



Isopogon & Petrophile Study Group

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STUDY GROUP LEADERS/NEWSLETTER EDITORS

Catriona Bate & Phil Trickett

Email: isopetstudygroup@gmail.com



Isopogon 'Silvertips', our new hybrid. See our discussion in this issue.

Back issues of the *Isopogon & Petrophile Study Group Newsletter* are available at
<http://anpsa.org.au/iso-petSG/IPSG-news.html>

Exchanging cuttings & seed

This is a way to share propagation material between study group members. All States apart from Western Australia allow cuttings to be mailed from NSW. If you would like to be sent cuttings/seed, here are the steps (may vary for seed-only requests):

1. Email us to check that material is currently available.
[\(isopetstudygroup@gmail.com\)](mailto:isopetstudygroup@gmail.com).
2. Once availability is confirmed, purchase an **EXPRESS POST** satchel from Australia Post (Small \$11.95 or Medium \$15.70), self-address it, put in an envelope and send to:
Isopogon & Petrophile Study Group
PO Box 291
ULLADULLA NSW 2539
3. We will then package up your cuttings/seed and send it back to you **Express Post**.
4. An email will be sent to you on the day the package is mailed so that you can be ready to propagate as soon as the parcel arrives!

Species currently available are:

Isopogon – anethifolius, anemonifolius (1.5m or 0.3m size), adenanthoides, axillaris, buxifolius var buxifolius, ‘Coaldale Cracker’, cuneatus (shrub or dwarf coastal form), dawsonii, divergens, dubius, fletcheri, formosus, latifolius, latifolius (low), linearis, mnoraifolius, nutans, scabriusculus ssp. stenophyllus, ‘Silvertips’, spathulatus, ‘Stuckey’s Hybrid’, trilobus
Petrophile – pedunculata, pulchella, recurva, serruriae, sessilis, shirleyae

We need to expand the available species list to include all species growing in members’ gardens. If you can provide material from other species, please let us know so we can add them to the list.

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Dear members

We’ve just spent a couple of days walking in local bushland and it’s amazing how uplifting spring in the bush is. It seems to be a very good year here and reports from the west about the wildflowers this year are glowing too. Too bad we didn’t make it over there for our September research trip (for the second year in a row).

Thank you for your messages of support and encouragement in relation to the winter edition of *Australian Plants* all about isopogons and petrophiles. We hope you find it a good read, and it is a reference you can keep for future use.

In our garden it’s been a bumper season so far, possibly the best ever. Unfortunately our wonderful large *I. dawsonii* plant which met visitors at the front steps slowly declined, probably due to record rain since early 2020. A recent dry period was too late to rescue this treasure. It happily withstood rain, lengthy dry periods and intense heat growing in rich soil in a raised bed and gave us enjoyment over ten years. All the other plants have been really turning it on. *I. cuneatus* flowered a little later than usual and has continued right up until now. Along with

I. latifolius and *I. 'Stuckey's Hybrid'*, the display has been tremendous and any plants lost to the fires are not even missed. Add to this an outstanding performance from low forms of *I. cuneatus* and *I. latifolius* and you have some idea of why even our rose-loving neighbour said, "I like the pinks". Meanwhile we are also enjoying watching some of our newer, less established species flowering beautifully and developing well. These include *I. nutans* and *I. 'Silvertips'* as well as *P. recurva*.

In this 29th edition of the newsletter we are travelling far and wide in our imaginations – to WA, Kangaroo Island and even Europe. North of Perth, in Lesueur National Park we examine a brand new isopogon. Then over to Kangaroo Island where we find a petrophile which grows only on that island. Kangaroo Island suffered very badly from bushfires in January 2020 and we see how their petrophile and their single isopogon species fared. Next, it's all the way to the Netherlands to consult member Liesbeth Uijtewaal, our expert on growing Australian plants in pots, to find out which of her techniques we can use when growing isopogons and petrophiles in containers. Liesbeth has a long record of success and grows a large number of isopogon and petrophile species.

We have very exciting news on pollinators, with new photos of native bees in action. To our knowledge, this is the first evidence of bud burglary ever captured, thanks to some eagle-eyed researchers. Look out for more articles on pollinators in future.

While we have previously mentioned a new natural hybrid we discovered a few years ago, our article this issue describes *Isopogon 'Silvertips'* in more detail and looks at its parentage and characteristics. This hybrid between *I. divergens* and *I. gardneri*, two of the most attractive isopogon species, is shaping up as an excellent ornamental which has huge potential for gardens.

Our profiles include *Isopogon tridens*, a little-known species but one of the most interesting because of its unusual white flowers. Large flower heads and interesting foliage makes this a candidate for gardens. Long leaved petrophiles are deservedly popular. However there are now quite a few different species and it is easy to mistake one for another. We profile one of the best, *Petrophile filifolia*, which is grown by several members in Victoria and even in NSW. Member Karlo Taliana also gives us a brief overview of one of the best plants native to the Sydney region, *Isopogon anemonifolius*.

Whether treating seeds with smoke water actually works is a perennial topic of debate in this study group. We report on research which, most unusually, includes some isopogon and petrophile species. While there is still much to discover, the findings are very interesting. On other propagation matters, Phil reports on the advantages he is finding using peat plugs to raise seeds.

Catriona & Phil

From our members

David Lightfoot, Melbourne VIC

Do you know if anyone in the study group is growing *Isopogon alcicornis*? And if so, whether they would have any cutting material or seed available to share? I used to have it a few years ago, but it died and is impossible to find in nurseries. It would go well in my roof garden and I'd love to grow it again.

We don't know of anyone growing this currently. One of our members in Sydney [and one near Melbourne] used to grow it but no longer has it. We intend to find alcicornis when we are able to travel to WA, hopefully in March/April next year. Good to hear you're still growing isopogons and petrophiles!

Thanks for the info. I was able to find it NE of Esperance in 2003. Interestingly it was often in partial shade and associated with small eucalypts if my memory serves me correctly. Only a few mature fruiting heads had seed, but some individual plants had heaps of seed. It germinated really easily too. It's one of my pinup plants and I

would love to grow it again. I now have my roof garden where I have been able to grow many previously difficult species so hoping to put it in there. I love Isop. villosus too.

Yes still growing a few species of Petropogons. Most were destroyed in the rebuild but a few survived and new ones have gone in. Currently in flower: Isopogons formosus, buxifolius, dawsonii, Coaldale Cracker, anemonifolius, prostratus, Candy Cones. Not flowering Isopogons Stuckey's Hybrid, latifolius (own roots looking v unhappy), asper (just finished), mnoraifolius, petiolaris. Plus a seedling of Isop. linearis. Petrophiles linearis, longifolia, shirleyae, pulchella, nivea (small cuttings with nursery plant looking very unhappy). Plus some cuttings of a few others not yet rooted eg teretifolia, ericifolia, squamata, media/brevifolia.

Liesbeth Uijtewaal, The Netherlands

April: Eight days ago I potted up ALL four *Isopogon scabriusculus* var *stenophyllus* cuttings I mentioned! I'm so pleased, four struck cuttings ready to be potted up in 29 days...I was a bit nervous about separating them but a shallow bowl of water and gently easing them apart did the trick.

A couple of questions that might be added to the newsletter (if you haven't finished it yet that is, you're so quick) or, if I'm too late, you might be able to shed some light too:

- 1) When potting up a couple of germinated seeds of *Petrophile serruriae* 'Pink' this morning I wondered once again why they should need smoke (according to the packet) to germinate. My reasoning: Two facts. One. Seeds of many Australian natives can lie dormant in the soil for years until there's a fire, stimulating them to germinate when the conditions are right. Good system. Two. I've been told that *Petrophile* and *Isopogon* seed need to be fresh to germinate or at least that's a theory. I have noticed that myself too. Then why should they belong to the group that responds to smoke to germinate???? They apparently don't stay dormant in the soil for long since they'll lose viability. However, now that I'm writing this it occurs to me that maybe seed merchants add 'use smoke' to the packet since smoke can give faster and more even germination to seeds that don't normally need smoke. Such seeds may benefit from smoke to 'revive' them when old? Or maybe it acts as a disclaimer like 'beware, this seed is difficult' to hide the fact that the seed may be old???? Whatever it is, I'm happy with every single seed that germinates after all.
- 2) Another question refers to *Petrophile fastigiata*. The first time my plant seemed to be budding up, two years from propagation (cutting), all promising buds turned into foliage. The second time all buds turned into flowers. Whoopee! This spring however there were loads of promising buds and yet...only four develop into flowers, the other ones turn into foliage once again (see pics). Has anyone experienced this too and what may be the reason for this????

You were right that we had finalised the newsletter when we received your email.

- 1) We suspect that commercial seed providers just include general advice, it's probably the same for all Aussie species they sell. And note that the pink *P. serruriae* is actually *P. axillaris*. Only some of our members ever use smoke treatment. We got good germination in the garden after our fires (often in areas subjected to lots of smoke but no direct fire!) but in genera like *grevillea*, *hakea*, *scaevola*. Footnote: see our report in this issue on recent research with smoke water.
- 2) According to our resident expert (John Knight) this phenomenon is known as floral reversion. It involves a switch from floral development back to vegetative development. We have noticed it to a lesser extent in other species such as *I. fletcheri* and *I. dubius*. The reasons are not well understood but may relate to environmental conditions.



May: *I. fletcheri* is budding up very well this year. The plant always has a pale yellowish look though, I might try adding some iron, see what happens. Do you know whether it lives in iron rich soils naturally?

Our plant often does the same thing. In the wild it grows over sandstone – in dry sclerophyll forest, heath or near peat swamp. Apparently, a peat bog environment is acidic, with a low concentration of dissolved oxygen,

and can produce 'bog iron', so you might be right about iron deficiency. Could be worth checking the pH level too.

August: I trust spring has sprung for you and that the flowers are amazing, in the garden as well as in the bush. *I. cuneatus* will have finished flowering by now. My grafted (cutting graft on formosus) *Isopogon cuneatus* is growing very well, I'm very pleased with that.

Ian Roberts, Blyth SA

I found a couple of [I&P] plants that were hiding the day you came, that you could have had, & sadly, 2 of the larger ones in pots that you helped ID dropped dead about 2 weeks later. Oh well, that's Proteaceae! Still very dry here. Just 77mm for the year to date. Will email some more pics of plants I've grown up in the Clare hills or photos from Pangarinda down near Tailem Bend...Potted on a swag of the one possibly related to *ericifolia* or *P. ericifolia* ssp *subpubescens*, also *seminuda*, *divaricata* & what you thought might be *I. longifolius*. Can you ID this one Mt Lesueur area. Going through my photos to try & Id a few. It's *I. sphaerocephalus* ssp. *lesueurensis*, the new *Lesueur Isopogon*. Thanks for ID. Wouldn't want to have to write that too many times!!



Left, *I. dubius*, right, *I. trilobus*, growing at Windmill Cottage, Blyth SA.

Paul Kennedy, Elliminty VIC

We had another 20mm which I could have done without. The Mallee Eucalyptus from the goldfields area have all died due to the ground being too wet. All the Isopogons apart from *cuneatus* have survived and are now in the process of flowering. *Cuneatus* turned up its toes in mid winter from probably wet feet...I am watching a couple of Isopogon plants that I propagated from old seed to see what flower they produce and hence hopefully to be able to identify them. Has dried up a bit here and slightly warmer so spring is here. The Hakeas in the varia group have been stunning in flower. Hope next year we can travel more... A big congratulations on 45 pages of Isopogons and Petrophiles in AP. It must have taken up a lot of time putting it all together. One of the unnamed species I have coming into flower could be *Isopogon pruinosis* from the photo and brief description. If it is, then it would be great news...I lost *Isopogon cuneatus* due to the soil being too moist. The next one will go in drier ground. The older Isopogons are just coming into flower so I am looking forward to seeing the flowers. The hybrid "Candy Cones" is going to flower too despite only being in the ground a year. Apart from *Isopogon cuneatus* we have lost only one Hakea (*polyanthema*) and all the Banksias are still alive.

Kevin Collins, Mount Barker WA

July: Kathy & I escaped for 4 days last week. We hooked up the little caravan and went out to Hyden. Weather was erratic with showers but we managed to climb over several large granite boulders in the area enjoying mosses, lichens and small rock pool gardens. Found lovely plants of *diploleana ferruginea* in flower, just a few orchids and a lovely Isopogon. We loved Buckleys Breakaway, a proteaceae hotspot. The pics are all from Buckleys Breakaway, S.W. of Hyden. Two mystery Petrophiles? See pics with seeds, cones & foliage. There was *P. glauca* at this site as well in early bud. Pink...*heteropyllus*?, *circinata*? & *phylicoides*? HELP!!!! Eagerly awaiting the full revision of I & Ps to be published in a guide?



From left, *I. gardneri*,
P. circinata, *P. phylicoides*

September: Unknown species from Bridgetown grown by Kathy's sister Erica. The lobes and leaves are flat. Plants in wild approx. 0.6m X 0.8m. The second is a tiny leafed Petrophile? I found on private property near Wellstead. The foliage is only 2 to 3 mm long and the cones 2mm long. I have grown two plants of this one from seed as well. The plant was around 0.2m X 0.3m. CHALLENGE for the day!!!!

First one is P. striata, second is P. squamata which is a very variable species. Look forward to cuttings once you grow them on Kevin!

Thanks for the diagnosis. Strongly agree with striata now I've checked it out. As for squamata...certainly a miniature leafed form with all dimensions a quarter the size of those per descriptions on Wikipedia or Florabase of the standard form. It was located at the interesting site on our friends private property near Wellstead and was growing with the outlier and slightly different form of *I. latifolius* in view of the south coast growing in rich gravelly clay based soils. The form we recently collected with Margaret at Point Anne was totally the opposite scale with very broad obovate leaves. The cuttings are looking good but no signs of new growth or roots as yet. Not tried the seed of these as yet.



A couple of recent cutting successes.
I. formosus & *P. longifolia*. (right)

P. rigida booming!!! My cutting grown *rigida* & *squamata* going gangbusters in the garden. (left)



Ian Cox, Kenthurst NSW

What a great issue of 'Australian Plants'. When I started reading I couldn't put it down. Everything we wanted to know about isopogons and petrophiles, and much more . . . These plants have a lot to be thankful for with you as their advocates and advertising agents!...The trouble is, I don't have any *I* or *Ps* growing in the garden, so don't have anything to write about. I do have *I. anemonifolius* and *P. pulchella* growing naturally in the bush part of the garden. I find they are hard to obtain, and would like to try some of the smaller grafted ones. Perhaps if you have any to spare I could buy a few from you next time we meet.

Mark & Carolyn Noake, Moruya NSW

Carolyn planted a million *I. formosus*, had to weed some out of the garden. Probably [came] from Kuranga – propagated easily (by cuttings). We have one about to berserkly flower, all budded up. Tried to take a pic of our bottle trees and this b... thing photo bombed us! (Picture, right)



Rhonda Daniels, Sydney NSW

Just a short note to say that *Isopogon formosus* seems to be flowering particularly well this season based on a few seen online at our recent Sutherland Group Zoom meeting and in a local Sutherland garden in full sun. It appears to be naturally well-branched with many purple flowerheads on such a small plant (left). It does raise the question of describing flower colour. In person, they look purple, but here they look pink - spectacular anyway, all without any pruning or much care.



Miriam Ford, Hurstbridge VIC

I haven't received my [AP] issue yet but look forward to it. WRT *P longifolia* change to *filifolia* when I was last at the Melton Botanic Garden between lockdown 4 & 5 I think I saw this lovely plant and Barb Pye told me about the name change. It is growing beautifully there and I now have one here in a raised bed.... They have a lovely lot of isopets in that garden.

Karlo Taliana, Georges Hall NSW

Our 15-year old grafted *Isopogon latifolius* (graft by Phil Keane, Ausplants) always seems to hit peak flowering after the newsletter is due, so here are some current pics. Approx 2.5mH x 3mW (but will be getting a good prune in a couple of months). Two flowering seasons this year due to some atypical conditions starting from last summer.



Mike Beamish, Boolarra, VIC

I have recently tripled the number of I&P's in my garden: the *I. anemonifolius* in the bottomless tub is still green, but hasn't grown much, while its companions have either died (*Grevillea chrysophaea*) or gone berserk (Yam Daisies); two new additions are *P. canescens* and *P. squamata*, both picked up at Friends of RBG Cranbourne autumn plants sales. Fingers crossed they will settle in to our soggy ground, over 800mm of rainfall so far this year.

My latest attempt at propagation of *P. pulchella* from fresh seed has resulted in a roughly 50% germination rate. About 90 seeds were sown in autumn, a couple of weeks after removing the cones from the parent plant,

drying and extraction. As you can see from the photo, there are about 48 seedlings in the container. This is similar to my last effort at growing from fresh seed and is also where the rot set in! The last batch didn't cope with the disturbance of pricking out and potting up and went into slow decline, all eventually perishing over the following 18 months. I hope I have better results this time.



Lisa Godden, southern Sydney NSW

Really enjoying my *Isopogon formosus* in their first year of flowering, I've got two in pots which both started as 50mm tube stock last June, I'm in Sydney. I thought the group might be interested to see the huge difference that the pot size made to the growth. The smaller one flowered first (it was in a sunnier spot) but the bigger one is far happier. Absolutely in love with these flowers, as is a resident tiny grasshopper which

lives in the small one. I've since planted out the smaller one into a new garden bed, hopefully it survives the transplant and becomes happier. Also as a light note, my dog has recently become dedicated to licking isopogon flowers. He likes all the different species I have. Maybe 'stopping to smell the isopogons' is the new mindfulness? Or maybe he's on to

something and they taste really good?



Rowan Ward, Canberra ACT

For an introduction, where to begin? I'm 60 years old, a Queenslander that has been marooned in Canberra for the last 15 years and I'm finally returning triumphant to north Queensland with half the family this December. We never did acclimatise to the cold...My tertiary studies are in environmental science and ecology, and I worked most of my career as a plant biosecurity officer with the Qld and federal governments, until retiring in 2015 to pursue my own native plant sales and landscaping business (which I now wish I'd done a lot earlier...). I've been an avid native plant grower since I was a teenager working at a govt native plant nursery in Brisbane (Bunyaville), where I took home plants on death row to nurse, observe and rehome them.

My interest in Isopogons and Petrophiles stems from growing some here in Canberra (*I. formosus* and *I. Pink Drumsticks*, plus recently *Adenanthos detmoldii*) and reading your articles in the latest Australian Plants journal, which I found absolutely fascinating. I'm wondering if the timing of your articles and my pending move to 10 acres of land in north Queensland could be serendipitous, wondering if there might be commercial demand (eg in the floristry business) for locally grown natives including Isopogons and Petrophiles in Innisfail and Cairns (the property we're moving to is at Utchee Creek, about 15 mins drive south of Innisfail). The challenge will be growing them in Australia's highest rainfall zone, so I would very much welcome any advice you might have on species and varieties and grafting combinations to try. I gleaned from your articles a reasonable place to start might be trying those listed on page 82 (Best species for summer-wet climates) which include several recommended for grafting, should I decide to go down that path. And I note that acquiring stock is going to be an issue. I look forward to a whole new world of learning.

Bee bandits sprung in bud burglaries

Pollen thieves have been caught in the act committing burglaries in broad daylight. Not waiting for the flower to open and offer its pollen to all and sundry, they broke into unopened buds to steal the fresh pollen for themselves. The cases occurred in *Petrophile linearis* in Western Australia and *Isopogon anemonifolius* in NSW, and both involved native bee culprits. The sticky loot was stashed with other pollen in their scopae (hairs on the hind legs which act like a basket) before the thieves staged a quick getaway.

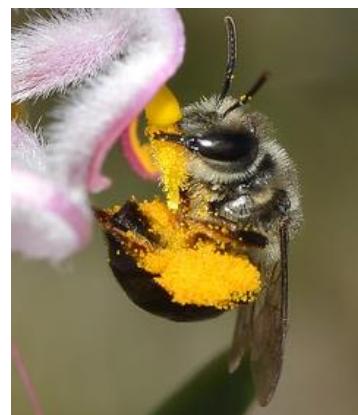
Jean and Fred Hort, Research Associates of the WA Herbarium, took these photos of a *Petrophile linearis* flower bud being plundered by a *Leioproctus sp.* bee in the Talbot Road Nature Reserve near Perth in August 2014. The reserve is located at the base of the Darling Scarp on the soils of the Ridge Hill Shelf. The bee has already collected pollen from other flowers, likely including other genera.



The native bee opens the flower. Here the bee works its mandibles to start separating the tepals.



Success. The bee hangs on as the flower opens and its four tepals spring back. The weight of the bee has pulled the pollen presenter down.



Here you can see the bee hanging onto the pollen presenter with its mandibles and using its legs to gather the pollen.



You have to hang on to get that pollen...



Have to get it all!

Photos and captions:
Jean and Fred Hort

On the other side of the country, Tessa Barratt, a spider and bee enthusiast from the Blue Mountains, observed the same phenomenon near Faulconbridge in late spring 2020. She has noticed many different native bee species foraging for pollen around flowering plants of *I. anemonifolius*.



Leioproctus sp. bee working on the limb of an *I. anemonifolius* flower with its mandibles to try to open it. Open sesame....



Photos:
Tessa Barratt

Once open, the bee quickly scrapes the pollen off the presenter with its forelegs, using its middle pair of legs to transfer it to its scopae on the hind legs.

This *Leioproctus* sp. bee clasped the limb with her legs while she worked on opening it. Tessa reports it actually looked like the bee was biting the bud. It is a different approach to the bee bandit captured in WA by the Horts, working side-on rather than in flight and front-on. The flower springs open and she harvests the pollen from the pollen presenter. While some patience in working on the bud is required, from the instant the bee finds the release mechanism, the process is lightning fast and the bee is on its way with the loot in double-quick time.

You can see for yourself in this extraordinary live footage captured by Tessa Barratt. Note that the action is very fast! [Bee video link](#). Tessa notes: 'My little point-and-shoot digital camera is far from perfect so please excuse the amateur footage and shaky camera. This is the best footage I could get. The bees also flew in such an erratic fashion, it was very hard to predict where they would eventually settle!'. Like bird enthusiasts, Tessa seems to have superhuman patience – she spent up to 15 minutes stalking the bees to get a clear shot, holding her breath so as not to disturb her subjects.

Bud burglary has not previously been witnessed in isopogons and petrophiles to our knowledge so its rarity or otherwise is so far unknown. It appears to leave no evidence behind on flowers forced in this way. This robbing behaviour has been recorded in species all over the world including other proteaceae such as *Macadamia*. Pollen theft and its implications has not been extensively studied.

The new Lesueur Isopogon

Lesueur National Park, northeast of Jurien Bay and three hours' drive north of Perth, is one of the most significant reserves for flora conservation in Western Australia. Lesueur is a hotspot for isopogons and petrophiles, with at least half a dozen petrophiles (*brevifolia*, *chrysanthia*, *linearis*, *macrostachya*, *rigida*, *seminuda* and *striata*) and several isopogons (*asper*, *autumnalis*, *dubius*, *linearis*) counted so far.

Several species from Lesueur cannot be found anywhere else in the world and have been included on an endangered list. Its important role in protecting our unique flora has just been enhanced with the naming of a new isopogon taxon which is only found within the park. The Lesueur Isopogon is a new subspecies of *Isopogon sphaerocephalus*. Named for its large globular flower heads, *Isopogon sphaerocephalus* was first

described by Lindley in 1840. Previously considered to be just a northern variant of *I. sphaerocephalus*, botanists Barbara Rye and Terry Macfarlane have established the distinctiveness of this variant, noting that while there may sometimes be overlap in individual characteristics of each variant, there are no specimens which overlap (i.e. they can all be conclusively identified to subspecies level). Earlier conclusions that the two variants intergrade or overlap are now explained by likely mislabelling of specimens. This means there are now two subspecies of *I. sphaerocephalus*, with the more common southern form now known as *I. sphaerocephalus* ssp. *sphaerocephalus*.

The Lesueur isopogon, *Isopogon sphaerocephalus* ssp. *lesueuerensis*, is named for the park. It is geographically disjunct, separated from other populations of *I. sphaerocephalus* by about 180 km. Plants of this new subspecies tend to be more hairy on their vegetative parts and to have more densely arranged, broader leaves (7–18 mm cf. 4–12 mm wide). While both subspecies have attractive hairy new growth, *lesueuerensis* leaves remain hairy throughout their life. The key differentiating characteristic for taxonomists is a longer pollen presenter (3.5–5 mm cf. 2.3–3.3 mm long).



This brings this taxon within scope of formal conservation efforts. It has a very restricted range, being known only from three hills over a distance of a few kilometres. Luckily it is already protected by being located within a national park. While its conservation status is currently still listed as not threatened, it is expected to be listed as Priority Two (poorly known from only one or a few locations, on land primarily managed for nature conservation).

This subspecies could prove to be even more attractive than the more common subspecies. The latter is not often seen in cultivation but is considered to display its flowers very well, with attractive flushes of hairy new growth. Plants are often willowy and graceful. The Lesueur subspecies is a more compact, dense, and leafy plant, not tending to reach the same height (1.5 m versus 2 m). The common subspecies is taller in character with a rather sparse sprinkling of leaves.

Isopogon sphaerocephalus ssp. *lesueuerensis* appears to have many more leaves but the same distinctive and highly attractive flower heads. Pale yellow flowers are smooth with a silky pom-pom on the end. This provides a beautiful display before opening, with a pattern of stars from above and a distinctive flat top. Each flower is relatively short (10-15 mm). After opening, the flowers bend back to hang downwards in a skirt underneath the erect buds.

Rye, B. L. & Macfarlane, T. D. (2019). A new name, clarification of synonymy, and a new subspecies for *Isopogon* (Proteaceae), in Western Australia. *Nuytsia* 30: 309-316. <https://florabase.dpaw.wa.gov.au/science/nuytsia/931.pdf>

Kangaroo Island's prickly survivors

Kangaroo Island, only twelve kilometres off the coast of South Australia, is home to a petrophile found nowhere else, *Petrophile multisecta*. One of the common names for this species is Wild Irishman, and after experiencing its intensely prickly leaves, it was easy to see why it might drive anyone, let alone an Irishman, wild! The only other isopogon or petrophile species which occurs on the island is *Isopogon ceratophyllus*, another prickly plant sometimes called Wild Irishman.

The island is a diversity hotspot. Like WA, it has impoverished soils exceptionally low in nutrients. A different evolutionary path to mainland Australia has resulted in differences compared to lookalike plants from elsewhere in Australia and 47 species which are only found on Kangaroo Island. In addition, the natural biodiversity developed without human interference until Flinders and Baudin arrived in 1802. Even now, it still retains much of its native flora because there have been no rabbits to decimate the vegetation.

Although the island specialises in pigfaces, guinea flowers, seagrasses and pondweeds, proteaceae found there include adenanthos, banksias, grevilleas and hakeas. As well as *P. multisecta*, three other proteaceae species have 100 per cent of their recorded range on Kangaroo Island – *Grevillea quinquenervis*, *Hakea aenigma* and *Adenanthera macropodiana* (Kangaroo Island Silver Bush, pictured right).

Our visit in May 2021 was to observe the effect of the severe bushfires of January 2020 which ravaged 50 per cent of the island.

The fires were chiefly confined to the western half of the island where most of the national parks and reserves are located. Adding to the fuel load in the centre and north were blue-gum and pine plantations. Although the island did receive its winter rains as usual last year, rainfall has been relatively low since the fires and conditions were much drier than usual last autumn, with winter rains sorely needed. Almost eighteen months after the fires, the bush was looking very good and showing excellent regrowth.

Petrophile multisecta is locally widespread and not considered threatened and we had no trouble locating it on roadsides. Phil has an amazing ability to drive and spot plants at the same time. The petrophile's foliage is bright green and its dense low mounded shape is very attractive. One of the earliest specimens we spotted had a cauliflower shape to outdo even the Cauliflower Hakea (*H. corymbosa*). *Petrophile multisecta* flowers over summer so we will have to go back to check out the inflorescences which are similar to other eastern petrophiles such as *P. sessilis*.

Petrophile multisecta often grows in great thickets, in seas of green about 50-60 cm high. It is found all over the island mainly on ironstone gravels and lateritic sandy soils, and we found a number of different forms. Some were dense and others more open, some were more obviously columnar. Their intricate foliage and columnar habit are reminiscent of more familiar species like *I. formosus*, *P. drummondii* or *P. sessilis*. In some cases the foliage looked more grey/green and in others the stems were red. This species grows from a lignotuber but also appears to grow from underground stems which travel. Coexisting species include *Banksia ornata*, *Banksia marginata*, *Hakea rostrata*, plus various species of grass tree, adenanthos, hakea, and scaevola.



Photo: Arthur Chapman



Braving wicked prickles to look closer, we found its rigid, terete leaves highly divided at wide angles creating well-defined three-dimensional stems. The many leaf divisions result in innumerable final leaf segments each ending in a sharp point and well-spaced for maximum protection. This is what makes the plant's exterior so prickly and its interior so inaccessible. It's great protection against the depredations of wallabies. There are many endangered animals endemic to the island which would find good protection under these fierce guardians e.g. bandicoots, bettongs, heath rats, dunnarts, land snails, beetles, trapdoor spiders, shield bugs and other bugs, and certain ant species.

The average rainfall on Kangaroo Island is just 550 mm with the eastern half of the island much drier than the west. Although plants are well adapted to this low rainfall, significant dieback occurs after long dry spells. *Petropetra multisecta* was generally in excellent condition, but we observed significant vegetation dieback in one area in the east. At Beyeria Conservation Park there were many dead trees and shrubs and the petrophiles there were in much poorer condition than elsewhere on the island.

Having a lignotuber gives *P. multisecta* the ability to resprout after fire, and it has recovered well. Its preponderance along roadsides shows it is also able to recover after council graders and trimmers have been along. However, the large thickets or groups of plants we saw are a linked community and this makes them very susceptible to the introduced root-rot fungus, *Pythophthora cinnamomi*. There was no evidence of new seedlings.



Left, resprouting from lignotuber; centre, burned cones; right, burned cone with seed still emerging.

Isopogon ceratophyllus was also regenerating strongly from the lignotuber. This species often co-occurs with *P. multisecta* but is less common on the island. Some specimens were very mature at around 1 m tall. It has flattened, prickly leaves. A highly distinctive feature is its red stems, red leaf portions and red buds.

The Kangaroo Island native plant nursery in Kingscote has a wide range of local native species. Since the fires, it has partnered with Nature Foundation SA to help restore habitat on the island, both for wildlife and to help protect farmers' livestock. Nursery and seedbank coordinator Veronica Bates doesn't usually grow *P. multisecta* but after the fires she collected soil from burnt areas and propagated from the seed soil bank. In this way she successfully raised a handful of seedlings. It generally grows from suckers or underground stems which travel.

While on the island we visited Stokes Bay Bush Garden. Owners John and Carol Stanton lost their home, extensive native garden and their business in the fires. Their garden was remarkable for its range of WA species and many were coming back although perhaps not in the spots the gardeners would prefer! While there are no longer many isopogon or petrophile species evident, the local *P. multisecta* was flourishing. John and Carol are now looking to re-establish their business and we certainly hope it goes well for them and that we isopogon and petrophile lovers will be visiting again soon.

Isopogon tridens (Meissner) F. von Mueller, *Fragm. 6: 239 (1868)*



Isopogon tridens was first formally described by Carl Meissner in 1855, giving it the name *Isopogon trilobus* var. *tridens*. Ferdinand von Mueller renamed the species *Isopogon tridens* in 1868. *Tridens* derives from the Latin (tres) three + (dens) teeth referring to the typical three-toothed leaves. Hence the common name three-toothed coneflower.

Description – *Isopogon tridens* is a low, bushy shrub to 1.2 m in height. Leaves are flat, undivided and narrowly cuneate, to 6.5 cm length, with obscure longitudinal veins, and three pungent pointed teeth. The inflorescence is depressed/globose and is surrounded by densely packed ovate, hairy involucral bracts, with flowers emerging through the top half of the inflorescence. Flowers are white, extending to a tan end and a white tuft of hairs at the tip. Apart from the tip the flowers are glabrous

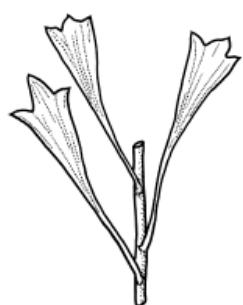
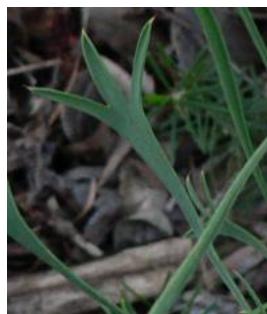
(hairless) and up to 28 mm long. Flowering occurs between June and August. The pollen presenters have a distinct constriction towards the middle, with the basal part sparsely pubescent and the remainder glabrous. Branchlets are reddish/brown and covered with a dense indumentum of short-white hairs.

Distribution – found in a small area from the Arrowsmith River/Three Springs area north of Perth, extending south to Eneabba. A convenient spot to find *I. tridens* is on the western side of the Brand Highway opposite Western Flora Caravan Park.



Cultivation – this is a species rarely seen in cultivation despite its lovely terminal large white flowers, a colour very rare in isopogons. On the odd occasion it's found in nurseries, it's generally labelled incorrectly as *I. trilobus*. Its low, compact habit, unusual foliage and showy white flowers are perfect for pots or well-drained gardens. Like many isopogons, annual pruning after flowering is recommended to maximise flower display the following year. For summer-wet gardens, grafting is highly recommended. It grafts readily onto eastern species *I. anethifolius*, *I. anemonifolius* and *I. 'Coaldale Cracker'*.

Confusing species – *I. tridens* is often confused with the southern species *I. trilobus* because of the similar three-lobed leaves but can be easily distinguished by its long, white, glabrous flowers versus the short, yellow, finely-hairy flowers of *I. trilobus*.



Left, varying leaf forms



Right, spent cone

Petrophile filifolia R. Br., *Trans. Linn. Soc. London* 10: 69 (1810)



Photo: Ian Roberts

Petrophile filifolia was first described by Robert Brown in 1810. However Bentham grouped it with *P. acicularis* and renamed both species *P. longifolia* var. *tenuifolia* in 1870. This name remained until 1995 when Foreman reinstated *P. acicularis* only. In 2005 Rye and Hislop reinstated *P. filifolia*, also recognising a new subspecies *laxa*.

Description – *Petrophile filifolia* is a low, mounding shrub to 0.5 m in height. Each year next season's flower buds sprout from the base of the current year's inflorescences creating a mounding form with increasing

numbers of inflorescences each year. The erect, long, terete leaves up to 280 mm in length surround each inflorescence and extend upwards in a slight to pronounced curve. The new growth is a vibrant deep red colour. The inflorescence is terminal, sessile and globose 25-45 mm in diameter. Involucral bracts are few and inconspicuous, but before flowering the prominent floral bracts are very showy due to attractive red tips. Flowers are cream to pale yellow, opening to reveal a prominent burgundy perianth beneath the anthers, and the initial yellow pollen presenters changing to orange then burgundy producing a stunning overall effect. The flowers are glabrous at the base but above become densely hairy, while the style is glabrous.

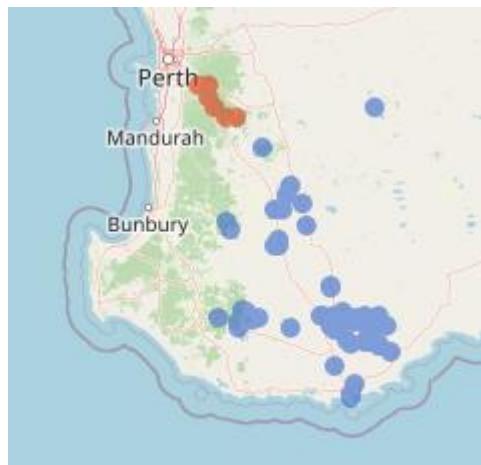


There are two subspecies:

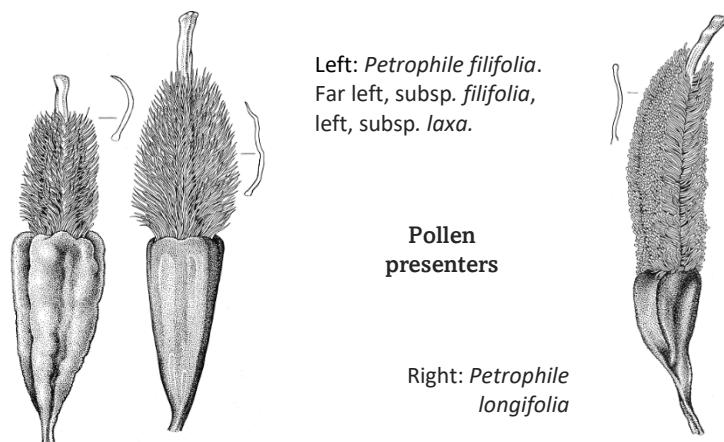
- subspecies *filifolia* – this is the subspecies widespread in cultivation and sold under the name of *P. longifolia*. It has a densely hairy limb with a tight, antrorse indumentum of short, acute hairs. It grows in winter-wet sandy or gravelly soils in heath or woodland. It flowers between October and January.
- subspecies *laxa* (pictured right) – *laxa* refers to the looser indumentum of the densely hairy tepal limb compared with subspecies *filifolia*. It is not as common as subspecies *filifolia*. Apart from the limb hairs, subspecies *laxa* differs from subspecies *filifolia* in its later flowering period (November to January) and the length of the hairs on the pollen presenter brush which are 0.5-0.8 mm, double those of subspecies *filifolia*. Conservation status: Priority Three.



Photo: Jean and Fred Hort



Distribution – Subspecies *filifolia* is found south-east from Dryandra Woodland to the Stirling Range and Albany, and east to Hassell National Park. Subspecies *laxa* is found in a restricted location north-west of subspecies *filifolia* between Armadale and Wandering. See map, left (blue = subsp. *filifolia*, orange = subsp. *laxa*).



Confusing species – *P. filifolia* is nearly always mislabelled as *P. longifolia* in commercial nurseries. However, *P. longifolia* differs in flowering earlier in August-September and unopened flower tips tend to be green rather than grey in *P. filifolia*. Other differences include a deep burgundy colour revealed behind exposed anthers in *P. filifolia* (cream/white in *P. longifolia*) and more steeply antrorse hairs on the brush just above the base giving the impression of a constriction between the pollen presenter brush and base (not apparent on *P. longifolia*).

Cultivation – *P. filifolia* is very widespread in cultivation under the name *P. longifolia*.

Subspecies *filifolia* is a spectacular species with the wow factor due to its showy flowers, erect long leaves and unusual mounding habit. It is commonly found in cultivation in the winter-wet/summer dry gardens of WA, SA and Victoria, where it has proven to be hardy and long-lived. In summer-wet eastern states gardens, it is best suited in well-drained pots or steeply sloping garden beds. Study Group members have grafted it onto eastern species *P. sessilis* and *P. pulchella* and trials continue. Unlike most petrophile species, *P. filifolia* should not be pruned, otherwise the natural mounding habit will be lost.



Tips on growing isopogons and petrophiles in pots from our specialist in Europe

Liesbeth Uijtewaal

Plants grow well in semi-shade as well as in full sun, seedlings flower in 3 years' time, cutting grown plants can flower in their second year, I treat them the same as any other (Australian) plant. Not a problem at all! I hardly ever prune them since they grow so neatly by nature. They get 3g/l Osmocote for natives in the new mix when they're potted on. This is once a year when they're lucky. If not, they just starve for another year.

In winter, light levels obviously are very low (short days, glasshouse) and humidity is high (around 90%) and yet plants don't seem to be bothered by this. Temperature is kept just above zero, on sunny days temps may rise to 10°C but then again in chilly overcast periods temps may stay around zero for days/weeks.

All species I have tried so far have proven to be suitable. Apart from *I. latifolius* that dropped dead for some unknown reason after some 5 years. Below are species I'm currently growing, I haven't added *P. axillaris* and *P. serruriae*. After all they're still babies and haven't proven themselves yet. All plants grow on their own roots apart from *I. cuneatus*; I couldn't get it to strike roots so after 6 weeks in the propagator I decided to graft a piece on *I. formosus* and it worked. The age of the oldest specimen of one species is mentioned after the name.



P. linearis in the glasshouse

ISOPOGONS

- 'Candy Cones' (3.5)
- 'Stuckey's Hybrid' (5)
- anemonifolius (3.5)
- anemonifolius 'Jervis Bay form' (2.5)
- anethifolius (3.5)
- cuneatus (grafted on formosus
7 years ago)
- dawsonii (5)
- divergens (7)
- dubius (3.5)
- fletcheri (3.5)
- formosus (10)
- mnoraifolius (5)
- petriolaris (6)
- scabriusculus ssp. stenophyllus (3.5)
- trilobus (4.5)

PETROPHILES

- ericifolia (3.5)
- fastigiata (4)
- linearis (5.5)
- pedunculata (3.5)
- pulchella (3.5)
- teretifolia (3.5)



Above,
I. latifolius
plant, and
in flower.

Right: *I.
formosus*



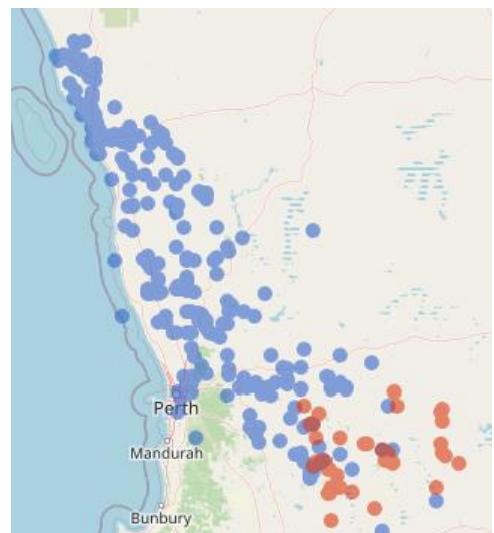
Isopogon 'Silvertips' – a new isopogon hybrid



Isopogon 'Silvertips' is the tentative name we have given to a natural hybrid between *Isopogon divergens* and *Isopogon gardneri*. Growing about 1.5–2 m, it has the large pink flower heads of the best western isopogon species. Its flowers have distinctive silvery tufts at the top which curve slightly over matt pink stalks somewhat reminiscent of tuckshop musksticks. Divided leaves are needle-like but not prickly.

The new hybrid comes from west of Perth, WA. One parent, *Isopogon divergens*, is well-known and easy to find, especially north of Perth. The other parent, *Isopogon gardneri*,

is less common with a smaller range west and south of Perth. The species do co-occur in a relatively small number of spots west and south of Perth (see map, right – blue = *I. divergens*, orange = *I. gardneri*). The specimen we found was quite mature and located next to mature, healthy specimens of the parents. It was a similar size to the parents. The *I. divergens* had bright pink flowers and the *I. gardneri* had pale pink flowers. The table below shows the results of a morphological comparison of the new hybrid and the parents.



Morphological comparison of the presumed hybrid and its two parent species

Character	<i>Isopogon divergens</i>	Presumed hybrid 'Silvertips'	<i>Isopogon gardneri</i>
LEAF Length	Petiole to 5.6cm; lamina to 10.5cm. Glabrous, terete, pinnate to bipinnate, soft. Pungent point	Petiole to 3.5cm; lamina to 6.5cm. Glabrous, terete, divaricate, interlacing, soft Pungent point	Petiole to 2.5cm; lamina to 4cm. Glabrous, terete, divaricate, interlacing, stiff. Pungent point, prickly
INFLORESCENCE	Sessile, terminal, globose 40-45mm diameter	Sessile, terminal, Up to 35mm long	Sessile, terminal, Up to 35mm long
Involutural bracts	Few, ovate, forms cup shape	Ovate, villous, to 8mm long, forms cup shape	Numerous, campanulate, to 8mm long, forms urn shape
FLOWERS			
Cone scales	Cuneate, villous	Subulate, narrow, tuft at apex	Narrow, linear, tuft at apex
Perianth length	Up to 25mm	Up to 30mm	Up to 30mm
Perianth hairs	Glabrous, short tuft of hair at apex	Pubescent, hairs thicker/longer near apex.	Villous, hairs thicker/longer near apex.
Colour	Pink/mauve to deep pink	Pink	Pale pink or yellow
Pollen presenter	Up to 4mm, constricted, 4-ridged.	Up to 4mm, constricted	Up to 4mm, constricted, short, reflexed hairs
BRANCHLETS	Reddish-brown, glabrous	Reddish-brown, glabrous	Reddish-brown, glabrous
Height	to 1.5m	1.5-2m	To 1.6m
Habit	Upright, open	Upright, open	Dense, upright
Flowering period	Aug-Oct	Aug-Nov	Sept-Dec
LIGNOTUBER	No	No	No

The main differences between the hybrid and its parents are:

- Leaves – length is in between parents (both petiole and lamina). It is shorter than *I. divergens*, longer than *I. gardneri*. The feel is soft like *I. divergens*, not stiff or prickly like *I. gardneri*. Leaves are divided at wide angles like *I. gardneri*.
- Inflorescence – similar to *I. gardneri* except for ovate involucral bracts rather than campanulate (bell-shaped), and the rings of overlapping bracts surrounding the flower heads form a cup-shaped structure rather than urn-shaped i.e. more open.
- Flowers – colour is a pink shade in between the parents. Flowers are less hairy than *I. gardneri* and more hairy than *I. divergens*, and matt in texture. The knots or bows formed by reflexed tepals lack a white edging or frill of perianth hairs as in *I. gardneri*. The tuft at the flower's apex is more prominent than either parent. It is similar to that in *I. gardneri* but contrasts with the smooth perianth tube. A real feature, the tuft curls over and reflects the sun giving it a silvery look.
- Habit – the hybrid's height and habit resembles *I. gardneri*. It is taller than it is wide.



Left,
I. divergens

Right,
I. gardneri



Isopogon ‘Silvertips’ has the most attractive aspects of *I. gardneri*, replacing its stiff prickliness with soft foliage. It has numerous, well-displayed flower heads and interesting foliage. Slender leaves occur on long canes. Attractive involucral bracts surrounding the flower head are a feature – they gather the flowers together in a cup shape, as if in a vase.

In the garden, this attractive hybrid is a superb feature plant. This hybrid will require good drainage when ungrafted and full sun and is likely to have hybrid vigour. Growing on a slope or in raised beds will promote success. It is likely to be susceptible to phytophthora so best grown in winter rainfall areas unless grafted. It grafts readily onto *I. ‘Coaldale Cracker’* so this is the way to go in east coast summer-wet areas. The flowering period is late August to (probably) November. Long canes can be pruned after flowering to maintain shape and promote more flowers next season. It should be an excellent cut flower.

Does smoke water have any effect on germination in isopogons and petrophiles?

Over the years our study group has conducted many experiments using smoke water to promote seed germination. Results have, overall, indicated that smoke water is not required for germination. Most members do not use any treatment at all on their seed.

Academic research has shown that it is mostly species which release their seed on maturity into a soil bank (non-serotinous) that respond to the stimulation of smoke to break their dormancy. In contrast, serotinous species have a canopy or aerial seed bank of non-dormant seeds which can remain viable for several years until release after a bushfire. The cones protect the seeds from predation and heat generated by fires. This method of seed release applies to nearly all species in the proteaceae family, including isopogons and petrophiles. Isopogon and petrophile cones will usually also release their seed in the case of death (of the plant, or when a branch or stem is broken off). Some species of isopogon and petrophile can release a small amount of seed spontaneously and so may be considered weakly serotinous.

While serotinous species do not require any further cue for germination once seeds are released, the seeds are often released into a post-fire environment that contains active smoke chemicals. It is possible that chemicals from smoke may regulate diverse aspects of plant development such as seedling fitness. A recent study conducted at the Department of Environment and Agriculture at Western Australia’s Curtin University examined the effect of smoke water on serotinous (canopy stored seed) proteaceae species in fire-prone southwestern Western Australia. Eight species were included in the study including three isopogons (*I. divergens*, *I. dubius* and *I. sp.*) and three petrophiles (*P. anceps*, *P. drummondii* and *P. filifolia*). These species are all serotinous reseeders killed by fire. *Banksia candolleana* and *B. menziesii* were the other species in the study. The study reported the effect of smoke water not only on seed germination but also the ‘fitness’ of germinated seedlings measured by root growth and shoot growth. We are not aware of any studies examining the effect of smoke stimulant on isopogons and petrophiles so this report provides valuable information.

The study compared species treated with smoke water with a control group of the same species. To ensure that seeds were not subject to any smoke effects in extracting them from their fruiting bodies, all seeds were extracted without the use of fire. Each species was treated with Oaten-Hay smoke water or for the control group, sterile deionised water. Seeds of each species were placed in Petri dishes in a controlled environment set at typical winter germination temperatures of 15°C with a light/dark cycle of 12 hours light/12 hours dark. Germination was confirmed once the length of the embryonic root measured 2 mm or greater. Once germinated, seedlings were grown on for five weeks to determine the effect of smoke water on shoot and root length.

Seed germination results: All eight species germinated readily, showing no significant differences between seeds treated with smoke water and the control group. This result was not surprising given past studies which indicate that it is mainly non-serotinous species which benefit from smoke exposure to trigger germination. Interestingly for study group members who find growing isopogons and petrophiles from seed difficult, all the isopogons and petrophiles in the study germinated at close to 100% within 30 days! The freshness of the seed which was mostly collected from wild plants and the seed sterilization treatment plus controlled laboratory conditions are likely factors contributing to high germination rates.

Seedling fitness results: The effect of smoke water on seedling fitness measured by shoot length and root length was inconclusive across the eight species. The only species to exhibit increased shoot length due to smoke-water treatment was *P. filifolia*. Only two species showed increased root length due to smoke-water treatment – *I. divergens* and *B. menziesii*. However, these increased shoot length and root length responses to smoke-water were not consistent within these species.

The mechanisms behind the germination and ‘seedling fitness’ responses to smoke stimulation remain unknown. The authors recommend a continuation of such work in southwestern Western Australia where an understanding of these mechanisms is important in devising appropriate fire-management strategies in a changing climate.

For those of us growing isopogons and petrophiles from seed, the general conclusion that smoke water is not significant for germination holds. This is important verification of study group findings.

E.M. Yearsley, W.M Fowler, T. He. [Does smoke-water enhance seedling fitness of serotinous species in fire-prone southwestern Western Australia?](#) *South African Journal of Botany* 11 (2018) 237-243

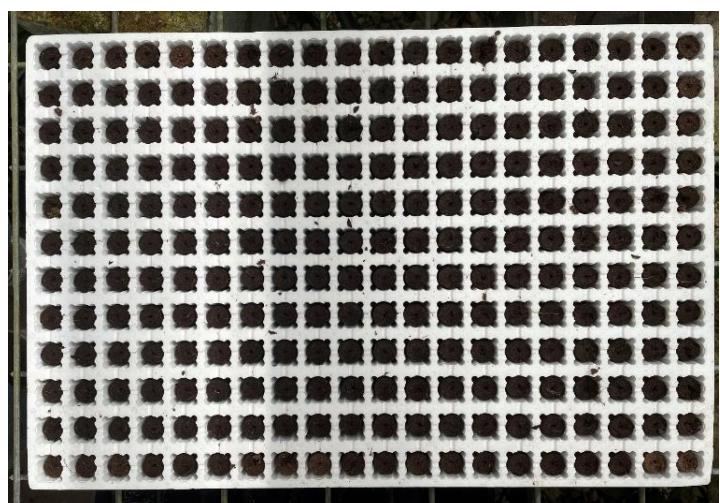
Managing transplant shock with peat plugs

A recurring complaint from study group propagators is the high rate of seedling deaths at the first transplant stage after seed germination (sometimes 100%). This disappointment is understandable as it hard enough to get I & Ps to germinate in the first place. We can't afford these transplant disasters. The good news is there is a simple solution.

For the last few years, I have germinated all my banksia stock plants in 20 mm peat plugs. These come in trays of 240 plugs (see photo), which are sold by national garden supplies wholesaler Garden City Plastics. Many APS groups source pots from there, so your group should be able to source these trays of plugs for you. Each plug has a slit on one side where seeds can be inserted. With *Banksia integrifolia* seeds, I get close to 100% germination in these plugs. I have now tried this method with petrophile seeds.

Pot up as soon as you see the true leaves starting to emerge. Generally roots will have started to grow through the plug by this stage.

Remove the plug carefully without putting pressure on the tiny seedling (I often push them out from underneath). Then simply plant the entire plug, as is, into your waiting pot filled with potting mix. This



prevents transplant shock from potting on, a big advantage. Amazingly, you can then put the potted seedling straight into the open without any protection and they bound away.

With petrophiles, germination rates remain an issue, but once they germinate they can be potted on with no transplant shock losses. Here is a tiny *Petrophile pulchella* seedling which was potted on three weeks ago and it's powering away, despite being subject to a few days in the high 20s.



Isopogon anemonifolius

Karlo Taliana

Isopogon anemonifolius (Broad-leaved Drumstick) was first collected by Daniel Solander at Botany Bay during Captain James Cook's voyage in 1770. It is the type species (the very first species described) for the genus with the genus name coming from the Greek 'isos' meaning 'equal', and 'pogon' meaning 'beard', referring to the equal length of the hairs on all sides of the nut. The species name is derived from the genus *Anemone* referring to the divided leaves which resemble anemones, and the Latin, 'folium' meaning 'leaf'.



This species grows as a bushy shrub with variable height (0.5m-2.0m) by 1.0m wide. It is more likely to be seen growing taller in habitats of dry sclerophyll forests. It's most often found across the heathland areas like those found on the ridge at Picnic Point, but it also exists over widespread sections of the Georges River National Park. It is the only member of its genus local to our area. In more coastal locations, some forms may grow to only 0.5m when exposed to strong headland winds.

The leaves are light green, 5-10cm long, usually flattened and divided into three segments – these in turn are divided into more linear lobes. The yellow flowerheads, 4cm wide, occur terminally, often in groups, from Spring to early Summer. Cones are globular, 2cm diameter, eventually dry out to release seed spontaneously. Following bushfires, this species may also regenerate by reshooting from its lignotuber. Propagation is possible using fresh seed or by semi-hardwood cuttings.

This article first appeared on the Plants Native to the Sydney Region Facebook page on 18 September 2021. The cover picture for the Facebook page is currently a photo of *I. anemonifolius* by Michael Andrew Swire.

Karlo's article had some enthusiastic responses, locals noting how well *I. anemonifolius* is flowering at the moment, the extra rain a factor this year. One person actually propagated this species by throwing the seed into a seed box and then forgetting about it until the seedling popped out. There was also agreement about the adaptability and relative toughness of this species. It grows on sandstone yet seems to survive in Illawarra gardens. A plant on a slope at Keiraville in soil with lots of rocks and clay in it has thrived. They will grow at sea level, near the coast at places like Jervis Bay and thrive in virtually pure sand near Norah Head on the Central Coast.

Footnote: A new video on isopogons has just been published online by APS NSW. Created by Ralph Cartwright from the Sutherland Group, it briefly explains what isopogons are and how the two main species of the Sydney region, *I. anemonifolius* and *I. anethifolius*, differ. Here is the link <https://youtu.be/rY1KnsSt7gc>.

Financial Report

Total 19/4/2021	\$1,804.06
Bank balance	\$1,700.62
Cash on hand	\$103.44
Donations/income	\$52.50
APS SA	\$10.00
SGAP QLD	\$20.00
Australian Plants	\$22.50
Expenditure	\$330.00
Australian Plants	\$330.00
Total 27/9/2021	\$1,526.56
Bank balance	\$1,423.12
Cash on hand	\$103.44