National Botanic Gardens

Growing Native Plants

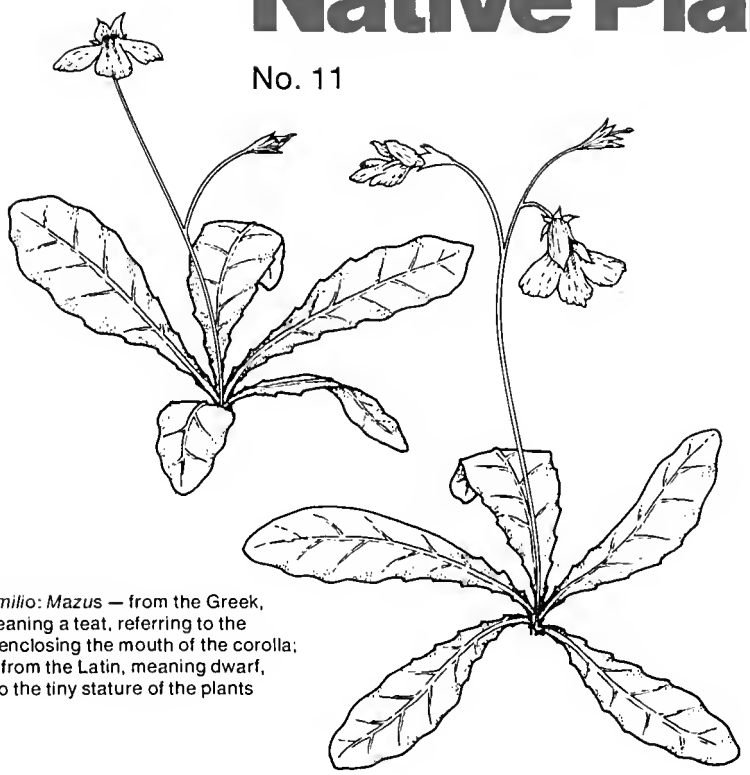
No.11

SPECIAL ISSUE:
ROCK GARDENS

National Botanic Gardens

Growing Native Plants

No. 11



Mazus pumilio: *Mazus* — from the Greek, mazos, meaning a teat, referring to the tubercles enclosing the mouth of the corolla; *pumilio* — from the Latin, meaning dwarf, referring to the tiny stature of the plants

CONTENTS

Australian Government Publishing Service, Canberra 1981

Numbering system changed

This issue of *Growing Native Plants* marks a change in the numbering system for the series. In the past each annual issue has been designated as a volume and has included the year of issue. It has now been decided that use of the term volume should be discontinued and that issues will be numbered consecutively from No. 1. This means that the very first issue, produced in 1971, will in future be known as No. 1. The number of the present issue, the latest to be produced, is No. 11.

The continuing popularity of the series has meant that many of the issues from 1971 to 1980 have been reprinted, and as these reprints or new editions proceed over the years the new numbering system will be implemented on their covers and title pages. Another decision made was to drop the year of issue which, it was thought, gave an unnecessarily dated air to the early issues especially as in many cases revised text or better photographs have been included in new editions.

Another decision made was to close off the cumulative index after the first ten issues. The chief reason for this was that the combined index was becoming too bulky for small booklets of mostly 24 pp. The index for the next ten issues, from No. 11 to No. 20, will again be cumulative. Pages in the *Growing Native Plants* series have been numbered from 1 onwards and this system will continue, with the last page in No. 10 being 248 and first in No. 11 249.

This issue of *Growing Native Plants* is devoted to rockery plants to coincide with the construction of a major rockery complex at the National Botanic Gardens. Planting in this area began in 1980 and its development will continue for several years. Many of the species described in this issue may be seen in this rockery.

A small rockery planted with members of the daisy family, Asteraceae, at the National Botanic Gardens

ROCKERIES: PLANNING, CONSTRUCTION AND PLANT SELECTION

A rock garden properly placed, constructed and maintained and with a population of well-chosen and skillfully grown plants constitutes one of the choicest departments of horticulture. — L. H. Bailey Hortorium (Cornell University), *Hortus Third*, Macmillan, New York, 1976.

Ranunculus lappaceus: *Ranunculus* — from the Latin, meaning 'a little frog' probably referring to the semi-aquatic habitat of some species; *lappaceus* — from the Latin, lappa, a burr, so lappaceus, burr-like, referring to the fruiting inflorescence

Introduction

Rockeries were originally conceived to enable plants from alpine regions to be grown satisfactorily. However, during the nineteenth century their use was extended to grow the enormous number of small plants which for both optimum culture and display could best be grown in this environment.

Rockery culture has many advantages. A rockery, being built above the surrounding soil level, may provide excellent drainage, an advantage which most small plants appreciate. Similarly it adds topographical interest to a garden which may otherwise be flat and monotonous. Small rock pockets allow soil types to be varied and thus many true alpine plants which grow best in peaty soils may enjoy this condition in a section of the rockery. These small pockets also provide sites where plants that tend to spread and become invasive may be contained without constant maintenance. A rockery may be designed also to accommodate those plants requiring wetter conditions. A pool may be built into the design and the 'wet-loving' plants may be used to surround the water feature. Rocks provide an insulating effect to the roots of plants and accordingly provide a cool root run. In winter they tend to have the opposite effect by storing heat from the sun during the day. They radiate this heat at night and give a positive frost protection to nearby plants. Large rocks are particularly effective in this regard. Finally, rockeries allow small plants to be readily seen by either isolating them in a rock pocket or by raising them above ground level closer to the eye of the viewer.

Location

A sunny aspect is generally preferred for most rockery plants but if an island rockery is to be constructed then obviously its southern side will receive a degree of shade. There are many plants that do well in these circumstances. Surrounding trees may provide some shade at different times of the day. Again, this can be used to advantage by choosing the correct plant material. In larger rockeries it is often necessary to use large shrubs to lend a sense of scale to the construction. These will also give shade and as well may offer a degree of frost protection.

If the rockery is constructed against a house or other structure then a northern aspect is preferred for the optimum growth of most species. Bare walls should be avoided behind such a rockery by the careful positioning of climbers or taller shrubs.

Materials and design

The construction of an aesthetically pleasing rockery is one of the most difficult aspects of landscaping. Various writers have referred scathingly to less successful rockery structures as having a 'shark's tooth effect' or resembling 'a vast petrified porcupine'. These

descriptions refer to a pile of soil on which many pointed rocks are scattered at random, pointed end facing upwards. One does not have to go far to see examples of such structures.

Perhaps the lesson to be learnt here is that before one designs a rockery, he or she should observe some natural rock formations. The scale of the formation should be noted together with the relationship of small to large rocks and the degree of exposure of rocks. With such observations in mind, a design can then be considered, not necessarily duplicating the natural structures, but attempting to utilise the principles therein.

If one is fortunate enough to have existing natural outcrops on site then it is important for supplementary rocks to be of the same type. However, few people are in this situation and rocks usually have to be purchased. Sedimentary rocks, such as sandstone, are preferred to those of volcanic origin as they can be readily split and they also weather quickly to give a natural appearance. Granite or other igneous rocks can only be used with pleasing effect if they are well weathered and do not have cut faces exposed to view.

Size of rock is the next consideration. Sizes of individual rocks depend on the overall extent of the rockery, but again the sense of scale is important. The largest rocks it is practical to obtain should be used to form the skeletal structure of the rockery. It is equally important to vary the size of rocks throughout the rockery, again remembering the observations made from nature.

Rocks are available commercially from merchants dealing in raw materials for landscaping and it is suggested that they be inspected prior to purchase. Rock should not be removed from natural areas as this tends to disturb reptile habitats and often exposes roots of surrounding shrubs.

Soils can be modified to suit the types of plant to be grown. As mentioned earlier, alpine plants will generally grow best in a soil rich in peat. Thus peat should be purchased separately and pre-mixed with loam or sand in the desired proportions. On the other hand plants from arid areas are best grown in a very sandy mix which will give perfect drainage. For general planting it is suggested that a proportion, approximately 30%, of organic matter should be incorporated into the loam as it is added. This may be in the form of peat, compost or old cow manure.

A warning should be given at this time to ensure that any added soil is weed free, in particular of weeds such as sorrel, couch, or oxalis which, once established in a rockery, are extremely difficult to remove.

Halgania cyanea: *Halgania* — named by Gaudichaud in 1829 after Emmanuel Halgan (1771–1852), a distinguished French vice-admiral; *cyanea* — from the Greek, meaning blue, referring to the flower colour

Construction

The outline of the rockery should be marked on the ground by positioning a garden hose or heavy rope into the desired shape. All grass or weeds should be removed from within this area, and if the soil is well drained it should be dug over to a depth of 15 cm. If the soil is poorly drained it should be removed to about 15 cm and replaced with either coarse blue metal or crushed rock to ensure good drainage.

A number of stakes should be hammered in over the area and string-lines run between these to indicate the proposed level of rocks. An approximate idea of the final appearance can thus be gained at this early stage and modifications readily made if the scale of the rockery is considered inappropriate. Once this has been finalised the basic soil mix should be added and contoured to the approximate form of the rockery.

The important step of rock placement must then begin.

Sedimentary rocks must be placed so that they appear natural. The strata should run in the same direction, usually horizontally, and at least half of the rock should be concealed in the soil of the rockery.

The basic form of the rockery should be developed first and gaps and rock pockets formed later. Care, however, must be taken that these pockets are an integral part of the rockery and do not appear to have been added as a convenient afterthought.

The special soil mixes may now be added; ensure that all gaps are filled thoroughly. About 20% excess soil should be allowed for settling and compaction. Settling can be accelerated by soaking the rockery. High percentage peat mixes may require long soakings to wet them thoroughly.

Pityrodia terminalis: *Pityrodia* — meaning obscure; *terminalis* — referring to the flowers, which are borne in a raceme-like terminal inflorescence

Lechenaultia formosa: *Lechenaultia* — after the French botanist Leschenault de la Tour (1773–1826); *formosa* — from the Latin, meaning finely formed, handsome, beautiful

Calocephalus brownii: *Calocephalus* — from the Greek, kalos, beautiful, and kephale, a head, alluding to the massed flower heads; *brownii* — after Robert Brown (1773–1858), a British botanist

Planting and selection

While design and construction of a rockery are critical in determining its final success, the selection of correct plant material is also of the utmost importance.

When a plant is added to a rockery, consideration must be given to the effect it may have on the other plants in the rockery:

Is it likely to become invasive?
Is it likely to set large quantities of viable easily germinated seed?
Is it likely to become too tall or spread unduly?
Will it sucker rampantly?

If the answer is 'yes' to any of the above questions, then either the plant should not be used or a special arrangement must be made by positioning it in a certain place; alternatively the gardener should be prepared to undertake considerable maintenance.

At this time, also, some knowledge of the natural habitat of a plant is beneficial in understanding the best aspect and soil type in which to position it.

Maintenance

Certain regular maintenance must be carried out in a rockery if it is going to retain a choice appearance and if plants are going to perform at their best.

(i) Growth control

If plants are chosen carefully and positioned in an appropriate place in the rockery, this type of maintenance will be minimised.

Some degree of pruning after flowering will be necessary to shape woody plants or to remove stems from perennials with a permanent rootstock. This latter group throws a flush of new growth in late winter or early spring, flowers in summer and tends to die down in autumn. Such species include *Parahebe perfoliata*, *Swainsona galegifolia*, *Helichrysum bracteatum* 'Diamond Head' and many others.

Spreading stoloniferous (*Viola hederacea*) or suckering (*Helichrysum scorpioides*) species may have to be contained by cutting back new shoots.

(ii) Weeding

The control of weeds is essential to maintain a rockery in good condition. It is best to carry out this task continuously and remove weeds before they seed. Perennial weeds such as couch, oxalis and sorrel are extremely difficult to control in a rockery where spraying is usually not feasible, and every effort should be made to prevent their introduction. Inspect all newly purchased plants to ensure these weeds are not present as this is the most common means of introduction.

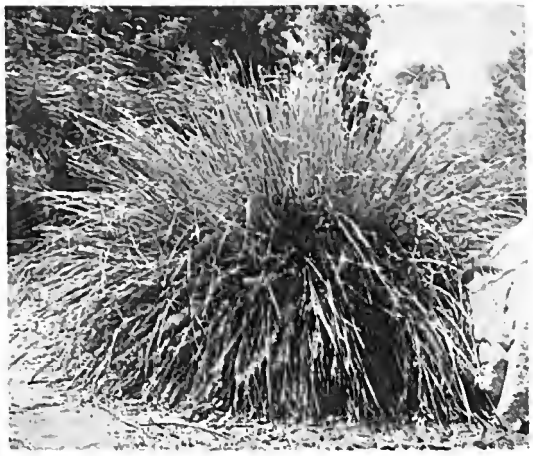
Isotoma anethifolia: *Isotoma* — from the Greek, isos, equal, and toma, a cutting or section, referring to the equal segments of the corolla; *anethifolia* — leaves like *Anethum*, one species of which is a herb named dill

(iii) Watering

As special attention has been given to improving drainage in the rockery, drying out is an inherent problem. During summer, watering must be done regularly to ensure that the sometimes delicate root systems do not desiccate.

(iv) Fertilising

Regular fertiliser application is necessary in a rockery as soil nutrients are lost readily by leaching. A dressing with a general fertiliser in spring and early autumn should enable plants to maintain vigour and produce maximum flowering. Many commercial general fertilisers are available, but care should be taken to avoid those high in phosphorus. A recommended balance of major elements is nitrogen 10%, phosphorus 4%, potassium 6–7%.



Lomandra longifolia: *Lomandra* — from the Greek, loma, fringe or margin, and andros, male, referring to the circular margins on the anthers of some species; *longifolia* — referring to the long leaves

Rockery plants

Several excellent rockery plants are described fully in this issue of *Growing Native Plants*, but the following list gives other examples of plants suitable for rockery cultivation with relevant comments.

Abelmoschus moschatus subsp. *tuberosus*: trailing plant, large pink flowers, frost tender, dies back to tuber in autumn.

Acacia gunnii: woody shrub to 40 cm, cream flowers, frost hardy.

Actinotus helianthi (Sydney flannel flower): herb to 50 cm, frost tender, white woolly flowers.

Ajuga australis: rosetted plant, mauve to purple flowers on spike to 30 cm, frost hardy.

Anigozanthos spp. (kangaroo paws): all species are suitable. Some are frost tender.

Artanema fimbriatum: perennial to 50 cm, blue flowers, frost tender, but will survive some frost when dormant.

Arthropodium milleflorum: small herb with dormant period, lilac flowers, fragrant, frost hardy.

Baeckea gunniana: low shrub, white flowers, frost hardy.

Baeckea ramosissima: low shrub, pink flowers, frost hardy.

Banksia dryandroides: low shrub, attractive foliage.

Banksia spp.: several prostrate species make useful rockery plants.

Bauera capitata: small shrub to 30 cm, pink flowers, frost hardy.

Blancoa canescens (red bugle): small herb with red, bell-like flowers.

Blandfordia spp. (Christmas bells): all species are suitable.

Darwinia oldfieldii: *Darwinia* — after Erasmus Darwin (1731–1802), physician, poet and botanist, and grandfather of Charles Darwin; *oldfieldii* — named after Augustus Frederick Oldfield (1820–87), who collected in southern Australia

Blechnum penna-marina: small fern for crevices, frost hardy.
Boronia spp.: most of the smaller species make excellent rockery subjects.
Brachycome spp.: most species are suitable.
Brunonia australis: rosetted herb, blue flowers, frost hardy.
Bulbine bulbosa: small, yellow-flowered herb, frost hardy, dies back during cooler months.
Calocephalus brownii (cushion bush): rounded shrub to 1 m, silvery-grey foliage, frost hardy.
Calostemma purpureum (garland lily): bulbous plant with wine-red flowers, dormant period, frost hardy.
Celmisia asteliifolia (snow daisy): grey-leaf herb, white flowers, frost hardy.
Cheiranthera linearis: small woody shrub to 30 cm, blue flowers, frost hardy.
Chorizema spp.: all are suitable. Some are frost tender.

Abelmoschus moschatus subsp. *tuberosus*: *Abelmoschus* — meaning obscure; *moschatus* — from the Greek, moschos, musk, referring to the musky scent; *tuberosus* — referring to the tuberous nature of the rootstock

Wahlenbergia stricta: *Wahlenbergia* — named by Schader in 1814 after George Wahlenberg, Professor of Botany at the University of Uppsala; *stricta* — straight or upright, referring to branches

Clianthus formosus (Sturt's desert pea): trailing plant with brilliant red and black flowers.
Conostylis spp.: all species are suitable.
Craspedia spp.: all species are suitable.
Crinum spp.: all are suitable. Some are frost tender.
Curcuma australasica: large, spade-like leaves, pink and yellow flowers, very frost tender.
Dampiera spp.: most species are suitable.
Darwinia spp.: most species are suitable.
Dendrobium speciosum (rock lily): an orchid, cream flowers, excellent for frost-free areas.
Dianella spp.: all species are suitable.
Dichopogon fimbriatum (chocolate lily): herb with dormant period, fragrant mauve flowers, frost hardy.
Diplarrena moraea: iris-like plant, with white flowers, frost hardy.
Dracophyllum spp.: all are suitable.
Dryandra spp.: several prostrate species are suitable.
Epacris spp.: all species prefer this method of cultivation.
Eremophila spp.: several small species are suitable.
Eurycles spp.: ideal for frost-free areas with some shade.
Frankenia spp.: most are suitable for the drier rockery.
Glischrocaryon spp.: excellent rockery subjects, frost hardy.
Goodenia spp.: all are suitable.
Grevillea fasciculata: low growing shrub, red flowers, frost hardy.
G. flexuosa: low shrub, pink flowers.
G. nana: prostrate shrub, cream flowers, frost tender.
G. synapheae: low, spreading shrub, cream flowers, frost hardy.
G. trinervis: low shrub, apricot flowers, frost hardy.
Haemodorum spp. (bloodroot): all are suitable. Most are frost tender.
Hakea myrtoides: low, spreading shrub, deep pink flowers, frost hardy.
Halgania cyanea: low shrub, blue flowers, frost hardy.
Helichrysum spp.: all but the taller shrubby members of the genus are suitable.
Hibbertia spp.: most are suitable.
Johnsonia lupulina: small herb with pink flowers, frost hardy.
Lechenaultia spp.: all species are suitable. Some are frost tender.
Lomandra spp.: most are suitable, particularly around a water feature.
Lythrum salicaria: tall perennial, suitable for water feature.

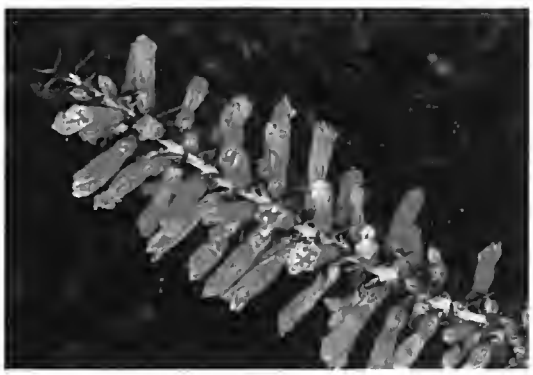
Stackhousia spathulata; *Stackhousia* — named after John Stackhouse (1742–1819), a Cornish botanist; *spathulata* — referring to the leaves shaped like a spatula

Helichrysum apiculatum; *Helichrysum* —from helios, the sun, and chrysos, golden, the Greco-Latin name of some yellow everlasting; *apiculatum* — from the Latin, meaning having a small point, referring to the apices of younger leaves

Macropidia fuliginosa (black kangaroo paw): strap-like leaves, black flowers, slightly frost tender.
Macrozamia spp.: all are suitable.
Mazus pumilio: suckering herb, mauve flowers, frost hardy.
Microstrobos fitzgeraldii: dwarf conifer, frost hardy.
Molineria recurvata: large leaves to 1 m, small yellow flowers, frost tender.

Blandfordia cunninghamii: *Blandfordia* — named in 1804 after George, Marquis of Blandford; *cunninghamii* —named after Allan Cunningham (1791–1839), an explorer and botanist

Epacris reclinata: *Epacris* — from the Greek, epi, upon, and akris, a summit or hill top, from the habitat of some species; *reclinata* — from the Latin, meaning turned down, referring to the branches which tend to be bent down on the rest of the plant



Orthrosanthus spp.: iris-like plants with blue flowers.
Parahebe spp.: plants with perennial root-stock, blue flowers, frost hardy.
Patersonia spp. (native iris): all suitable.
Pentachondra pumila: prostrate shrub, white flowers, red fruits, very slow, frost hardy.
Platytheca verticillata: low shrub, dark-blue flowers.
Pseuderanthemum variabile: small perennial, pink flower, frost hardy.
Ptilotus spp.: all are suitable in dry locations.
Pultenaea pedunculata: prostrate plant, yellow-orange pea flowers, frost hardy.
Pultenaea spp.: several other low or prostrate members of the genus are suitable.
Ranunculus spp.: all are suitable.
Scaevola spp.: all are suitable (some are frost tender).
Sowerbaea spp. (vanilla lily): all are suitable.
Stackhousia spp.: all are suitable.
Stylidium spp. (trigger plants): most are suitable.
Swainsona spp.: several smaller species are suitable.
Tetratheca spp. (black-eyed Susans): all are suitable.
Thysanotus spp. (fringed lilies): all are suitable.
Verticordia spp. (feather flowers): smaller species are suitable.
Wahlenbergia spp. (Australian bluebells): most are suitable.
Wurmbea dioica (early Nancy): very small plant with white flowers blotched with purple, dormant in autumn, frost hardy.
Xanthosia rotundifolia (Southern Cross): sprawling perennial to 30 cm. Unusual flowers in form of cross, frost hardy.

For further information about the above species it is suggested that readers refer to the following publications:

G. M. Elliot, *Australian Plants for Small Gardens and Containers*, Hyland House, Melbourne, 1979.
T. Y. Harris, *Small Plants and Containers*, Nelson, Melbourne, 1979.
National Botanic Gardens, *Growing Native Plants*, Nos 1 to 10, Australian Government Publishing Service, Canberra, 1971-80.
Society for Growing Australian Plants, *Australian Plants*, Vols 1 to 10, Sydney, 1959–80.
J. W. Wrigley, & M. Fagg, *Australian Native Plants*, William Collins, Sydney, 1979.

John Wrigley

CYPERUS LUCIDUS

Distribution

Cyperus lucidus is a member of the sedge family, Cyperaceae, a cosmopolitan family of grass-like herbs usually found growing in moist situations in most climatic regions. There are over thirty Cyperaceae genera in Australia including *Cyperus*, *Carex*, *Gahnia* and *Scirpus*. Although not often grown as garden plants, some Cyperaceae are most attractive and would well merit inclusion, whilst others are considered noxious weeds which one could well do without. The African species, *Cyperus alternifolius*, the umbrella plant, is a popular potted plant.

Cyperus lucidus: *Cyperus* — derived from kyperus, an old Greek name for a sedge; *lucidus* — from the Greek, meaning shining, clear, transparent and referring to the flowering head

C. lucidus occurs naturally in eastern Australia from Tasmania to Queensland and through into New Guinea, along margins of creeks and rivers, at or close to the water's edge. It is a robust perennial sedge growing from a short, thick rootstock. The stems are solid, triangular in cross-section and grow to 1.3 m. The leaves, which all grow from the base of the stem to about 1 m in length, are thick and glossy. The flowers, which individually are inconspicuous, form an attractive umbrella-like head which is bright red when young, turning red-brown[1] as it matures. The fruit is a small, dark, three-angular nut.

Fresh seed will germinate readily within about a month in a warm situation, the seedlings establishing readily. At the National Botanic Gardens, however, propagation generally has been by division of the rootstock. The plants will grow in either full sun or partial shade and could well be incorporated into a rockery which includes a water feature by ensuring that the roots are either in the water or close to it. The clump may be divided and replanted in autumn if it has outgrown its site. If the leaves are cut back in late autumn new leaves and flowers will develop in spring. The flowering period is from approximately October to December. *C. lucidus* is generally free of pests and diseases and is frost hardy in Canberra.

Julia Rymer

[1] RHS Colour Chart, 1966: floral cluster: greyed-red group 178A.

ERYNGIUM ROSTRATUM

Distribution

Eryngium rostratum: *Eryngium* — after the ancient Greco-Latin name for a similar plant commonly called sea holly; *rostratum* — from the Latin, rostrum, meaning beak

The genus *Eryngium* has approximately 230 species in tropical and temperate parts of the world, but only four or five are endemic to Australia. *Eryngium* is a member of the Apiaceae family, the carrot and the Australian flannel flower (*Actinotus helianthi*) being familiar members of the same family.

In Australia, *E. rostratum* is widespread throughout temperate woodlands and grasslands and can be seen growing naturally around Canberra.

E. rostratum is a perennial herb, which dies down during the autumn and emerges in late winter to flower in summer. In July or August a rosette of narrow, spiny, divided leaves, with a subsucculent or waxy appearance, develops. By mid summer the flowering stems extend to 60 cm and a mass of crowded bright blue flowers is produced with long, spiky bracts to 2.5 cm in globular, thistle-like heads on rigid branched stems. The stems and bracts are a metallic blue[1] and give rise to its common name, blue devil.

The terminal flower heads open first; below them are the side branches which open next and their side branches carry on until all flowers are open. Each flower lasts several weeks, giving the plant an impressive display of colour.

E. rostratum has long been neglected as a garden plant and its full potential has not been realised. It could be ideally used as a rockery plant in an open, sunny position, both for its colour and dramatic form.

The blue devil is relatively long lived with some plants still thriving at the National Botanic Gardens from 1971 plantings. They are easily grown from seed, sown in punnets in early December and planted out in April to allow their fleshy taproots to develop to sustain them when they 'die down' during the winter months.

Any soil seems to be suitable provided it is well drained, but a sunny position is essential. No pests or diseases have been noticed and it is frost hardy.

The flowering stems can be cut to the base and used as fresh flowers or dried floral arrangements. Their colour and texture make interesting and attractive displays.

Nora Ollerenshaw

[1] RHS Colour Chart, 1966: flowers (lower half of petal and anthers), violet-blue group 98A–C; bracts (upper surface), violet-blue group 98A–C; stems, greyed-green group 191B, blue group 101C.

SCLERANTHUS BIFLORUS

Distribution

Scleranthus biflorus: *Scleranthus* — derived from two Greek words meaning hard flower, referring to the hardened fruiting perianth; *biflorus* — two flowered

Scleranthus is a small genus in the family Caryophyllaceae. Of the ten known species, four are endemic to eastern Australia, the remainder native to Europe, Africa and Asia.

S. biflorus is widely distributed in Tasmania, Victoria, New South Wales, the Australian Capital Territory, Queensland and New Zealand, from the coast to alpine areas.

It is a bright green cushion-like perennial herb of attractive compact growth habit. The plant is only a few centimetres high with a spread of approximately 40 cm. The common names, two-flowered knawel and Canberra grass, have been applied to this species but are rarely used, the generic name *Scleranthus* being favoured.

Grown often as a border, ground cover or rockery plant in full sun, the fine textured, rather 'moss-like' appearance contrasts well with broad-leaved plants. It may be planted most successfully either singly or as a group, and complements rock features well by tending to cling to rocks and shape itself into crevices. The degree of compactness of individual plants is related to origin, with lowland forms exhibiting a more open habit. The petal-less flowers of *S. biflorus* appear during November and December in the ACT, the calyces being yellow-green[1] in colour. Flowers are very small and in terminal pairs on a common peduncle. The peduncle elongates from 1–4 cm and, being straw coloured, contrasts with the foliage in an unusual way. The fruit is a one-seeded hardened nutlet enclosed by the persistent calyx.

The leaves of *S. biflorus* are rigid and crowded, 0.5–1 cm long, and occur towards the stem apices. The procumbent stems, being congested, give the plant a mound-like appearance. Growth is relatively slow; however, well-established plants may be easily divided and the divisions successfully replanted. New plants may also be produced in time from cuttings.

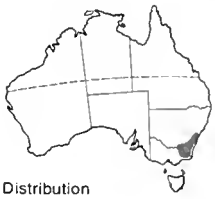
When this plant is being sited in the garden, a full sun position with adequate moisture will ensure the optimum growth conditions. Soil types do not appear to be critical.

The pathogenic fungus *Rhizoctonia* sp., can be responsible for some dead areas appearing within a plant mound. If the mound is cleaned out and a suitable fungicide applied, new plant growth will replace that lost. Weedless garden areas are preferable for cultivation, as strong growing weeds such as sheep sorrel (*Rumex acetosella*) and oxalis (*Oxalis corniculata*) which thrive in acid soils, may grow through the plants and spoil the compact appearance.

Barrie Hadlow

[1] RHS Colour Chart, 1966: yellow-green group 146B.

HIBBERTIA PEDUNCULATA



Distribution

The genus *Hibbertia* is the sole representative of the family Dilleniaceae in temperate Australia and includes about 90–100 species. Some members of the genus were introduced to cultivation many years ago, there being records of *H. dentata* and *H. perfoliata* growing in Europe in the early nineteenth century.

Generally, however, the genus has not been easy to cultivate, showing extreme susceptibility to root rot (*Phytophthora cinnamomi*) with a resultant short life in the open garden.

There are several exceptions and *H. pedunculata* is one of them. Occurring in open forests of the mountains and coastal areas of NSW and eastern Victoria, this low, usually prostrate shrub forms a hardy, long-lived specimen in cultivation.

It may spread to 60 cm and occasional erect stems may reach 20 cm, but it is generally prostrate with stems rooting at the nodes. This latter habit may account for its hardiness. The shining, dark green leaves are linear, 3–10 mm long, and form a strong contrast to the bright yellow flowers.[1]

The five-petalled flowers appear in late spring and summer, but it is not unusual to see the odd flower throughout the year. Each bloom is held on a slender, long stalk exceeding the leaves and is about 1.2 cm in diameter. They are fragile and unsuitable for picking as is the entire genus, but the profusion of flowers makes it a most suitable garden plant.

In cultivation, *H. pedunculata* will tolerate all but very wet conditions, but its habit lends itself to rockery culture and it thrives in the well-drained soils of a rockery.

The oldest plants in the National Botanic Gardens were established in 1968 and have shown no damage by frost.

Propagation is easy from cuttings taken when new growth has begun to harden off. Such material can be found from late spring to autumn in well-grown plants. It may also be possible to obtain new plants by layering, making use of the species' habit of rooting at the nodes. The growth habit of *H. pedunculata* is very compact and it tends to suppress weed growth when used as a ground cover planted at 50 cm centres.

The species appears to be pest- and disease-free.

John Wrigley

[1] RHS Colour Chart, 1966: flowers, yellow group 9A.

Hibbertia pedunculata: *Hibbertia* — after George Hibbert (d. 1837 or 1838), a London merchant and patron of botany who maintained a botanic gardens at Clapham, London; *pedunculata* — refers to the flowers being borne on stalks or peduncles

DISELMA ARCHERI, MICROCACHRYS TETRAGONA

Distribution

Diselma archeri: Diselma — from the Greek, di, two, and selma, meaning upper deck, alluding to the two fertile scales; *archeri* — named after the collector of the species, William Archer (1820–74), Fellow of the Linnaean Society, architect, and Member of Parliament for Deloraine in Tasmania

These two conifers, which are endemic to Tasmania, grow in alpine areas at altitudes between 1000 m and 1400 m. Both species are ideally suited to cultivation in rock gardens and containers.

Diselm*a *archeri

In its natural environment, this species grows into a small compact tree, sometimes reaching 6 m in height. It rarely reaches this size in the home garden, where it has been reported to form a bushy shrub up to 2 m tall in ten years.

Diselma archeri has minute, scale-like, deep green leaves, closely pressed against and concealing the stem, giving the branches a four-sided appearance. Being a dioecious conifer, the male and female cones are borne on separate plants. Both types of cone are small (2–6 mm) and solitary, developing on the ends of the branches. Each female cone produces up to two small winged seeds.

Though it is not yet commonly grown, this plant is quite tolerant of cultivation, growing well in composted soil. It is frost tolerant and can be planted in a range of positions from full sun to deep shade. Adequate moisture is the most important requirement for this species, particularly in spring and summer.

Although it is possible to raise plants from seed, these are often difficult to obtain as the small seed is shed rapidly by the plants and therefore proves difficult to collect. The easiest method of propagation is from cuttings taken in either spring or autumn, using 40–50 mm long semi-ripe tips of vigorous shoots, although older or harder material will also strike quite well. The cuttings are prepared by cleanly removing side branchlets from the base. They can then be inserted for one-half to two-thirds of their length in a rooting medium consisting of one part fine grade peat moss to two parts coarse, washed river sand by volume. (See *Growing Native Plants*, No. 2.)

The use of rooting hormones, misting or soil heating is not essential, though particular attention must be paid to adequate watering. At the National Botanic Gardens, cuttings taken in autumn have rooted in four to five months with 90% success.

There have been no reports of pest or disease infestations on this species. Plants can be seen growing in the Tasmanian flora section of the Gardens, but the natural soil of this area does not promote optimum growth.

***Microcachrys tetragon*a** (creeping pine)

This attractive dwarf conifer has a low, creeping growth habit with straggling branches 40–100 cm long. As an ornamental it can be planted in a rockery setting, being either allowed to sprawl naturally among the rocks, or pruned back a little to give a bushier effect. Alternatively it can be planted in a tall pot and allowed to trail over the sides.

The foliage of *Microcachrys tetragona* is remarkably similar to *Diselma archeri* in appearance with tiny, thick, overlapping, scale-like leaves arranged in four rows along the branches giving a square cross-section to the stem.

This species is also dioecious. The male cones are small inconspicuous structures, 2–3 mm long, borne on the ends of the branches. The ripe female seed cones, though only 6–8 mm long, are most conspicuous as the bract scales surrounding the seeds become fleshy and scarlet in colour. The seeds of this species are hard, brown, and produced on the upper surfaces of the cone scales; like *D. archeri* they are difficult to collect.

Microcachrys tetragona grows best in a well-drained soil high in organic matter (peaty) and requires plenty of water. Though it grows in full sun in its native Tasmania, the loss of plants at the National Botanic Gardens during a very hot and dry summer suggests that light shade is more suitable at lower altitudes. As with *Diselma archeri*, this species is frost tolerant.

Propagation techniques are the same as for *Diselma archeri*.

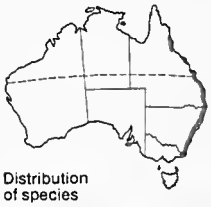
This species also appears to be free from most garden pests and diseases.

Stephen Hughes

Microcachrys tetragona: *Microcachrys* — of Greek origin meaning micro-winter bud, referring to the minute 2 mm male cones; *tetragona* — from the Greek, meaning four-angled

BAECKEA VIRGATA

'Howie's Feathertips'



Distribution of species

Baeckea virgata: Baeckea — after Dr Abraham Baeck (1713–95), a Swedish naturalist and physician; *virgata* — from the Latin, virgatus, meaning twiggy, long and slender

Many plants require the specialised environmental conditions provided by rockeries for successful growth. Many others will grow well in a wide range of conditions, but are shown to advantage by placing them in a rock garden.

Baeckea virgata 'Howie's Feathertips' is such a plant.

This registered cultivar is a *Baeckea virgata* seedling variant, selected by S. A. and J. M. Howie's nursery in Coopers Plains, Queensland. It forms a small, dense shrub growing to 50 cm high and up to 1 m wide. Its weeping habit makes it ideal for growing over rock walls or ledges.

The branchlets are numerous and pendulous, with narrow leaves.

Apart from its unusual habit the flowers of *B. virgata* 'Howie's Feathertips' are a significant and prominent feature. These are borne in small clusters at the ends of the branchlets and are a brilliant white[1], 6 mm across.

The normal form of *Baeckea virgata*, which grows to 3 m tall, is an adaptable plant, tolerating a wide range of soil types and soil moisture conditions. The cultivar is equally adaptable, but grows best in a moist, well-drained, sunny situation. Maximum flowering potential is also achieved under these conditions.

As for many plants in the family Myrtaceae, this cultivar is susceptible to periodic attacks by the webbing moth caterpillar (family Pyralidae). This pest is easily recognised by the matted lumps of 'webbing' and dead leaves usually partially concealed amongst the foliage and constructed around or between the stems. The caterpillar emerges at night to consume the foliage and shelters during daylight hours. The webbing may be readily removed by hand and crushed or if chemical control is preferred, Carbaryl should be used.

Baeckea virgata 'Howie's Feathertips' remains dense and pruning is not usually necessary. A general purpose NPK fertiliser (see introductory article) applied in early spring and early autumn is advantageous.

Another attractive cultivar registered by Howie's Nursery is *B. virgata* 'Howie's Sweet Midget'. This is also a selected seedling variant which grows to 30 cm high x 60 cm wide. It is compact and has extremely fine foliage. Its compact, layered habit could be used to great advantage in a rockery.

Both cultivars must be propagated vegetatively to ensure the cultivar form is retained. Seedlings grown from either of these cultivars could revert to the normal form of *B. virgata*.

Geoff Butler

[1] RHS Colour Chart, 1966: petals, white group 155A.

VIOLA BETONICIFOLIA

Distribution

Viola betonicifolia: *Viola* — meaning obscure; *betonicifolia* — from *Betonica*, a genus of plants now possibly included in *Stachys*; *folia* — from the Latin for leaf, alluding to the leaves being similar to those of *Betonica*

The genus *Viola* is large with over 500 species. The majority of these grow in temperate parts of the northern hemisphere with only four species occurring naturally in Australia. One of these, *Viola betonicifolia*, occurs over much of the moderate rainfall areas of eastern Australia, extending from Tasmania to Cape York. It also occurs in Papua-New Guinea.

Plants are often found in damp, shaded forest habitats, but they may also occur in more open sclerophyll forest or on grassy hillsides, growing well on cleared land not heavily grazed. Plants occur singly although clusters are more common. Individual plants have a tufted appearance growing from 5–40 cm high depending on local conditions. When found in an exposed situation, plants may die down to a perennial rootstock, particularly during a severe winter or drought.

V. betonicifolia will often set seed without obvious flowering, the plant producing some small, self-pollinating flowers that never open. This phenomenon is known as cleistogamy. Normal flowers are also produced. Plants can be seen flowering prolifically, especially in spring. Flowers are usually 2 cm across and held singly above the foliage on slender stems. The colour may vary from pale purple to violet[1], fading with age. Leaves are 3–30 cm long, with a long petiole and a leaf blade resembling an arrow head.

As with many plants with a wide natural distribution, best results are often obtained by growing a local form or one from a location similar to the area in which it will be cultivated.

New plants can be grown easily from seed that may be available on cultivated plants throughout the year. Like other *Viola* spp., once a plant is established in the garden self-sown seedlings appear around the mother plant in a short time. Division of large plants during winter and the use of root cuttings are other possible methods of increasing limited stocks or maintaining selected forms.

Pests and diseases have not been observed although it is suspected that earwigs cause some damage by eating flowers.

A rockery is an ideal site for *Viola betonicifolia* and it can be used to advantage in small pockets of fairly deep soil where the thickened main root can establish.

Peter Ollerenshaw

[1] RHS Colour Chart, 1966: petals, violet group 87A to purple-violet group 81B.

BORONIA SERRULATA

Distribution

Boronia serrulata, or native rose, occurs naturally on the NSW central coast, within a radius of about 50 km of Sydney from Gosford to the Royal National Park, where it is found growing in semi-shade amongst outcrops of Hawkesbury sandstone.

The native rose forms an attractive upright shrub to 1 m high by 0.6 m in diameter, with crowded, bright green, rhomboid leaves, which turn bronze in frosty winters and are aromatic when crushed. In spring the cup-shaped flowers appear in clusters at the end of the branches. They are bright pink[1] and have a refreshing fragrance.

Propagation is by semi-hardwood cuttings taken in early summer. Seed germinates well after bushfires, but although some success has been achieved by chipping the hard seed coat and leaching in running water, this method of propagation is not reliable; further experimentation is needed to determine the conditions for germination.

For optimum growth *B. serrulata* should be grown in well-drained soil, in a raised rockery, preferably with some additional rocks placed around the root zone to give the plant a cool root run. A general fertiliser (refer to introductory article) will be beneficial if applied in late winter and late summer.

Several plants of *B. serrulata* have been growing at the National Botanic Gardens under large eucalypts since 1968. These were planted with sandstone slabs around their roots several centimetres below the surface. Other plants have also been established since that time, but many have been lost due to poor drainage in heavy soils.

Leaf-eating caterpillars and root rot sometimes affect this species.

The former is best controlled by removing the grub by hand rather than by spraying. The incidence of root rot is usually reduced by planting in well-drained conditions such as a rockery.

In summary *B. serrulata* is an attractive shrub all the year round. It is frost hardy, will tolerate heavy shade to almost full sun, makes an excellent specimen plant and performs well as a cut flower. It has been available at commercial nurseries for a number of years.

Stuart Donaldson

[1] RHS Colour Chart, 1966: stamens and corolla, red-purple group 68B.

Boronia serrulata: *Boronia* — after Francesco Borone (1769–94), an Italian plant collector; *serrulata* — from the Latin, serra, meaning saw, a reference to the fine serrations on the leaves

DARWINIA FASCICULARIS

Distribution

Darwinia fascicularis subsp. *fascicularis*: *Darwinia* — after Erasmus Darwin (1731–1802), physician, poet and botanist, and grandfather of Charles Darwin; *fascicularis* — from the Latin, fasciculus, meaning a little bundle, and referring to leaves which are clustered at ends of branchlets; *oligantha* — from the Greek, oligo, few, and anthos, flower, referring to the small number of flowers in each inflorescence

As a result of taxonomic work published in 1962 *Darwinia fascicularis* was split into two subspecies, both of which are useful plants for the rockery.

D. fascicularis subsp. *fascicularis* occurs naturally from Gosford to Bulli in NSW within 30 km of the coast, growing in shallow soil at the edge of flat, exposed, sandstone ridges usually in dry sclerophyll scrub or in heathland below 500 m.

It forms a neat, compact, rounded shrub to 1 m x 1 m with light green, needle-like leaves, crowded at the end of branches opposite or whorled around the stem. The flowers are in clusters of from four to twenty nestled in the foliage from early spring to late autumn. Individually they are small and tubular with a protruding style, and after opening creamy-white, turn bright red[1] with age.

D. fascicularis subsp. *oligantha* occurs in the higher parts of the Blue Mountains from Mt Banks to Wentworth Falls, where it is found growing on shallow soils at the edges of sandstone exposures, at about 600 m.

It forms a decumbent shrub rarely more than 50 cm high and spreads to 1 m in diameter. Its branches will root readily when left in contact with the soil. The foliage is slightly less crowded and darker than the former subspecies. Flowers are generally in clusters of four to six, but the colour is similar.

Both forms require good drainage, and if planted in an exposed site, a cool root run is beneficial. A general fertiliser (refer to introductory article) applied in late winter and autumn will improve flowering.

Both may be propagated by cuttings taken in early summer, but seed has been found to be difficult to germinate. It has been suggested that *D. fascicularis* subsp. *fascicularis* could be used as rootstock for less hardy West Australian species of *Darwinia*. This has yet to be tried. *D. taxifolia* is another hardy species that may also serve this purpose.

Both forms have proved to be frost hardy and will grow in full sun to heavy shade. A small number of plants have been growing since 1962 in the National Botanic Gardens; however, the lack of good drainage has caused losses in less favoured sites. Pests and diseases have not been noted as a problem except for occasional webbing moth caterpillar attacks.

D. fascicularis subsp. *fascicularis* is also a very useful cut flower.

Stuart Donaldson

[1] RHS Colour Chart, 1966: stamens, red group 51B; floral tube, yellow group 11D.

CHORIZEMA CORDATUM

Distribution

Chorizema cordatum: *Chorizema* — from the Greek, choros, dance, and zema, drinking vessel; *cordatum* — from the Latin, cordis, heart

The genus *Chorizema* contains approximately eighteen species and all but one are endemic to Western Australia. The generic name, derived from the Greek choros (dance) and zema (a drinking vessel) was given by the botanist Labillardiere in 1792 when the plant was discovered near a waterhole by a thirsty expedition party.

Chorizema cordatum, commonly known as the heart-leaf flame pea, occurs naturally in the forests of south-western Australia on gravelly or loamy soils. When in flower this small scrambling shrub is conspicuous with its loose racemes of orange-red or yellow pea flowers.[1] Flowering in spring, the blooms are in racemes up to 12 cm long and are borne either terminally or in the leaf axils.

The alternate leaves are often heart shaped, sometimes narrower, 3–5 cm long with slightly undulate margins.

In cultivation *C. cordatum* grows best in a well-drained, sandy soil with some shade. When given these conditions the species will form a slender, often scrambling shrub to 80 cm high x 1.5 m wide with thin weak branches. Satisfactory growth has also been recorded on heavier clay soils. When planted in a shaded position, flower colours are deeper. Different forms of the species are available, including a yellow-flowered form.

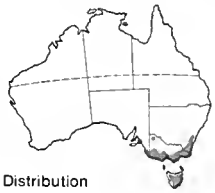
Propagation is best achieved from pretreated seed (see *Growing Native Plants*, No. 2) sown in spring or autumn in frost-free areas. Some success has been recorded from cuttings of semi-hardened material. Plants will generally flower at two–three years of age. Little maintenance is necessary once they are planted out apart from a light tip pruning and removal of old wood after flowering. Because the plants are delicately surface rooted, mulching and supplementary watering are necessary for plants in exposed situations. In Canberra, the species is slightly frost tender and requires protection from the severe frosts. Some overhead tree shelter is usually sufficient. Serious defoliation caused by caterpillars has been noted on occasions and these may be controlled by spraying with Carbaryl. No other pests or diseases have been observed; however, those who wish to collect seed will have to watch for seed-eating insects entering the small, soft, inflated pod before maturity.

Although somewhat larger than other rockery plants *C. cordatum* could have a prominent position in a shadier corner. Its weak branches and scrambling habit allow the plant to be trained or trailed over rocks or other features. Outside the rockery the plant forms a spectacular understorey shrub.

Ron Jackson

[1] RHS Colour Chart, 1966: keel, red group 44B; standard, red-purple group 57B.

MENTHA DIEMENICA



Distribution

About twenty-five species of *Mentha* are distributed throughout the world, with six being endemic to Australia. All have aromatic foliage, a characteristic of the family Lamiaceae, to which they belong.

Mentha diemenica occurs in grassland and forest habitats from the Mt Lofty Ranges in South Australia, throughout Victoria and Tasmania, and north to the Blue Mountains of New South Wales. It is a strongly suckering plant which in cold, dry conditions may become dormant, but when growing vigorously forms a dense ground cover 10–15 cm high.

The dull green, opposite leaves are ovate to lanceolate and 4–12 cm long. They are usually entire, but occasionally obscure teeth are noticed on the leaf margins. Leaves may be sessile or have a short petiole.

Flowers are borne in the upper leaf axils from late spring to summer. Each axil bears one to four flowers, giving two to eight flowers at each node. They are usually mauve or lilac[1] with four small petals each extending 2–3 mm beyond the tubular calyx.

In cultivation, *M. diemenica* grows well in a slightly damp site in either reasonably heavy shade or full sun. In good conditions in a rockery it may become invasive and thus should be contained in a rock pocket or regularly controlled by removing suckers.

It is a desirable plant between drive strips or near stepping stones where its fragrant aroma is noticed when it is trodden on.

Propagation is easy from cuttings taken at any time when the plant is growing vigorously, or by division when rooted pieces may be removed and re-established in a new situation. These new plants must be kept moist after transplanting.

M. diemenica is frost hardy, but it is susceptible to a rust fungus causing small brown spots on the underside of the leaves. This may be controlled with a suitable fungicide.

The leaves of this native mint may be used as a flavouring and garnish for cool summer drinks in a similar manner to the common introduced mint.

John Wrigley

[1] RHS Colour Chart, 1966: flower, violet group 87C.

Mentha diemenica: *Mentha* — from a Latin name for mint; *diemenica* — of Tasmania (known earlier as Van Diemen's Land), where the species occurs

LECHENAULTIA BILOBA

Distribution

The genus *Lechenaultia* is a group of twenty small woody or semi-woody plants endemic to Australia. Their range of colours and shades of blue, green, yellow, red and white make them highly prized for horticultural work.

The correct spelling of the generic name, *Lechenaultia*, is open to some argument. It was named after Leschenault de la Tour, a botanist who visited Australia in 1802–3. However, when Robert Brown, an early botanist, first published the name he spelt it *Lechenaultia*, omitting the 's'.

All but three of the species are endemic to Western Australia and the most famous of all is the blue lechenaultia — *L. biloba*. It is said to have been known as the 'floor of the sky' by the Pingarra Aborigines, and on viewing a massed display of the iridescent blue flowers,[1] one can easily visualise this.

The flowers, which grow to 1.5 cm long by 2–3 cm in diameter, have a tubular corolla, split on one side, and surrounded by five sepals. The corolla has five lobes and when laid flat it resembles an open fan or a hand with spread fingers. In *L. biloba* the corolla lobes are again divided into two segments, from which the specific name is derived. Flowering time is from late winter through to summer. The leaves are soft, blue-green in colour, 3–9 mm long to 2 mm across, crowded and heathlike.

The plant occurs naturally in gravelly and sandy soils of southern and central Western Australia. In its natural habitat it forms an open spreading plant to 50 cm high.

Various shades of blue are the most common flower colour in *L. biloba*, but variants exist. One is a pure white form while another, a bicoloured form, has been registered as a cultivar. *L. biloba* 'White Flash' has a distinct white central portion within the flower and a deep blue outer area.

In cultivation it is essential that the plant is grown in a sandy, well-drained situation. Plants in heavier sites will generally not last a season. The plant is not a long-lived one, three to four years being its most probable life span. A suckering form of the species also exists and this has great potential with a probable longer life.

The species is easily propagated by cuttings taken at any time of the year with most success in late spring and summer. Cuttings have reportedly been struck *in situ*, in rockeries in full sun in front of large rocks. Semi-hardened material 6–10 cm long gives the best results.

Encouraging results with the species have been achieved at the National Botanic Gardens in built-up beds with added limestone chips; however, this is not a prerequisite for their culture. The most important cultivation requirement is a perfectly drained situation, best achieved in rockeries, built-up beds or pots. *L. biloba* has been successfully cultivated in pots for many years in Europe. Minimal watering is required and the roots will penetrate deeply in a free-draining soil.

L. biloba can be allowed to straggle over rocks, or a light pruning after flowering will encourage a more compact shrub. No injurious pests or diseases have been noted and the species is frost tolerant.

Ron Jackson

[1] RHS Colour Chart, 1966: corolla tube, blue group 101A.

Lechenaultia biloba: *Lechenaultia* — after the French botanist Leschenault de la Tour (1773–1826); *biloba* — referring to the divided corolla lobe

INDEX

GARDENS RENAMED
The Canberra Botanic Gardens was renamed the National Botanic Gardens on 21 December 1978 because the new name was considered more appropriate in view of the national characteristics of the living collection. This is being assembled from field collections undertaken in all parts of Australia, the collected specimens being grown at Canberra and the Gardens' Jervis Bay annexe on the east coast of the continent

AUTHORSHIP Articles for *Growing Native Plants* are supplied by trained horticultural staff at the National Botanic Gardens. The Editor is the Curator of the Gardens, John Wrigley. Photographs for this volume were supplied by three members of the Gardens' staff — Murray Fagg, Ron Hotchkiss and Andrew McWhirter. The drawing on the title page is by Murray Fagg.

COLOUR REFERENCES Colours are identified for the benefit of overseas readers according to the 1966 edition of the colour charts of the Royal Horticultural Society, London

Back cover: *Scleranthus biflorus*

Front cover: *Lechenaultia biloba*

Prepared by the Department of the Capital Territory
Printed by Prestige Litho Printing Co. Brisbane

ISBN 0 642 05900 4
R80/543 Cat. No. 80 1935 1

Recommended retail price $1.50