

Australian Native Plants Society (Australia) Inc



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GSG Vic Programme 2016

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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.

See page 3 for details on Victorian activities.

GSG Living Collection

There has been further extensive planting of the collection, with the development of a South Australian Grevillea bed, a *Grevillea alpina* hill, many areas of Western Australian Grevilleas and a lovely NSW Grevillea bed. Any volunteer help would be greatly appreciated as the garden is now getting just too much to care for alone. Special thanks must go to those members who have donated plants recently to the collection: Brian Weir, Graeme Woods, Phil Vaughan, Neville Collier, Dave Binch, Barry Teague, Mike Williams, Humphris Nursery and Kuranga Nursery. Any members wishing to get seed or cutting material are most welcome – come and have a look around and collect your own.

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GSG NSW Programme 2016

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

GSG SE Qld Programme 2016

Meetings are usually held on the last Sunday of the even months. We meet for a communal morning tea at 9.30am after which the meetings commence at 10.00am. Visitors are always welcome. For more information or to check venues etc please contact **Ross Reddick** on 0405 510 459 or **Denis Cox** on (07) 5546 8590 as changes can occur.

Sunday, 28 August

VENUE: Meet at the Lookout in Kooralbyn, (which has a visitor facilities and is quite close to Bryson Easton's Street) for morning tea. After Morning tea we will move on to Bryson Easton's property

SUBJECT: Bryson to guide a tour of his property

PHONE: 0402 242 180

TIME: 9:30am for 10am meeting

Monday, 26 September

VENUE: Mt Coot-tha Botanic Garden; meeting in the picnic shelters where road becomes two way (note the change to Monday is so that members can drive into the Grevillea garden area)

SUBJECT: Review of the Grevillea Gardens

TIME: 9:30am for 10am meeting

Sunday, 30 October

VENUE: At the home of Fran and Jim Standing Mount Clunie, Mount Clunie Road, Woodenbong, NSW 2476

SUBJECT: TBA

PHONE: (07) 4666 5118

TIME: 9:30am for 10am meeting

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

Peter Olde

Welcome to midwinter. As this issue is the responsibility of the Queensland members I want to thank them all for their contribution to this high quality newsletter. There is administrative change north of the border too. Thanks to Bryson Easton and Noreen Baxter who have worked reliably and tirelessly for the Study Group for last few years. Welcome Denis and Ross and thanks for putting up your hand. Denis is co-author and driving force behind the book *Mangroves to Mountains*, an excellent flora guide. Other authors include wife Jan Glazebrook, Glenn Leiper and Kerry Rathie, all strong supporters of the *Grevillea* Study Group.

The conservation situation with *Grevillea hodgei* is serious. This important and rare species was once widely sold and grown in Australia. But now no-one grows it much and I find it hard to get in nurseries. Whatever happened to conservation by cultivation? It is a hardy 'tropical-style' species that tolerates quite low winter temperatures. Australians generally have missed the boat with this species. Under the name 'Spiderman' *Grevillea*, it was the leading *Grevillea* seller in the Dutch flower market for many years with thousands of bunches sold annually out of Israel. This is a species we can all get behind. Letters to political masters will hopefully assist in its preservation on Rupari Hill. Of course, it bears the name of one of our iconic members and *Grevillea* lover, Merv Hodge. See Glenn Leiper's article.

I note with sadness the recent death of Dave Mason, known to many of you for his enthusiasm and grafting ability. He phoned me soon after the doctors had told him they could do no more. He was not apparently overwhelmed. 'We'll see what happens' he remarked as he donated all his best slides to GSG and began updating his contribution as an author of the *grevilleas* of north-east New South Wales. Sadly, we seem to be losing all our old members.

I was shocked to see repeated in the Queensland State Newsletter an excellent article that emanated from the Bonsai SG. It is an aspect of cultivation we do not see much. The National Bonsai and Penjing Collection is located with the National Arboretum in Canberra. We visited during the Federal Conference, but it is a worth a private visit for the excellence of its display and the variety of species. Everyone is welcome.

Unfortunately we have had to leave out a number of articles in this issue that have accumulated from various authors outside Queensland. Sometimes we do not have the space or the article clashes with the newsletter theme, if there is such a thing. We try to give priority to the state responsible for the articles. New South Wales is next but we will publish all outstanding articles in the next newsletter. We ask for your understanding and patience. Do not make the mistake of thinking your efforts are unwelcome.

Peter Olde

David Rex Mason January, 1944 – March, 2016

I write with great sadness to record the passing of Dave Mason at the age of 72 years from cancer. Dave came to attention in the *Grevillea* Study Group when, from his home at Woodburn in northern New South Wales, he enthusiastically embraced *grevilleas* and the art of grafting them. It was around 1990 when I asked him for some help in tracking down in the wild some populations that I thought might be new species of *Grevillea*. It was Dave who sought them out locally and took me to them, little suspecting that I would name *Grevillea masonii* for him. Dave aimed to grow all the species and graft them, maintaining a section of his garden for them that he proudly displayed to any visitors.

Dave was born in South Australia and worked for the PMG. from the age of 15, eventually rising to Postmaster. After marrying Eva in 1980, he continued working with the postal service before deciding to leave and become self-employed, first with the purchase of a bread run in Brisbane, later with the purchase of a milk run around Coraki. Later they purchased a book business in Brisbane before retiring to Valla Beach where Dave became a part-time school bus driver.

During his time with the Far North Coast Group of SGAP, Dave produced two booklets on the north coast Proteaceae - *Banksia* and *Grevillea*. He also assisted the late Dr. Calder Chaffey in the production of his book on ferns. During the time of his final illness, after being told nothing further could be done, he rang me and donated his slides and spent time updating his books on the Proteaceae, which he donated to the Lismore Botanic Garden. Dave was an enthusiastic traveller and I wish him well on his journey into the unknown. Dave showed great courage and resignation at being told his time was coming fast. He leaves Eva, his wife, and two daughters whom he adored now grown to adulthood.



Victorian Chapter news

Grevillea Crawl Central Victoria: Saturday 20th – Monday 22nd August

Ian Evans will be leading us to see some of the more unusual and new Grevillea sites that he has discovered around the Bendigo region, as well as visits to top native gardens and nurseries.

Please register ASAP with Neil Marriott at neil@whitegumsaustralia.com or 0353 562404 ASAP if interested. If there are not enough members registering the weekend will have to be cancelled, so please register now.

Tentative itinerary

(detailed itinerary will be emailed/ sent out to all registrants prior to trip)

Saturday 20th August: Meet at **Bealiba** (*G. ilicifolia*), **Kingower** (*G. dryophylla, alpina, micrantha*), **Rose Hill – Nth of Inglewood** (*G. alpina, rosmarinifolia*), **Terrapee** (*G. rosmarinifolia*), **Quambatook** (*G. rosmarinifolia*), **Derby** (*G. rosmarinifolia*). Return to Ian and Lynn Evans at **29 Evans Rd, Myers Flat** for BYO BBQ and social get together. Overnight stop at Eaglehawk for a motel or Maiden Gully for a caravan park.

Sunday 21st: August Jackass Flat (*G. alpina, dryophylla*), **Bagshot** (*G. rosmarinifolia, alpina*), **Barnadown** (*G. rosmarinifolia, alpina*), **Costerfield** (*G. sp aff alpina*), **Heathcote/Mt Ida** (*G. alpina*), **James Ck** (*G. rosmarinifolia*), **Elphinstone** (*G. alpina, dryophylla? rosmarinifolia*), **Taradale** (*G. alpina, obtecta*) **Lauriston** (*G. repens?*). Return to Bendigo for tea at local pub.

Monday 22nd August: Garden visits to Beth and Geoff Hosking garden and Marilyn Sprague's garden, Mandurang. Nursery visit to Goldfields Nursery, Tannery Lane Mandurang.

The Living Collection

We have had wonderful autumn and winter rains in the Grampians region this year, and are now madly planting out the many new Grevilleas we have purchased or been given over the last 12 months. Special thanks must go to Phil Vaughan, Barry Teague, Brian Weir, Robert Brown and Dave Binch for their most generous donations to the living collection. Phil has discovered a superb dwarf form of *Grevillea candelabroides* and now has these available as grafted plants. We have now added a further 38 species and subspecies to the collection, and are just about to plant out an avenue of wonderful grafted standards along the entrance track into the Grevillea gardens.

Special thanks must also go to Barry Teague from Swan Hill, who came down and spent almost a week here, digging holes and preparing for our winter plant out. Barry also had the only known living plants of *Grevillea brachystachya* under cultivation and from seed he provided from these, we have now planted out both grafted and seed grown plants. Thanks also to Mt Annan Botanic Gardens for providing wonderful grafting material for the living collection.

If you would like a free holiday in our B&B cottage in return for a bit of work in the gardens just let me know! And don't forget, free cutting material for any members of the Study Group – let me know what you are after!!

Ross Reddick

Grevillea Study Group (SEQ) report

In recent years there has been some concern regarding the steady decline in the numbers attending meetings. At the same time it was noticed that the meetings scheduled for "outside" the Brisbane area attracted a number of extremely interested and interesting visitors. So a conscious decision was made to hold some meetings "outside" of Brisbane. This has resulted in an increased number of attendees at meetings, but the additional travel does make it harder for some folk to get to all the meetings.

Anyone who has difficulty getting to meetings is welcome to contact Bryson Easton on 0402 242 180 or bryson.easton@hotmail.com or myself on 07 3871 3932 or rbaxn2@bigpond.com. as it might be possible for a member living near them to provide them with a lift.

The 2016 Meeting Calendar reflects the increasing number of rural participants and has really put the SEQ in our Grevillea Study Group. Also it provides an opportunity for members to enjoy a wider range of lovely gardens.

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Another side effect of travelling further for meetings is that some attendees plan an overnight stay in the area with the beneficial side effect of increasing the social interaction of members. In particular our meeting at Mount Clunie, NSW has become the outstanding annual event. The hospitality of Fran and Jim Standing in not only hosting the meeting but offering overnight camping facilities to all comers, plus cabins for a fortunate few, combined with their spectacular garden makes it a great weekend. The attendees who arrive Saturday afternoon have ample time to enjoy the garden or take a walk on Mt Clunie followed up with a communal evening meal. Attending a meeting has never been so relaxing and entertaining as everyone shares their experiences, knowledge and love of gardening.

This year our group has received a "boost" with the attendance of growers Richard and Lana Tomkin and Phillip and Alexis Vaughan at a couple of meetings. The opportunity to buy some of their stock and hear their propagation and grafting techniques has been greatly appreciated.

The Grevillea Study Group (SEQ) has had a lengthy relationship with the Mount Coot-tha Botanic Gardens. In 2015, after 42 years as Curator of the Botanic Garden Ross McKinnon retired. Dale Arvidsson, previously Curator at the Mackay Botanic Garden has been appointed as his successor.

I believe it was Merv Hodge who initiated a policy of donating some Grevilleas and assisting Mount Coot-tha to source other Grevilleas for the garden. This is a worthwhile tradition which GSG has continued. Now under the care of Roseanne Matters and her staff the Grevillea Garden has flourished and is looking the best I have ever seen it. The Mount Coot-tha staff are to be congratulated on the current high standard of the Native Plants section of the gardens.

On week days cars can be driven into the Mt Coot-tha Botanic Gardens grounds and parked close to the Native Plant section. On weekends the gardens are closed to vehicular traffic so a lot of visitors to the gardens never make to the Native Plant Section which is located quite a distance from the entry gate and up a fairly steep hill. If you come to Brisbane, or if you live here and have not recently done so, include the Botanic Garden on your must do list, it is well worth a visit for an hour or two or a day. A GSG (SEQ) meeting will be held at the Mt Coot-tha Botanic Garden on 26 September 2016, this is a Monday so that the less mobile members will be able to drive right into the area where the Grevillea gardens are situated.

Peter Olde

Conservation Biology © 2002 Wiley

Abstract:

Grevillea scapigera is one of the world's rarest plant species, currently known from only five plants in the wild. In 1995, 10 plants were selected from the 47 plants known at the time to act as genetically representative founders for translocation into secure sites. Ramets were micropropagated and introduced into one of these secure sites (Corrigin) in 1996, 1997, and 1998. By late 1998, 266 plants had been successfully translocated and were producing large numbers of seeds. With the development of an artificial seed-germination technique and because of an absence of seed germination in situ, seed was collected from these plants and germinated ex situ, and 161 seedlings were returned to the field site in winter 1999. We used the DNA fingerprinting

technique of amplified fragment-length polymorphism (AFLP) to (1) assess the genetic fidelity of the clones through the propagation process, (2) contrast genetic variation and average genetic similarities of the F1s to their parents to assess genetic decline, and (3) assign paternity to the reintroduced seeds to assess the reproductive success of each clone. We found that 8 clones, not 10, were present in the translocated population, 54% of all plants were a single clone, and the F1s were on average 22% more inbred and 20% less heterozygous than their parents, largely because 85% of all seeds were the product of only 4 clones. Ultimately, effective population size (N_e) of the founding population was approximately two. Our

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results highlight the difficulty of maintaining genetic fidelity through a large translocation program. More generally, rapid genetic decline may be a feature of many translocated populations when N_e is small, which may ultimately threaten their long-term survival. Strategies to reverse this genetic decline include equalizing founder numbers, adding new genotypes when discovered, optimizing genetic structure and plant density to promote multiple siring and reduce kinship, promoting natural seed germination in situ rather than artificially germinating seeds ex situ, and

creating a metapopulation of numerous translocated populations to restore historical distribution patterns and processes.

Rapid Genetic Decline in a Translocated Population of the Endangered Plant *Grevillea scapigera*
Siegfried L. Krauss, Bob Dixon and Kingsley W. Dixon
Conservation Biology
Vol. 16, No. 4 (Aug., 2002), pp. 986-994
Published by: Wiley

Peter Olde

Grevillea montana

According to Loudon (1830: 40) *Grevillea montana* was introduced to horticulture in 1822. The most likely source was Allan Cunningham or Charles Fraser. Cavanagh (1984: 11) gives an introduction date of 1803 and suggests it to be a probable form of *Grevillea mucronulata*. No reference for this date was cited, and regrettably, none can be found subsequently. Sweet (1818: 22), incorrectly cited by Olde & Marriott (1994: 111) as the source for the same date, does not mention *G. montana* at all but gives the date 1803 for *Grevillea arenaria*. Cavanagh (1995: 6) gives Peter Good as the collector but according to Edwards (1981) Good did not travel to the area of its occurrence. Sweet (1830: 446) also lists its introduction but gives no date. Since *G. montana* is not listed in any other earlier nursery catalogue including Knight (1808: 75), nor by Aiton (1810–13) at Kew, the introduction date of 1803 seems likely to be erroneous for *G. montana*.

Nonetheless, Robert Brown well knew this species as a dried specimen. He described it in 1810 from a specimen that I believe was collected by Francis Barrallier during a survey of the Coal River and district near Newcastle in 1802. Horticulturally though it was not introduced until at least 1822.

References

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Olde PM & Marriott NR (1994) The *Grevillea* Book. Vol. 1. (Kangaroo Press: Kenthurst, New South Wales)

Sweet R (1818) Hortus Suburbanus Londinensis. p. 22. (James Ridgway: London)

Sweet R (1830) Sweet's Hortus Britannicus. Edition 2. [*Grevillea* P. 446] (James Ridgeway: London)

Erratum

An exploration of *Grevillea alpina* variation; are pollinator switches evident?
Grevillea Study Group Newsletter 103,
February 2016, page 5.

In this article there was an oversight in not acknowledging the co-supervisory role of Susan Hoebee, alongside Trevor Edwards, in guiding Reannon Smith's honours research in the Department of Ecology, Environment and Evolution, La Trobe University.

Grevillea hodgei

I was a study group member for a while but can never make meetings up here as I'm always out in the field chasing plants or with botanists giving them a hand. Never a dull moment!

I'm the Conservation Officer for the Queensland region SGAP (now NPQ) and have been involved in an issue regarding proposed development of the only one of the 12 Glass House Mountains not protected under some form of reserve, Rupari Hill. It's next to Coochin Hills and is home to *Grevillea hodgei*. It's only found on Coochin Hills and Rupari Hill to be exact, but I suspect you're fully aware of that!

The population of the *Grevillea* at both locations has reduced considerably in recent years and the summit of Rupari Hill has been mostly cleared for various towers and water tanks. Now with the roll-out of the NBN project, another tower has been approved for the summit along with more clearing. A member of the local catchment group, Roger Callen, and I have been monitoring the tiny population on the hill and Roger has just reported that there has been a sudden demise of nearly all *Grevillea* specimens on the summit. He suspects there's been a bit of foul play unfortunately. We'd hate to believe that this could possibly be true but as it only appears that it's the *grevilleas* (both mature specimens and young ones) that have died or disappeared, then there are not many alternative conclusions we can come to.

In recent years Roger has found five small populations of the *Grevillea* on the hill (most on or near the summit) and all these on or near the summit have been affected.

Unfortunately Roger is feeling as though he may have contributed to their demise in a roundabout way as he had a map at a meeting showing where these *Grevilleas* were.

While rainfall in the district has been below average, no other species on the hill are suffering to the same extent as the *grevilleas*, emphasising our concerns about what's contributing to their demise.

NPQ has written many letters to both the Federal Environment Dept and State Environment Dept, as well as the local council and the local councillor, with limited supportive responses to date unfortunately. The local councillor though seems to be very supportive for the hill to be acquired by council but I suspect he could be a lone voice in amongst the other councillors.

It's of great concern what's happening to this threatened species. Officers within the local council are very supportive of the high priority for Rupari Hill's protection, but I guess the many other forces within council don't necessarily see environmental issues such as this as of high concern. Maybe if there was a cute and cuddly population of koalas there it might be a different matter!

The local branch of NPQ, Sunshine Coast, has a permit to propagate threatened species and I hope that they get involved in this issue. I've suggested to Roger that he contact them ASAP to see if a partnership could be formed between the community's Catchment Group, NPQ and Unity Water who have the blanket approval to clear any vegetation from the boundary fences around the summit enclosure at present. This would be an opportunity for Unity Water to not only get involved in a partnership with the local community but also to get involved in a positive environmental program to arrest the decline of the *Grevillea* population at the site they have impacted upon.

However, a propagation program will need to focus on an end use for the propagated *Grevilleas* that isn't solely centred on garden plantings. Sunshine Coast NPQ member and well-known inaugural SGAP Qld member David Hockings has stated that *Grevillea hodgei* readily hybridises when brought into cultivation. [I have not noticed this. P. Olde] So it would seem that the best proposal would be to get as many of the *Grevillea* specimens into the wild habitat, away from close influence of garden *Grevilleas*, in sites that are suitable for revegetation around the general Rupari Hill/Coochin Hills complex.

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While there of course will be various planted Grevilleas (probably mainly hybrids) in local people's gardens, there are no reported hybrid seedlings in evidence to date on Rupari Hill or Coochin to the best of my knowledge.

While all this is happening, it's also of concern that the species is only listed as "vulnerable" under Queensland's Nature Conservation Act. Surely the highest classification of "endangered" is warranted now. And of even greater concern, is that it has no listing under the federal Environment Protection and Biodiversity Conservation Act. Here's a plant

that has only two small semi-detached populations at Rupari Hill and Coochin Hills (about half a kilometre apart) with the local council allowing development of the former, and populations plummeting, but no will by governments at any level to provide any adequate conservation support.

We live in a world now dominated by decision makers who have lost touch with the real world unfortunately.

If you can assist this cause by phone calls, letters or other means, please contact me on 07 3287.

Ruth McLucas

Grevilleas as Bonsai

From the Australian Plants as Bonsai Study Group Newsletter 27, 2015.

This is an update to an article I wrote in 2009, when I only had three grevilleas. Some photos do not show them at their flowering best, however I think it is important that they have a pleasing structure that I can enjoy when they are not flowering.



'Scarlet Sprite' Photo 1 – *Grevillea* 'Scarlet Sprite' in flower (2012)

My first bonsai grevillea was *Grevillea rosmarinifolia* 'Scarlet Sprite', purchased in 2003 and consciously developed to look as 'natural as possible'. I now have

three 'Scarlet Sprites' of different ages and have found them to be quite hardy in pot culture. They will produce new shoots on branches up to 5-6mm if the growth is young, but on older wood new shoots only appear on branches up to about 3mm in diameter. Branches cut back leaving no foliage will die.

Also responds quite well to being wired and tolerates the odd wire scar. I cut back after the flowering season (August to October) finishes, and as needed during summer to keep in shape. It generally flowers prolifically (Photo 1) however last year I did not do the post-flowering trim until mid-March, and last spring's flowering was very poor. I have reshaped it a bit in recent years and I like the change (Photo 2).



Photo 2 – *Grevillea* 'Scarlet Sprite' (2015)

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G. curviloba (Photo 3) is also hardy and grows quite vigorously, even in this shallow pot. I would not have bought it if I realised it was *G. biternata* renamed. I remembered it from 40 years ago as a straggly, short-lived garden plant. Until it was transferred into this pot in spring, I allowed its growth to be a bit shaggy and it has flowered well during August to October. I trimmed it quite seriously in mid-February and will leave it now until spring and hope for many sweet-scented flowers. The specimen pictured was purchased in 2008 in a 10cm pot and first shaped in 2009.



Photo 3 – *Grevillea curviloba*

Grevillea 'Pink Lady' (Photo 4), a hybrid with *G. juniperina* as one parent, has similar needle-like leaves to 'Scarlet Sprite' but is less vigorous. As a young plant purchased in 2004, it flowered quite prolifically from late October into November. Now I find it has flowers from late winter to autumn; however the flowers are sparser than they used to be. I am not sure if this is due to its age or a changed care and fertilising regime (details later). Looking at the photo, perhaps it just needs a bigger pot.



Photo 4 – *Grevillea* 'Pink Lady'

I have tried three forms of *G. australis*: upright, prostrate and 'Hollybank'. Only the uprights survive and they are vigorous and hardy, although they have quite different growth forms. Specimen 1 (Photo 5) started out with prostrate growth and I thought I had mixed up the labels. I was quite enjoying working with its interesting shape when it suddenly started producing strong upward shoots from just about everywhere. It has finer, more compact foliage than specimen 2 (Photo 6) and flowers more prolifically. Both produce new shoots on young wood up to 1cm in diameter and tolerate wiring and recover from wiring scars.



Photo 5 – *Grevillea australis* - specimen 1



Photo 6 – *Grevillea australis* - specimen 2

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Other grevilleas I am growing that seem quite hardy include:

G. iaspicola, native to the ACT area. I bought this one 18 months ago as tube stock. It has grown vigorously and been cut back just as vigorously. So far it has had few, but delightful, flowers. If it does not flower well over the coming winter I will let it grow more freely and develop it into a bigger plant.

G. jephcottii grows well and its flowers are delicate and unusual.

G. 'Poorinda Marion' (Photo 7) grows well and has a magnificent display of red flowers, however its pruning scars do not heal as well as some, for example *G. 'Scarlet Sprite'* and *G. australis*.

G. lanigera 'Honeyeater Heaven' does not shoot back very well and is slow to thicken, but is worth persevering with for its generous display of red and cream flowers (Photo 8).

Others I am working with include *G. juniperina* 'New Blood', *G. obtusifolia*.



Photo 7 – *Grevillea* 'Poorinda Marion'



Photo 8 – *Grevillea* 'Honeyeater Heaven'.

'Gingin Gem', and *G. 'Big Red'*, which have flowers all survived a year in my care. I have given up on *G. 'Winparra Gem'*. It seems prone to root rot, averse to being wired and

very unforgiving of wire scars. It could well work for someone else under different growing conditions. I have had similar problems with *G. diminuta* and now enjoy it in the garden. I think the intolerance of wire scars and poor scar healing of some grevilleas may reflect different thicknesses of their bark, as the ones I have had the most trouble with all seem to have darker, harder and thinner bark than the 'forgiving' ones.

My grevilleas receive the same basic care as all my bonsai: a fairly open mix with *Osmocote*; same watering regime via an automated system; fertilised every 2-4 weeks with *Powerfeed* and *Seaso!* from September to February, occasionally sprinkling a bit of *Osmocote* on the soil surface; then *Thrive Fruit and Flowers* until May. I rely on the *Osmocote* to get them through the winter.

There are many more grevilleas to explore as bonsai. The rewards are great when they flower magnificently and worth the occasional loss when a plant turns out not to work, at least for you. The main downside has been the nectar feeding birds. I used to find it quite charming to have a honeyeater feeding off my bonsai, however this last season they have broken several branches by landing on the tree rather than the bench. If I had the space I would plant lots of grevilleas in my back garden and hope they left the bonsai alone.

Problems in Cultivation of *Grevillea alpina*

Grevillea alpina was the first species of *Grevillea* that I encountered in 1968. It was growing in my own backyard in a government house in Aranda (Belconnen) on the western foothills of Black Mountain in Canberra ACT. Most of the topsoil had been stripped back to fine gravelly clay during the landscaping of the suburb but this one plant had survived. It is distinctive among the species for its small flower with a short style and its fat scarlet perianth. It can be seen all over Black Mountain and in the natural parts of the National Botanic Gardens as a stunted semi-prostrate to procumbent plant.

With its huge variation in growth habit and flower, conflorescence shape and colour, *G. alpina* is surely the favourite *Grevillea* species of the Victorian flora, occurring elsewhere in only a few areas of southern NSW and the ACT. *G. alpina* has been the subject of numerous field trips by the *Grevillea* Study Group in Victoria which have been reported in several past issues of this newsletter. The success of these trips has owed much to the research, exploration and discoveries of various populations by GSG members such as David Shiells, Ian Evans, Geoffrey Roche, Peter Olde and ourselves which have added to our direct knowledge of the extent and variation of the species (not overlooking the fact that many of these populations had already been collected and recorded by the State Herbaria). Recently, the taxonomy of *G. alpina* has been under review. For all its variation in form and habitat, its survival in cultivation has been limited to but a few forms. Evidently, as with *G. chrysophaea*, its cultivation requirements are more stringent than those of the closely related species *G. rosmarinifolia* and *G. lanigera*.

In our garden in Bulleen on deep improved clay-loam soils incorporating up to 50% sand and 25% loam, more recently including 10-15% added compost plus trace elements, some blood and bone and potassium sulfate, gypsum and soil wetting agents, forms from the Warby Range, Everton, Warrenbayne, Mt Evelyn and the foot of the Strathbogrie Range near Euroa have survived for 5-6 years.

Possible factors affecting the viability of *Grevillea alpina* in cultivation include:

- its hairy indumentum (causing susceptibility to fungal attack in humid conditions)
- propagation from seed or cutting,
- size of the pot and plant,
- the usual variants of soil pH, drainage and moisture retention,
- nutrient levels,
- climate and aspect – sunlight, shade and shelter from strong winds,
- ground cover with mulch and prostrate plants, and
- companion plants such as small acacias which can fumigate the soil and fix atmospheric nitrogen.

Management of the established plant could also be important with suitable watering regimes, regular light pruning of this and adjacent plants to ensure adequate aeration during wet and humid weather, use of fungicides and supplementary nutrients.

The range of habitats, form, flower type and colour is extensive. Populations of tall forms of *G. alpina*: plants 2-2.5 m occur in the northern Grampians at Mt Zero and up a steep gully above the Cave of Ghosts, and near Drummond, Samaria Wells, the Warby Range and Everton near Beechworth. **Low** forms of *G. alpina* abound and are well known in The Grampians including the Black Range near Stawell, Mt Cole, Black Mountain ACT, Maryborough, Lerderderg Gorge, Mt Evelyn (Dandenong Range) and Chiltern,

The Solution:

Knowledge and observations of the survivability of individual plants occurring naturally, versus hand-propagated plants grown from seed or cutting and replanted alongside naturally occurring plants could be helpful in a long-term project.

Illawarra Grevillea Park OPEN DAYS 2016

July 2, 3, 9, 10
September 3, 4, 10, 11

Opening hrs are 10am – 4pm

Location

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

Admission

\$5 adults, children with adults are free

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

Meantime, grafting of the best forms of *G. alpina* would appear to have the potential to resolve most the cultivation problems except susceptibility to humidity and fungal attack, but unfortunately grafted plants are virtually unavailable. It has apparently been difficult to find a compatible host for the stock and it has been necessary to use an intermediate graft compatible with both stock and scion. This has been done for many other species and cultivars of *Grevillea*, and it would be wonderful if one or more of our grafters in the group could begin to develop this technique for a large range of the races and forms of *G alpina*. The problems of damping off during propagation have doubtless been an unfavourable factor. Neil Marriott has reported some success with *G. rosmarinifolia* (subalpine form) as a rootstock, and more trials with this combination should be undertaken. One of us (Max) has suggested (herewith) trialing hardy *G. alpina x rosmarinifolia* hybrids such as *G. 'Bonnie Prince Charlie'* or *G. 'Fireworks'* as rootstocks, and would encourage propagators to give these a trial, or perhaps as an interstock onto *G. robusta*. Growers further north in temperate climates could try *G.*

arenaria hybrids or perhaps a new one, *G. 'Spider Mist'*, soon to be released. It is a hybrid between *G. arenaria* and *G. alpina*.

At Panrock Ridge I (Neil) have trialed my technique of planting out into a bed of washed river sand below and around each *G alpina* plant. So far this technique has had mostly amazing success, with superb plants establishing strongly. However this summer I have lost many of this year's plantings due to the dry conditions. Being planted into pure washed sand gives perfect drainage and high air-filled soil porosity (both essential for fine root survival during wet conditions). However plants can easily dry out if not watered regularly until they are well established. I will continue trialing this technique and will report back in due course on my successes or failures.

Christine Guthrie

More on *Grevillea hodgei* (Coochin Hills Grevillea)

When I read Glen Leiper's article (see page 7) I realised that *Grevillea hodgei* was the plant we grew in our garden many years ago, then known as *Grevillea 'Coochin Hills'*. It was very popular as it was hardy and flowered non stop - a great garden plant. I had no idea it was such a rare plant in the wild.

The Grevillea Study Group (SEQ) had a field trip in July 2009 which included Rupari Hill near Beerwah, assisted by Barbara Henderson, leader of the Wallum & Coastal Heathland Study Group. Barbara wrote an extensive report on the field trip for Qld SGAP Bulletin in September 2009 and this is an excerpt about Rupari Hill:

"On Rupari or Tower Hill there are two large towers/tanks for the town, reached via a gravel road with a locked gate. The botanical wonders of this hill are typical of many of the Glass House Mountains, with similar species to the more distant Wild Horse Mountain. *Grevillea hodgei* was our target here, soon seen as there were many plants in flower, with brushes of rich cream. Immediately to the south-west we could see the two Coochin Hills, which originally gave their name to this

Grevillea. In company with it were several plants found only on these hills of the Glass House Mountains." *G.hodgei* is one of five threatened species found there, including *Eucalyptus curtisii* and *Leucopogon recurvisepalus*.

It is so disappointing that *G. hodgei* is now disappearing from Rupari Hill which is not protected and that it is not grown widely any more.



Developing a protocol for tissue culture of Grevillea

We have put forward a joint venture project between Kings Park, the Grevillea Study Group and RIRDC which the Study Group has agreed to fund on completion to the sum of \$5000. The results of the study will be made available for publication in the Study Group newsletter. We intend to document the Kings Park Tissue Culture protocol, which appears to work for a wide range of species, hybrids and cultivars. Time to flower from deflasking, important for cut-flower growers and other protocols useful to nurserymen and amateur horticulturists will also be documented.

The first milestone report was submitted on 30 November 2014.

1. Initiation methods developed

Research into sterilisation treatments for tissue culture initiation on Grevillea material collected from cultivated stock plants showed explants treated with Sodium Dichloriscyanurate plus a surfactant displayed the least oxidising effect when compared to Sodium hypochlorite or Calcium hypochlorite alternatives.

Explant material from actively growing vegetative or non-flowering tips was placed into sterile sealed

food containers with moistened sterile paper towels then surface sterilised in a Laminar Flow cabinet and cleaned for 15 minutes.

Plant material was agitated on a shaker for 5 minutes then transferred to clean sterilant before brushing the material with a soft brush. Material was then removed and placed back into fresh sterilant for a final 5 minute brushing. The explants were then trimmed and prepared for culturing during the final cleaning stage. All excisions and trimming was completed while immersed in sterilant. Material was transferred into a sterile strainer and triple rinsed in sterilised DI water.

2. Optimum Subculture System Determined

Explant establishment onto full Murashige and Skoog (FMS) salts and vitamins and myo-inositol minus growth hormones was the most suitable media for the first fortnight.

Explants then responded positively to FMS plus selected cytokinins with a high production ratio achieved. Explants were then sub-cultured onto Lloyd and McCown's (1981) Woody Plant Medium (WPM) resting stage for experiments on root strike.

Correspondence

I noticed a comment by Merv Hodge in a recent GSG newsletter that a plant known as *G. 'Kimberley Gold'* is a presumed hybrid between *G. aurea* and *G. wickhamii*. Do you have an opinion on whether this is likely?

I'm asking because we have a plant here that looks similar (see attached). It was collected by Marion Blackwell in the Kimberley many years ago and we have now propagated it from cuttings. Marion collected seed from a gold flowering plant and she says the seedling is very similar to the parent. From my experience in breeding if the original plant is a hybrid then the seedlings should be different from the parent. So my presumption is that this plant is either a new species or a subspecies. Matt and Russell Barrett have looked at it and they believe it is a hybrid. The seedling of Marion's we have is setting selfed viable seed so we will germinate them and see if the next generation is also similar.



Ed. (P. Olde) The parentage of *G. 'Kimberley Gold'* is *G. wickhamii* ssp. *aprica* x *G. miniata* to the best of my knowledge. The lovely yellow photo of *G. wickhamii* is a reasonably common variant of subsp. *aprica* so far as I am aware, which is what I reckon you have there. I could be wrong, of course.

Case reports

An unusual cause of caustic burns

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Two children in far northern Western Australia tattooed their arms with maangga berries (*Grevillea pyramidalis* ssp. *leucadendron*), which resulted in unintentional, caustic, partial thickness skin burns requiring specialist burn care. An understanding of the chemistry of the burn agent (5-n-alkyl resorcinol), appropriate first aid management and referral, and possible physiological sequelae are essential for optimal medical management and preventive community education.

Clinical records

Patient 1

A 10-year-old Aboriginal girl with burns was referred to the Princess Margaret Hospital burns unit by a local general practitioner in far northern Western Australia. Relatively little was known about the nature of her burns or the potential toxic chemical sequelae and, because of the distances involved, it was decided to bring her to Perth. The patient had used local berries to "tattoo" both her forearms, causing bilateral caustic burns to 1% of her body surface area (Box 1, A). After consultation with the burns unit, the area was washed thoroughly with water to remove any remaining traces of caustic substance and the pH of the area was repeatedly tested. The berries had induced a partial thickness burn with blistering of the skin. The blisters were deroofed and washed and the pH checked again. The child was observed overnight for systemic and metabolic effects. The burns were initially treated with nanocrystalline silver dressing and hydrocolloid dressing, which were changed every 2 days (Box 1, B and C). These were later replaced with calcium alginate dressing and hypoallergenic polyacrylate adhesive, which were changed every 2 days until complete resolution 3 weeks later. The patient was advised to massage and moisturise the area and to use sunscreen protection.

Patient 2

Almost exactly 1 year later, a 14-year-old Aboriginal girl with burns was referred to the burns unit from the same area as Patient 1. The maangga berry was confirmed as the

seed pod she had used. She had burns on her right forearm, cubital fossa and distal arm. The area was washed with soap and water and irrigated while determining the pH of the wound area. She was admitted for wound dressing, observation and treatment for metabolic derangement. She sustained partial thickness burns to 3% of her body surface area. Her forearm was treated with nanocrystalline silver dressing and hydrocolloid dressing, which were changed every 2 days, then replaced with calcium alginate dressing and hypoallergenic polyacrylate adhesive, which were changed every 3 days until complete resolution after 3 weeks. She was advised to massage and moisturise the affected area and protect it from direct sunlight.

Discussion

Most caustic burns are secondary to accidental ingestion of a corrosive substance, causing significant oesophageal stricture or perforation, or from topical exposure to agricultural or building chemicals.^{1,2} According to some studies, almost half the burns described are in children (despite them comprising less than 3% of all burns), and burns have significant cultural and psychological sequelae.^{3,4}

Excluding a few case series of self-inflicted garlic burns and fruit juice mouthwash gingivitis, as far as we are aware, no described cases exist of caustic burns from plant matter, especially plants that have cultural significance for the Aboriginal people of Australia.⁵ Of further interest is that the topical chemical burn also may have significant systemic consequences related to the burn chemical.

1 Partial thickness burns to the left arm of a 10-year-old Aboriginal girl (Patient 1), secondary to self-tattoo with berries from *Grevillea pyramidalis* ssp. *leucadendron*



A. Day 1. B. Day 3 (after 2 days' dressings). C. Day 6 (after 5 days' dressings).

Case reports

Regional and national poisons centres were contacted for advice, but staff were unable to advise on the management of the patients because little is known about this berry internationally.

The patients were from an area that is a natural habitat for *Grevillea pyramidalis* ssp. *leucodendron*. The tree is also known as the konkerberry, maangga berry or caustic tree, which are generic terms for many different species of berry shrubs. These berries have traditionally been used by local Aboriginal people for tattooing; the berry is used to puncture the skin, and the fluid released from the berry causes a greenish discoloration of the skin followed by permanent black tattooing. The elders of the various tribes within the relevant region have been made aware (after liaising with the burns unit) of the potential harmful effects of the berries when used incorrectly by inexperienced users.

High-performance liquid chromatography has been used to isolate the corrosive substance, identified as 5-n-alkyl resorcinol, a phenol derivative, which is also a precursor for tetrahydrocannabinoid (the psychoactive chemical in marijuana). There has been a resurgence of interest in 5-n-alkyl resorcinol because of its antioxidant, antigenotoxic and cytostatic characteristics. It is a phenolic lipid metabolite of plants, animals, fungi and bacteria during normal development, as well as during times of stress, such as when infection or wounds are present or when the organism is affected by ultraviolet radiation. It has also been found to inhibit bacterial, fungal, parasitic and protozoal growth, and to reduce the efficacy of viral transfection.⁶ Chemical burning seems to occur when 5-n-alkyl resorcinol binds with proteins to form esters that irreversibly bind calcium. This interferes with cellular mitochondrial performance, leading to cellular anoxia and energy deprivation, causing protoplasmic poisoning and necrosis. This organic compound also binds and dissolves the lipid membrane of the skin cells, leading to proteinaceous structural disruption.

In a medical setting, naturally derived 5-n-alkyl resorcinol could be used as a potent heat shock protein-90 (Hsp-90) inhibitor. Hsp-90 is instrumental in the regulation of oncoproteins Her2, Akt, Bcr-Abl, c-Kit, EGFR and mutant BRAF, and when these oncoproteins are dysregulated, they lead to solid and haematological cancers.⁷ Clinically, Hsp-90 is the active compound in endodontic fillings and vascular glue and has been used extensively as a peeling agent.⁸

5-n-alkyl resorcinol has many side effects, including theoretical goitrogenic consequences, and *G. pyramidalis* is

2 *Grevillea pyramidalis* ssp. *leucodendron*



Photography by Lynley Wallis. Used with permission (<http://florabase.dec.wa.gov.au/help/copyright>).

3 Geographic distribution of *Grevillea pyramidalis* ssp. *leucodendron*



Map data by Paul Gioia and the Western Australian Herbarium. Used with permission (<http://florabase.dec.wa.gov.au/help/copyright>).

listed as poisonous in the United States Food and Drug Administration Poisonous Plant Database (<http://www.accessdata.fda.gov/scripts/plantox/index.cfm>). The fact that *G. pyramidalis* berry juice causes haemolysis is of concern, but the cardiac glycosides it contains may be of more concern, even though ingestion (not skin penetration) is required for a lethal dose. Other effects of cardiac glycosides include blurred vision, nausea, vomiting, bradycardia, confusion and lethargy, and people showing these signs after contact with *G. pyramidalis* should be referred to an emergency department immediately.

We hope this article may be educational for doctors in far northern Western Australia and anyone coming into contact with the *Grevillea* species, some of which (eg, *G. banksii* and *G. robusta*) contain trace cyanide and grow in residential Australian gardens. We believe these two cases offer a unique insight into a region-specific phenomenon.

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Seed bank**Matt Hurst**

37 Heydon Ave, Wagga Wagga 2650 NSW

Phone (02) 6925 1273

Please include a stamped self addressed envelope.**\$1.50 + s.a.e.**

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

Free + s.a.e.

<i>Grevillea banksii</i> prostrate white
<i>Grevillea banksii</i> prostrate red
<i>Grevillea banksii</i> prostrate red ex 1770
<i>Grevillea bracteosa</i>
<i>Grevillea glauca</i>
<i>Grevillea juncifolia</i>
<i>Grevillea johnsonii</i> red flowers
<i>Grevillea longistyla</i>
<i>Grevillea leucopteris</i>
<i>Grevillea magnifica</i>
<i>Grevillea</i> 'Moonlight'
<i>Grevillea petrophiloides</i>
<i>Grevillea plurijuga</i>
<i>Grevillea ramosissima</i>
<i>Grevillea robusta</i>
<i>Grevillea stenobotrya</i>

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.

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**

Financial report – June 2016

Income	
Subscriptions	\$525.00
Interest	0.30
	<hr/>
	\$525.30
Expenditure	
Newsletter publishing	\$240.00
Printing	153.85
Postage	64.00
Stationery	7.00
Top up business cheque account	150.00
Reimbursement expense to P. Olde	2,702.63
	<hr/>
	\$3,317.48

Amount in interest bearing deposit till 31/8/2016
\$19,002.58

Balance in current account 24/6/2016
\$1,595.04

Balance in business cheque account 24/6/16
\$98.68

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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.

Postmessage: grevilleas@yahoogroups.com

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Unsubscribe: grevilleas-unsubscribe@yahoo.com

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URL to this page: <http://groups.yahoo.com/group/grevilleas>

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Deadline for articles for the next newsletter is 30 September 2016, 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.

2015 2016

If a cross appears in both boxes this will be your last newsletter.

Membership fees

The annual subscription is \$10 per year or \$40 for 5 years. If you choose to receive the newsletter by email there will be a 50% discount ie membership will be \$5 per year – \$20 for 5 yrs. I would encourage everyone to take advantage of the savings by paying for 5 years, and choosing email. Overseas membership \$20 if posted.