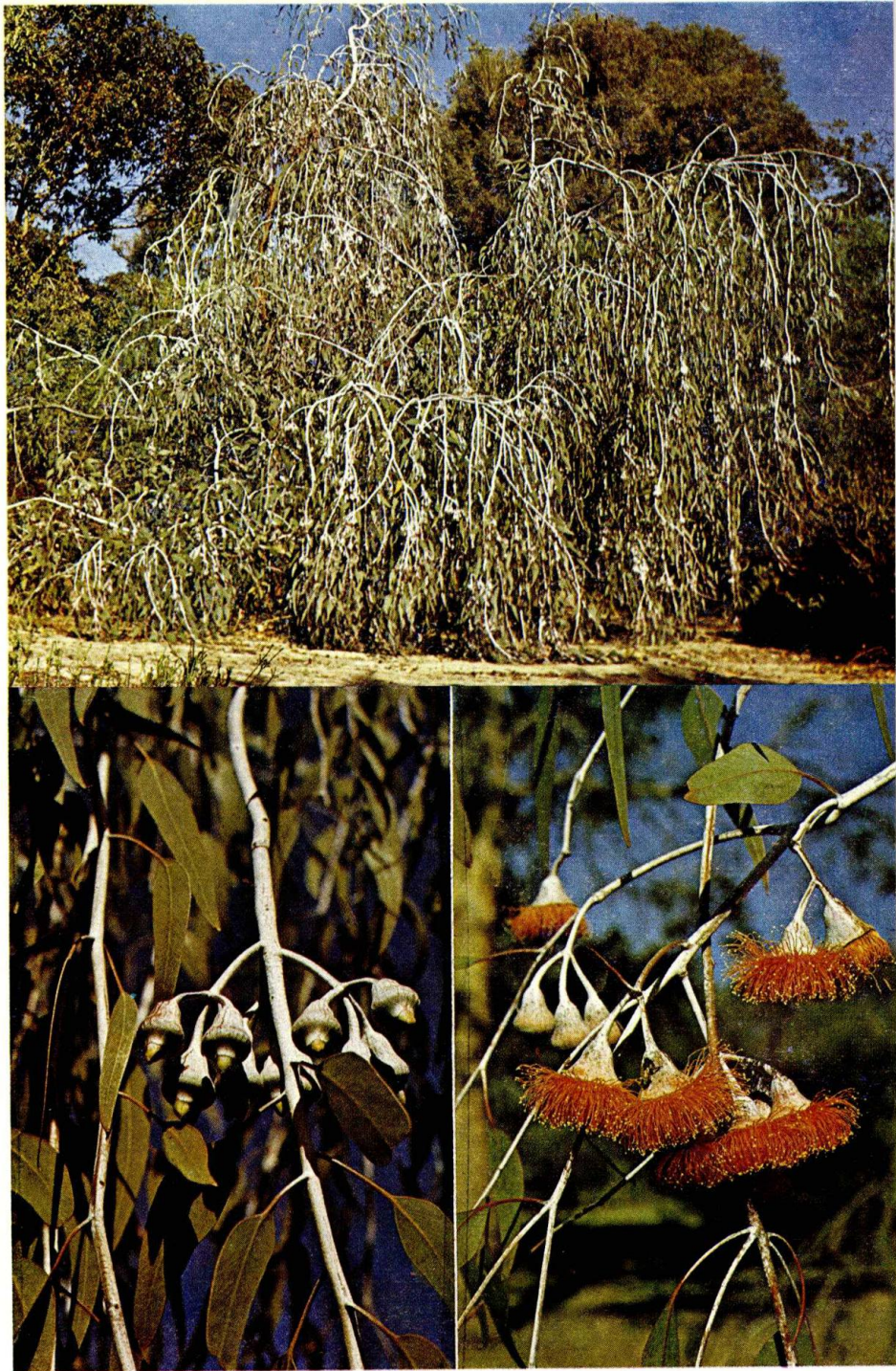
A form of *Agonis flexuosa* first noticed growing in a container in a private garden in the Busselton area of Western Australia. It is a tall shrub which is known to reach a height of about 4 metres in 10 years.

Diagnosis:

The distinguishing feature which makes this plant different from the normal form is that the leaves are much more crowded. Individual leaf lamina are generally narrower than normal, the lamina always ending one third to half of the way along the leaf. The remainder of the leaf is reduced to a thread-like extension of the mid-rib.

Propagation is by cuttings.

Reference Specimen: Accession number 93, Canberra Botanic Gardens.



Eucalyptus caesia "Silver Princess". Tree, fruit and flowers.

***Ceratopetalum gummiferum* 'Christmas Snow'**

Origin:

This form of *Ceratopetalum gummiferum* was noticed as a variant in a tray of seedlings raised by Mr. Roy Whalen of Kotara, N.S.W. in 1955.

Diagnosis:

C. gummiferum 'Christmas Snow' differs from other known forms of the species in the variegation of its leaves. The variegation is of the "blotched" variety, with irregular patches of cream varying from 3-50% of leaf surface. Some minor variegation also occurs; these are pale greyish green patches and are not strongly discernable.

Leaf Colour Coding:

Predominant colour: yellow green group 147 A-B; (R.H.S. Colour Chart); blotching: yellow group, 6D; minor variegation: greyed green group, 192A.

Reference Specimen: Accession number 7, Canberra Botanic Gardens.

Comparative Specimen:

C. gummiferum Sm. Termeil State Forest, New South Wales, 14 km from Ulladulla toward Batemans Bay. I. Telford, 24.1.1968. (C.B.G. 024228).

***Eucryphia lucida* 'Leatherwood Cream'**

Diagnosis:

Differs from *Eucryphia lucida* (Labill.) Baill. in the consistently retuse apex of its leaves and in its greenish-yellow and marginal or edged leaf variegation (margin: ca. 25% yellow group, 4D, inner portion of variegation: green group 137C; R.H.S. Colour Chart 1966 edition).

Differs from *E. milliganii* Hook.f. in its slightly longer (ca. 2.5 cm) and oblong elliptical leaves and the marginal leaf variegation as above.

Morphologically this cultivar essentially agrees with CBG 26450 (filed under *E. lucida*) so far as morphology of the uppermost stems and leaves are concerned, excepting for the characters given above.

Reference Specimen:

Eucryphia lucida 'Leatherwood Cream'. Accession number 6. C.B.C.

A shrub of some horticultural merit, the cream edging of its leaves giving added beauty to this plant which is a member of an inherently attractive group. The leaves appear to be intermediate between those of *E. lucida* and *E. milliganii*, being of a size found more often in the former but with the indentation of the leaf apex usually found in the latter.

***Prostanthera cuneata* 'Alpine Gold'**

Origin:

A form of *Prostanthera cuneata* noticed on Mt. McDonald in the McAlister River watershed in Victoria by Mr. Bill Cane of Maffra, Victoria.

Diagnosis:

Differs from other known forms of *Prostanthera cuneata* Benth. in the variegation of its upper leaves. Colour proportions vary from $\pm$ 90% golden yellow to $\pm$ 20% where the leaves are merely edged with gold. Variegation is absent from the lower leaves of the branches, but the green of these is virtually masked by the brilliant yellow of the younger leaves.

Leaf Colour Coding:

Terminal leaves: yellow green group 154A (R.H.S. Colour Chart 1966 edition); Lower green leaves: green group, 136A.

Reference Specimen: Accession number 5, Canberra Botanic Gardens.

Comparative Specimen: *Prostanthera cuneata* Benth. near Tiboudes Hut, Grey Mare Track, Snowy Mountains, New South Wales, below hut, near creek, in heath. E. S. Carroll, 19th January, 1966. (C.B.G. 015092).

BURRENDONG — AUSTRALIA'S ARBORETUM

A lesson in preservation
inspired by George Althofer

The implication in the heading is that the arboretum at Burrendong Dam near Wellington, N.S.W., is Australia's official Arboretum for its flora. It is not thought it should receive more government recognition (i.e. Federal, the State is already supporting it to a limited extent). It is certainly the only extensive arboretum in Australia.

What a magnificent concept — to cultivate in groves, all the wildflowers of Australia that will grow there. Already many thousands of plants have flowered and readers are urged to visit this spectacular area. Accommodation is available at Wellington and there is a modern caravan and camping park on the shores of Lake Burrendong, nearby.

Why have I not publicised this development before? To date it has been a mecca for "wildflower nuts" as the thousands of flowering wildflowers have dispersed in groups over 400 acres of hilly land. All efforts and finance were devoted entirely to their establishment and the acres of weed and grass and absence of good tracks would have encouraged the critical to be more vocal.

Visit this reserve and write to your Member of Parliament to sponsor more financial support for this National Spectacle.

Callistemon — Bottlebrushes

As advised in the previous issue we have implemented a scheme for the adequate naming of species of *Callistemon* and the development of the best forms for horticultural use. Have you joined this project and planted *Callistemon* species in your garden? We also mentioned the intention to establish arboreta in various parts of Australia. One of these is at Burrendong Reserve where the following species will be flowering in 1977:

Callistemon acuminatus, *C. brachyandrus*, *C. citrinus* (many forms), *C. linearifolius*, *C. comboyensis*, *C. pallidus*, *C. paludosus*, *C. pinifolius* (red, cream and green flowered forms), *C. phoeniceus*, *C. rigidus*, *C. shiressii*, *C. speciosus*, *C. teretifolius*, *C. violaceus*, *C. pachyphyllus*, *C. salignus* (and forms), *C. sieberi*, *C. rugulosus*, *C. pallyphyllus*, *C. flavovirens*, *C. angustifolius*, *C. macropunctatus*, *C. subulatus*, *C. polyandrus*, *C. lilacinus*. Some of these names are old and are used subject to a revision of the genus such as *C. violaceus* and *C. lilacinus*.

Preservation Of Our Flora

The Burrendong Arboretum was founded on the ideals of preservation of all our flora. This does not include only the spectacular flowering plants. The collection of plants is amazing, such genera as *Casuarina* and *Hakea* being very well represented. George Althofer, the notable pioneer in the development of the Australian Flora for horticulture readily conceded there is a limit to what can be grown at Burrendong and earnestly seeks the creation of similar arboreta in all parts of Australia. I hope we do not wake up too late, that our unique flora is rapidly disappearing.

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Research on *Plantago*

by Barbara G. Briggs, National
Herbarium of New South Wales

Plantago is well known in the form of "Plantain", "Rib-grass" or "Lamb's Tongues", the familiar *Plantago lanceolata* which is so common on road verges, in pastures and in wasteland. Other widespread, naturalised species are *P. coronopus*, "Buck's-horn Plantain", with deeply lobed leaves, particularly common near the sea, and *P. major*, "Large Plantain", with its broad soft leaves. Several other species are also naturalised but not so common or extensive.

Despite the common name of "Rib-grass" sometimes used for one of its species, *Plantago* is not a genus of grasses. It belongs to the family Plantaginaceae, which is among the more highly evolved groups of Dicotyledons. This is related, although rather distantly, to such families as the Scrophulariaceae (which includes *Veronica* and *Linaria*) and the Lamiaceae (also known as Labiatae — the Mint family). Unlike most members of related families, the Plantains generally have several parallel major veins in the leaves as well as small inconspicuous flowers which are wind-pollinated and have only 4 sepals and 4 corolla-lobes.

It is not widely appreciated that Australia has some 24 native species, including five which are limited to Tasmania and one (*P. hedleyi*) found only on the mountains of Lord Howe Island. Some of these have close relatives in New Zealand or New Guinea but, with one exception, the native species occur only in Australia. The 14 species which are native to New South Wales have been investigated jointly by botanists at the National Herbarium of New South Wales, the University of Sydney and the Canberra Botanic Garden, in preparing the treatment of Plantaginaceae for the Flora of New South Wales. In the course of this work it became clear that five of the species had not been formally named; all had been collected long ago but their distinctness had not been recognised and they had been included with other species. They were named in a short technical article; Briggs, B. G., Carolin, R. C., and Pulley, J. M.: New species and lectotypification in Australian *Plantago*. Contrib. N.S.W. Nat. Herb. 4: 395-398 (1973).

The tablelands and alpine regions include the greatest concentration of *Plantago* species. All have small flowers but some of the alpine species are surprisingly handsome compared with their weedy relatives. On the Kosciusko plateau the rosettes of glossy, acute leaves of *P. muelleri* are found in moist alpine and subalpine situations while the related *P. glacialis* (newly described) forms a close turf of tiny rosettes in the seepage areas below long-lasting snow drifts. Unfortunately these plants are strictly limited to such areas and do not thrive for long when transplanted to lower altitudes. Two other recently named species are also found in alpine and subalpine zones: *P. alpestris* has elliptic leaves, each with three major veins and mostly about 6-8 cm long and 1-2 cm broad; it occurs in moist open depressions surrounded by grassland, whereas *P. euryphylla* is a constituent of the grasslands and has larger leaves 3-10 cm long and 1-4 cm broad with 5 (or rarely more) conspicuous veins.

Other newly named species are as follows: *P. cladarophylla* is a plant of stream banks and swamps of the Barrington and Gloucester Tops and has long flowering spikes and narrow leaves of thin texture, 7-25 cm long and 0.8-2.2 cm wide. *P. turrifera* is a small annual of inland districts of both eastern and western Australia; its fruits have a short but stout cylindrical projection on the top, which ends in a truncate apex.

A satisfactory classification of *Plantago* in Australia seems to have been much delayed because of a chance decision on the part of the celebrated botanist, Robert Brown, who visited Australia with Matthew Flinders in the



Top: *Plantago muelleri* and *P. alpestris* growing in alpine herbfield. *P. muelleri* has acute leaves and very short flowering stems which elongate in the fruiting stage. The flowers are almost hidden among the leaves and, for the youngest flowers, only the erect pale styles are visible in the centre of the rosette. *P. alpestris* has more rounded leaves and flower-spikes on longer stems. About $\frac{3}{4}$ natural size.

Bottom: *Plantago glacialis* forming a dense turf of tiny rosettes. The short, slender flowering stalks usually each bear only 2 flowers. About twice natural size.

Photos: Colin Totterdell.

"Investigator". Brown gave the name *Plantago varia* to one of the species he collected. This was quite an appropriate name but subsequently it seems to have been thought that *P. varia* could encompass any extent of variation. *P. varia* is a perennial species most common on the tablelands (although not at the highest altitudes) of New South Wales, Victoria and Tasmania, but the name has also been used for very different plants — even desert annuals.

In addition to describing the five new species it has been necessary to bring back into use the names for six others which had previously been described but had subsequently been generally included in the *P. varia*. These are as follows:

- P. debilis* ranges from the edges of coastal rainforests to the banks of creeks in central Australia but is most abundant in moist, eastern eucalypt forests. It has broad, soft leaves and rather widely separated, small flowers;
- P. hispida* is a species of rocky places (but not found on infertile sandstones), both on the coast and inland to the tablelands, also in parts of Victoria, South Australia, Western Australia and Tasmania, with numerous flowering spikes and narrow leaves;
- P. antarctica*, of the lower slopes of the Kosciusko plateau and comparable locations in Victoria and Tasmania, resembles *P. varia* in having a well-developed tap-root but has smaller flowers and glabrous sepals;
- P. gaudichaudii*, of grasslands on heavy clay soils, also resembles *P. varia* but has narrower leaves and different leaf hairs;
- P. drummondii*, a species of the inland, extends from western New South Wales to Western Australia and has relatively large fruits which, like the bracts and sepals, are glossy and usually dark brown or almost black;
- P. cunninghamii*, another inland species, ranges from New South Wales to Western Australia. Its features are intermediate between those of *turritifera* and *drummondii* and, like these two species, it is an annual. These inland species are regarded as good stock-feed for the short time that they are green in the winter and spring. The seeds of many *Plantagos* are slimy when wet; this feature is particularly noticeable in these annual species and has given them the common name "Wild Sago".

In addition to the characteristics mentioned above, many other features have been taken into account in the classification of these species. Some plants are, at times, rather difficult to identify with certainty but all species have their particular characteristics and many also differ in the types of habitats in which they are found. A relatively detailed, technical treatment will be published in the "Flora of New South Wales" series, produced by the National Herbarium of New South Wales, but it will be some time before this is published and available.

AUSTRALIAN PLANTS — OUR NEXT ISSUE

You will note some changes in the presentation of this issue. There will be more in the next two issues. These are designed to stimulate comment. Our objective is to produce this periodical to your satisfaction. Suggestions for change, or no change, should be addressed to the Secretary of the Society listed for your State, not to the Editor.

Photographers: I desperately need slides of *Grevillea*, especially *G. parallelinervis*, *G. aspera*, *G. umbellifera*, *G. jamesonia*, *G. oncogyne* and *G. stenophylla*. Please send to Editor.

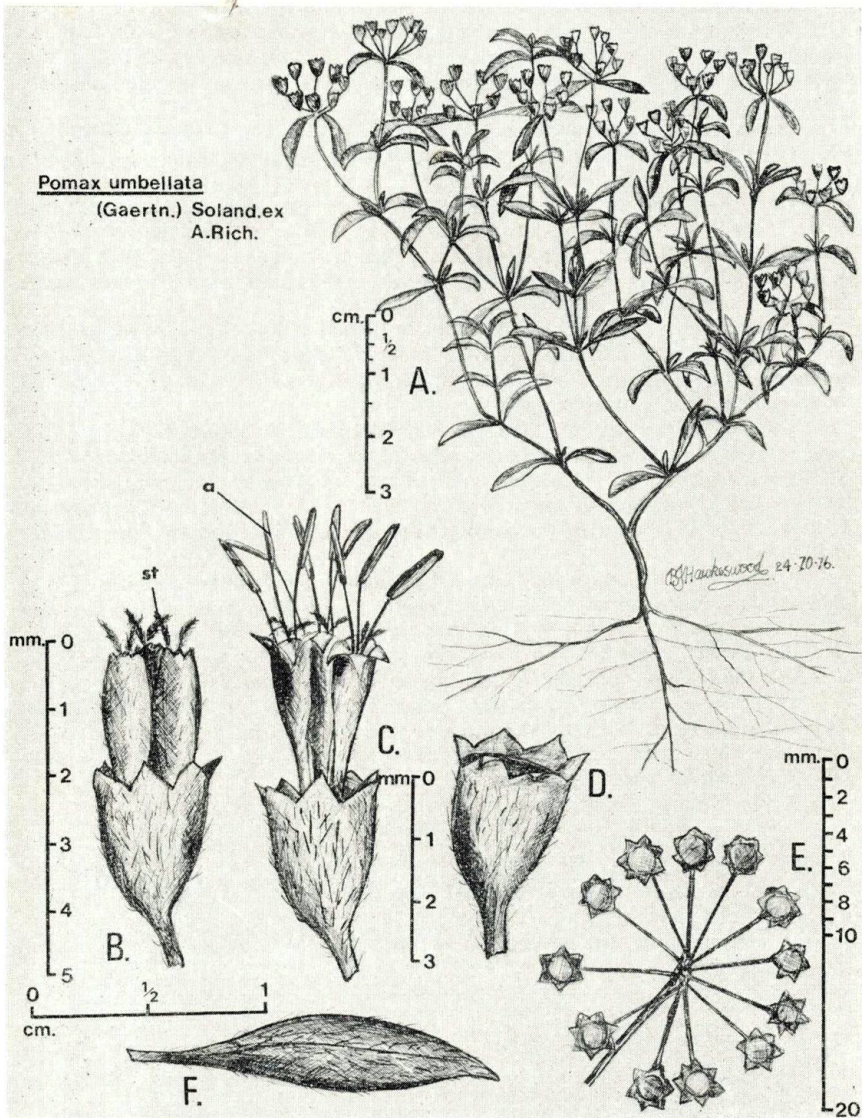
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Proceedings of a Symposium held under the auspices of the U.S.-Australia Agreement for Scientific and Technical Co-operation, Canberra, 1975. Presented by 54 experts in their fields, the subjects cover the manner in which organic materials and nutrients are distributed in plants. Related factors are, how environmental factors regulate growth, how nutrients may be used more effectively, how diseases spread in plants and the effectiveness of substances applied to plants such as growth regulators, herbicides and insecticides. 484 pages, 22 cm x 15 cm.

POMAX

by T. J. Hawkeswood, Glenbrook, N.S.W.
Illustrations by Brian Hawkeswood.

To many people, the small, insignificant *Pomax umbellata* would appear as an unwanted weed, but to myself it is a plant which I think is probably worthy of cultivation as an interesting addition to a bush garden. Although a common plant, in many situations, it is not very well known and hence I



- A. A $\pm$ glabrous form, showing many umbellate inflorescences.
B. A simple head of flowers in bud, about to bloom. Note styles (st).
C. A simple head of flowers in bloom. Anthers (a).
D. Capsule.
E. Terminal umbel of 12 capsules.
F. Typical leaf of a lightly pubescent form of *Pomax*.

would like to introduce this plant to the various readers who may be interested in knowing something about its biology.

Botanically it is a member of the family Rubiaceae, which is a very large family of trees, shrubs and herbaceous plants with a widespread distribution, but its main centre of location is in the tropical regions of the world. Many of the tropical members have conspicuous and powerfully odorous tubular flowers, while such economically important genera as *Coffea* (the coffee plant) belong to this family. About 400 genera and 6,000 species are known, Australia's share of indigenous species being about 190 in approximately 37 genera. The genus *Pomax* is one of four monotypic genera which are indigenous to Australia, having only one species, *Pomax umbellata* (Gaertn.) Solander ex A. Rich, which is endemic.

There are some interesting botanical features of *Pomax* which are characteristic of the family in general and some features which are characteristic of only *Pomax* itself. The following is a simple description of *Pomax*:

The leaves are opposite and simple (i.e. not divided), with stipules that are situated on the stem between pairs of leaf bases and which are so similar to the leaves that apparent whorls (group of three or more appendages arising from an axis at one level) of leaves are formed (see diagram). Many plants in the Rubiaceae have this characteristic.

Pomax has a distinctive characteristic in that it has bisexual flowers that are united in twos or threes with a common calyx which has six to eight lobes and these flowers compose a simple head. *Pomax* is unusual in having this common calyx arrangement.

The purple corolla-tube, which is funnel-shaped, is approximately 2-4 mm long and the yellowish-orange anthers of the five or fewer stamens are strongly exserted, i.e., projected well above the flower (see diagram). The anthers are quite long in relation to the size of the flower, being almost as long or equal in length to the corolla-tube and are attached on very slender filaments.

The simple heads of flowers are arranged on slender peduncles in a terminal inflorescence of 5-12 heads, mostly 12, to form a terminal umbellate inflorescence which forms most of the upper parts of the plant; hence the specific epithet *umbellata*, meaning "an umbel or in the form of an umbel". The diagram of the full plant shows many of these umbellate inflorescences.

The fruit of *Pomax* is a capsule about 3 mm long and has an operculum or lid and contains 2-3 reddish, wrinkled and grooved seeds, 2½-3 mm long. It is from this operculum that the genus *Pomax* receives its name; it is from the Greek *pōma*, which means a lid.

A full botanical description of the plant would be as follows:

Pomax umbellata (Gaertn.) Solander ex. A. Rich. (1788)

A small perennial herb, erect or diffuse, tufted or rhizomatous, 10-35 cm in height, much branched, usually more or less hirsute, sometimes glabrous. Leaves opposite, lanceolate-elliptical, ovate-lanceolate or lanceolate 8-25 mm long, dark green, shortly petiolate or sessile; stipular sheath lanceolate (stipules similar to leaves so that apparent whorls of leaves are formed).

Flowers usually 2-4, mostly 2, united by their calyces into a simple head, the receptacles of each head appearing like a simple campanulate receptacle or cupule which enlarges to 4-5 mm when in fruit. The heads are on peduncles (rays) about 1 cm long when in fruit. The reddish calyx-segments or valves are deltoid- acuminate or obtuse, short and unequal, crowning the cupule and 6-8 in number; inner valves or lobes are united to form a deciduous operculum, these lobes are much smaller and inconspicuous than the larger outer ones.

Corolla funnel-shaped, caducous, about 5 mm long, 5-lobed; stamens 5, or fewer, inserted at the base of the corolla-tube; filaments long; anthers exserted. Ovary 1-celled with one erect ovule. Style filiform and deeply divided into two long exserted filiform hispid branches, one sometimes abortive. Fruit is a 2-4 celled valvate capsule containing, two, three or four rough reddish-brown seeds with a white reticulum. Flowers mostly from July-November.

Pomax umbellata is a relatively common plant with a widespread distribution in five States of Australia. The plant is not found in Tasmania, the Northern Territory, or the hot inland of Queensland, and northern Western Australia, as it is a temperate species usually found growing on sandstone outcrops in the Sydney region, granite hillsides in N.E. N.S.W., and mostly on sandy soils throughout S.A. and W.A. Its northern range appears to be

the Burdekin River near Rockhampton. From here it stretches through to the Brisbane region, the New England Tablelands, the Blue Mountains and Port Jackson areas, the A.C.T., N.E. Victoria, Flinders Range, and the Ereman Province of W.A. Specimens have been collected from as far inland as near Lake Eyre, S.A., and Warialda, N.S.W. Such a widespread species exists in several forms (i.e. polymorphic). The differences between the forms are mainly in the size of the leaves, growth habit, and degree of pubescence. Several species of *Pomax* had been discovered and named at various times in the past, but now it is usually held that *Pomax* exists as one species only but which is polymorphic.

In the Sydney region (and perhaps in other localities), I have seen crimson to dark-red leaves on *Pomax* plants, which may be due, in complexity, to the lack of soil nutrients and other factors, since these plants grow on sands (or sandstone) in these areas, which are low in fertility. However, the red and green leaves on the one specimen give the plant a contrasting appearance against the green foliage of other plants.

Nothing is recorded on the cultivation of *Pomax* in gardens. In the bush it is often an insignificant and spindly plant and the flowers do not persist for any length of time, but I feel if given plenty of soil nutrients and a moderate supply of water and sunlight, they may grow into more attractive shrubs. The plants yield a high percentage of seed and it is easily collected. So now it is up to somebody who is interested and willing to seek the usefulness of *Pomax umbellata* as a garden plant.

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Of the Myrtaceae Family



FENZLIA OBTUSA

Fenzlia obtusa grows in sunny situations on or behind the seaside sandhills. You will find it just north of Cairns at Yorkey's Knob and in an area just south-east of Cooktown. It forms a low bushy scrub to 1 metre high with neat opposite leaves slightly reminiscent of *Metrosideros*. The obtuse leaves are 2 to 2.5 cm long, shiny, dark green above with contrasting light downy undersurface. The flowers that are borne singly in the upper leaf axils are about $\frac{1}{2}$ in. in diameter. The five rounded petals are pink and there is a tuft of many darker pink stamens in the centre. The hard oval $\frac{1}{4}$ in. fruit contains 2 or 3 seeds.