

Australian Native Plants Society (Australia) Inc



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Newsletter No. 94 – February 2013

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GSG Vic Programme 2013

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Contact Neil for queries about program for the year. Any members who would like to visit the official collection, obtain cutting material or seed, assist in its maintenance, and stay in our cottage for a few days are invited to contact Neil.

GSG NSW Programme 2013

For more details contact **Peter Olde** 02 4659 6598.

Open Garden

WHEN: Saturday & Sunday, 27 & 28 April
VENUE: 'Silky Oaks' 140 Russell Lane Oakdale
SUBJECT: Garden Tours 11am & 2pm each day
Plant Sales

Special thanks to the Victorian chapter for this edition of the newsletter. Queensland members, please note deadlines on back page for the following newsletter.

Illawarra Grevillea Park OPEN DAYS 2013

April 27th, 28th, May 4th, 5th
July 6th, 7th, 13th, 14th
September 7th, 8th, 14th, 15th
Opening hrs are 10am – 4pm

Location

The Park is located at the rear of Bulli Showground, Princess Highway, Bulli.

Admission

\$5 adults, children accompanied by adults are free

Barbeque and picnic facilities available

email info@grevilleapark.org or
visit www.grevilleapark.org

GSG SE Qld Programme 2013

Morning tea at 9.30am, meetings commence at 10.00am. For more information contact **Bryson Easton** on (07) 3121 4480 or 0402242180.

Sunday, 24 February

VENUE: Home of Peter & Carol Bevan
10 Patrick St, Lowood, Qld 4311

PHONE: (07) 5426 1690

SUBJECT: Peter will discuss his current propagation by cutting methodology

DIRECTIONS: Take the Warrego Hwy. Turn off the Warrego Hwy at the Brisbane Valley Hwy exit, turn left onto Forest Hill Fernvale Road, left curve to Railway St, left turn to Main St Lowood, right turn to Walter Rd, right turn to James St, left into Pryde St, finally right into Patrick St.

Sunday, 29 April

VENUE: Mt Coot-tha Botanic Gardens

SUBJECT: A review of the Grevilleas planted at Mt Coot-tha

Sunday, 30 June

VENUE: Home of Jan Glazebrook & Denis Cox
87 Daintree Dr. Logan Village, 4207

PHONE: (07) 5546 8590

SUBJECT: Review of the photographs from the 2012 Grevillea excursion

Inside this issue:

- Grevillea Study Group *Grevillea alpina* Grevillea Crawl Spring 2012 field trip report
- Grevilleas news
- Pollination of Grevilleas
- Morphological and genetic variation in the holly grevillea
- The Grevillea and Hakea relationship
- Some observations on growing Grevilleas from cuttings (and a few questions)
- Seed bank

For some of our members and friends the year's beginning has not been propitious. First there was the news of Martin Swanson's wholesale propagation nursery in Gippsland, Victoria destroyed by bushfire. Below I attach part of an email from Merv Hodge from Brisbane

The last email that I received was on 27/01/13 and then came the rain. As far as I am aware all of the people in our district with 5546---- numbers were out of action. I suspect that the cable connecting us to Logan Village Exchange [on the other side of the Logan River] was washed away or badly damaged. I arranged to have calls to our phone redirected to our mobile. The river rose considerably and whilst I would not call it a raging torrent it was not far from it.

To compound the problem I had in addition arranged with Telstra for a new "package" just prior to the rain and they stuffed it up. I am still sorting that out. We lost power as well and this also meant no computer.

Other appliances that needed power were our refrigerators and freezers and pump for out household water supply. This meant much wasted food and necessitated dropping a clean bucket into one of our tanks for drinking, washing dishes [by hand], flushing the toilet and washing ourselves. Fortunately we have a gas stove so we could cook our food. The normal ignition system would not work [it depends on power] so we had to use the old fashion way and light it with a match.

Because our mobile was left on continuously the battery almost went flat. Fortunately we have a Jump Starter fully charged and it is equipped with a cigarette lighter type outlet. If you have the right cord to connect them together it is an easy job to recharge a mobile. For the uninitiated a jump starter is a device that serves as a battery by connecting it across a car's battery if it runs flat. You then start the car in the normal way and remove the jump starter. You need to keep the jump starter charged

of course. Very handy if caught in a remote region or to save a possible long wait for the RACQ

These problems are only an inconvenience when compared to others whose homes were flooded or destroyed. I will try to catch up with emails ASAP but there are so many to forward on I will have to enjoy them myself and be selective about what I send on. I will discuss damage to plants in another email when I can.

Here in Sydney we have had an extended dry, now relieved by a 200 mm downpour. The dry has killed many of my plants and I am searching for replacements. Hardly a drop of rain since last April when we had a similar amount of flooding rain. These conditions are a real test for the plants, not only for them to survive water deprivation, but also they become weakened and open to insect and other pest attack, the most notable recently being that of the resurgent rabbit. For people in non-urban areas we should have a discussion on the best way to be rid of this pest. Articles on this anyone?

Field trips

This year, 2013, I am proposing a field trip to the Victorian and New South Wales snowfields to be held on the first weekend of November, say from November 1–4. There are many species in this area we have not looked at and it is a beautiful area at that time of year. More details of the species next newsletter.

Next year 2014, we propose to conduct a field trip to examine all the Sydney grevilleas. This will be held in early September so I am giving notice now. It is a busy time of year usually and I would hope that if there are competing events you will let me know so that we can perhaps fit them around our schedule. I am here proposing September 15–21. Let me know if you would like to come and the dates do not work for you. List of species next newsletter.

Neil Marriott

Following on from our Grevillea Crawl in Spring 2011 researching for a full revision of the *Grevillea alpina* complex, a further trip was organised for late September in 2012. We needed to check out as many populations of *Grevillea alpina* in its type location in the Grampians National Park, as well as all the new locations discovered by Geoff Roche, Ian Evans and others over the last few years for the root-suckering Pyrenees race. There were also several other locations in central Victoria that we needed to re-check.

Wendy and I made it open house, and on Friday the first members arrived and the fun began! Participating this year were Peter Olde and Ray Brown from Sydney, Max and Regina McDowall, Phil Hempel and Peter Smith from Melbourne, Martin Rigg from Yackandandah, Werner Kutsche and Tammy Thanh from Adelaide, Ian Evans from Bendigo, Geoff Roche from Maryborough, Dave Shiells from Shepparton and John O'Hara from Keilor. As well as these members of the Study

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Group we also had APS NSW members Mark and Peta Abell and Victorian members Ken and Sue McLean who both happened to be staying in our B&B cottage for the weekend and so joined in the fun.

On Saturday morning we headed off to the western side of our Black Range to inspect the fabulous form of *Grevillea alpina* that grows at Bunjil's Cave Scenic Reserve. We did not need to go far as practically the entire roadside in front of the carpark at the reserve was massed with beautiful low specimens all in full flower and presenting a wonderful display. The plants here were low shrubs to 0.4 x 1m wide with massed large orange and red flowers, growing in granite sandy loam in open heathy-woodland of Yellow Box *Eucalyptus melliodora*. After much photography, recording and collection of specimens we continued on to our next destination just to the north of Stawell.

At the northern end of Deep Lead Flora and Fauna Reserve in the Ironbark Ranges we recorded our next population of *Grevillea alpina* on Centre Road. Here we found a quite different form that was strongly erect at 1-1.5m x 0.4-0.5m wide, but again with the large and showy orange and red flowers typical of the type form. To the best of our knowledge this is only the third population known of erect plants of the type form, that are taller than they are wide. The best known of these is the population growing just to the west of Mt Zero (and there is a very small and localised population at the southern end of Rosea Track, collected by Geoff Roche, Wendy and I earlier in the year). The plants in the Ironbark Ranges were growing in stony sandy-loam under tall Red Ironbarks *Eucalyptus tricarpa* and Red Stringybarks *E. macrorhyncha*. Also growing with the *Grevillea alpina* were lovely silver leaf forms of *G. aquifolium* with distinct orange to yellow flowers turning red at anthesis. The strange thing is that all populations of *Grevillea alpina* elsewhere in the Ironbark Ranges and surrounds are low and spreading; what makes these three populations strongly erect, and are they morphologically distinct in any way other than their growth habit?

We then headed out of the Flora Reserve through Deep Lead where, as if to confirm this difference, on the Illawarra Road we collected from a third population of *Grevillea alpina* which was again low and spreading. The plants here were growing in deep sand again in heathy woodland but among tall Austral Grasstrees *Xanthorrhoea australis* and massed Heath Myrtle *Micromyrtus ciliatus*.

Next we went south to Lake Fyans to pale sandy-clay under widely spaced Yellow Box trees. Here, in an area of open Sedge-rich Woodland we found a small population of *Grevillea alpina* with distinctly glossy green foliage and showy heads of orange and red waxy flowers. The plants were small and decumbent with the largest only reaching 0.3x0.4m. What wonderful specimens for growing in a rockery or in tubs!

From here we continued on to Pomonal where we visited Phil Williams at his wonderful Wildflower Nursery. It had been raining on and off all morning, so far only while we were driving. However the heavens opened while we were buying up loads of Phil's unusual plants, and within a few minutes the ground was white with hail. We all crowded under Phil's nursery shed and once again, no-one got wet.

After leaving Pomonal we drove into the Grampians National Park to Mt William, the site of the original collection or type of *Grevillea alpina*. As soon as we drove out of the forested lower slopes and into the exposed rocky heathlands we found the plants we were looking for. On both sides of the road *Grevillea alpina* was recorded growing in shallow sandy soils amongst great slabs of sandstone. The plants were low to medium rounded shrubs at 0.5x1-1.2m with distinctly retrorse leaves and again the showy heads of orange and red flowers.



Grevillea alpina type form at type location Mt William, Grampians NP

From Mt William we then continued north toward Mt Zero to survey the extent of the upright Mt Zero form. This will define the range or any range overlaps between the normal decumbent forms and the upright form. Midway between Roses Gap and Mt Zero we came upon a good population of *Grevillea gariwerdensis* growing near Plantation Road. The plants were found growing in dense swampy heathland in a drainage line that crossed the road. Most plants were open and spreading and were all in flower with pale pink or white open spider flowers.

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Grevillea gariwerdensis – Plantation Road

We drove on north to Roses Gap to search for an unusual form of *Grevillea alpina* lodged in Melbourne Herbarium (ENS Jackson 1538 [MEL 1617527]) with lifting indumentum on the lower surface of the leaves. We located a good population of the subspecies which clearly showed that the unusual specimen was not typical of the area, as all had the usual appressed hairs on the lower leaf surface.

As we approached Mt Zero along the Halls Gap Road we came upon a colony of lovely low, strongly arching shrubs of *Grevillea alpina* with typical flowers and again with strongly retrorse leaves. We then continued, driving south of Mt Zero and, on turning into a small track to the west of the mount we immediately came upon the distinct upright Mt Zero form. Unlike the upright population growing in the Ironbarks, these were growing in very deep white sand. Investigation of the area showed that there were no intermediate forms –they abruptly changed from decumbent to upright, and then back to decumbent again further down the track.

Although we had several more populations we wanted to survey, time was against us and we returned home to an enjoyable evening BBQ and a great chance to socialise with fellow GSG members.

Sunday morning saw the arrival of APS members Jan and Graeme Donnan and Stan and Anne Barker from East Gippsland who joined with the study group members for a tour of our gardens, home of the GSG living collection. We then headed off north-east of Stawell to Morri Morri State Forest to survey the most unusual form of *Grevillea alpina* that is confined to this area. This form is closest to the 'Goldfields' form of *Grevillea alpina*, but differs in a number of characters; it may well warrant formal recognition. Geoff Roche led us via a series of back roads to several small population SW of the Morri Morri Forest. However the main treat was on the sides of Morri Morri Wallaloo East

Road just south of Morri Morri Reserve. Here we found a massed display of superb rounded shrubs in full flower growing in dry heathy woodland in sandy buckshot loam. Plants were generally around 1-1.5x1-1.5m with lovely rich pink and cream flowers in showy terminal and axillary heads. After making collections we continued on up the road to the south-west corner of Morri Morri Forest where the major population of this form occurs.



Grevillea alpina 'Goldfields' – Morri Morri form

From Morri Morri we continued east into the Pyrenees Ranges searching for several elusive populations of *Grevillea alpina*, that Geoff and Ian had previously discovered. There was a good population growing in very dry open heathy woodland, where the plants were quite tiny and hard to find, being almost prostrate and only spreading 0.4-0.6m, but with the most attractive large waxy orange and red flowers in open clusters.

We then headed into the ranges near Moonambel where local APS Vic member Bernard Abadie had discovered a most distinct form of *Grevillea dryophylla* growing along a track in the middle of Taltarni Winery!! The plants were in superb condition growing around 0.6-1m x 1.5m with massed showy flowers of a red styles and a black perianth. The foliage was also most attractive, being grey green and deeply lobed. This lovely colour combination has not been observed in any other population of the species, and Peter was so amazed with the population that he speculated it may well be a new subspecies!! Whether it is or not, it was a most welcome diversion to our 'alpina' hunting. Specimens were taken to be lodged in the Melbourne and Sydney herbaria before we continued on to Avoca to study yet another population of *Grevillea alpina* growing on No 1 Creek Road to the south-west of the town.

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Grevillea dryophylla – Taltarni Winery form



Grevillea alpina suckering into an old grave, Mt Cole Cemetery

Having found the population we sat down for a quick bite to eat before checking out the grevilleas. The plants here were shrubby, growing from 0.3-0.5x0.6m, again with spectacular heads of waxy orange and red flowers.

From Avoca we then turned on our way back home, stopping first to collect a population of *Grevillea alpina* growing on the Pyrenees Highway between Elmhurst and Ararat. The plants were located growing on dry gravelly/stony-clay ridges in open heathy woodland under stunted Long-leaf Box *Eucalyptus gonicalyx* and Yellow Box *E. melliodora*. The grevilleas which grew to 0.4x 0.8m were again attractively in flower with a most pleasing display of showy yellow and orange-red flowers.

The next site was for many of us a welcome return to the Mt Cole Cemetery, as we had been to this site on previous Victorian chapter Grevillea Crawls. The cemetery is one of the most beautiful I have seen, being located on a high ridge well above the local township of Warrack, in the foothills of the Mt Cole Range. The area is dry box forest, dominated by Yellow Box *Eucalyptus melliodora*. The understorey is an extremely rich and diverse mixture of native grasses and heathy plants, and includes a superb display of the most delightful low root suckering *Grevillea alpina*. These varied in colour from orange and yellow to rich orange-red and yellow. The wonderful feature of the cemetery is that the site is mowed each year, which promotes the regeneration of the ground flora, which is still growing in spectacular profusion all around the grave sites. Most other country cemeteries are managed with herbicide.

From Mt Cole we drove south to the Western Highway, where, on the southern slopes of Mt Langi Ghiran we collected our final population of *Grevillea alpina* for the day. The plants here, growing on the sides of the highway, were low rounded sub-shrubs to 0.3 x 0.7m again with the same lovely orange and red flowers. However it was noted that nearly all the plants in this population were in a state of poor health possibly due to drought, roadside pollution or even an outbreak of *Phytophthora*.

As darkness descended we reluctantly headed off home where we quickly cleaned up before heading in to Stawell for a superb Chinese feast at the 'Nash Hotel' followed by a wonderful evening of socialising and discussion focussed primarily on our discoveries and what was in store for tomorrow.

Monday morning saw us on our way to the goldfields of central Victoria. We met up with Geoff Roche at a superb area of Box-Ironbark forest just to the west of Moonlight Flat where Geoff had discovered a population of *Grevillea dryophylla* with flower colours that ranged from the typical reds through pinks and oranges to the most common, bright yellow. After drooling over these for far too long we continued on to the western outskirts of Maryborough where Geoff took us to a population of 'Goldfields' form of *Grevillea alpina* that, like the *Grevillea dryophyllas* were of every flower colour. Several were even close to pure white, with a pale greenish-yellow pistil.

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Grevillea dryophylla – Moonlight Flat yellow form

From Maryborough we then drove on to Maldon where we stopped for lunch before continuing east of the town to inspect a population of *Grevillea alpina* that Ian Evans had previously discovered. These were growing in quite dense heathy box forest with an almost continuous cover of Long-leaf Box *E goniocalyx* over thick heath scrub. The grevilleas were growing to 0.8x 0.8m and were open and straggly with masses of soft pinky-red and white flowers and were clearly a different race to those already seen on the crawl. Heading further east we arrived at another one of Ian's discoveries on the north-west edge of Castlemaine. Here were plants of *Grevillea alpina* that again were different to those already seen, with close affinities to the Melbourne race, and the same as the population we had collected last year to the east of Castlemaine.

We drove into the Fryers Ranges and down to Porcupine Ridge, where the year before, Geoff and I had found another unusual population of *Grevillea alpina*. Arriving at the site we spread out, admiring the beautiful and highly varied *Grevillea obtecta* that also grows in this area. These were found in flower in one area, with their massed pale fawn or occasionally reddish toothbrush flowers on delightful creeping mats. The *Grevillea alpina* plants were low domes to 0.3x0.5m with showy heads of orange-red flowers that appeared to be similar to those from the Crowe Range further to the south-west, near Shepherds Flat.

From here the crawl broke up with members going their various ways back home. It was a wonderful weekend, and I wish to thank all who came and made it such a rich, educational and enjoyable time. Great credit must go to Peter Olde who has spent many months resolving the often subtle differences between/among the many populations of *Grevillea alpina*. Peter patiently shared with us his expertise, at each location explaining how the plants differed from

those previously seen, and I am sure we all came away with a better grasp of how to identify the various races of this wonderful grevillea and what a mammoth task it is to describe the alpina complex.



The 'Grevillea Gang' at the end of our crawl
L to R: John O'Hara, Ian Evans, Regina McDowall, Max McDowall, Peter Smith, Neil Marriott, Martin Rigg, Peter Olde, David Shiells, Ray Brown, Geoff Roche Photo – Wendy Marriott

So what were the outcomes of the field trip? I feel our aim was to get a better grasp of all the forms; flowering specimens in the field allow for accurate recording of habitat preferences, as well as distinct diagnostic characters to be more readily observable.

We did confirm the habitat preferences of the 'Grampians' form for free-draining sands, primarily in Heathy Woodland
the 'Pyrenees' form for auriferous gravelly clay-loams in Grassy Woodland, &
the 'Goldfields' form for auriferous gravelly clay-loams in Box/Ironbark Shrub Woodland.

However nothing we observed answers why the three erect clones of the 'Grampians' form have evolved to be so distinct in HABIT to the multitude of other populations growing in apparently identical habitats in close proximity.

We now know the significance of branchlet and foliar indumentum, and this trip confirmed these characters in the field. However there are also as many new questions to be answered, such as why the 'Goldfields' form occurs where it does, while another unusual form with relationship to the 'Melbourne' form also occurs in the goldfields around the Castlemaine-Elphinstone-Fryers Range area. I guess this is what makes field trips like this so valuable –there is just so much out there for us still to discover!

Martin Swanson, Wildtech

News has just been received that bushfires have claimed all the nursery buildings and gardens of Martin Swanson, Wildtech Nursery, Licola Rd Glenmaggie. This devastating news not only affects Martin, his family and workers but also the whole native plant industry to which Martin is a major supplier. We have heard that he is relocating to another site in Heyfield but needless to say such a rebuild will take much hard work and time. The Study Group wishes Martin well and may need to assist him with plant material when required.

'We got trashed by the fire and are relocating our propagation down to our Heyfield site. Our gardens and nursery buildings were nuked here and there is no point rebuilding and replanting only to have it happen again.'
Regards, Martin

Kuranga Nursery grafting program

Victorias, and probably Australia's largest native nursery, Kuranga at Mt Evelyn have now employed a full time highly skilled grafter and APS Victoria member Maja Zweck to produce an extensive collection of grevilleas for sale. This is most wonderful news as there are now very few nurseries nation-wide that supply an extensive range of grevillea species, with most only selling a handful, many of which are inferior hybrids. We are fortunate in Victoria to have several smaller suppliers of a good range of grevilleas including Vaughan's Nursery, near Geelong and Grevillea Maximus Nursery near Bairnsdale run

by enthusiastic study group member Robert Brown. The decision by Kuranga will greatly increase the number of grevillea species that will become available to the general public including Grevillea Study Group members. Maja has visited GSG member Graeme Woods as well as the official GSG collection at 'Panrock Ridge' to obtain an extensive range of grevillea species for their first release. Initial information from Maja indicates that she has succeeded in grafting a very large range of our very rare grevilleas.

The Grevillea Study Group live collection at 'Panrock Ridge'

Sadly most of western Victoria missed out on winter and spring rains last year, creating a disastrous state this very hot and dry summer. Despite losing a very large number of established Banksias and Dryandras, we have lost few Grevilleas –mostly young plants not yet fully established. In fact most of the WA and inland Grevilleas had their best flowering for years – obviously drought has been well adapted for in both these areas! *Grevillea juncifolia* particularly

the dwarf 'Swirley' form were covered in flower, as was *Grevillea murex* which is extremely rare both in the wild and under cultivation.

Several members have visited to obtain seed or cutting material from rare plants in the collection, and if any other members would like material they should contact me and we can arrange for material to be sent or collected in person.

White-flowered plants of *Grevillea lavandulacea* - Victor Harbor form discovered

APS SA member and fellow Grevillea enthusiast and Study Group member Brian Freeman of Victor Harbor has recently discovered several beautiful plants of the Victor Harbor form of *Grevillea lavandulacea* with pure white flowers. As Brian was coming over to Victoria at the time he brought me a small batch of cuttings of the plants, and these have just struck. Once they are hardened off I will grow them on so we can take further cuttings which will be distributed back to Brian and other Study Group members both in Victoria and in South Australia. Congratulations to Brian for discovering such an exciting plant, and for acting quickly to ensure its survival.



Grevillea lavandulacea - 'Victor Harbor White' Photo: Brian Freeman

Checklist of Grevilleas

In one of the very first Grevillea Study Group newsletters Peter Olde published a complete list of all known Grevilleas at that time. Since that time there have been three revisions of the genus; McGillivray for his publication 'Grevillea', Olde and Marriott for 'The Grevillea Book' and Bob Makinson for the Flora of Australia. However, since these revisions there has never been another published complete list of our beloved genus!!

At one stage, former member Dave Mason compiled a list that he developed as a computer spreadsheet so a small number of members who had large collections of species could list those species that they had. This was distributed by Dave primarily between himself, Edgar Burt, Merv Hodge and myself. In this way, we all knew who had what species and we could then organise for cuttings, seed or plants to be provided to those that needed them.

Sadly there is no such list today, and Peter has no idea of where we could get one. This is a most unfortunate predicament where the study group does not even have a comprehensive list of all the species that we are studying!! As a result I am putting out a request for any member who may have an electronic species list on their computer, be it comprehensive or only partial.

I am willing to work on any list that members may be able to email to me to create an up to date comprehensive species list. So PLEASE, is there anyone out there who has a list I can work on?? If this can be achieved, there are today a number of members who are again keen to share their own species list with other members so we can again organise an exchange of material between members. Once we have a new and comprehensive species list I will happily email it to any members who request it.

Direct deposits can be made into the Grevillea Study Group account

BSB 112-879

Account Number 016526630

(St George Bank).

Please notify the Treasurer
of transfer
by email

(bruce.moffatt@tpg.com.au)

or by post to

**Grevillea Study Group,
32 Blanche St Oatley, NSW 2223**

Pollination of Grevilleas

Susan Hoebee gained her PhD studying the conservation genetics of the endangered Grevillea iaspicula. After several research positions, she is now a Research Lecturer at La Trobe University, and directs a number of plant evolutionary projects (often in collaboration with Dr Trevor Edwards).

Pioneering work on Grevilleas noted similarities to the proteaceous South African genus *Leucadendron* and suggested the genus be named *Leucadendroides* (Solander c. 1770). In 1794, Smith proposed the name *Embothrium* because of similarities to the South American genus. It was not until 1810 that Robert Brown officially named them *Grevillea*, and this name has persisted.

There are just over 360 recognised species of *Grevillea*, mostly endemic to Australia, plus many natural hybrids, and a growing number of recognized cultivars. They cover a huge range of habitats, from tropical to alpine, and everything in between. They may be widespread and common, or highly endemic and critically endangered. There is also an enormous range of floral diversity, exemplified by the “toothbrush” versus “spider” presentation of inflorescences.

Susan focused her talk on the unique mechanisms of pollen presentation in grevilleas, and discussed the various insects, birds and animals which may or may not be effective pollinators.

Grevilleas, and other members of the Proteaceae, are fairly unique in that the pollen displayed on a “pollen presenter” after it is shed from the anthers (which remain fixed to the tepals). The pollen presenter is also the site of the stigma which receives pollen for fertilization. This apparent conflict of interest in the sexual role of the pollen presenter is countered owing to separation of sexes in time. Proteaceous species are protandrous with the male phase functioning first, during which the pollen presenter advertises the mature pollen to suitable pollinators. This typically lasts for a few days before the female phase is initiated and the stigma becomes receptive to pollen being brought in by a pollinator. Susan showed a fascinating series of electron micrograph pictures of how the pollen presenter matures through time.



Grevillea iaspicula – photo by Susan Hoebee

Creatures are attracted to flowers by a variety of mechanisms which, collectively, define a pollination syndrome). The landing platform will suit some insects but not others. The flower colour will attract some creatures but not others. The scent, the time of day when the flower is open, and the part of the flower which contains the nectar, are all designed to appeal to a suitable pollinator.

Because of the unusual structure of the pollen presenter in grevilleas, not all visitors to the flower will make contact with the pollen. It depends on where the visitor lands, and how they access the nectar which they are seeking. The Eastern Spinebill is a classic *Grevillea* pollinator, because its size and the way it probes the flowers means that its head will invariably brush against the pollen presenter. On the other hand, bees, butterflies and moths may be effective pollinators for some grevilleas, but they may also just be nectar robbers which deplete the supply of nectar in the flower and thereby reduce the flowers attractiveness to true pollinators.



A pair of White-plumed Honeyeaters on *Grevillea iaspicula*
Spinebill pollination – Source: Wrigley, J.W & Fagg M. (1989: 30)

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Apis mellifera (European Honey Bee) – photo by Susan Hoebbe

Exotic honey bees can be pollinators, but are often not as effective as our native bees. Butterflies are ineffective as pollinators, and are regarded as nectar robbers. Beetles, birds and mammals can be either nectar robbers or true pollinators. This is an area where a lot of research still needs to be done as it clearly varies according to the plant species in question.

Many species of ants visit the flowers to obtain nectar, and in the process pollen as well. But some ants also secrete an antibacterial agent which sterilizes the pollen and renders it useless.

One of Susan's students, Juli Atkinson, is working on a project to investigate the species boundaries in several interesting Victorian

grevillea species in the subgroup *floribunda*—*G. alpina*, *G. celata*, and *G. chrysophaea*. *G. celata* is a vulnerable species, occurring in the Nowa Nowa area of east Gippsland, and may be a natural hybrid between *G. alpina* and *G. chrysophaea*.

Juli is exploring aspects of their reproduction, population genetics, and ultimately the evolutionary trajectory of these species. This involves phylogenetic techniques, population genetics, morphology, reproductive ecology (who might be pollinating these species), and cross-compatibility. This also leads to the question of whether our species remain true species, or is there natural inter-breeding between species.

Early indications are that nectar levels vary among the different species and forms. Combined with colour variation, this may hint at different pollinators. Results are inconclusive as yet, but observations and research is ongoing.

We thank Susan for coming to share with us some of this research work that is going on, and anticipate hearing more from her and Juli in the future.

Typical syndromes

Pollinator	Corolla Morphology	Floral Characteristics			Time of Flowering
		Reward	Colour	Scent	
Bee	Bilateral landing platform	Nectar and/or pollen	Blue, yellow, purple	Fresh, strong	Day
Butterfly	Landing platform; sometimes nectar spurs	Nectar	Bright; often red	Fresh, weak	Day
Moth	Dissected; sometimes nectar spurs	Nectar	White or pale	Sweet, strong	Night/Dusk
Fly (reward)	Radial, shallow	Nectar and/or pollen	Light	Faint	Day
Fly (carriion)	Enclosed or open	None	Brownish, purplish	Rotten, strong	Day or Night
Bee	Bilateral landing platform	Nectar and/or pollen	Blue, yellow, purple	Fresh, strong	Day
Butterfly	Landing platform; sometimes nectar spurs	Nectar	Bright; often red	Fresh, weak	Day
Moth	Dissected; sometimes nectar spurs	Nectar	White or pale	Sweet, strong	Night/Dusk
Fly (reward)	Radial, shallow	Nectar and/or pollen	Light	Faint	Day
Fly (carriion)	Enclosed or open	None	Brownish, purplish	Rotten, strong	Day or Night

Morphological and genetic variation in the holly grevillea, *Grevillea aquifolium* Lindl. (Grevilleoideae: Proteaceae)

Report to the Hansjörg Eichler Scientific Research Fund (Australian Systematic Botany Society).

Introduction

My Ph.D. research is investigating morphological and genetic variation in the holly grevillea, *Grevillea aquifolium* Lindl. The holly grevilleas, also known as the '*G. aquifolium* group', are those species 'with holly-like leaves and 'toothbrush' inflorescences and their close relatives' (McGillivray 1993). The group includes 20 taxa, including subspecies, and is distributed through south-eastern Australia. It is an informal grouping within the Asplenifolia-Hookeriana Subgroup of the Pteridifolia Group in Makinson's (2000) informal classification of *Grevillea*.

Grevillea aquifolium is the second-most widespread holly grevillea species and currently the most morphologically variable (Fig. 1). Olde and Marriott (1995) distinguish some 12 'horticultural forms' of *G. aquifolium* on the basis of leaf and floral morphology as well as flower colour. In South Australia, *G. aquifolium* is confined to several small disjunct populations in the lower southeast of the state, from ~25 km northeast of Robe to the coast southwest of Mt Gambier (McGillivray 1993; Olde and Marriott 1995) (Fig. 1). South Australian populations include Carpenters Rocks, Buck Lake Conservation Park and in the West Dairy Ranges. *Grevillea aquifolium* is mainly found in western Victoria, from the Stawell and Grampians area to the Little Desert (Olde and Marriott 1995; Makinson 1996). The species is also found in the Kentbruck Heath area near Portland in far southwest Victoria (McGillivray 1993; Olde and Marriott 1995; Makinson 1996).

Grevillea aquifolium grows in a variety of sandy soil types and in a wide range of habitats, including wet to dry sclerophyll forest, open woodland, low to tall heath-land, swampland and mallee woodland (Barker 1986; Olde and Marriott 1995; Makinson 1996, 2000). More rarely, populations are found on clay or loamy soils derived from limestone, including limestone outcrops or pavements (Olde and Marriott 1995; Makinson 1996, 2000).

Grevillea aquifolium is primarily bird pollinated; however, pollination may also be facilitated by bees and/or ants (pers obs. 2006, 2008). Regeneration is from either seed or root-suckers, with some populations exclusively clonal (Makinson 2000). Natural hybrids occur between *G. aquifolium* and

G. microstegia in several areas on and below Mt Cassell in the Grampians, especially along Redman Road where populations of both species are in close proximity to each other (Olde and Marriott 1995a). In addition, there is a hybrid population of *G. aquifolium* and *G. montis-cole* near Mt William in the central Grampians (N. Marriott pers comm. 2007). The two forms from the Little Desert National Park ('Cooack' and 'Little Desert suckering' forms; Olde and Marriott 1995) are very similar in appearance, but differ in their mode of reproduction: the 'Little Desert (suckering)' form is apparently clonal, while the 'Cooack' form regenerates only via seed. Finally, the 'South Australian' form of *G. aquifolium* differs from the Victorian populations by growing on alkaline soils, with several populations growing in soil pockets on limestone outcrops (Olde and Marriott 1995).

Over most of its geographical range, *G. aquifolium* is widespread and common, with many populations located within State or Federally-protected parks, in particular Grampians National Park, or within State Forests or other reserves. However, several populations, especially at Cooack and Portland, have been reduced by clearing for agriculture and are close to extinction (Olde and Marriott 1995). In addition, if definable groups are found to be present within *G. aquifolium* and require formal recognition, then the conservation status and requirements of several populations may need to be re-assessed.

Project Aims

The main components of my Ph.D. project are to:

- document the morphological variation within *G. aquifolium* across its geographic range.
- investigate genetic variation, using microsatellites (SSRs), and determine whether this is correlated with morphological variation, and to what extent this is influenced by local population size or gene flow between related species.
- resolve the taxonomy of *G. aquifolium* regarding forms: i.e., are there definable groups present within this species that require recognition and if so, what is their conservation status?

The financial support provided through the Hansjörg Eichler Scientific Research Fund made the initial generation of multiplexed microsatellite profiles possible.

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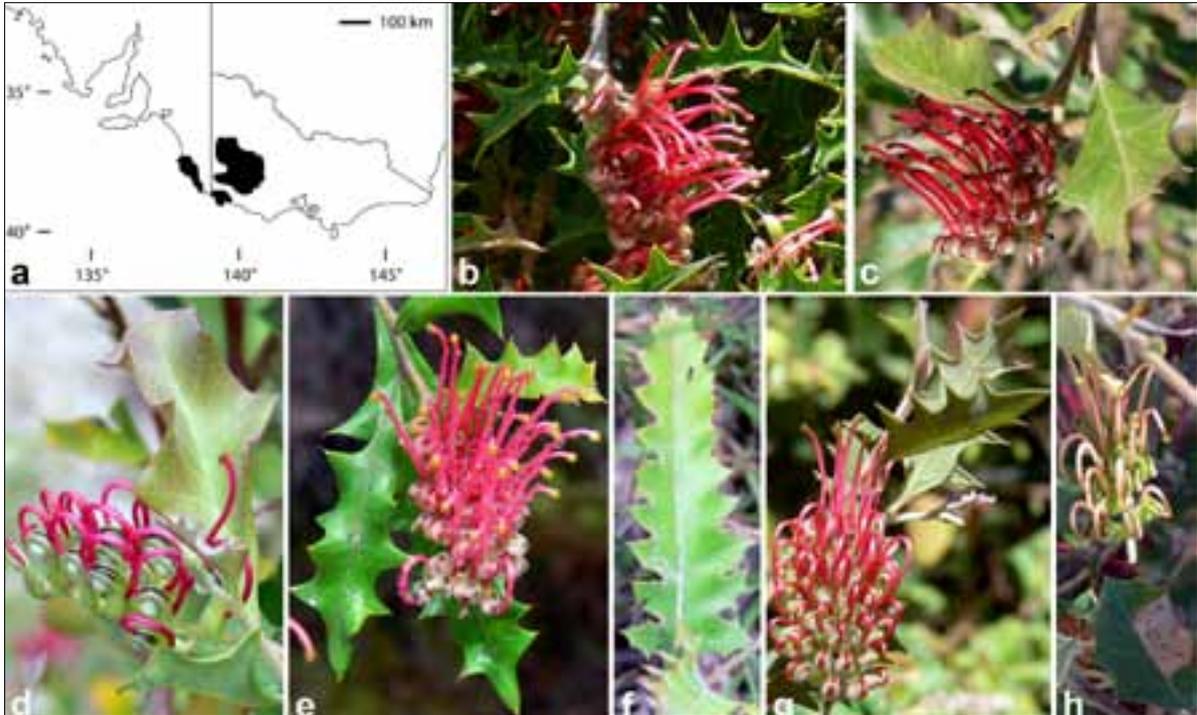


Figure 1. *Grevillea aquifolium*. (a) Distribution map of *G. aquifolium*. (b-h) Some examples of the morphological variation observed in *G. aquifolium*: (b) Mt William, Grampians National Park Vic.; (c) Pomonal, Grampians National Park Vic.; (d) Bray Junction Native Forest Reserve, SA; (e) Goat Track, Grampians National Park Vic.; (f) Fyans Creek, Grampians National Park Vic.; (g) Redman Road, Grampians National Park Vic.; and (h) Natimuk-Hamilton Rd, Vic.

Field Work

In November 2006 I undertook fieldwork in the Grampians and Little Desert National Parks in western Victoria. Unfortunately, the month before I commenced my Ph.D. (March 2006), a bushfire burnt a large area of the Grampians National Park and so the opportunity to collect was limited, with many areas, particularly the Victoria Valley, closed to all traffic. The devastation caused by the bushfire was severe (Fig. 2), with some mature trees completely burnt through.

However, I was able to collect *G. aquifolium* from 24 sites along the eastern side of the park,

including from the Mt William, Mt Difficult and Serra Ranges. I also collected *G. aquifolium* from two sites in the central block of the Little Desert National Park. The leaves of the Little Desert plants, growing on straight white sand, were yellow-green in colour with the leaves curled in on themselves, minimising water loss. The sand was so white that I kept expecting to see the ocean each time we climbed a ridge or turned a corner! Despite the restrictions on collecting in the Grampians, the trip was a success; I collected 132 plants with both vouchers and leaves for DNA analysis from 26 sites.



Figure 2. Photos of the Grampians National Park, taken in February 2006, six months after the Mount Lubra bushfire. On the pathway to The Balconies from Reids Lookout (at left), and the road to the Mount William carpark (at right), looking along the road towards Halls Gap.

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Genetic Variation: Microsatellites

Microsatellites, also called Short Simple Repeats (SSRs), Simple Sequence Repeats (also SSRs) or Short Tandem Repeats (STRs), consist of short sequences of DNA, usually 2–6 base pairs (bp) long, that are repeated so as to give short arrays of 20–100bp at each locus (e.g., ATATATATAT...) and are randomly distributed throughout the nuclear and plastid genomes (Armour *et al.* 1999; Wang *et al.* 1994; Goldstein and Schlötterer 1999). Microsatellites are usually highly polymorphic molecular markers, with many alleles at a particular locus. The variation detected in microsatellite analyses results from changes to the number of repeat units due to errors in DNA replication at the locus under study (Avice 2004; Lowe *et al.* 2004; Armour *et al.* 1999). Microsatellites are relatively abundant, highly reproducible co-dominant markers (i.e., heterozygotes can be distinguished in the profile) that are thought to have a uniform coverage across the genome. They are considered to have high mutation rates compared with other DNA markers, making them useful for intra-population level studies of organisms (Lowe *et al.* 2004).

Microsatellites have been used in studies of population-level genetic variation in a broad range of species including other *Grevillea* species (Goldstein and Schlötterer 1999; England *et al.* 2002; Whelan *et al.* 2006; Hoebee 2002). Fortunately, there already exist 12 nuclear microsatellite primers for use in *Grevillea*, developed from *G. macleayana* (England *et al.* 2002) and *G. iaspicula* (Hoebee 2002). Some of these primers are known to amplify microsatellites in other holly grevillea species such as *G. repens* (Holmes *et al.* 2008), *G. infecunda* and *G. renwickiana* (E. James pers comm. 2008). In the initial screen, I determined that four microsatellite loci developed from *G. macleayana* (primers Gm10, Gm13, Gm15, Gm25; England *et al.* 2002) were transferable to *G. aquifolium*. DNA was extracted from all plants collected so far and the amplifications (via PCR) of each microsatellite primer performed separately. The PCRs were performed separately to make sure that each primer had been successfully amplified. The PCR products were then multiplexed and sent for separation by capillary electrophoresis by Applied Genetic Diagnostics (Department of

Pathology, University of Melbourne). An initial analysis of the data obtained from 83 plants scored for three microsatellite loci (primers Gm10, Gm13, Gm15) was performed and the preliminary results were presented at the 2008 ASBS Conference in Adelaide.

The results so far show that microsatellite primers developed from *G. macleayana* are transferable to *G. aquifolium*. For the 83 collections analysed, there were 12 shared multi-locus genotypes (more than one plant exhibiting the same genotype) and 47 unique multi-locus genotypes. Of the 12 shared multi-locus genotypes recovered in the preliminary analysis, one showed possible evidence of clonality. This genotype was found in three of five plants collected at a single locality (Crater Track, Little Desert National Park Vic.) and returned statistically significant Pgen and Pse values of <0.0001 and <0.01, respectively. The probability of genotype (Pgen) is an estimate of the probability of identical genotypes arising under sexual reproduction with random mating, while the probability of second encounter (Pse) is an estimate of the probability of a second encounter of a specific multi-locus genotype generated by sexual reproduction under random mating. Significant scores for both of these probability estimates suggests the possibility of clonality at this locality; Olde and Marriott (1995) also described an exclusive clonally-reproducing population from this area.

The microsatellite markers analysed (Gm10, Gm13, Gm15) show variation both within and between collecting sites; there is also some suggestion of genetic differentiation between Grampians and Little Desert populations, but the sample sizes are not yet sufficient.

Current and Future Directions

Recently in December 2008, I completed fieldwork in south-eastern South Australia and western Victoria, with the objective of collecting samples from disjunct populations on *G. aquifolium* in those areas. I was able to collect specimens from Carpenter Rocks (near Mount Gambier) and also from the Bray Junction and Bagdad Native Forest Reserves near Robe in South Australia. These collections represent the western extremities of the geographic distribution of this taxon. From Victoria I was

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able to collect specimens from the eastern parts of the Little Desert National Park (Cooack Rd area); the Black Range State Park; Deep Lead Flora Reserve and Stawell; the Lower Glenelg National Park near Portland and from the Victoria Range in the Grampians National Park. *Grevillea aquifolium* has now been collected from the major known areas of its distribution; DNA isolation and preparation of microsatellite profiles for these collections will commence early in 2009.

I am currently screening the remaining microsatellite loci to determine whether they are applicable to *G. aquifolium*. I have three more loci that are amplifiable and polymorphic in *G. aquifolium* and am in the process of optimising the PCR protocols for the other loci to check whether they are applicable. Approximately one-third of the initial profiles need to be repeated to confirm presence of peaks for some loci. I am also testing chloroplast DNA regions for DNA sequencing; this work will build on the work already done by Gareth Holmes (University of Melbourne).

Acknowledgements

I would like to thank the Australian Systematic Botany Society for financial support provided through the Hansjörg Eichler Scientific Research Fund. I would also like to make special mention of Greg Downing, for accompanying me on the fieldtrips in 2006 and 2008, as well as Val and Andrew Downing, who participated in the December 2008 trip to South Australia and western Victoria. I would like to thank the Parks Victoria rangers, Department of Sustainability and Environment (DSE) and ForestrySA officers, for their assistance and access to national parks and forestry land and Neil Marriott, for suggesting potential collection sites. Finally I would like to thank my supervisors Dr Mike Bayly and Prof. Pauline Ladiges for their help, guidance and support.

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The *Grevillea* and *Hakea* relationship

Once it was mentioned to me that *Grevillea* and *Hakea* had similar features to the extent that there may be a cross over that causes some or all to be lumped together, they are so closely related. The individual flower appearance on both is very similar making identification on this feature between genera difficult. Most of the characteristics defining both genera are present in a small subset of species of the other genera.

The majority of *Hakea* species have leaves in which both surfaces are similar in appearance or, if they are terete, they are usually without an obvious groove or grooves for their whole length, however *Grevillea hakeoides* is so similar that this feature is reflected in its name.

Styles and ovaries are, with only 1 or 2 exceptions, glabrous in *Hakea*, but so they can be in *Grevillea*; in this case the presence of hairs can generally be taken as an indication of *Grevillea*. *Hakea* species have sessile ovaries and so a stipitate ovary is an indication of *Grevillea*, however I think this is not so in the corkwood *Hakeas* like *H. lorea*.

Hakea fruits are woody and retained for some time on the plant in an unopened state, however some readily open on the plant such as *H. nodosa* and *H. sericea*. The fruits of *Grevillea* are not woody and not usually retained on the plant, however some are woody as in *G. glauca* with fruits that are big enough to be used as clothes pegs, hence the name "Bushman's Clothes Peg". Some have the warty appearance of *Hakea* fruit, as in *G. petrophiloides* and other *Grevilleas* have seeds almost identical in shape to some *Hakeas*. Open woody *Hakea* fruits reveal seeds with an asymmetrical papery wing while the seeds of *Grevillea* are either symmetrically winged or not winged at all. The opened *Hakea* fruit displays two distinct coloured wood sections and often this is stated as another difference to *Grevillea* however I believe the darker coloured wood in the fruit is just the colouring transferred

from the dark wings of the seed. If you scratch this dark section the colouring comes off and is extremely thin, the underneath colour is the same as the remainder of the fruit. This does not make a strong key.

On general plant appearances, many species of both genera look similar as in the flowers of *G. petrophiloides* and *G. stenobotrya* resemble *H. bucculenta*, and my first observation of *G. australis* made me think how it looked like many of the *Hakeas*. *H. purpurea* is often confused by some as being a *Grevillea* and *G. subterlineata* at first glance resembles a *Hakea*.

The clear, definitive, botanical identification differences between *Hakea* and *Grevillea* that can be applied with 100% accuracy are boiled down to the papery wings on the seed! This is less of a difference than between closely related species and even sub-species of other genera. This is very similar to the differences between *Banksia* and *Dryandra* that were lumped together although actually based on DNA. Will DNA be used to determine the *Hakea* and *Grevillea* story, hopefully this would not lead them to be lumped together but their relationship just noted in the general description. As has been pointed out to me *Grevillea* could be defined by the shape of the conflorescence, a distinction can be made between cylindrical conflorescence and one-sided tooth brush flower shape. Let's not talk about *Lomatia* and its seeds and its relationship to *Grevillea*.

Reference

Australian Hakea species: identification and information by Robyn Barker

Some observations on growing Grevilleas from cuttings (and a few questions)

Over the last few years, we took cuttings in February-March because we believed that providing we could keep the pots moist and prevent overheating, they would root much more quickly and still have plenty of time to develop into sizeable plants by late autumn. Many were *Eremophilas* which we were growing for our daughter in Mildura and the results were, to say the least, spectacular – 100% success in three to five weeks was not uncommon.

This year we tried a few Grevilleas as well and went even earlier, January 14. The ones I had least faith in were *G. 'Robyn Gordon'* and *G. 'Pink Surprise'*. Both parent plants are over 30 years old and have just come out of around 11 years of drought. I really struggled to find any decent cutting material but finished up with four pieces for each, heel cutting with a few new leaves. Our propagation set-up is not sophisticated, no misting or bottom heat, just a small glasshouse facing north and covered with shade cloth on hot days. Being a traditionalist, I still use coarse washed sand as the main propagating medium, mixed 4 to 1 with fine coir peat. Cuttings were dipped in "Clonex Purple".

Imagine my surprise when on February 11, just four weeks later, I saw roots growing out of the drainage holes in 'Robyn Gordon'. Surprise turned to astonishment when I found that all four pieces had good strong roots, something I would have thought impossible from such unpromising starting material. The attached picture shows the potted up plants in mid March, just two months after the cuttings were taken. 'Pink Surprise' was somewhat slower, two with roots by 2 March, but given that we have in the past had trouble striking it, we were more than satisfied.

Contrast this with the behaviour of one of my favourites, *Grevillea buxifolia*. We have grown this since the early 1970s and always manage to have a few plants in the garden, grown from cuttings. The trouble is, they seem to be very difficult to strike, we only ever seemed to get one or two out of a batch, often none at all. And they take forever to strike. From a batch we took on 25 March last year, one had roots by late October with two more by December. (This year's batches have done nothing so far). Of course, this sort of thing characterises growing Australian plants, some species are easy to propagate, others prove to be impossible. So this prompts me to ask a few questions.

How old is a cutting-grown plant?

Put at its simplest, the question is "If I strike cuttings from a ten year plant, how old is the resultant plant?" Richard Tomkin asked this question in N/L 54 of October 1999 (p. 6) and considered that the answer would be "ten years". So that "new" plant you have proudly grown may already be well into middle age. If this proposition is true, it has other ramifications for the length of life we might expect to get from a plant. Say a species has a garden life of 15 to 18 years. A new plant grown from a 10 year old specimen might then only survive for around five to eight years in the garden. Given that cuttings are normally taken from new growth, which means plant cells that have developed in the previous few months, it all seems a bit difficult to believe but I guess it is all to do with genetics. Remember the first cloned animal, Dolly the sheep? I have seen it said the Dolly was a three year old lamb when born (her mother was three at the time of cloning). So my challenge is, can someone provide a scientific explanation of the proposition that a cutting grown plant is effectively/genetically the same age as the specimen from which it was taken.

Is there any way to improve the strike rate for cuttings that are difficult to root?

There are obviously other techniques such as bottom heat, misting, use of different rooting compounds, heel or stem cuttings etc which may or may not lead to improvement but I was told many years ago of a practice which I have not tested but which was claimed to give better results over time. This involved taking cuttings of very young material and then continually taking cuttings from the next generation progeny. The theory goes like this. Say you struck one out of twenty at your first attempt. You then take cuttings from that one plant and the result might be three struck cuttings. You take cuttings from these and you might get say, seven out of twenty, and so forth. Sounds good but does anyone know if it works/will work? How do nurseries continue to supply year after year new batches of hybrids which do not propagate from seed? Do they regularly replace their stock plants and if so how do they prevent an inevitable decline in vigour over time? (especially if our proposition about the genetic age of cutting grown specimens, above, is correct). Is anyone able to further this discussion?

continued >

Postscript

It is May 2 and I have just planted out one "Robyn Gordon" and the strongest "Pink Surprise". Remember, the cuttings for these were taken from plus 30 year old parents on 14 January and struck within a few weeks. The "Pink Surprise" was about 30 cm high, the "Robyn Gordon" plants between 20 and 25 cm, while the original cutting material was no more than 5 to 8 cm., amazing growth in some three and a half months from setting the cuttings. It appears that taking cuttings in summer has much to recommend it.



45g Grevillea cuttings May 2012

Seed Bank**Matt Hurst**

37 Heydon Ave, Wagga Wagga 2650 NSW
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Please include a stamped self addressed envelope.

\$1.50 + s.a.e.

<i>Grevillea aurea</i>	<i>Grevillea monticola</i>
<i>Grevillea baileyana</i>	<i>Grevillea nana</i>
<i>Grevillea banksii alba</i> prostrate	ssp <i>abbreviata</i>
<i>Grevillea biternata</i>	<i>Grevillea newbeyi</i>
<i>Grevillea</i> <i>candelabroides</i>	<i>Grevillea nudiflora</i>
<i>Grevillea crithmifolia</i>	<i>Grevillea occidentalis</i>
<i>Grevillea decora</i>	<i>Grevillea paniculata</i>
<i>Grevillea decurrens</i>	<i>Grevillea paradoxa</i> (ltd)
<i>Grevillea eriobotrya</i>	<i>Grevillea polybotrya</i>
<i>Grevillea eriostachya</i>	<i>Grevillea pteridifolia</i>
<i>Grevillea excelsior</i>	<i>Grevillea pulchella</i>
<i>Grevillea floribunda</i>	<i>Grevillea refracta</i>
ex Coonabarabran	<i>Grevillea ramosissima</i>
<i>Grevillea glauca</i>	<i>Grevillea stenobotrya</i>
<i>Grevillea johnsonii</i> (ltd)	<i>Grevillea striata</i> (ltd)
<i>Grevillea juncifolia</i>	<i>Grevillea superba</i>
<i>Grevillea leucopteris</i>	<i>Grevillea synapheae</i>
<i>Grevillea longistyla</i>	<i>Grevillea teretifolia</i>
<i>Grevillea magnifica</i>	<i>Grevillea tetragonoloba</i>
ssp <i>magnifica</i>	<i>Grevillea triloba</i>
<i>Grevillea manglesii</i>	<i>Grevillea triternata</i>
ssp <i>manglesii</i> (ltd)	<i>Grevillea vestita</i>
	<i>Grevillea wickamii</i>
	ssp <i>aprica</i>
	<i>Grevillea wilsonii</i>

Free + s.a.e.

<i>Grevillea nana</i> ssp <i>abbreviata</i>	<i>Grevillea leucopteris</i>
<i>Grevillea banksii alba</i>	<i>Grevillea longistyla</i>
<i>Grevillea banksii</i> – grey leaf form	<i>Grevillea mimosoides</i>
<i>Grevillea banksii</i> – red tree form	<i>Grevillea</i> 'Moonlight'
<i>Grevillea banksii</i> – red prostrate	<i>Grevillea</i> 'Moonlight x Ivanhoe'?
<i>Grevillea Bon Accord</i>	<i>Grevillea occidentalis</i>
<i>Grevillea caleyi</i>	<i>Grevillea plurijuga</i>
<i>Grevillea crithmifolia</i>	<i>Grevillea pteridifolia</i>
<i>Grevillea decora</i>	<i>Grevillea robusta</i>
<i>Grevillea didymobotrya</i>	<i>Grevillea</i> 'Sandra Gordon'
<i>Grevillea diversifolia</i>	<i>Grevillea superba</i>
ssp <i>subtersericata</i>	<i>Grevillea synapheae</i>
<i>Grevillea eriostachya</i>	<i>Grevillea tripartita</i> ssp <i>macrostylis</i>
<i>Grevillea floribunda</i>	<i>Grevillea vestita</i>
<i>Grevillea goodii</i>	<i>Grevillea wilkinsonii</i>
<i>Grevillea johnsonii</i>	
<i>Grevillea johnsonii</i> 'Orange'	

Please note: seed from hybrid -substitute -cultivated plants does not necessarily come true to type.

Fresh stocks of garden seed are desperately needed as most species are almost out of seed. Can members asking for seed please give an alternative list in case some species are no longer in stock. It is preferred if requests are sent with a small padded post pack. It costs less to send at approx \$1.50 per letter than padding an envelope at \$2.00 each or more so the seed will survive the trip down the sorting rollers. It's a good idea to send extra stamps with requests as extra postage is usually needed to be paid with almost every request. Leftover stamps would be sent back with your seed.

Financial Report – February 2013

Income

Subscriptions	\$285.00
Seeds	4.50
Interest	3.88

\$293.38

Expenditure

Newsletter publishing	\$240.00
Printing	234.90
Postage	57.55
Bank fees	2.50

\$534.95

Amount in interest bearing deposit till 25/2/2013
\$28,755.26

Balance in current account 1/2/2013
\$1,142.73

Balance in business cheque account 1/2/2013
\$982.68

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Curator of Seed Bank

Matt Hurst
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Email Group

This email group was begun by John and Ruth Sparrow from Queensland. Free membership.

To subscribe, go to groups.yahoo.com and register, using the cyber-form provided. You must provide a user name and password as well as your email address to enable continuing access to the site which houses all emails and discussions to date.

You will receive a confirming email back and then you are able to access the site wherein you can select the groups to which you would like to subscribe. In this case search for 'grevilleas' and then subscribe.

Following this you will receive the latest emails regularly in your email to which you can respond. This is a good way to encourage new growers and those interested in the genus.

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grevilleas@yahoogroups.com
3. URL for Grevillea Study Group website
<http://asgap.org.au/grevSG/index.html>

Deadline for articles for the next newsletter is 31 May 2013, please send your articles to peter.olde@exemail.com.au before this date.

If a cross appears in the box, your subscription 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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