



GREVILLEA STUDY GROUP

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Newsletter N° 37

From the Leader

by Peter Olde.

Welcome to the Grevillea Study Group for 1994. Once again, congratulations to the Queensland membership for conducting such a vibrant and enthusiastic group. Bi-monthly meetings are well attended, the topics set for discussion both interesting and educational, the venues congenial and full of grevilleas. The collector spirit is well advanced amongst these people and there are usually interesting plant sales, swaps, raffles, and cutting exchange as an additional bonus to attract attendance. The membership in other States envies you. At least in New South Wales, we have resolved to emulate your achievements. In 1995, we will be organising bi-monthly meetings in New South Wales, along the same successful lines as those operating in Queensland.

This year we propose a giant plant sale and garden visit at the Hunter Region Botanic Garden on August 27, commencing at 1 pm. At this stage, we are uncertain whether to advertise to the public. However, members are invited to bring as many plants for sale as they can. Hybrids are welcome for this event. It is suggested that 10% of the turnover be given to the Study Group to assist in its research. Donations of plants will also be welcome. It is hoped that we will see many grafted plants for sale too. Members will be in charge of their own plants. Hopefully, many of our interstate members will attend. The Grevillea Garden is quite outstanding.

Most of the organisation of this event is being conducted by the Curator of the Grevillea Garden, Heather Clarke, 31 Pokolbin Street, Broadmeadow 2292. If you can assist her in any way would you please be in contact. We hope to have a small tent display of grevilleas in tubes as well as a Foyer Display of grevillea photography. Any other manageable suggestions are welcome. Heather advises that up to 10 caravans can be accommodated on the site but facilities are limited to one hot shower and two toilets at night. However, there is a commercial caravan park nearby (Pacific Gardens, 049 87 2224) and a motel (Motel Farm, 049 87 1211). If booking the motel, the price quoted to the Botanic Gardens is \$60 per double including continental breakfast, \$10 per person extra. On Sunday, August 28, we hope to have a short Study Group meeting, followed by a garden crawl or visit

to plants in the wild. This will depend on a survey of what areas remain untouched by recent horrific bushfires which burnt out many places we hoped to visit. Could members from the Newcastle area assist Heather in the organisation of this event?

Research: Most monies expended to date have been on travel expenses associated with taxonomic research by myself. To date, this has resulted in several papers, the most recent being published in *Nuytsia* at the end of 1993. This paper deals with 8 new species and 8 new subspecies of *Grevillea* in Western Australia. In addition 3 currently accepted subspecies are raised to specific rank and *Grevillea flexuosa* is reinstated from synonymy. I have forwarded a copy of these papers to Merv Hodge, Christine Guthrie and Neil Marriott who was co-author on this paper. I have a few more spares but after that you will have to use the photocopier. Four more papers dealing with new species in eastern Australia have been accepted for publication in *Telopea* in March 1994. If other members have other areas which they wish to research themselves or have researched by others, they should let me know. Otherwise, most money raised by the Study Group will go on taxonomic research where a large number of areas still require further work.

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WHAT'S IN A NAME?

That Elusive Species Concept

by Kerry Rathie (Reprinted from SGAP Queensland Region Bulletin, December 1993)

At the September 1993 meeting of the Grevillea Study Group, the visiting leader, Peter Olde, initiated a lively discussion on what constituted a valid species. He pointed out that he regarded most "distinct to common sense" groupings as separate species, while many of these had been relegated to subspecies level, or ignored altogether (reduced to synonymy is the official jargon!), by McGillivray in his recent revision of the genus Grevillea. I've been asked to comment on the controversy.

So who is right? Well, it all depends. Most geneticists and workers in evolution follow the species concept of Ernst Mayr, who defined a species as a genetically distinct interbreeding group of organisms. If a plant, say a eucalypt, grows from Mt. Kosciusko to the sea, and at high altitudes is a shrub, becoming a tall tree at low altitudes, that does not make the "tree" and "shrub" forms into separate species, even if their form is largely under genetic control. If the shape transition is gradual, and all forms can interbreed, Mayr calls them a single widespread species. The gradation is called a cline.

Dust storms can, and do, blow the tiny seeds of *Eucalyptus camaldulensis* over all mainland Australia, enabling the red gum species to stay inter-linked. Likewise, it is moulded by natural selection to yield, for example, salt-tolerant strains in some saline areas, and near-prostrate strains in very windy areas, but remains a single genetic entity.

Identical-looking plants or animals can belong to different species. Examples are myriad. Most people know the harmless "fruit flies" (*Drosophila*), actually vinegar flies that feed on the fungi on rotten fruit. Most areas support several species that look identical to humans, even under the microscope, but never interbreed in nature. Some keep apart due to different behaviour – e.g. night-maters and day-maters – but most are chromosomally different, rendering hybrids sterile and forcing strong natural selection against hybridising. I suspect species A often smells horrible to species B, and vice versa.

Geneticists can now use the polymerase chain reaction (PCR) method to obtain large amounts of any desired DNA, and compare gene subunits from different species to estimate how long ago such "sibling" species split from their common ancestor. The answer is often in many thousands of years.

New Zealand conservationists recently found their problem of preserving the rare "brown" kiwi increased when its chromosomes were studied. It turned out that there were actually two brown kiwi species, of radically different chromosome structure, and unable to interbreed. The boundary between the two types was not between the North and South Islands, but about halfway down the South Island.

Similarly, several north Queensland rock wallaby populations have recently been found, upon chromosome studies, to be separate species rather than isolated occurrences of a single widespread species, as believed previously. Many plant and insect species once their chromosomes are studied, are certain to actually consist of several sibling species.

Taxonomists try to differentiate species, and the higher groupings like Tribes and Families, on their morphological features, like flower form and type of fruit, that alter most slowly under evolution. They place little credence on traits like flower colour and leaf shape that alter rapidly under evolution, or are easily affected by climate or nutrition. Also,

they have a bias (born of convenience) towards traits (unlike colour) that are preserved in dried or pickled specimens. Very few plants, save a few crop species, have been studied extensively at the chromosomal level.

Since Grevilleas have relatively large seeds, populations isolated geographically are likely not to be inter-breeding, and so may often (almost always?) be distinct species. A low trickle of gene exchange between otherwise distinct populations is usually not taken as sufficient cause not to call them separate species

That separate species from different areas will often cross readily when in cultivation means only that, being apart, they haven't (a) merged to become one, nor (b) needed to evolve strategies to reduce hybridisation. If species A and B overlap in parts of their range, it is common for hybrids to be freely produced from crosses between the "non-overlapping" parts of the two species, but not from attempted crosses among the co-existing areas.

In such cases, if hybrids are less suited to the environment than the "pure" parents, evolution separates the species by strategies like different flowering times, "rejection" of foreign pollen, or different micro-habitats.

I believe that leaf type should be partly discounted in taxonomy, due to the leaf variation caused by the plant's age, health and nutrition, but not entirely ignored. Similarly for bark, flower colour and so on. If in doubt, look at many characters, and as the final arbiter, look at DNA sequences, and the actual gene exchange (if any) between the populations of interest.

Morphology can be deceptive – a single gene (BEARDED) can make wheat look awfully like barley, and the gene does exist in wild wheats.

McGillivray's lumping of, for example, *Grevillea decora* and *G. pluricaulis* as subspecies of *G. goodii* strikes me as clearly wrong, even if their dried flowers look similar. Hundreds of kilometres separate each species, and *G. goodii* is a groundcover, *G. decora* a large single-trunked shrub or small tree, while *G. pluricaulis* is a small multi-stemmed shrub with annual stems arising from a perennial lignotuber. No intermediates exist.

Whether to split the various geographical forms of, e.g. *G. arenaria* into separate species is more contentious, and depends on how different they are, and whether gene interchange occurs between them. Perhaps sub-species status is appropriate in some such cases.

Changes to one or a few genes do not warrant a new species; a white waratah is still a waratah, and a gene-modified blue rose will still be a rose.

The division between species and subspecies status is often of critical legal importance in the U.S., where large sums of Federal Government money are available to protect the habitat of threatened species, but usually not for lower categories of taxonomic classification. Brisbane did have its local *Melaleuca irbyana*, but recent name changes have made it *M. tamariscina* ssp. *irbyana*.

Such a change could spell doom for a threatened population, were it in the U.S. Our conservation laws may soon make similar distinctions. A coyote population in the U.S., believed distinct, lost its legal protection recently when DNA tests proved its members to be of mainly hybrid origin.



IN THE WILD



A taxonomic revision of *Grevillea angulata* (Proteaceae: Grevilleoideae) and closely related species from the Northern Territory and Western Australia.

by Peter M. Olde and Neil R. Marriott

(This is a summary of the above paper which was published in *Telopea* 5(2): 399-417)

Introduction

Recent collections and further study of existing specimens has formed the basis for the recognition of three new species of *Grevillea* (*G. aurea*, *G. brevis* and *G. glabrescens*) which were formerly accommodated within *G. angulata* by McGillivray (1993). In addition, one new species (*G. microcarpa*) has been recognised from specimens currently identified as *G. agrifolia*. *G. prasina* described by McGillivray (1993) also forms part of this group.

1. *Grevillea angulata* R. Br.

A spreading to spindly, single-stemmed shrub, prostrate in sub-coastal conditions, 0.1-2.5 m tall. The leaves are 2-12 cm long, with an open indumentum on the lower surface and prominent venation. The type form has obovate to oblong, broad (2-5 cm wide) leaves with 2-10 shallow lobes, while the narrow-leaved form has oblong leaves usually 1.5-2.5 cm, with 8-24 deeper lobes. The flowers are green in bud maturing through white to cream or pale yellow and are sweetly scented.

Flowering period: March-September.

Distribution: *G. angulata* is confined to the offshore islands and northern mainland Northern Territory extending south to and east from the East Alligator River.

Conservation status: Not considered to be at risk. It is included in Kakadu National Park only at its northern periphery.

Habitat and ecology: Occurs in eucalypt woodland in sandy soils, or at the top of laterite cliffs in sandy loam and in the lee of such cliffs in sandy dunes. The species is killed by severe fire and regenerates from seed, but is able to survive low-level burn-offs by regenerating from epicormic buds on the stems.

2. *Grevillea glabrescens* P. Olde & N. Marriott, sp. nov.

A spreading to erect, sometimes open, single-stemmed shrub, 0.9-2.5 m tall. The leaves are glabrous, (6.5-)8-11(-13) cm long, (1-)2-4 cm wide with 2-10 deep lobes. The flowers are green, aging to white and cream and are sweetly scented.

Flowering period: Dependent on length of wet season, with specimens in flower being collected in all months except December.

Distribution: It occurs from Graveside Gorge south to about 10 km S of El Sharana in Kakadu National Park. The distribution is separated by over 100 km SW from the most southerly collection of *G. angulata*.

Conservation status: 2RCt is recommended until the area is fully surveyed. All known populations are within Kakadu National Park.

Habitat and Ecology: Found exclusively on the sandstone escarpment either in low heath at the top or just below the top, on the slopes, in valleys, or beside dried creek beds. It grows in sandy, rocky and shallow soils or in cracks and crevices.

3. *Grevillea aurea* P. Olde & N. Marriott, sp. nov.

An erect, single-stemmed shrub 2-3.5(-6) m tall, with green to blue-green, glabrous leaves, 7-16 cm long and 1.5-4.5 cm wide with 8-24 deep lobes and prominent venation. The buds are red to orange. The perianth is usually orange-red to yellow, sometimes cream to creamy-yellow, with a cream to orange style. This golden-yellow flower colour is the most obvious feature which distinguishes *G. aurea* from *G. glabrescens* and *G. brevis*.

Flowering period: March to September.

Distribution: It is known from three areas; north-east of Jabiru, in the Graveside Gorge - Deaf Adder Gorge - Gilruth Creek area and north-west of Barramundi Gorge.

Conservation status: *G. aurea* occurs wholly within Kakadu National Park and is not considered at risk.

Habitat and ecology: *G. aurea* is most often found in rocky talus on sandstone or at the top of sandstone plateaux in open heath or heathy forest. It has also been recorded as growing in deep sand beside a stream and on stony slopes in the upper reaches of creek and river catchments. Regenerates from seed after fire.

4. *Grevillea brevis* P. Olde & N. Marriott, sp. nov.

A single-stemmed shrub 1-2.5 m high. Leaves are 7-15 cm long, 0.6-1.5 cm wide, glabrous, narrow-elliptic to elliptic to oblong-elliptic, either entire, or some leaves with 1-3 lobes. The perianth is white to yellow or creamy-green and the style is green to pale cream. The species name *brevis*, meaning short, refers to the shorter pistils of this species compared to other members of this group.

Flowering period: February-July.

Distribution: It is confined to a few areas on the eastern and western sides of the Marawal Plateau, Kakadu National Park. Specimens have also been collected in the Douglas Springs - Bloomfield Springs area and in an area south of Big Sunday.

Conservation status: The species has a limited distribution entirely within Kakadu National Park but is relatively common at each site.

Habitat and ecology: Found on top or just below the top of the sandstone plateau in laterised, rocky sand in *Asteromyrtus* heathland or in brown, kaolinised clay mixed with laterite in broad, shallow valleys, sometimes also recorded in deep grey sandy soil.

5. *Grevillea prasina* McGillivray

A spreading, multi-stemmed, lignotuberous shrub 1-2(-3.5) m high. The leaves are bright, pale green, 3-8.5 cm long, 2-5 cm wide, glabrous, ovate to broadly elliptic with 4-10 lobes with pungent spines 2-3 mm long. Flowers are green to white becoming cream to yellow with age and are sweetly scented.

Flowering period: March-September.

Distribution: Northern Territory, extending from the Victoria River District south, and in Western Australia, extending from the Northern Territory border to the Pentecost River.

(Taxonomic review of *G. angulata* (continued))

Conservation status: Not rare.

Habitat and ecology: Occurs in clumps on sandstone or limestone hills usually in rocky situations or woodland extending from the ridgetops to creek beds in sandy, often skeletal soils. Regenerates from seed or lignotuber after fire.

6. *Grevillea agrifolia* A. Cunn. ex R. Br.

A single-stemmed shrub to small tree 2-4(-6) m tall. Leaves silvery-grey, grey or blue-grey, (5-)7-16 cm long, 3.5-9.5 cm wide with a sparse closely appressed indumentum on the upper surface, obovate to almost round, with 1-8 scarcely evident shallow lobes. Flowers are green maturing white to cream, and are sweetly scented.

Flowering period: March-September.

Distribution: Widespread from the north-western Northern Territory to the Kimberley and adjacent off-shore islands.

Conservation status: Not rare.

Habitat and ecology: Found mostly in open woodland in medium to high rainfall areas where it sometimes forms clumps up to 50 m across. Grows mostly in deep or shallow

sandy soils but sometimes in lateritic loam. Regenerates both from seed and from epicormic buds along the stems and branchlets after low-intensity fires.

7. *Grevillea microcarpa* P. Olde & N. Marriott, sp. nov.

A bushy shrub 1-2.5 m tall, 2-3 m wide. Leaves are olive-green, 0.5-7.5(-9)cm long, 0.5-4(-5)cm wide, obovate to elliptic, margin either entire or with 1-7 irregular, shallow lobes. Flowers are green becoming white and ageing to cream or yellow, and are sweetly perfumed. The species name *microcarpa* refers to the small fruits of this species (by comparison with those of *G. agrifolia*).

Flowering period: May-July, possibly longer.

Distribution: It is confined to a small area in the northern Kimberley extending from Napier Broome Bay to the lower King Edward and Drysdale Rivers.

Conservation status: Locally common but its distribution is restricted and a code of 3R is recommended.

Habitat and ecology: Occurs around sandstone outcrops either in crevices or in gravelly sand, on hillsides or in and near creek lines.

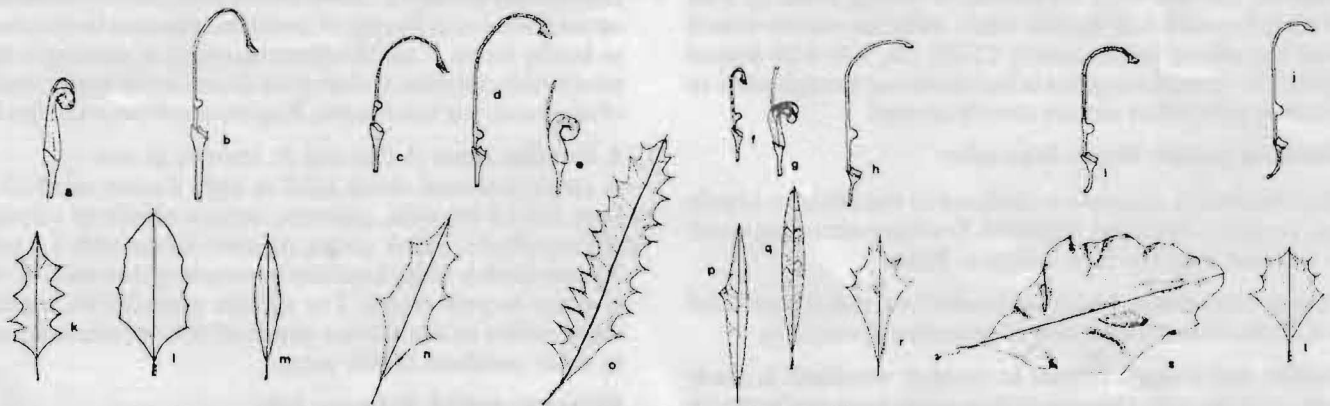


Figure 1. Flowers and leaves of the *G. angulata* group. *G. angulata*: a, perianth shape before anthesis (typical of group); b, pistil; k, l, typical leaf forms; m, simple leaf. *G. glabrescens*: c, pistil; n, typical leaf. *G. aurea*: d, pistil; e, perianth shape at anthesis; o, typical leaf. *G. brevis*: f, pistil; g, perianth after anthesis (typical of group); p, q, typical leaves. *G. prasina*: h, pistil; r, typical leaf. *G. agrifolia*: i, pistil; s, typical leaf. *G. microcarpa*: j, pistil; t, typical leaf. (Leaves all x 0.25; flowers all x 1).

Key to group

- 1 Adult leaves either entirely glabrous or, rarely, with a few scattered hairs
 - 2 Style-end lacking hairs or granules; branchlets sharply angular and ridged; habit lignotuberous, usually with many stems **5. *G. prasina***
 - 2* Style-end hairy or granulate; branchlets slightly angular or round; habit single-stemmed
 - 3 Pistil > 15 mm long; most leaves > 2cm wide, 2-24 toothed
 - 4 Dorsal tepals not or scarcely reflexing at anthesis; unit conflorescence 4-16cm long; perianth strongly revolute, 2-3mm wide, mostly yellow to gold; style usually granulate from the apex for at least half of its length **3. *G. aurea***
 - 4* Dorsal tepals reflexing markedly to reveal the inner surface at anthesis; unit conflorescence 2-4 cm long; perianth revolute in the upper half, 1.5-2mm wide, green to white; style granulate in the apical few mm **2. *G. glabrescens***
 - 3* Pistil < 13mm long; most leaves < 1.5cm wide, 0-3 toothed **4. *G. brevis***
- 1* Adult leaves bearing a moderately sparse to dense, often inconspicuous indumentum on one or both surfaces
 - 5 Mature fruits 18-23mm long; pericarp 2.8-4.6mm thick at centre-face; most leaves < 4cm wide; style usually with an inconspicuous, spreading indumentum over most of its length **6. *G. agrifolia***
 - 5* Mature fruits < 15mm long; pericarp < 1.5mm thick at centre-face; most leaves < 4cm wide; style either entirely glabrous or with a sparse indumentum
 - 6 Style-end granulate, papillose or with short erect trichomes; outer perianth surface glabrous **1. *G. angulata***
 - 6* Style-end smooth, glabrous; outer perianth surface hairy or glabrous
 - 7 Leaf indumentum dense; branchlets angular to round; leaves olive-green to grey-green **7. *G. microcarpa***
 - 7* Leaf indumentum sparse; branchlets sharply angular; leaves bright green **5. *G. prasina***

IN THE WILD (continued)

The Survival of *Grevillea caleyii*

(from an article by Greg Lenthén which appeared in the Sydney Morning Herald, March 11, 1994)

The Terrey Hills grevillea (*Grevillea caleyii*) lives dangerously, flirting with fire and dancing along freeways. It likes the iron-rich soil at the top of the ridge, but unhappily, road builders like the tops of ridges too. Which is part of the reason this rare native Sydney plant is on the "endangered" list. That, and the recent bushfires which ravaged its habitat.

Humans and nature seem determined to hasten *G. caleyii* along the path to doom. But standing between the plant and oblivion is a National Parks and Wildlife Service research scientist, Dr Tony Auld. He has taken a special interest in *G. caleyii*, which grows only along four kilometres of Mona Vale Road, from the Forest Way intersection north to the Baha'i Temple. Its total habitat is no more than 20 scattered hectares, most of which were burnt in the January fires.

Walking in the bush off Mona Vale Road yesterday, Dr Auld pointed to the fingers of green running along the blackened trunks of gums, banksias and tea-trees. They survive fires while *G. caleyii* is destroyed and must grow again from seed.

At the height of the blaze, there were fears that *G. caleyii* would be wiped out. But yesterday, only a short distance off Mona Vale Road at the curiously named Tumbledown Dick, new plants were springing up below the spindly skeletons of those that had been burnt.

The plant was probably saved from extinction because it had been 15 to 20 years since the last fires, so there were plenty of seeds in the ground. Another fire before the new generation has a chance to seed would be a disaster.

G. caleyii has never been known outside its habitat in Terrey Hills since it was described and named at the turn of the century. The classification of "endangered" means that the grevillea could disappear within the next decade or two.

The Australian Nature Conservation Agency is funding a recovery plan for *G. caleyii*, which involves trying to preserve it in its habitat and taking seeds from each area where it grows, so it can be regenerated.

Dr Auld came to the Terrey Hills grevillea as part of a wider study of grevilleas, seeking to establish what made some common and others rare. Part of his work is understanding why a habitat is restricted. Is it because the plant will not grow anywhere else or because something limits its distribution?

Dr Auld has concluded that *G. caleyii* is rare partly because, unlike other grevilleas, its seeds lack the fatty material to attract ants, which would distribute them. Also the seeds are regarded as top tucker by native rats and swamp wallabies.

Dr Auld is concerned that planned widening of Mona Vale Road is likely to claim more of the plant's habitat. *G. caleyii* would have been quite common in the Terrey Hills area before it was developed. Unfortunately roads have been put in the places where it liked to grow.

Cultivation is not really an answer because *G. caleyii* is a bit of an ugly sapling. It is a straggly bushy shrub, which becomes a bit leggy, however it does have attractive red flowers.

GROUP ACTIVITIES

S.E. Qld Group

March 27: *Kaolite and zeolite* — Property of Ralph and Margaret Hickling, between Woodford and Kilcoy, about 1 hour from Brisbane. Phone (07) 359 4574

May 29: *Water retention and best use of available water* — Home of Jan Glazebrook and Dennis Cox, 87 Daintree Drive, Logan Village. Phone (075) 46 8590

July 31: *Incompatibility of grafted plants*. — Home of Graham Nosworthy, 609 Grandview Road, Pullenvale. Phone (07) 374 2178

Sept 25: *Garden visit* — Home of Dave Mason, Dibbs Street, Coraki, N.S.W. Phone (066) 832 583

Oct 30: *Good garden practices* — Home of Merv Hodge, 81-89 Loganview Road, Logan Reserve. Phone (075) 46 3322

Nov 27: *New introductions and garden visit* — Home of Edgar and Pat Burt, Pikes Road, Glasshouse Mountains. Phone (074) 969 450

New South Wales

Aug 27-28: *Plant sale and visit to Hunter Region Botanic Garden and grevilleas in the Newcastle area* (see "From Your Leader" on front page.)

ACTIVITY REPORT

Activities Report S.E. Qld Group

by Lorna Murray

31 October 1993. This meeting of the Grevillea Study Group in S.E. Qld was held at the home of Ron and Elaine Jell at Clear Mountain. In spite of the wet weather about 40 members attended.

The topic on this occasion was "Grevilleas on their own roots", with the discussion led by Merv Hodge. Comparisons with the reliability of grafted plants were made.

Grevilleas which have grown satisfactorily on their own roots in some members' gardens in S.E. Qld include – *Grevillea decora*, *G. banksii*, *G. speciosa*, *G. longifolia*, *G. asplenifolia*, *G. floribunda*, *G. singuliflora*, *G. arenaria*, *G. oldei*, *G. glosadenia*, *G. caleyii*, *G. glauca*, *G. parallela*, *G. lanigera* (particularly the Mt. Tamboritha form), *G. endlicheriana*, *G. venusta*, *G. bipinnatifida*, *G. thelemanniana ssp obtusifolia* (upright form) and the rainforest grevilleas, *G. baileyana* and *G. hilliana*. However not all members had found the species in this list to be reliable without grafting, and it was generally agreed that drainage and soil type had to be considered when selecting species. Excessive rainfall, even once a year, can be a problem in some situations, and can cause the death of a well-grown plant growing on its own roots.

As an example of the effect of position and drainage we were able to view a steep, rather dry bank at the back of the Jell's house, where some plants on their roots were growing better than grafted ones, apparently because the area was too dry for the *G. robusta* rootstock to grow well. It was considered that *G. banksii* might be a preferable rootstock here, as this species was growing quite well in this particular location.

One member has grown *G. shiressii* and *G. argyrophylla* without grafting, but these plants received only natural rainfall in a generally dry season. Also some members claimed that *G. formosa* and *G. dryandri* grew quite well on their own roots in a well-drained position, but others had found that these grevilleas lived only a short time unless grafted. It was observed that *G. petrophiloides ssp. magnifica* and *G. petrophiloides ssp. oligomera* were often satisfactory on their own roots, while *G. petrophiloides ssp. petrophiloides* did not survive for long.

In summary it was concluded that many grevillea species were much more reliable here when grafted than when growing on their own roots, whether cutting or seedling grown. This applied particularly to W.A. and southern species, and plants with hairy or silvery leaves were very suspect. It was also observed that such species did better as grafted plants if the foliage was kept dry and the roots only were watered. In some situations where it was observed that grafted plants did not do very well, it was probably due to incompatibility between the species and the rootstock, and suggested that other rootstocks need to be tried.

With reference to the product *Foli-R-Phos* discussed by Neil Marriott in Newsletter No. 36, it was pointed out to Queensland members that this is sold locally under the name *Phosjet 200*.

28 November 1993. The last meeting of year was held at the residence of Merv and Olwyn Hodge, Logan Reserve. There was another good attendance of over 40 members and visitors.

After arrangements were finalised for venues and topics for meetings next year, there was a general discussion on queries raised by members. The use of kaolite or zeolite in potting mixes was considered. It was decided to make this a topic for a meeting in 1994, with some members to obtain more information on the subject before then.

There was also discussion on solutions to prolong the vase life of grevilleas. *Flower Fresh*, which is a mixture of sugar, citric acid and sodium hypochlorite in water, has been used for some years by Queensland S.G.A.P. for flower display and this has proved useful with most native plants. However, it has been observed that *G. "Honey Gem"* collapsed in this solution. Members involved in flower arranging are to investigate this further. A summary of experiments carried out by Daryl Joyce at C.S.I.R.O. St. Lucia on "Vase solutions for grevilleas" was distributed to interested members.

30 January 1994. The first meeting for 1994 was held at the home of Pat Shaw at Macgregor. The topic for discussion was "Small Grevilleas", an ideal choice for a meeting at Pat's garden, because many small grevilleas are being grown successfully there, both grafted and on their own roots.

Discussion centred on about 50 species and subspecies which were considered to fall into the small grevillea category. Some species which have been found to be very difficult to grow in Brisbane were *G. alpina*, *G. aspera*, *G. quercifolia*, *G. maxwellii*, *G. secunda* and *G. repens*. *G. thyrsooides* and *G. dryandroides* have problems if the foliage is touching the ground, and should perform better if grafted as a standard on tall rootstock.

One member suggested that small ground cover plants which are prickly should be avoided unless the garden was weed-free. Allowing weeds or grass to grow through low-growing grevilleas leads to disaster as they stay too wet and die quickly. Everyone agreed on the difficulty of weeding around plants with pungent foliage, and this led to discussion on the use of *Roundup* or *Gramoxone* for weed control. *Gramoxone* was considered to be a much safer weedicide than any of the products based on glyphosate, including *Roundup*, as *Gramoxone* breaks down very quickly and is less dangerous for the operator. The product sold as *Fusilade* appears to be very satisfactory for the control of grasses, but unfortunately will not kill sedges.

Ralph Hickling reported on some effects of the tornado which passed across his property near Kilcoy recently. Wind speed was estimated at more than 80 km/h. Five well established grevilleas were lost. Of these, two were growing on their own roots, while the other three, *G. paradoxa*, *G. polybotrya* and *G. candelabroides* were grafted on to *G. robusta*. The grafts held firm but all plants snapped off at ground level.

PROPAGATION

The Seed Bank

by Judy Smith

I have had a very good response to my *Grevillea barklyana* ssp. *macleayana* and *G. endlicheriana* seed. It has renewed my enthusiasm and I have been collecting madly ever since. I now have more of the above seeds if anyone is still interested, and according to feedback, the seed has a good germination rate.

In my Sydney garden, the grevilleas that grow especially well are usually the hybrids, as much as my preferences are for the Western Australian grevilleas. I have also started collecting the seeds from these hybrids. A hybrid is a plant produced from two parents from different species and these first offspring, called F1 hybrids, are often more vigorous growers than their parents. They may be either sterile (don't produce seeds) or the seed they produce are not exactly the same as the hybrid. I have been collecting the seed of some of these hybrids as the seedlings they produce are beautiful grevilleas anyway. Some appear to be the same as the parent, others are different, there are no guarantees. I will use the example of *G. 'Sid Reynolds'*. It is a great screen plant and has lovely reddish flowers (see Newsletter No. 30). It is a hybrid of *G. stenomeria* and *G. thelemanniana* ssp. *pinaster*. If you planted the seed from *G. 'Sid Reynolds'*, you could end up with *G. 'Sid Reynolds'*, *G. stenomeria*, *G. thelemanniana* or something completely different.

I had the pleasure of receiving some seed from a new member of the study group, Mr Owen Brown. He would like to know if there is anyone belonging to the group who lives in the Darwin area who would be prepared to send him some seeds of the Northern Territory species (and *G. flexuosa*). If anyone can help, please write to him - 1/1 Ramsay Crescent, Golden Beach 4551.

Free seed is available from the seed bank by sending a stamped, self-addressed envelope to **Judy Smith, 15 Cromdale Street, Mortdale 2223.**

Please remember that seed collected from a garden situation cannot be guaranteed to be a true species, and may in fact be a hybrid. Most of the free seed has been collected in this way. Seed for sale has been purchased from reputable companies and can be expected to be the true species. Seed for sale is \$1.50 per packet plus a self-addressed envelope with a 70 cent stamp.

Free Seed List

G. asplenifolia, *G. banksii*, *G. banksii* (Qld tree form), *G. banksii alba*, *G. barklyana*, *G. brachystachya*, *G. endlicheriana*, *G. glabrata*, *G. glossadenia*, *G. juniperina* (red), *G. juniperina* (yellow), *G. longifolia*, *G. longistyla*, *G. microstegia*, *G. rivularis*, *G. pteridifolia*, *G. pungens*, *G. thelemanniana*, *G. venusta*, *G. victoriae* (*tenuinervis*)

Hybrid Seed

G. 'Caloundra Gem' (pale pink showy flowers which are seen for most of the year — probably a hybrid of *G. banksii* var. *forsteri* and *G. whiteana*), *G. 'Copper Rocket'* (young growth is coppery and the flowers are pale pinkish-purple — parents are most likely *G. barklyana* (Victorian form) and *G. rivularis* or *G. acanthifolia* — grows best in semi-shade, likes moisture and is a useful screen plant). *G. 'Coastal Glow'* (a hybrid of *G. barklyana* ssp. *macleayana* and either *G. asplenifolia* or *G. longifolia* — very hardy with deep pink toothbrush flowers for most of the year). *G. 'Sid Reynolds'* (lots of seed available). *G. 'Moonlight'* - (also known as *G. 'Edna Ellen'* — suspected to be a cross between *G. whiteana* (Mundubbera form) and *G. banksii* — flowers for most of the year and is very similar to *G. whiteana*).

Seed for Sale

G. pilulifera, *G. quercifolia*, *G. stenobotrya*, *G. dryandri*, *G. refracta*, *G. decora*

More Tips on Growing Grevillea From Seed.

by Norm McCarthy, Toowoomba, Qld.

A nursery friend of mine uses *Fongarid* quite extensively to prevent seedlings and cuttings from 'damping off' to great effect. I also sterilise coarse sand with boiling water, which I then use as a separate medium for all types of seedlings, to my satisfaction.

Wherever there is moisture and humidity, it seems, fungal infection can be in evidence. Overhead watering seems to encourage nasties, so I try to avoid this as far as seedlings are concerned.

I have also germinated some seeds using boiling water, as well as individually nicking each seed. I then place the seeds on damp cotton wool which is kept moist until the seeds germinate.

At this stage I monitor the seed bed by using a weak fungicide solution, just a pinch of powder to one litre of tap water. I put this in a cheap Woolies Selecta Spray bottle and use as required. I still use *Captan* to good effect, although it is apparently unobtainable, but there are others available. It certainly seems to work and keep nasties away. Unmonitored

seeds are soon affected by fungal spores in situ, which can inhibit good germination.

Personally, I have found that other than quite fresh seed causes great difficulty. I once, many years ago, collected seed of *Grevillea scortechinii* at Cottonvale, near Stanthorpe, and *G. longistyla* at Gurulmundi, near Miles in S.E. Queensland. I had a success rate of 42 out of 50 for *G. scortechinii*, and 45 out of 50 for *G. longistyla*. See my report in *Australian Plants Vol.8, No.67*, page 330. Maybe you will find value in my methods.

Nowadays I use cuttings to obtain new plants but prefer to graft plants, which I consider is the ultimate. Of course, where seed only is available one can only try and hope, using fresh seed if possible.

These are my observations over many years, and I do fervently hope that someone, somewhere, may unlock the door to greater and more successful germination.

Grevilleas of the Hunter Region Botanic Gardens

by Heather Clarke, Hon. Curator, Grevillea Collection, Hunter Region Botanic Gardens.

Grevillea wilsonii

Common Name: Wilsons Grevillea

Origin: Darling Ranges, south-west corner of W.A.

Habitat: Grows in lateritic soils in forests.

Growth Habit: A rounded shrub up to 1.5 m x 1.5 m, flowering time August to January. The young growth is glabrous or sometimes glaucous or reddish.

Leaves: The leaves are light green, bipinnately lobed with an irregular number of lobes. They are crowded and entangled with narrow spreading segments, the ultimate segments being sharply pointed and the margins turned under to form two grooves with the mid-rib. Leaf length is to 50 mm.

Racemes: The flowers are a brilliant scarlet red, terminal and erect, 7 cm x 7 cm, often on short branches. Each flower is held on a slender, smooth, red stalk about 2 mm long. The red perianth is smooth on the outside and hairy within and it splits along one side to release the slightly hairy red style which is up to 35 mm long. The perianth usually blackens with age.

General Information: This species is recognised as one of the most desirable because of its brilliant red floral display. It has been grown successfully on the east coast but requires very good drainage and full sun to part shade. It adapts to clay soils, is frost hardy, and is attractive to nectar-feeding birds. It may die back after dry periods but will respond to light pruning.

Location In the Gardens: We have two 3 year old plants which have flowered this year for the first time; 1. to the right of Cunningham's Track in the W.A. section at the northern end of the semi-circular viewing track. 2. turn left from Cunningham's Track and follow the path towards the mound. Halfway down and well marked is the other *G. wilsonii*. Although touchy to grow in gardens, and 'condition' dependent, it is a lovely, small, bird attracting plant.

A Personal Look At Grevillea Discovery

by Heather Clarke,

While boring a friend with my "Grevillea comments" recently I remarked that some 65-70% of all Grevilleas come from Western Australia. To my surprise her reply was to the effect that her great grandfather's brother had discovered one - and in fact she gave me a hand written document of the "discoverer's" history which I thought you might like to share with me.

The plant concerned was: *Grevillea wilsonii*.

Family History: Dr. Thomas Braidwood Wilson (1792-1843).

Dr. Wilson was born in Parish of Carnwarth, West Lothian-shire, Scotland. He made nine voyages in convict ships on which he was the surgeon.

He was shipwrecked in Torres Strait in 1829, and spent two weeks with others in an open boat, before being picked up by the brig 'Amity' and brought to Fremantle, W.A. There he found the 'Governor Phillip', bound for Sydney but was delayed by a couple of weeks in King George Sound - when the ship ran aground and required recaulking.

To fill in time, he explored the land west of Fredericktown (Albany) and with a party of five, two of which were convicts, he went on a 10 day, 250km 'walk'.

Dr. Wilson found a number of new plants, one a grevillea, which was later to be called *Grevillea wilsonii*.

On another voyage he arrived in Hobart Town in 1831 bringing many European plants and the first hive of bees to survive in Australia. Some of these plants were: Moss rose, Lilac, Laurel and Lauristinus. In 1836 he settled in N.S.W. on his 'land grant' property at Braidwood and died there in 1843. Drought had reduced him to bankruptcy.

FINANCIAL REPORT

MARCH 1994

| Income | | Expenditure | |
|---------------|-----------------|-----------------------------------|-----------------|
| Subscriptions | \$355.00 | Newsletter Expenses | 200.00 |
| Seeds | 4.50 | Postage | 111.80 |
| | | Stationery (envelopes and labels) | 39.60 |
| | | Research Expenses | \$500.00 |
| | | | \$851.40 |
| | <u>\$359.50</u> | Balance on Hand 11.3.94 | <u>\$534.25</u> |

OFFICE BEARERS

Leader: Peter Olde, 138 Fowler Road, Illawong 2234. (02) 543 2242

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Seed Bank: Judy Smith, 15 Cromdale Street, Mortdale 2223 (02) 579 1455

Cuttings Exchange:

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If a cross appears in the box, your subscription of \$5.00 is due.
Please send to the Treasurer, Christine Guthrie, 32 Blanche Street, Oatley 2223.
Please make all cheques payable to the Grevillea Study Group.

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