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# Australian Plants

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*Colour Photography By Frank Hurley*

*Blocks Courtesy of John Sands Pty. Ltd.*

## CHRISTMAS BELLS *Blandfordia grandiflora*

**CULTIVATION OF CHRISTMAS BELLS** ..... ..... *by P. J. Parry, Page 3*
**CHRISTMAS BELLS FROM SEED** ..... ..... ..... ..... *by H. Boyd, Page 4*
**N.S.W. CHRISTMAS BUSH FROM SEED** ..... ..... *by H. Brackpool, Page 5*
**WEST AUSTRALIAN CHRISTMAS TREE** ..... ..... *by L. O'Grady, Page 9*

## THIS PUBLICATION

"Australian Plants" is published by The Society for Growing Australian Plants on a non-profitmaking basis and with honorary officers. It does not deal with internal society affairs and as a National Preservation Journal, it has succeeded due to the enthusiastic support of other societies, the home gardener and the country resident. Many readers will find only a proportion of the articles of immediate interest or understanding, but that proportion, always the largest part of each issue, is simply written by competent writers from all parts of Australia, and clearly illustrated with sketches and full colour pictures. The semi-technical sections are carefully checked by the leading professional authorities in Australia for accuracy and all readers will find them a very valuable reference in the future.

This issue is the first in Volume No. 2. A very good quality plastic covered stiff binder is available at almost cost price of 12/- for each of Volumes 1 and 2. Volume 2 will comprise 8 issues, Nos. 13-20.

CHRISTMAS CARDS?

Why not use this issue as a novel Christmas card to your friends completing the following plaque with your Christmas greetings. Copies are available from the Editor, 250 Picnic Point Road, Picnic Point, N.S.W., with an envelope, at 3/- each plus 5d. postage or for 4 copies or more 3/- each including postage. Copies will be sent direct if required on receipt of instructions and your Christmas message. All previous issues are 3/- each.

*To* .....

*Wishing you a Merry Christmas and a Happy New Year and hoping you will receive a wealth of interest and knowledge from this delightful publication.*

*From* .....

## VOLUME I AVAILABLE AS BOUND BOOK—A BEAUTIFUL CHRISTMAS PRESENT

All issues of Volume No. 1, together with an index and a large glossary of botanical terms, have been bound in stiff plastic covered, gold lettered volumes. Available at a cost of three pounds plus 1/3 postage, this is a beautifully produced book of value and interest to all. Many early issues have been reprinted and many new articles included in place of advertisements, for presentation in book form. The binding has been skillfully done to enable the book to open out flat at any page. This will soon become a rare out-of-print book of considerable value and every member and reader will be very sorry if they miss purchasing one at this special low price.

## THE LANGUAGE OF BOTANY

For those who do not purchase a bound volume they can obtain this 48-page booklet suitable for filing in your binder, from the Editor at 2/6 including postage. It started as a glossary. It became too large and is really a dictionary of terms for the layman and the botanist.

# CULTIVATION OF CHRISTMAS BELLS

*By P. J. PARRY*

The Christmas Bell, in my opinion, will become one of the most popular Australian native plants grown under cultivation. They can be grown in most gardens and have an exceptionally long life. Plants in my trial beds are forty (40) years old and are still flourishing.

Plants are grown from seeds. Growth is very slow for the first year, but plants can be transferred to their permanent positions when from one to two years old and should flower at three years. They are best planted in a raised bed about twelve (12) inches apart and being a bulbous plant the Christmas Bell adapts itself to very dry conditions, but the beds should not be allowed to dry out and an occasional watering during dry periods is recommended. Once established it should be given occasional light dressings of blood and bone.

When picking blooms the stem should be cut, not pulled up as this leaves a cavity; and through this cavity water could enter the bulb and cause a rot which would destroy the plant.

## THE GENUS BLANDFORDIA

*Prepared in association with L. JOHNSON.*

KEY TO SPECIES OF BLANDFORDIA

1. Leaves about ¼ inch broad.
   2. Leaf margins rough (finely crenulate); stamens attached above the middle of the perianth (Tasmania). *B. punicea*
   2. *Leaf margins smooth; stamens attached below the middle of the perianth. *B. cunninghamii*
1. *Leaves 1/16 to 3/8 inch broad.
   3. Flowers more or less tubular in shape except near base. ¼-½ inch diameter. *B. nobilis*
   3. *Flowers broadly flared, 3/4 to 1 inch diameter. *B. grandiflora*

1. *Blandfordia cunninghamii* (formerly wrongly called *B. grandiflora).*

Flowers red at base, yellow for about one third of its length, much dilated from the narrow base; two inches long, stamens attached below the middle of the perianth or floral envelope, in crowded many flowered racemes. Leaves are strap shaped with smooth margins. Found in the Blue Mountains of N.S.W. south to Mittagong.

2. *Blandfordia grandiflora* (Syn. *B. flammea).*

Red with yellow tips, or occasionally yellow throughout, drooping flowers 1½ to 2 inches long, broad almost from base, and much widened upwards, almost bell shaped in dense umbel-like clusters. Leaves very narrow with rough margins.

Found on the coast and tablelands of N.S.W., from the Hawkesbury District and lower Blue Mountains, north as far as southern areas of Queensland.

3. *Blandfordia nobilis.*

Flowers orange with yellow margins or occasionally yellow throughout, about 1¼ inches long, much dilated from the narrow base at above the middle to almost a tube. They occur in loose racemes, usually few in number with long pedicels. Leaves as in *Blandfordia grandiflora.*

*Blandfordia nobilis* and *Blandfordia grandiflora* grade into each other in the Hawkesbury—Gosford area, where all kinds of intermediate forms may be found.

4. *Blandfordia punicea* (Syn. *B. marginata).*

Flowers orange red, about 1½ inches long, narrow, tapering to base, lobes ¼ inch long, stamens attached much above middle in crowded, many-flowered racemes. Leaves rough on margins.

Found in Tasmania only.

EDITOR'S NOTE: Both "Floralands" (Parry) and "Willunga" (Twyford) nurseries advise good stocks of Christmas Bells. Seed readily available from most suppliers.

# Christmas Bell from Seed

*TREATMENT OF BLANDFORDIA SEED AND MULTIPLICATION BY DIVISION*

*By H. BOYD*

The method used by the Native Plant Propagation and Research Society is a simple one using aluminium ice cream trays with holes punched in the bottom. These are filled with vermiculite (an almost sterile medium available at reasonable price) which is wetted with a urea based nutrient (Aquasol) to the makers directions. The seed is placed on the surface and lightly covered with vermiculite. It will germinate in about three weeks The seedlings can be removed in three to twelve months. Movement is facilitated by the small plants producing white tuberous roots so that plants can be moved almost at any stage.

If very alkaline water is encountered, about two drops of spirits of salts (hydrochloric acid) to 3-4 gallons of water, overcomes this. Water seedlings and plants with a nutrient solution about once a month. The seedlings can be grown on as pot subjects or planted out in the garden.

*MULTIPLICATION BY DIVISION*

Carefully lift an old plant and you will note that this old plant is a collection of adventitious plants growing around the original seedling. Each can be broken or cut away from its neighbour and grown on separately. These plants should flower the following year.

*Blandfordia* belong to the family *Liliaceae*, fruit a three-celled capsule containing a lot of rough seed. If the seed is dried well after collection it has a long life—to 4 years or longer, if stored under good conditions.

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# NATIVE PLANTS FROM SEED

*By H. BRACKPOOL*

In the September, 1961, issue No. 8, I gave my method for growing waratahs. I have grown many native plants from this method including the following:

1. N.S.W. Christmas Bush seeds.
2. Christmas Bell seeds. If fresh these will give 100% germination.
3. Pea flowered bushes such as *Gompholobium*.
4. *Eucalyptus ficifolia*. Best planted in November or December.

When preparing a pot for seed I place a curved piece of broken terracotta pot over the drainage hole and fill to about one third with small pieces of coke or stones. I put some dead *Banksia ericifolia* needles or crushed dead gum leaves on top of these, and then almost fill the pot with bush sand or the like. Place seeds on top and cover with a quarter of an inch of bright sand finishing the level just low enough to take the watering.

The pots, directly under a large *Banksia ericifolia* tree, get possibly 10% sunlight in summer but much greater the rest of the year. They are stood on bricks. As you can deduce all my seeds are brought up out of doors. I do not use any fertilizer but Banksia needles fall onto the pots.

## *I GROW CHRISTMAS BELLS EASILY*

Christmas Bells will not stand transplanting, or this is my experience, and like to have their roots down deep, so the bigger the initial seed pots the better; therefore, if you put only about four seeds in each pot, say in February when they ripen the first year, you can put the whole pot ball out in May of the following year without any root disturbance at all. They must be grown in bush sand with a little shade of other plants, but where winter sunshine from the north can penetrate, and it could help to put some leaf mould down in the bottom of the hole before placing the pot ball in position. Several plants together seem to do better as they seem to like company. They should flower in three or four years.

## *GROW N.S.W. CHRISTMAS BUSH FROM SEED*

N.S.W. Christmas Bush seeds, that I picked and put in when just beginning to drop from the plant, took much longer to germinate than those gathered a month or so later. Some of the latter came up in about a fortnight; whereas the former I expect to come up after three months as with my previous plantings. Of course, as the seed pots are out of doors under the Banksia, continued wet weather can have varying effects on them but, when about a quarter of an inch of bright sand is over the top of any seeds, heavy rain usually does not wash them away, and the clean sand may possibly help to keep the pots freer from any soil infections. Of course, all seed pots must be kept watered. even if this means doing it twice a day during summer heat waves; and I find that the fewer seeds of any shrub or tree that you put into a pot, the less pricking out of extras will you be tempted to do, and the better will be your eventual results.

Christmas Bushes should always be planted out before the limited space in the pots can cramp or affect their tap roots. They either race then or they do not. If they race they can flower in two or three years. If they do not make much growth in that time they probably never will, so it is advisable to plant several in various positions if you want to be sure of having good Christmas Bushes, and it is a good idea to use the seedlings with the reddest growth at the tips. They can be planted out into any type of soil provided the positions are well drained.

## THE TREATMENT OF PLANTS WITH MAGNESIUM SULPHATE

*By H. BOYD*

Experiments with magnesium sulphate (Epsom Salts) on native plants, seedlings and orchids over the last five (5) years point that this substance is a very valuable nutrient. It has been used in addition to the usual NPK urea based (Aquasol) fertiliser. With some epiphytic orchids the improvement is spectacular. Seedling growth is increased in plants of the *Monocotyledoneae* such as orchids, Pathos, ginger and Christmas Bells, and the *Dicotyledons*, flowering trees and shrubs.

Pricked out seedlings of *Grevillea robusta* at a height of 4 inches, growing in a foot square seedling box were used in the experiment. They were being watered with a commercial nutrient, aquasol. Half of the boxes (3) were treated with ten grains of magnesium sulphate distributed evenly over the surface. The crystals had been reduced in size by crushing. The dosage is not critical and for approximate comparison, an aspro tablet is 5 grains. Greater amounts can be used.

Within a week the treated plants were a much deeper green (by test) than the untreated plants, all boxes continuing to receive the same amount of commercial nutrient. Ten grains were administered monthly on the treated plants which, after twelve (12) months, were five inches taller than the untreated seedlings which never caught up. The trunks on the treated plants are much thicker and carry more branchlets and leaves. Xylem and phloem are adventitiously affected.

This experiment was typical of many performed and it was found that magnesium sulphate distributed dry over the surface gives a better result than when applied in solution. As it is very hydroscopic (takes up water) we do not water the day we administer it.

*STIMULANT FOR EPIPHYTIC ORCHIDS:*

For orchids growing on blocks, dissolve one heaped teaspoonful in two quarts of water and wet the block with this solution, twice a month in summer and once in winter. It is equally effective on exotic species as well as native orchids, the results being evident by the increased root growth, both in numbers and length and the number of pseudo bulbs produced on treated plants. The plants were also watered once a fortnight with urea based nutrient that contains a little magnesium sulphate.

For terrestrial orchids, *Calanthe* and *Phaius* tested, the crushed crystals were applied dry over the surface with noticeable results.

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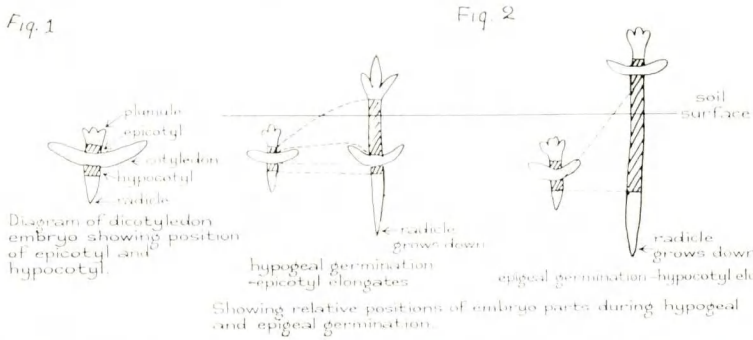
# GERMINATION (I)

*By HELEN LEE*

In considering the topic of germination, I will deal first with the morphological changes which occur as the seedling develops. Later, some of the factors which control germination will be considered.

*A. dicotyledons*

When the seed starts to grow the cotyledons may remain below the soil surface or they may be pushed out into the air. The relative growth rates of certain parts of the embryo will determine which of these alternatives will occur. In the embryo the part of the axis immediately above the point of attachment of the cotyledons is called the epicotyl (epi—above, cotyl—cotyledon) and the part below the point of attachment is called the hypocotyl (hypo—below). See Fig. 1. The epicotyl represents a transition and has the same internal structure whereas the hypocotyl represents a transition zone between root and shoot.



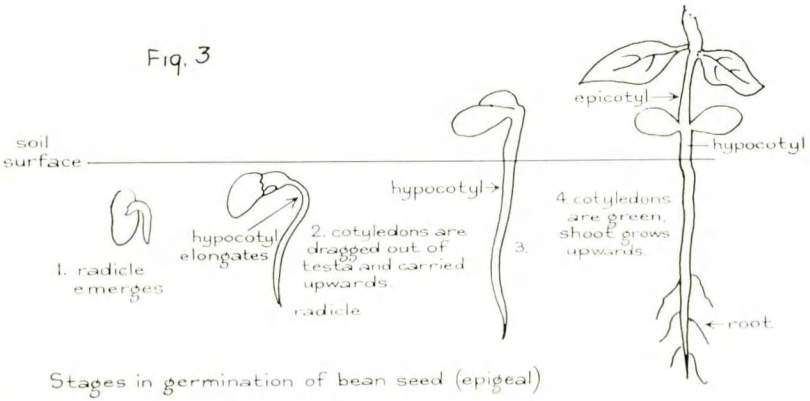

On germination of a seed the elongation of the epicotyl and hypocotyl occurs at different rates. If the epicotyl grows more rapidly the cotyledons will remain below the ground and the germination is said to be hypogeal (hypo—below, geal—the earth). If the hypocotyl grows more rapidly, the cotyledons are pushed above the surface and the germination is said to be epigeal. (Fig. 2).

Hypogeal germination occurs in the broad bean, garden peas, etc. When a broad bean germinates the first structure to appear is the radicle which emerges through a split in the seed coat or testa. It grows downwards and eventually develops into the root system of the plant. After the radicle has emerged, the plumule or young shoot grows upwards, breaks through the surface of the soil and in due course the first leaves appear. Until this stage is reached the food supply of the young plant comes from the endosperm or the cotyledons which have remained below the ground, still enclosed in the testa.

Examples of plants with epigeal germination are french bean and Eucalyptus. On germination the radicle emerges and grows downwards. Then the hypocotyl starts to elongate and grows upwards, dragging the cotyledons up through the soil. During this period the hypocotyl is curved and only straightens out when the cotyledons have appeared above the surface of the soil. (Fig. 3). The cotyledons open out and turn green and the plumule grows up between them and produces the first true leaves.

When the germination of an endospermic seed, such as the castor oil bean, is epigeal, the endosperm adheres to the underside of the cotyledons through which the food material is absorbed into the young plant. The cotyledons open out, turn green, and are active for a short period after which they wither and drop off.

Fig. 3

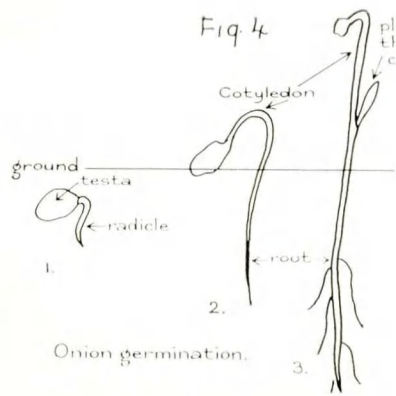



Stages in germination of bean seed (epigeal)

*B. monocotyledons*.....

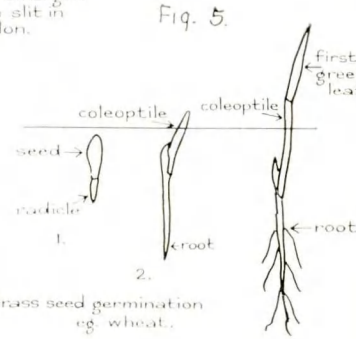
The terms epigeal and hypogeal cannot be satisfactorily applied to the germination of monocotyledons seeds. So this subdivision is not used as it was in the dicotyledons. In monocotyledons, unlike the dicotyledons, the cotyledon may often increase in size during germination and is often the first structure to appear above the surface of the soil. On germination, the radicle emerges first and grows downwards. In onion, the cotyledon elongates, drags the seed above the surface, straightens out and turns green. The plumule eventually emerges through a slit in the side of the cotyledon and grows upwards to form the shoot, while the cotyledon withers away. (Fig. 4). In the germination of grass seeds the coleoptile (which is part of the cotyledon) grows up as a tube and first green leaf emerges through the top of it. (Fig. 5). Thus, in monocotyledons, the cotyledon protects the young shoot during germination as well as acting as the organ through which food is absorbed from the endosperm into the young plant.

Fig. 4




Onion germination.

Fig. 5.




Grass seed germination eg. wheat.



*Colour Photography by Frank Hurley* *Blocks Courtesy of John Sands Ltd.*

*Nuytsia floribunda* [Labill.] R.Br.

# THE CHRISTMAS TREE OF W.A.

*By LES O'GRADY*

West Australian Christmas Tree (*Nuytsia floribunda*) seed should be sown on top of the ground. They could be half covered but never fully covered. If the seeds are kept moist or set on moist ground, the root will push out into the ground after a few weeks. After the root comes through, say

**EDITOR'S NOTE:** This article is to introduce the W.A. Christmas Tree to readers in the hope that they will purchase seed (readily available from the W.A. Forestry Commission, Perth, W.A. at 2/6 per packet) and grow this plant. A future Christmas issue may feature this beautiful tree more fully based on members' experiences over the next few years.

½ in. long, the seed can be picked up and planted with the root only in pots of soil rich in organic matter. No host is necessary. Plant out in shade or in the open when six inches high and keep watered. Manuring has no effect.

The young lants will, as they develop, parasitise on adjacent trees but this I think is their means of survival adopted after centuries of evolution in low rainfall. Actually *Nuytsia floribunda* withstands extreme climatic conditions and soil types, i.e., from peaty acid swamps to yellow and reddish sands in limestone. They cannot be killed by fire. The hotter the fire the more vigorous the suckering and the heavier the blossoming.

However, growth from seed is slow, 6"-12" per year is my experience. Once the roots get down in the subsoil, they may speed up.

***From W. Cane, Maffra, Victoria:***

I cannot write about *Nutysia floribunda* with definite authority although my experiments may be of interest. In several check experiments with seed sown in pots, some with carrot seed as was once recommended, and some without other seed, the results have been near enough to equal. In another trial with some plants in containers watered frequently against others kept rather dry, the rate of growth over a 18-month period showed time and time again, the more water applied the greater the growth rate. Plants watered well were 2 feet high while the drier plants were only 6 inches high.

This species is not always, if ever, a parasite, in my opinion. I have seen a plant 10 years of age, that could only have had grass as a host and it was large enough to soon kill any grass if it tried to live on it.

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# MY BANKSIAS

*By K. STUCKEY*

My property at Furner, South Australia is situated about 20 miles from the sea with an average rainfall of 30". The garden is on a low sandy bank, the sand overlying sandstone and some limestone. The soil is slightly acid. My early experiences in growing Banksia may be of interest.

*B. burdetti* two plants planted last autumn one in an elevated, dry position the other in a lower, damp position.

*B. browni* planted 1959, looks very happy and is now 5 feet high. Several more planted in 1961, one planted in shade of a stringy-bark and had summer watering is not doing as well as others planted in open positions and no watering.

*B. baueri* planted 1959. Dry, open position and has had no watering. Has grown into a bush of about three feet and this year had five flower heads, the largest being eleven inches long and eight inches in diameter.

*B. cayleyi* several planted 1961, no watering, have made little growth and not thriving.

*B. collina* four years old, planted in elevated dry position—has had some summer watering. Has grown to 6ft, flowered sparingly but is not a very robust specimen.

*B. coccinea*—2ft. planted 1960. Unfortunately, both were planted in similar situations, i.e., in semi-shade and receive summer watering, they have grown rather spindly to about 2½ft.

*B. ericifolia*—five years old, in an elevated dry position but receives an occasional summer watering. It is not a very healthy shrub and only flowers sparingly. There is another specimen in the district planted in a position where the water table in winter comes to within 18 inches of ground level and this is a really good specimen.

*B. elderiana* was planted in 1961 but is very unhappy.

*B. grandis* planted in 1958, grew slowly, then was severely damaged mechanically (viz., by one cow). However it is still making slow progress.

*B. laricina* planted 1961 but died the first year.

*B. lindleyana* planted 1961, has made very little growth but is now thriving.

*B. littoralis* planted in 1958, in semi-shade, summer watering and has grown well, flowering profusely. Has grown to a height of 8 feet.

*B. menziesii* planted 1958 grew reasonably well for three years but during the past year has been at a standstill.

*B. nutans* planted in 1959 in open position with no watering, appears to be doing well.

*Banksia obvollata* planted 1961. Plants in semi-shade appear to be much better than those planted in open position, although none have really flourished. When as seedlings potted in tubes of local sand plus leaf-mould the seedlings had a tendency to yellow off. I gave several seedlings a dilute dose of iron chelate and they quickly recovered their green colour compared with the untreated seedlings. Was it the iron they required or increased acidity?

**Editor's Note—Mr. K. Stuckey, "Kandara", Furner, South Australia, will lead a study section in the species of *Banksia*. Please report to him of your experiences or assist by growing a few Banksia in your garden. The gardening monthly "Your Garden" in its August, September and October issues have published an excellent article by Alf Gray on the forms of Banksia, tall trees, small shrubs, and small prostrate forms together with precise information on how to grow them in your garden. Write to the publishers, for a copy of each if you do not have one The article is of such a high standard, it is not proposed to deal with Banksia in this publication for some time, pending further results so be sure to procure your copies of "Your Garden".**

*B. occidentalis* planted 1960 in open position and no water and has done very well, growing to five feet in a little over two years. Others planted in 1961 are doing equally as well.

*B. praemorsa* this Banksia was comparatively easy to grow from seed —not damping off, but since planting out in 1961 has done very poorly.

*B. prionotes* planted 1960 in open position and not watered, it looks happy and is now 5ft. tall. Others planted in 1961 are also doing well.

*B. repens* planted in 1961 in both open and semi-shade with about equal results so far, they are making steady but not rapid growth and are showing signs of making lateral growth just below ground level.

*Banksia sceptrum* planted in 1961—another one that is on the very doubtful list.

*Banksia solandri* planted in 1961 but it disappeared. It is comparatively easy to grow to the seedling stage and I have a number coming on.

*B. sphaerocarpus* planted in 1960 in a dry, open position. It has grown well into a shrubby bush about three feet tall and has three buds forming at present.

*B. speciosa* planted in 1961 in dry, open position. The several specimens have all grown remarkably quickly and are up to four feet high at present. The young growth is very lovely, a downy rosette of rusty red shading to brown and light green.

*B. tricuspis* planted 1961 in dry, open position but is only just existing.

*B. violacea* planted in 1960 in dry, open position. Appears to be healthy but has not made great growth.

Banksias *aemula, dryandroides, ilicifolia, quercifolia* and *robur* have been planted out this autumn.

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# Hot Weather Gardening

*By J. HAMERSLEY—President, West Australia*

We in Western Australia have only just finished the longest, hottest, and driest summer in living memory and have only in June been able to put away our hoses and sprinklers. None the less, the casualties here amongst young plants that had "taken" before Christmas were neglible and the mature plants carried through intact. After some five years we have worked out a reasonably successful system for coping with the summers. It is based on mulch, water, and windbreaks. To my surprise, the move five years ago from a garden on 14ft. of white sand to one on solid clay a spit under heavy loam—an old orchard in fact—has made practically no difference to my hot weather practices.

**MULCH**

SAWDUST AND SHAVINGS—

There are many materials suitable for mulch: cheapness and availability are governing factors—in fact you take what you can get and learn how to handle it by experience. I have used sawdust but found although it keeps the soil surface moist, it is difficult to water through when the ground does dry out, unless the hose is dribbled down under the mulch. Sawdust, least, holds a lot of water and has the advantages outlined by Pax Lindsay.

SEAWEED—

Seaweed is very highly thought of as a mulch where it is easily available. It is reported to let the water from sprinklers run through easily to the soil and this is most important in W.A. where constant sprinkling is called for from October to April at least. It also contains minerals generally short in our coastal plain sands.

CASUARINA AND PINE NEEDLES—

These are probably the most satisfactory mulches available in that they don't absorb much of the water that falls on them and yet can form a close cover for the soil. They don't inhibit weed growth as well as sawdust, but none the less cut it down to negligible proportions. They are also easily available, if you are prepared to get it yourself, and clean and light to handle.

DRIED GRASS—

The easiest mulch I have found is the dried grass around the yard and house paddock which has to be raked up anyway. A good deal of the seed has fallen by the time I need it, early December, and there is not much weed growth until the first rains of autumn, when the whole is hoed lightly into the top three inches. I have done this for about 15 years, on both natives and exotics and found it invaluable.

This year I took a thermometer into the garden one hottish afternoon and did some tests at 2.00 p.m.

Shade temperature, 95 deg.; 1 inch deep in dry grey sand, 135 deg.; 1 inch deep in heavy loam unmulched, watered 5 hours ago, 126 deg., 1 inch deep in heavy mulched soil watered 5 hours ago, 95 deg.

GRAVEL, COARSE SAND—

Some of the ground hugging plants cannot be heavily mulched, with vegetable matter, yet do not relish being used as a ground cover themselves if they are in full sun all day. Leschenaultias, Dampieras and scaevolas appreciate a gravel mulch and in fact sucker very freely and spread when the ground is shaded bv an inch or so of gravel, but in really hot weather partial shade from other plants or trees saves them dying right back. Even the litter of the bush is sufficient cover to let them flourish. Gravel also keeps them from getting clogged up with dirt splashed up by rain or sprinklers.

## WATER

This is entirely a matter of gumption and what you have got. There is a measurable amount of water available to plants in any given area. In a garden the planting may bear no relation to the water available and the gardener has to supplement the water supplies as well as conserve moisture by mulching. I have plenty of water available and use it wastefully and I find natives perfectly happy as long as the watering is consistent. If you have young fresh growth on a plant during a heatwave it will need more water than a plant which has been allowed to come to rest naturally. Trees out in the paddock without watering or competition for soil moisture have done nearly as well as those in the garden freely watered but with heavy competition.

I find the frequency of watering has to be regulated far more by winds than temperatures—a land wind, even a cold land wind, dries out all uncovered soils overnight and plants seem to hate it as much as people. A windbreak seems valuable for hot weather gardening if the garden is at all exposed to land winds. Anything planted in spring or summer appreciates this, and I put a nest of dried grass or pine needles right up on the top of anything under a foot high.

In a new garden wind protection is enormously important and is well worth the time and money it may cost to help you through the first couple of summers.

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# MULCHING THE GARDEN

A mulch is any substance used as a ground cover. It is spread over a soil surface primarily to prevent loss of soil moisture by evaporation[1]. It is also used to protect roots of plants from heat, cold, drought, and to keep down weeds, etc.[2] It must also be attractive enough to promote colour harmony.

The choice of a mulch is usually influenced by circumstances. The use of a permanent mulch of stones and coarse gravel coupled with systematic feeding of plants gives very good results with native plants. As reported by T. R. N. Lothian in the last issue, this is particularly suitable for dry hot areas. Large stones also serve to effectively anchor the plants reducing wind damage. The problems are the availability of suitable stone and if coarse gravel, prevention of its eventual loss by incorporation in the soil.

1. Water moves up to the soil surface by capillary action, clinging to soil particles and pore spaces. If the mulch is of fine particles, the capillary action of the water continues up through the mulch and the soil moisture is still last. It may also pack in too tight preventing entry of water when watering and the very necessary entry of oxygen and exit of carbon dioxide from the soil. If the mulch is of extremely coarse particles the greater air movement will cause greater evaporation of soil moisture. Thus this function is related to:—

2. The physical features of a mulch, being a weed deterrent; providing protection or insulation of roots and soil surface tissue from heat, cold and wind; maintaining long lasting, non-packing and staying-put capabilities; lacking disagreeable dusts and odours; and promoting ease of application, removal and displacement, are also related to:—

3. The chemical aspects of a mulch, its ability to conserve moisture; to exhibit a slow breakdown or composition rate, so as to forestall live tissue burns and nitrogen deficiencies; to provide nutrients sufficient to supplement limited fertiliser applications; to possess a heat absorbing colour for winter mulch particularly in cold areas, or to reflect heat in hot areas; and to create desirable soil modifications by eventually being incorporated into the soil.

## WOOD SAWDUST AND SHAVINGS AS A MULCH

Other organic materials are listed in "Hot Weather Gardening" but it is inevitable that the main controversy should rage around the material most readily available, sawdust and shavings. Pax Lindsay reported on its use in the last issue and he was pleased to have evoked comment.

From P. J. Parry, Gosford, N.S.W.: The use of sawdust proved disastrous to my Boronia section, especially the native rose. Use with caution around young choice plants.

From H. Caulfield, Curator Botanic Gardens, Brisbane, Qld: I use 3 inches of sawdust all over garden beds with good results. It is an excellent mulch.

From C. M. Taylor, the N.S.W. Society President.

One factor we must not lose sight of is that sawdust and shavings are wood, the product of a tree just as leafmould is. When composted it becomes rotten wood and depending on the locality where the trees were grown so the pH and trace elements in your compost vary. Thus leafmould or wood shavings from an area where the pH is 5-5.5 is not suitable (in the raw state) for many types of plants without the liberal addition of lime whereas for orchids, azalias, etc., it is ideal. It is a good mulch for most of our native shrubs. As so many are surface rooters it protects the roots from drying out as well as from cold, and slightly raises the humidity in the near vicinity. Thus take care that the butt of the plant or tree is kept free or mould or collar rot may be induced.

The whole of my orchid house is covered with shavings 4 inches deep keeping the house entirely free of weeds, but more important, maintaining a higher humidity as the mulch is always wet.

As a potting medium pure shavings are almost the ideal mixture providing the pH is suitable for the variety of plant grown. *Melaleuca Leptospermum* and *Acacia* seedlings make wonderful growth with splendid root systems when grown on in pure shavings. Water well as shavings dry out quickly. However unless previously composted, they breakdown and lose 75 per cent of their bulk within 12 months allowing the plant to sink down in the pot or holding it or exposing the roots.

Uncomposted sawdust is, in my opinion, not suitable as a mulch or for pot culture as water does not permeate through freely enough. Sawdust or shavings composted by mixing 6 parts of wood material to one part of fresh fowl manure and sprinkled lightly with dolomite and blood and bone, turned and mixed until the heat has gone out of it, is ready for use on almost any variety of potted or garden plant.

## SEAWEED AS A MULCH

Many may be fortunate enough to be situated as well as Mr. K. Stuckey of South Australia who reports:

The mulch used in my garden is a weed growth collected from the shore of Lake George. The lake is salty so the weed is collected after the end of the winter when the salt has ben leached out of the weed by the winter rains. The weed is soft and stringy and when placed on the garden several inches thick makes a dense but porous mat ideal for keeping weed growth down and yet does not restrict the entrance of rain or water as sawdust has a tendency to do. An application of lake weed of three inches lasts for two years when a good dressing of blood and bone manure is applied evenly over the whole area and not just around each individual plant so that the root system of plants is encouraged to travel and work for their living. A fresh layer of lake weed mulch is then spread over the top-dressed area.

A HANDBOOK TO THE PLANTS OF VICTORIA By J. H. Willis, price 45/-
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The first of two volumes planned as a guide to the flora of Australia (Vol. 2 not yet available), this is essentially a botanical book. They list botanical descriptions of all plants native to Victoria. As the only accurate reference to the flora of Victora they will be of essential value to all botanists. Prepared in a key form throughout, it provides however, much more information about individual species than is usual in a key.

It is especially styled however, to be of value to the amateur botanist, the interested bushwalker or keen plant collector and grower. The key features used are those readily discernable and do not require fine dissection and magnification of tiny plant parts. The book is not equivalent to a full-length, comprehensive flora of the State with long detailed botanal descriptions usually too technical for most readers, but gives an accurate guide to all plants in the Victorian area for those keen enough to try to use the simple key system used.

The author is well known throughout Australia as a leading authority by the Professional Botanist, and as a sympathetic and patient adviser to all those amateurs and laymen interested in wildflowers, and this experience is reflected in this book of 450 pages.

AUSTRALIAN PLANTS FOR THE GARDEN By Thistle Y. Harris

This is not a new book. It has survived many years through successive revisions and reprints and is still recognised as the leading reference for a book devoted entirely to encouraging the cultivation of native plants in home gardens. I have found it a valuable reference for years, the chapters speaking for themselves; Plants and Soil, Planning the Garden, Getting the Garden Ready, Garden Craft, Wildings and Cultivated Plants, The Naming of Plants, Plant Maladies and Their Control, Small Gardens, Hedges and Windbreaks, Bog Gardens, Rock Gardens, Mat-forming and Cover Plants, Climbing Plants, Windowboxes and Tubs, Ferns, Wattles or Acacias, Some More Decorative Shrubs, Trees for Parks and Large Gardens, Garden Plans, etc.

This large 350-page book deals competently under these headings with all the aspects of growing native plants in your garden. The colour plate of *Callistemon viminalis* on page 21 is reproduced from the frontispiece to this book.

EASTERN PARK NURSERY PLANTING GUIDE

The 1962 edition written by the very competent wildflower writer and grower, E. M. M. Boddy, available at 4/-, is principally a catalogue to the excellent plants available at the nursery. (See advertisement). However over 1400 species in the 60-page book are listed under headings such a Dwarf or Low Growing Windbreak Trees—Front Row, Medium Windbreak Trees—Centre Row, Ornamental Shrubs, etc., giving mature height, habit, and flower colour. Mr. Boddy dispatches to all parts of Australia, most successfully.

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# VERTICORDIA FOR THE GARDEN

*By W. A. STRUTT—National Park, W.A.*

Part Two—For Inland Areas

It should not be assumed that the *Verticordia* species dealt with in part one were recommended exclusively for trial in coastal areas—far from it. The chances of successful introduction of these into inland districts should be infinitely greater, the soil conditions, drier atmosphere and less density of timber and undergrowth resembling more closely the natural environment of the genus in Western Australia. Supplementing those species already commented on I would add the following as worthy of concentrated effort: *Verticordia grandis, V. monadelpha, V. spicata, V. brownii, V. drummondii, V. ovalifolia.*

*Verticordia monadelpha* with its dense mass of deep pink woolly flowers on slender stalks which stand erect to a height of over three feet in aged plants is one to feature on higher slopes and gravelly or stony ridges and is one of the most spectacular of the *Verticordias.*

To avoid unnecessary repetition concerning species commented on in the earlier guide for coastal growers, and to simplify association of the varieties with their soil types I am grouping them as follows:

*Group A*—for low levels, swampy, sandy to porous clay and tolerant of water *Verticordia* species—*Nitens, densiflora, serrata.*

*Group B*—well-drained sandy or friable loam with pebbly gravel or small stones in the subsoil not detrimental in any way: *Verticordia* species—*chrysantha, drummondii, grandis, brownii, insignis, ovalifolia, picta, spicata.*

*Group C*— for higher levels and steeper slopes where rocks and stones outcrop freely and surface soil not abundant: *Verticordia* species—*acerosa, grandiflora, huegelii, monadelpha* and *plumosa.*

*Verticordia grandis,* growing to three and four feet high with large scarlet flowers clustered round the terminal spikes of new growth make it an attractive feature of the sandy and light-loam areas of the northern wheat belt. The grey-green of the almost orbicular small leaves surrounding the small branches above nude stems enhances the colouring of the bright blossom.

*Verticordia spicata* also favours the sandy and loose textured soils; a small shrub with a range of colours in the flowers from yellow to purple and density of blossom and small leaves crowding its branches make it one of the most attractive of the genus.

*Verticordia brownii,* a pure white flowering species is conspicuous amongst the variety of colours of other genera featuring the poorer quality open heath soils of the inland, the compact mass of blossom resembling a cauliflower: that naturally enough being its local common name.

*Verticordia ovalifolia* another attractive white flowering member of the family is an erect shrub to thirty inches in height, the obovate leaves and clusters of flowers ensure its popularity as a garden subject. This is one species which could favour slopes and ridges with small stones or gravel lumps in loose soil.

*Verticordia drummondii* also would not be averse to stony or rubbly conditions and porous clay soil as well as sand. Its clusters of pink and near white flowers on the terminal spikes of an erect shrub are sufficiently attractive to justify its inclusion with the more attractive members of the genus.

Since *Verticordia species etheliana, penigera, penicilaris* and *muelleriana* have been under observation by competent authorities in N.S.W. their observa-

tions could be of more value than general remarks on conditions favouring the species in W.A. They are recommended for trial if seeds are obtainable.

Having extensively travelled Australia and having a knowledge of each individual state equal to that of Western Australia I am commenting as if unlimited supplies of seed were available to scatter for natural germination in suitable soil types, and honestly believe that establishment of plants could take place. I see no reason to consider otherwise and can imagine large inland areas carrying a density of *Verticordia* shrubs as they do in their natural environment.

In South Australian agric. soils of Eyres Peninsular and North-West of Port Augusta in the lakes districts even where the soil tends to be more compact and clayey species B could be given a trial while species C could prove adaptable to the slopes and higher elevations of the stoney or rocky hills of the Gawler Ranges, the Flinders Range and the slopes surrounding the Barossa Valley. In the eastern half practically all the country from The Coorong, in fact from the Kingston-Narracoorte line north to the Lake Frome area resembles Western Australia's eastern and north-eastern wheat belt and pastoral areas where species B and C flourish.

In Victoria continuing eastwards from Pinnaroo (S.A.) into the Mallee wheat lands and from Bordertown (S.A.) through Dimboola, Nhill and Murtoa to the old alluvial gold working west of Ballarat the sandy topped lighter country and the light-grey and yellow clay areas, surface sprinkled with quartzy-gravelly rubble seem to me ideal for species B with species C selected for stonier ridges. I could not commit myself to predict any great success with any species for adaptation to the rich black and deep red agricultural soils of the Wimmera or the Ballarat-Bungaraee and Daylesford-Trentham districts. In the latter I think the cold winter combined with the heavy soil would create exceptionally adverse conditions. Throughout all the auriferous country west and north of the Great Dividing Range around centres such as Castlemaine, St. Arnaud, Rushworth, Rochester, Benalla and Glenrowan species C could be suited on the higher stony levels while in less elevated situations, particularly where soil is friable B species would have excellent prospects. Particularly round Violet-town, Euroa and Yea have I seen country I would consider ideal for B and also for A.

Across the border into the Riverina and New South Wales those loose sandy areas approaching Narrandera from the south and round Condoblin on the Lachlan—the sandy pine ridges further west in the pastoral country—the free soils of the agricultural areas of Barellan, Coolamon, Dunedoo and Coorabarabran the possibilities are these for species B while for C conditions as indicated for Victoria are duplicated round such centres as the quartz and rubble undulations of Wyalong, Melrose, Gulgong, Gilgandra and Coonamble. All the Western foothills from Bathurst, north to the Tenterfield-Warialda districts could prove a trialling ground for these species which are at home amongst rocks of various kinds. The Young, Cowra, Forbes, Parkes and Peak Hill districts could suit all species when varying soil types and elevations are considered.

Along the Queensland border on both sides also, all species are worth a trial. From Collarenebri and Goodooga north through St. George, across through Surat and Mitchell, from Moree and Warialda through the sandy tracts of the tobacco areas of Texas and Yelarbon and further north the Milmerran and Cecil plains districts appear particularly promising for the species favouring sandy soils. The loose textured soils of the extensive flats of the pastoral country where the Beahinia and Wilga grows throughout south-western and central Queensland—all this appears to me ideal for

species B while in all the areas mentioned the hard baked red soil ridges, timbered with Mulga and Gidgee could prove as suitable for the C group as any pebbly, stony or rocky undulations which they favour in their home state. I definitely consider prospects good throughout the Kingaroy and Preston districts and across to Gayndah and, further north, from Eidsvold through Chacow to the Callide and Dawson Valleys always bearing in mind the soil texture suitable for each group as conditions can be found to cover all species mentioned.

Since the basic nature of my contribution is *Verticordias* for the garden and not an extensive establishment by natural germination, where conditions as suggested, are not natural in the garden they could be approximated. It will be noticed that only once have I referred to an area as suitable for the A group, but where water and sand and leaf mould are available the right textured soil could be made up in any household plot or shrubbery, right through the inland, to give these a fair trial.

Part one, (March, 1961, issue of "Australian Plants") submitted to guide native flora growers in coastal areas, should also be accepted for what can be gleaned from it, concerning the species mentioned, by inland enthusiasts as well. With the combined information supplied by such experts as Mr. Quick, Mr. Doney and Mr. Roberts I am confident that those fortunate enough to obtain seeds will, in the course of two or three years, be well on the way to having successfully adapted these attractive natives to new environments.

## VERTICORDIA—A further report by W. N. B. Quick (c.f. No. 3 Issue)

Some twelve species of Verticordia under trial have been most successful shrubs. However, during the November wind-storms, when bushes of small species were laden with flowers, it became obvious that their small root systems would be weak without some shelter. Plants in the lee of other low-growing but stouter shrubs of similar stature were undamaged. Shelter, however, should not be overdone, all species, generally speaking, liking lots and lots of fresh moving air, sun, and a friable acid soil with good drainage. With such small root systems, drainage need not be to any depth, and it is easy to arrange for their needs in any garden.

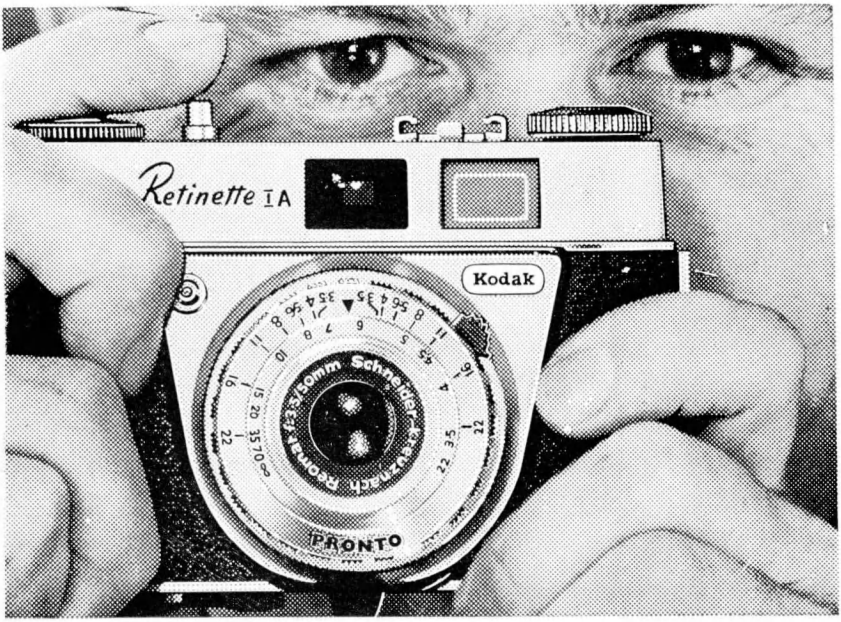
If a very open position in the garden is not available, choose one which is rather dry and semi-shaded in summer, for example, around the base of some substantial tree. Plants will stand quite heavy cutting during or after flowering, and definitely benefit from this treatment. No species should be allowed to exceed eighteen inches in height unless the ground is very stony and dry.

The species doing well are *V. acerosa, V. brownii, V. densiflora* (s), *V. huegeli* (s), *V. insignis* and var. *grandiflora, V. mitchelliana, V. monadelpha, V. pennigera* (s), *V. picta* and *V. plumosa*. (s) established well enough to self sow. *V. drummondi, V. grandiflora* and *V. nitens* to be given a further trial in better positions. *V. chrysantha preissi, V. lindleyi, V. pholidophylla* and *V. spicata* giving fair results to date.

### *From J. M. Wilson—Highett, Melbourne, Victoria*

I have had growing for some time in available spaces in the garden, plants of *Verticordia plumosa* and *V. densiflora*. Neither growth nor flowering could be called first class. Twelve months ago I acquired nine further species, *V. brownii, V. nitans, V. acerosa, V. picta, V. monadelpha, V. chrysantha preisii, V. densiflora, V. insignis* and *V. huegeli stylosa*, and bearing in mind Mr. Quick's theory about air circulation around the plants, I set them in a new bed on their own. This bed was obtained by digging up a section of lawn in front of the glasshouse which ensured that the Verticordias were not overshadowed by plants at the rear. The project has proved most successful as all the plants except *V. nitens* are strong healthy and vigorous and all are flowering well despite the large number of cuttings I have taken already. Incidentally I have just potted up the first of these

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# CALLISTEMON VIMINALIS, Weeping Red Bottlebrush

This bottlebrush species may be grown as a large bush, to form a large hedge or windbreak, but more usually it is grown as a small tree. It makes a fair street tree as shown below, its application for this purpose being improved by trimming off the lower branches. By correct pruning it can be made to conform to any size. It is quite hardy and suitable for a wide range of soils from clay to sand, revelling in wet conditions.

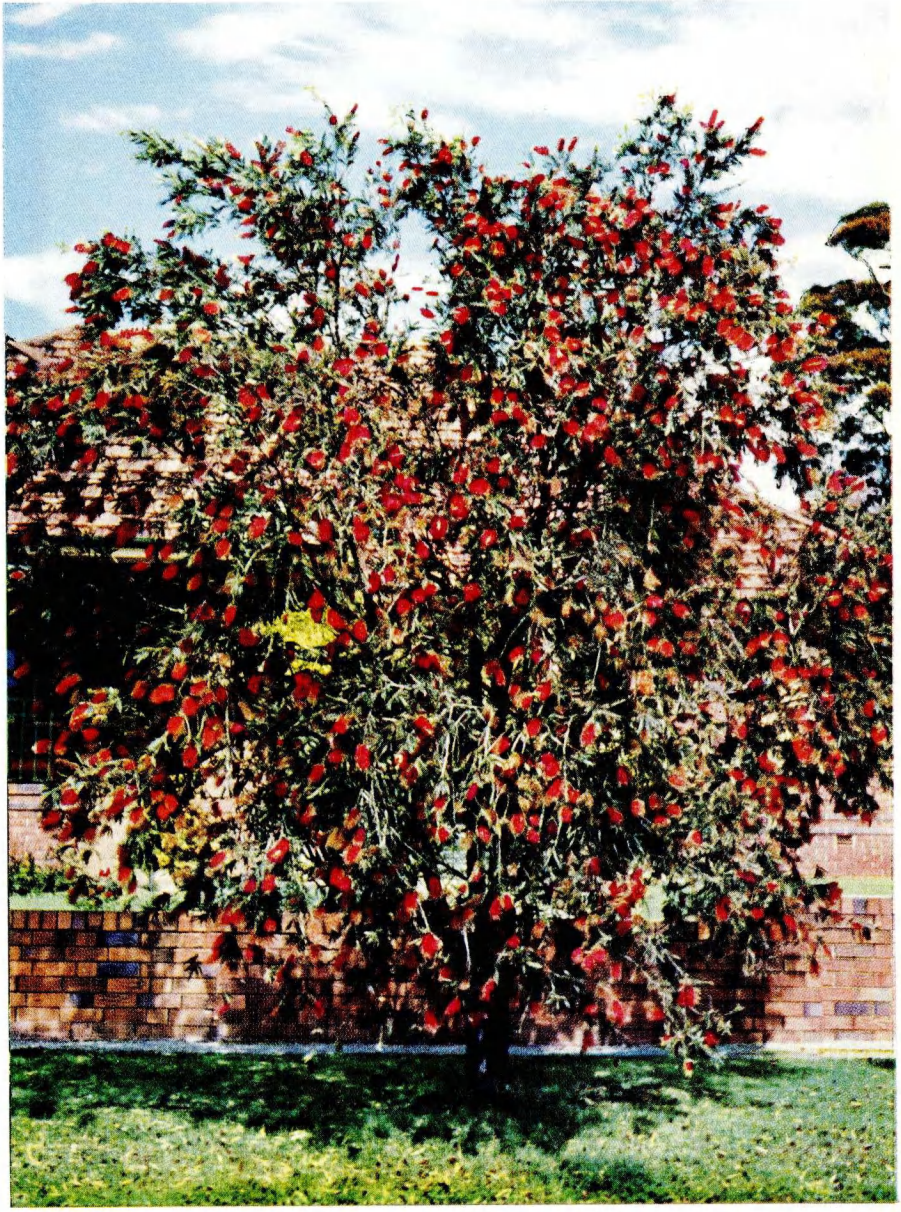


*Photo: Quinton F. Davis* *Blocks by Courtesy of Angus & Robertson*

Reprinted from "Australian Plants for the Garden", by Thistle Y. Harris

The tree has a rough bark of pleasing scaly appearance. It is a little variable, the best forms having willow-like branches and soft green leaves 3-4 inches in length. The young leaves with their bronze-coloured hairs, are at the tips of the branches in spring, making almost as a good a show as the long red flower spikes that appear shortly after.

The plant occurs naturally along the east coast rivers of N.S.W., but will grow in any part of Australia where it receives reasonable watering. It can also withstand severe dry spells when well established. As a tall hedge alternating with species of *Callistemon salignus*, a white bottlebrush, it makes a beautiful show as well as a thick hardy windbreak.

## THE WEEPING BOTTLEBRUSH AS A STREET TREE

*Toowoomba City Council—Queensland*

Toowoomba is on the crest of the dividing range west of Brisbane. The eastern side of the town is very subject to low cloud and mist giving a very moist atmosphere for long periods. *Callistemon viminalis* was planted in streets on the western side of the town which is much less subject to these conditions, but exposed to easterly winds and heavier frosts. Planted in August, 1958, when 18 months old in heavy volcanic soil, the average height is now 7 feet. Now flowering very well (October) they have come up to expectations as a street tree suitable for these severe conditions.—W. L. Miller.

*Bellingen Shire Council—North Coast, N.S.W.*

The older plantings of *Callistemon viminalis* would be 9-10 years old with others at 6 and 2 years old. Respective heights would be 16 feet high, 6 feet diameter, 12ft. high, 4ft. diam., and 3½ feet high. They are planted in alluvial soil ranging from 6 feet to 2 feet in depth. In one section they are planted with a red form of *Callistemon salignus* giving an interesting variation in habit, foliage and flowers. The weeping habit of *Callistemon viminalis* and its flower size, show considerable variation, one of our trees having quite large brushes. —Dr. Hewitt.

*Council of the Shire of Wade, Griffith, N.S.W.*

My experience with *Callistemon viminalis* planted in three streets in the town of Griffith, has been disappointing. Now 4 years old they have been slow growing and have not to date formed an attractive tree. They may be better suited to districts with a higher yearly rainfall than 15 inches. I have found *Callistemon salignus* to be most successful and more suitable to the area for the purpose of town beautification.—E. W. Moore, Shire Clerk.

## BOTTLEBRUSHES FROM SEED

Reports are being received from all parts of Australia, of the complete success by readers with the germination of seed of species of *Callistemon* (bottlebrushes), *Melaleuca* (Honey Myrtles), *Kunzea*, *Leptospermum* (tea trees), *Calothamnus* (net bushes), in fact most of the *Myrtaceae*. They used the bog plant method given in issue No. 10. All you need is mature seed (see advt. for seedsmen or readily collected from capsules taken from the bushes when three years old and left in a bottle in the sun for a few days), a plastic pot and a non-ferrous tray. Try it. Success is certain.

*From J. L. ABEL, Nowra, N.S.W,*

I have tried to germinate seed of *Calytrix tetragona* without success Fortunately I noticed plants growing almost in a bog so I planted the seed using the bog method with excellent results. A little field observation made all the difference.

Will West Australian readers try with *Verticordia* seed. If they will send me (the editor) the seed of as many species of *Verticordia* or *Calytrix* as possible I will certainly give it a go. Just parcel up the dropped flower heads from under the bushes.

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MULTI-PURPOSE SPRAY

# The Genus Melaleuca

*By C. N. DEBENHAM—Museum of Applied Arts and Sciences, N.S.W.*

Part II. The basal-flowered species with alternate leaves. (Series *Basiflorae*. sub-series *Alternifoliae* Benth.).

This sub-series is concerned with those melaleucas which have their flowers arranged in clusters, either axillary or lateral, on the previous season's growth. Their separation from the *Decussatae* is based on the alternate-leaf arrangement and the predominance of floral-shoots bearing simple hairs. The members are mainly of the temperate south-west and the tropical north, not well-known to horticulture.

A. The temperate species.

i. *Leaves broad, not longer than 15 mm.* Shrubs of rather rare occurrence, noted as of spreading habit and reaching abt. 3m. (9ft.) in height.

The components of the broad-leaved group are three species of the west coast and inland, and one from the south coast, *M. depauperata*, little-known and recorded originally from the Fitzgerald River. The Umbrella Bush, *M. cardiophylla*, has appeared as including two forms, one (the variety *longistaminea*) with staminal bundles noted to attain 20 mm. in length. For the true nature of the Umbrella Bush we are indebted to the Curator of the Western Australian Herbarium, R. D. Royce, who comments: "*M. cardiophylla* itself is a rare plant and has been collected only a few times (during recent years) in the west coastal areas. The variety *longistaminea* is unknown to me and is not represented in this Herbarium. On the other hand the var. *parviflora* is extremely common and widely distributed."

The summer-flowering *M. lateriflora*, once of frequent occurrence in a traverse of the sandy loam areas from the Avon and Blackwood Rivers towards the Coolgardie district, has two forms which differ in leaf shape from the type. The rather rare *M. undulata* has been found as a robust, somewhat gnarled, low shrub.

i.a. Filaments coloured (pink or purple) in groups of less than 15. (Usual number 7-11.) Flowers few, in loose globular heads at first lateral. Leaves 3-5 mm. in length, ovate, obtuse, flat or slightly concave, with inconspicuous venation, sessile. J-K (south coast)
21. *M. depauperata* Turcz. (1852)

i.b. Filaments white or yellowish-white, in groups of at least 15 and usually more. Leaves broad at base and almost sessile, with prominent venation. Filaments pinnately arranged on a broad claw. Fruit at the base of leafy shoots, crowded but free from each other; sepals not persistent. Leaves usually cordate at the base, often stem-clasping, broadly lanceolate to orbicular, acuminate or pungent-pointed, 6-12mm. in length, 5-veined or striate (i.e., multi-veined). E, E-K. 22. *M. cardiophylla* F. Muell. (1859).
Flowers smaller than type; receptacles woolly.
var. *parviflora* Benth.
Leaves narrowed to a distinct petiole; venation inconspicuous or obscurely striate. Sepals long-persistent and prominent on fruit.
Flowers and fruit often in short, globular, tightly-packed clusters; receptacle base often with a dense silky tuft. Filaments crowded at the end of a broad claw. Leaves 6-10 mm. long, broadly lanceolate to obovate, obtuse. E,E-K
23. *M. lateriflora* Benth. (1866).
Leaves narrowed to very short petioles and with acute and pungent-pointed apices, up to 15mm. long.
var. *acutifolia* Benth.
Leaves rounded at both ends, elliptical.
var. *elliptica* Benth.
Flowers and fruit not crowded; receptacles coarsely silky. Filaments crowded at the end of a narrow claw. Leaves 10-12mm. long, lanceolate to ovate-lanceolate, acute and pungent, flat but with undulate margins. E,E-K.
24. *M. undulata* Benth. (1866)

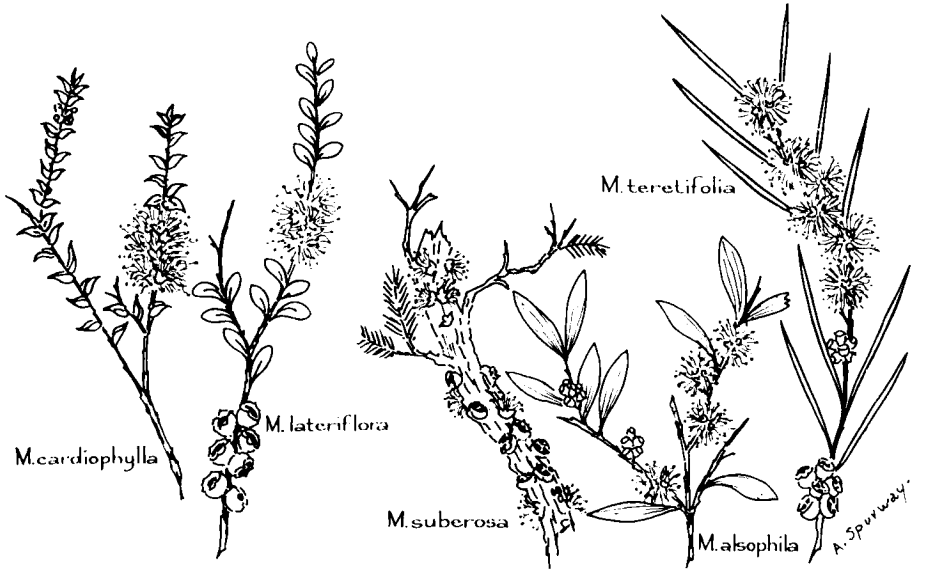
*ii. Leaves narrow (mainly linear).*

This group is most difficult for comment in the space available. The members are dispersed in both the south-west and south temperate regions. In the south are *M. neglecta* and *M. oraria*, both proposed as distinct species but their separation is by no means clear. The occurrence of *M. neglecta* is given as the Grampians, and Dimboola in the Wimmera District, of Victoria, besides

EDITOR'S NOTE: letters in key refer to Geographic Regions in Issue No. 10.

the Torrens Gorge near Adelaide. The author of *M. oraria* states it to have a wide dispersal in the south-east of South Australia and on Kangaroo Island. Both are strongly linked with *M. brevifolia*, one of the three components making up and displacing the *M. fasciculiflora* of Bentham.

Known to horticulture is the Cork Bark Honey Mirtle from areas (e.g., the Kalgan Plains) near the south coast from Cape Riche to King Georges Sound. A prominent feature is the very corky textured and deeply fissured floral




branches but in the early eighteenth-century collections of Drummond, not all material showed this character. Drummond's collections (including as well the material which Bentham later based his *M. fasciculiflora*) somehow reached Russia and came to the attention (1852) of a name prominent as author of several Australian species. Turczaninow. This authority found that the Honey Myrtle material was of two quite distinct components and gave the names *M. lateralis* and *M. angulata*. At a later date (1862) and on material from another source, von Mueller gave *M. exarata* as the species name for the Cork Bark Myrtle, then, in 1874, acknowledged Turczaninow's species but placed them as synonyms of his own species. The duplication in names, of course, creates the question of priority but in this case, the problem has been avoided by the acceptance (Gardner, 1931) of an epithet which predated them all. Thus the correct name has become *M. suberosa*, used by the German Schauer (1845) for material (brought back by Preiss) so withered in condtion that he was doubtful of its genus and tentatively described the species under *Calothamnus*.

With the exception of the sem-prostrate, spreading Cork Bark Honey Myrtle others of the group are erect shrubs up to 3m. in height. The moisture-loving *M. teretifolia* of principally the Swan River district, is a summer-

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flowering spreading shrub.

ii.a. Flowers axillary or lateral, often close together and so forming loose spikes. Fruit often corky-textured. Leaves linear to narrowly lanceolate, not longer than 15mm.

Flowers and fruit usually immersed in the fissures of a corky shoot. Filaments red or purple. Leaves 4-5 mm. long, linear, concave or somewhat terete, obtuse. Sepals usually prominent and long persistent. E (south coast).

25. *M. suberosa* (Schau.) C. A. Gardn. (1931)

Floral branches not enveloping flowers but, with the fruit, often corky. Filaments white. Leaves up to 12 mm., linear to narrowly lanceolate, concave or somewhat terete, usually crowded. Sepals rarely persistent on fruit.

The separation of the species making up this complex is beyond both the scope of the key and the writer's ability to find tangible differences. Included are:

A. Western species

E (individual extents unknown until resolution of the species)

26. *M. apodocephala* (Turcz (1852).
27. *M. bracteosa* Turcz. (1852)
28. *M. brevifolia* Turcz. (1852)

B. Eastern species

29. *M. neglecta* Ewart & Wood (1910).
30. *M. oraria* J. M. Black (1945).

ii.b. Flowers mainly in globular axillary clusters on shoots not continued in growth. Leaves exceeding 25mm. in length.

Filaments white. Fruit globular to urceolate, the sepals persistent but not prominent. Leaves 30-70mm. in length, linear, terete, with acute and straight apex, sessile. E (west coast)

31. *M. teretifolia* Endl. (1837).

B.The tropical species.

Three members, two of which are paperbarks of wide dispersal, the other, *M. graminea*, known mainly from a collection taken from an unstated location within the Kimberley Division and with size and habit not recorded. Found on saline sites of the coast bordering the Kimberley is *M. alsophila*, an erect shrub or small tree. Reaching tree size but often found stunted and shrublike is *M. acacioides*. This paperbark is widely spread throughout the Cape York Peninsular and follows the coastal rivers around the Gulf.

Leaves above 30mm. in length. Filaments white or cream, few in the bundles.

Leaves linear, pungent, sessile, 1 or 3-veined. Flowers in axillary globular clusters with filaments in groups of 7-9. F (extent unknown)

32. *M. graminea* S. le Moore (1920).

Leaves lanceolate to oblanceolate, narrowed at the base to distinct petioles, often obscurely pinnately veined.

Flowers in axillary or lateral clusters on shoots which are without hairs and continue growth during or after the flowering period. Filaments in groups of 7-11, white or pinkish, on rather broad, long claws. Leaves 35-60mm., acute or obtuse, with a distinct point, 3-7 veined. F (coast). 33. *M. alsophila* A. Cunn. ex Benth. (1866).

Flowers and fruit lateral or axillary along the older branches. Filaments in groups of 5-7 at the end of a narrow and long claw, cream coloured. Leaves 30-45mm., obtuse with a point, 3-5 veined. A (wide).

34. *M. acacioides* F. Muell. (1862).

Leaves narrower, longer (up to 60mm.), more acute and sharp-pointed, very narrowly drawn at the base to a somewhat longer petiole.

var. *angustifolia* Domin.

## MY MELALUCAS by A. L. Hargrave, Melbourne.

Shrubby Melaleucas are my favourite plant, being so accommodating. There are about 140 species in Australia, not all the shrubby type of course, but most will thrive in almost all conditions. They grow in yellow sand, gravelly soil, swamps, limestone and sand belts. There is nothing one can write about growing methods as they are like Topsy, they just grow. They are easily propagated by seed or vegetatively.

The species of *Melaleuca* that I have growing are: *M. armillaris, ciliosa, filifolia, longicoma scabra, scabra* varieties *tricophylla, subtrigona* and *tuberculata, graminea, brevifolia, acuminata, oraria, lateritia, deltoidea, elliptica, megacephala*, both red and yellow forms, *nodosa, triterata, wilsoni, glomerata, cordata, lateriflora, thymoides, cliffortoides, diosmifolia, tenella, densa, suberosa, huegelii, radula, gibbosa, micromera, seriata, platycalyx, steedmani, fulgens, polygaloides, squamea, glaberrima, incana, pulchella, thymifolia, blaeriaefolia, tamaricina, striata, cardiophylla.*

## MELALEUCA NEGLECTA from Fred Hall, Adelaide

An erect glabrous shrub of rather limited distribution, growing in the Torrens Gorge (near Adelaide) and in western Victoria it is known locally as "mallee honey myrtle". It grows well in the garden, reasonably dense, with foliage right down to the ground.

The leaves are short, obtuse, semi erect and crowded on the branches with a slightly greyish bloom making the shrub quite attractive even when not in flower. The flowers are borne on last year's wood and can be either in short clusters or long interrupted spikes. The petals and filaments are white and being on the old wood, though attractive, are not particularly showy.

We have it growing in sandy soil, in an exposed position, that is alternatively wet and dry and where it is subject to a battering from strong S.E. winds for 6 months of the year. It has given a good account of itself, being 4-5 feet high at 4 years old.

# THE ORCHID LUISIA

*By A. W. DOCKRILL*

The one Australian species of the Genus *Luisia, Luisia teretifolium Gaud,* extends to New Guinea and beyond. However it is possible that more than one species is involved. There are 16 recorded species in this genus of epiphytes the others occuring in India, Malaya, the Indian Archipelago, some Pacific Islands, New Guinea and Australia.

In Australia the species *Luisia teretifolium* Gaud is confined to Cape York Peninsular preferring the mangrove swamps, growing on either mangroves or paperbarks. The author has not seen a plant growing vigorously under cultivation. It is not a common plant and not much experimenting in growing of it has been carried out. It has very large exposed roots so perhaps would respond to mounting somewhat in the manner of members of the genus *Phalaenopsis* but given more light. It is rather shy-flowering and the flowers are quite small. It is of much more interest to the botanist than the horticulturalist and every effort should be made to conserve the plants in their natural habitat.

*LUISIA TERETIFOLIUM* Gaud., Freye. Voy. Bot. 427, 137 (1826).

A wiry epiphyte. Roots up to 60 cm. long x 0.3-0.6 cm. broad, branched, flat or round. Stem 10-40 x 0.2-0.5 cm., sometimes branched, woody, almost clothed in scarious sheathing leaf bases. Leaves 4-12, 6-15 x 0.2-0.4 cm., terete, sheathing. Inflorescences axillary; axillary; peduncle 5-6 x 3-4mm., obconical; pedicels 3-8, 7-9 x about 0.7mm., crowded at the apex of the peduncle; bracts small, triangular, sheathing, persistent. Flowers 10-12 mm. diam.; sepals and petals green, incurved; labellum large, dark red, expanding, completely dominating the flower. Dorsal sepal 5-7 x 2.5-3.5mm., suboblong, cucullate. Lateral sepals 7-8 x 3-4mm., obcuneate. Petals about 10 x 2mm., linear. Labellum about 5.5-6.5 x 5.5-6.5mm, adnate to apex of column foot, trilobate, densely tomentose so as to appear like rich red velvet; lateral lobes about 2 x 1.5mm., more or less obcuneate, upturned from the lamina; mid-lobe about 3.5-4.5 x 5.5-6.5mm., obreniform, channelled longitudinally above and each side of channel convex. Column about 4 x 2mm., not prominently winged, somewhat constricted about the middle, having a wine-coloured patch below the stigma; foot about 2mm. long, at right angles to column. Stigma obcordiform but truncate at base. Rostellum lorate, upturned about the middle. Anther translucent green but appearing yellow as colour of pollinia shows through, each cell half closed by a delicate membrane which holds pollinia in place. Pollinia 2, large, orbicular, each connected by a short caudicle to a common lorate stipe, the free apex of which extends up behind pollinia; viscidium large, orbicular.

DISTRIBUTION:—Sparingly distributed throughout the coast (particularly eastern) of Cape York Peninsular, extending to New Guinea and beyond. However it remains to be proven that plants from all these localities are conspecific. It seems to favour the mangrove swamps.

FLOWERING PERIOD:—Usually December to January.

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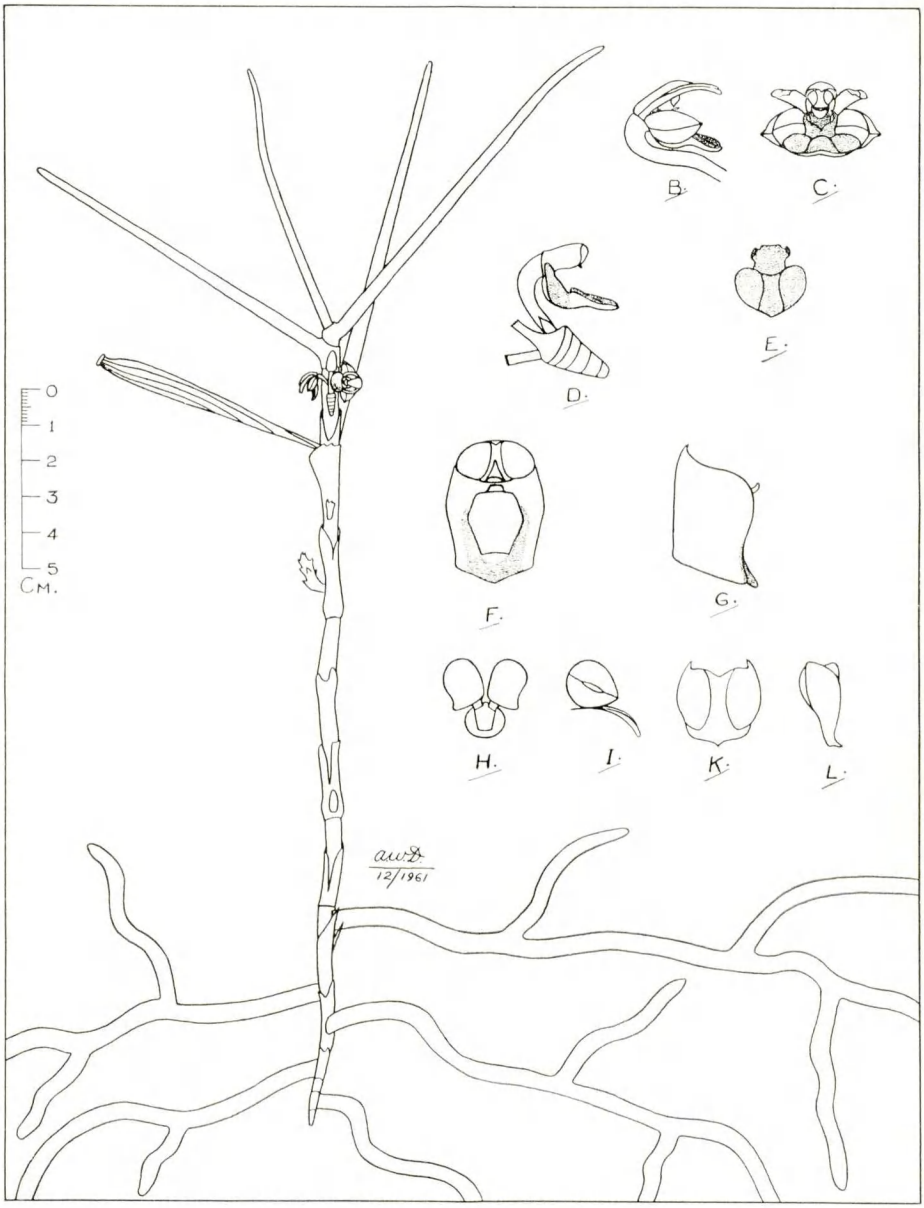
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# *Luisia Teretifolium Gaud.*




A. Plant, size to scale
B. Flower from the side, scale x 3
C. Flower from the front, scale x 3
D. Column, labellum and penduncle from the side, scale x 3
E. Labellum from above, scale x 3
F. Column (anther removed) from the front, scale x 10
G. Column (anther removed) from the side, scale x 10
H. Pollinia from the front, scale x 10
I. Pollinia from the side, scale x 10
K. Anther from above, scale x 10
L. Anther from the side, scale x 10

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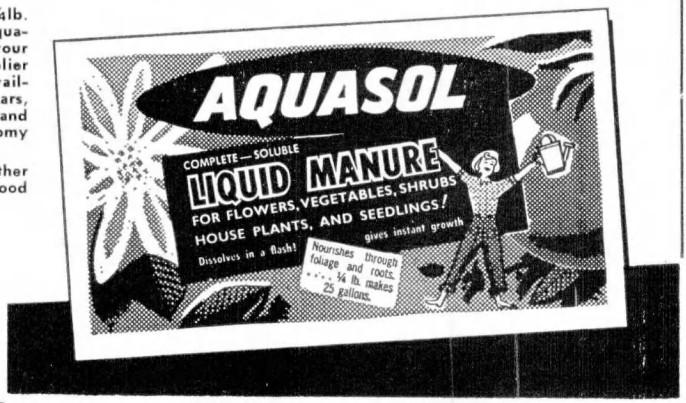
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# LIPARIS COELOGYNOIDES

*By C. K. INGRAM*

Australia is not richly endowed with members of the orchid genus Liparis. Although throughout the world, there are more than 100 species of this group of epiphytic and terrestrial herbs only seven species are to be found in Australia. All seven occur in Queensland four only of these in New South Wales, and none in any of the other states. On the other hand, no Australian species is found elsewhere.

Of the N.S.W. species, only one is distributed to any extent, viz., the Yellow Rock Orchid, *Liparis reflexa* (R.Br.) Lindl., which is usually found



on the coast and tablelands, growing in dense masses on rock-ledges or crevices. The species illustrated, *L. coelogynoides* (F. Muell.) Benth., is found sparsely throughout the North Coast, on tree-trunks. This particular specimen came from the Carrai Plateau rainforest on the Upper Macleay River. It rather resembles *L. reflexa,* but the leaves of the former are shorter, more rigid and acute and the flowering racemes more slender. The leaves of *L. reflexa* are rather flaccid and thick, and the odour of the yellowish flowers is rather unpleasant. The flowers of *L. coelogynoides* are greenish and lack this strong, objectionable odour. In both, the stems are reduced to pseudo-bulbs.

All the *Liparis species* flower in the summer or autumn. The other two N.S.W. species, *L. habenarina* and *L. simmondsii* are terrestrial herbs from the Far North Coast. Curiously enough, systematists group Liparis, not with the large group of epiphytes, but with the terrestrials.

## DENDROBIUM RIGIDUM

*By R. F. LEANEY, F.R.H.S.*

*Dendrobium,* from Dendron, a tree, and Bios, life; *rigidum* in illusion to the rigid nature of the plant.

*Dendrobium rigidum* is a native of the near coastal areas of north Queensland. Apparently it is fairly common and this makes me wonder why this lovely little gem is not more often met with. Indeed until about three years ago I had only seen one plant in the thirty odd years I have been growing and collecting. This apparent scarcity amidst plenty is rather odd and Fitzgerald remarked in 1877 "*Rigidum* has apparently been little known since Solander." Very likely Solander, with time on his hands when Captain Cook beached the "Endeavour" at Cairns for the necessary extensive repairs, found *D. rigidum* and took specimens back to England but of this I am unable to find any actual proof.

Sufficient to say that until some unknown kind person sent me a nice specimen a few years ago, I had only seen *D. rigidum* once before in my life. For some other reason not known to me *D. rigidum* has since then, specially lately, been coming down in fairly good quantities and many of my "Orchid Friends" now have plants all doing quite well.

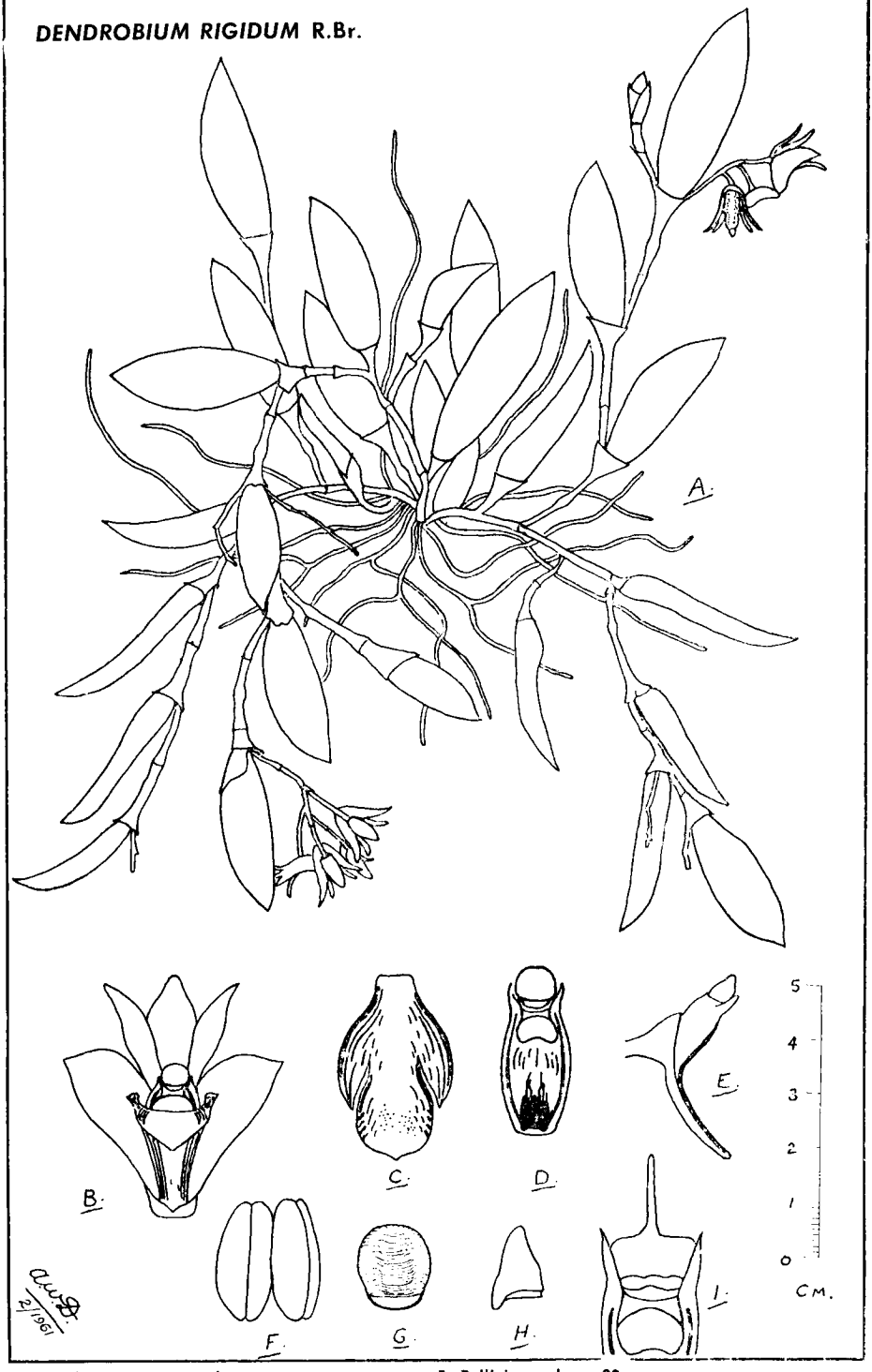
This brings me to another point, *D. rigidum* seems to "do" quite well in the relatively wet and cold of a Sydney bush-house because most of the plants I know are doing just that. Fitzgerald in 1877 also noted this fact although I myself find it does better in the glasshouse with a little heat in the winter. Under these conditions it seems to be seldom out of flower, with the main season in spring and autumn, the flowers are firm and long lasting.

I grow *D. rigidum* on a piece of "Paper" bark wood with bark preserved by tightly binding each end with fine copper wire, if you can get a piece with a small branch, firmly fix the plant in the crook of the branch and bind very tightly with a good gauge of nylon fishing line, hang up near the roof or light source and leave well alone. All epiphytes hate disturbance they seem to prefer a poor fixture to being moved to what would be a better situation.

*D. rigidum* was first botanically described by R. Brown in 1810. It seems quite odd to me that this lovely little plant had to wait 150 years to come to be grown, known and loved.

If you live on the eastern coast not further south than, say the Illawarra of N.S.W. and can give reasonable conditions you will find a plant of *D. rigidum* much easier to handle than any other north Queensland species.

## *DENDROBIUM RIGIDUM* R.Br.




A. Plant, size to scale
B. Flower from the front, scale x 4
C. Labellum flattened out, scale x 4
D. Column from the front, scale x 5
E. Column from the side, scale x 5
F. Pollinia, scale x 20
G. Anther from the front, scale x 10
H. Anther from the side, scale x 10
I. Top of column, anther removed, scale x 10



Photo by Reg Leaney. Plant shown almost twice full size.

## *DENDROBIUM RIGIDUM* . . . By A. W. Dockrill

*Dendrobium rigidum* R.Br. occurs in large numbers on mangroves but is sometimes found many miles inland, often as very large plants, on such trees as iron barks. It is a free flowering, hardy plant and will even grow in a sheltered bush-house in Sydney, provided it is given plenty of light and removed to a glasshouse for the coldest months. It is impatient of over potting. On an inverted earthenware (clay) saucer, with bark, leafmould, etc., or on a slab of tree fern trimmings.

*DENDROBIUM RIGIDUM* R.Br., Prodr. (1810): 333.

An epiphyte growing in clumps, erect when young, pendulous later. Roots about 0.7-1.0mm. diam. Rhizome much branched at the base only; branches up to 30 x about 0.15cm. but not often seen over 15cm. long. Leaves 1-6 x 0.7-1.5cm., grey-green, elliptical or falcate-elliptical, apiculate, very thick, rugose, not channelled. Inflorescences axillary; peduncles about 1-2 x 0.1cm.; pedicels about 2-7, 5-12 x 0.7mm. Flowers 10-15mm. diam., cream with varying amounts of red, sometimes almost wholly red, the labellum usually yellow with red markings. Dorsal sepal 6-9 x 3-4.5 mm., ovate or oblong, obtuse. Lateral sepals 7-12 x 3-5mm., subfalcate, joined at their bases but not forming a true mentum. Petals 6-9 x 1-2 mm., sublinear. Labellum 6-9 x 4-6mm., curved, trilobate; lateral lobes 2-3 x 1-1.5mm., subfalcate; mid-lobe 4-6 x 2.5-3.5mm., suboblong. Column 6-7 x about 2mm., including the foot, green with the foot outlined and stained with red; wings minute, broad at the base but ending in points, erect, extending to about half the height of the anther. Stigma reniform. Rostellum a short but very broad platform. Anther very deep, concave anterioly, attached to the column by a long and very slender filament. Pollinia conistent with the genus, 4 in 2 pair, no caudicle or stipe present.

DISTRIBUTION: North Queensland, particularly Cape York Peninsular, frequently found on mangroves but extends to ranges.

FLOWERING PERIOD: Almost any time of the year, often several times per year.

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