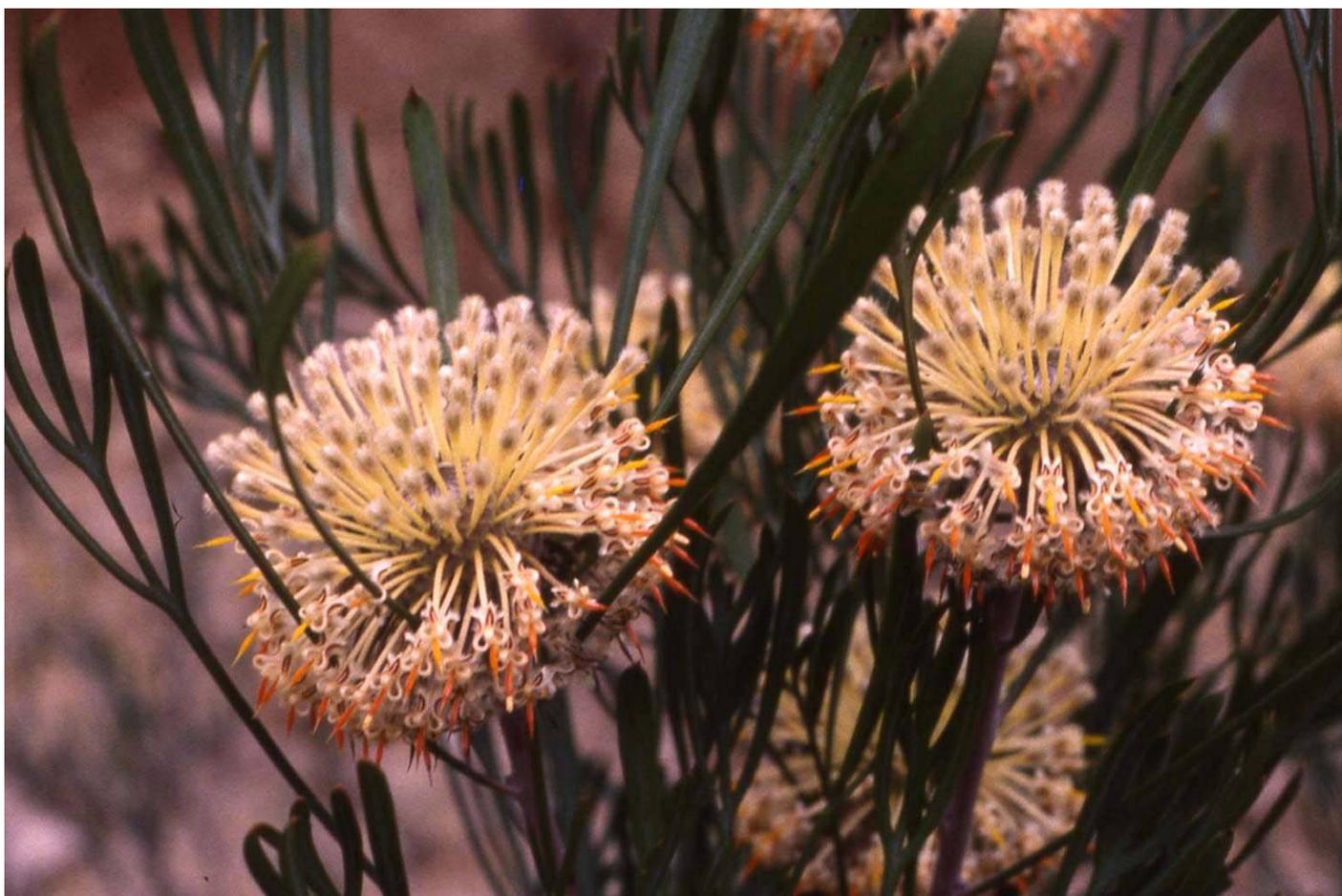

ISOPOGONS & PETROPHILES

The Association of Societies for Growing Australian Plants Isopogon & Petrophile Study Group Newsletter

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Isopogon dawsonii. Near Kerrabee, NSW, October 1990.
(See page 6 for more details about this species)

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EDITORIAL

Welcome to the seventh edition of *Isopogons* and *Petrophiles*.

What a strange year it has been weather wise. In Melbourne, we have had a very mild winter with average rainfall for the first time in years, following on from last year's fairly dry summer. The spring has also been mild with only a day or two over 30°C and many with sub 20°C maxima. Most of my plants have finished flowering now and I had an excellent show from *Isopogon anemonifolius*, *Isopogon formosus* and *Isopogon mnoraifolius* particularly. As with many of my plants there have been a few losses, but I have some cuttings and seedlings coming through as replacements.

I was lucky enough to be able to attend ASGAP 2005 in Perth in October and had an absolutely marvellous time. It was great to catch up with a few study group members during the meeting. The preconference tour, out into the wheatbelt, went through country I'd never seen before and was excellent. I'd like to give a huge thanks to the organisers and to our guides and hosts on that tour, the Barrows and the Keigherys. I saw a large number of species of *Isopogon* and *Petrophile*, a number I had never seen "in the flesh" before. Perhaps the most spectacular was *Petrophile heterophylla* in a gravel pit in the Dryandra woodland reserve. This is a truly magnificent species in flower and would be a welcome addition to any medium to large garden. Other new species (for me) included *Isopogon scabriusculus*, *Isopogon gardneri* and *Petrophile*

circinata. On that tour I got to see *Banksia cuneata* and in fact we found a new population of this rare and unusual *Banksia*. In addition, I had a day in the Stirling ranges and was pleasantly surprised to see that *Isopogon latifolius* had returned around the base of Mt Trio.



Petrophile heterophylla

Whilst in Perth I found *Petrophile latericola* (see issues 3 & 4) for sale at the Kings Park wildflower festival and snapped it up. It is looking well in its pot and a number of cuttings have been taken with no losses so far (fingers crossed). It is great to see a rare and endangered taxon being grown for sale.

In this issue Tony Cavanagh tells us about some of the early writings about these genera in 19th Century British popular botanical publications. The featured species is *Isopogon dawsonii*, the tallest of all the *Isopogons* and *Petrophiles*. Bob O'Neill tells us about his wonderful garden east of Melbourne (<http://www.katandragardens.com.au/index.html>).



Isopogon latifolius

My congratulations go to Bob for being named the ABC Gardening Australia Gardener of the Year. His garden really is amazing and well worth a visit. Its also nice to see an Australian native enthusiast being given this award.

(<http://www.abc.net.au/gardening/stories/s1503293.htm>)

Thanks to everyone who's contributed, and I hope you

all enjoy the newsletter.

David Lightfoot ☺

Members' letters and emails

From Dan K. Adelaide, SA.

Jan 2005

*This is the reply to an email of mine where I asked Dan if his grafted *I. latifolius* had flowered.*

David,

No flowers yet unfortunately!

The plant is growing well, and is now 1m or so, although the scion has outrun the rootstock and it has turned into a low sprawling shrub - it needs the assistance of the ground to keep upright!

Hopefully I will get some flowers next year, but the plant has certainly outlasted any of my non-grafted attempts.

My bush block however has hundreds of *I. ceratophyllum* appearing in an area that was grazed until a few years ago - quite spectacular.

Dan

*I asked Dan for some more info on the *I. ceratophyllum*.*

They are a very common plant throughout the 130 odd acres, with a range from seedlings to large plants.

There were plenty of flowers last spring, I assume there are seed heads, I haven't really checked!

The area that was previously grazed has been pleasing, many things are regenerating there, but there is a little Isopogon plant every few metres over a large area (not big clumps as such)- they really seem to be making the most of their opportunity!

From Tony Cavanagh, Ocean Grove, Vic

Jan 2005

*Tony sent some photos for identification of an Isopogon that was flowering in his garden. It was *I. alcornis* and so I asked him from where he'd got such a rare Isopogon.*

Also thanks for naming my Isopogon.

That is the name [*I. alcornis*] I had on it so I will replace the label. I bought the plant from one of our local APS members who had collected seed in WA. It was a healthy plant when bought and is now about 3-4 years old and perhaps 30 cm by 50 cm, flowering for the first time around November I think. It is in a dry shade spot (one of the best positions for many Isopogons) and receives minimal watering. I am pleased that it is rare and I will try to propagate it from cuttings in the next month or so.

*Let us know how your cuttings of *I. alcornis* go, Tony. In the wild it tends to be in dry woodland rather than heath and so is in part shade. It seemed to be associated with small Eucs like *Euc forrestiana*- not sure if that's just coincidence or some mycorrhizal association.*

From Phil Trickett, Canberra, ACT

Jan 2005

How's your garden? We have had an excellent season so far, with good rain. A grafted *I. latifolius* that we bought from Philip Vaughan is thriving, but we also have three ungrafted ones that are also doing well. Most of the other Isopogons and Petrophiles that we have are going well, though our two *P. ericifolias* have succumbed. They seem to be difficult. Do you have any of these?

[Yes and I too find them difficult. They strike well from cuttings and grow in the pot only to die soon after being planted. I must say that I have not waited until early autumn to plant them out and they may survive better if they have a longer time to establish before summer heat. Ed.]

In autumn last year, I tried around 20 different Isopogon/Petrophile seed lots purchased from Nindethana, but only 3

planted surfaced. This was consistent with previous unsuccessful attempts at growing Isopogons and Petrophiles from seed.



Petrophile filifolia subsp. *laxa*

However, last spring I planted some fresh seed (*I. dubius* I collected from Tootbardie Road near Hi-Vallee in 2003 and *P. canescens* collected in 2004) and had quite spectacular results, with twenty five *I. dubius* and six *P. canescens* seedlings produced. This makes me wonder whether seed freshness is vital for Isopogons and Petrophiles. Anyway

it has restored my enthusiasm for growing Isopogons and Petrophiles from seed after the previous disappointments. I am currently collecting some fresh seed to try again this autumn.

Regards

Phil

I agree with Phil's point re fresh seed. I have been universally unsuccessful with old seed and seem anecdotally to do better with fresh. It may be influenced by the storage of the seed as well. Anyone have any success in germinating older seed? Ed

From Fred Hort, Perth WA

Jan 2005

Fred and Jean Hort are volunteers for CALM in WA and help look for populations of rare and endangered plants. They sent an email with photos of *Petrophile filifolia* subsp. *laxa* Rye & Hislop ms that is only known



Seed thickly dispersed under a burnt plant

from 5 populations in State forests SE of Perth. Although these are reserves they do

not offer the same level of protection as National Parks and can be used for logging etc. Documenting rare and priority plants in these forests may lead to the granting of a higher level of protection to these wonderful remnant bushlands.

It is interesting to note the volume of seed released from the plant following a fire (see photo above). Petrophiles, in general, store their seed in woody fruit until the plant dies, or a fire goes through, when they are released. I would hypothesise that smoke treatment is not necessary, as the seed is not usually in the soil and should not need to remain dormant once released. There is little research available to answer this question.

From Margaret Pieroni, Denmark, WA
Feb 2005

Hi David. Here are a few up-dates. I left Attadale before the plant with the fine, divided terete leaves flowered so now we'll never know what it is (was?). The Petrophile on The Diamonds Hill, to my chagrin, turned out to be *P. phylloides*. It isn't illustrated in the Flora, so I missed it. Anyhow, I'm pretty sure it hasn't been collected from there. Mt. Ragged, not far away is a location for it, though. I'm doing a painting of *P. helicophylla* at the moment. I'm using a photo for the flowers and I'll paint the rest from the potted plant. I haven't seen the ones at the Banksia Farm for a while but I'm hoping, since there were several flowering that there might be some seed set - there are none on the one I have here. I would like to include an enlarged seed in the painting.

From Mic Forster, Sydney, NSW
March 2005

Mic performed a germination experiment on 2 year old Petrophile pulchella seeds. He was looking at the

question of whether presoaking the seed before sowing improved germination rates. These seed are covered in hair and there is some speculation that the hairs are hydrophobic and thus repel water from the seed. The function would be to allow the seed to contact water and germinate only in the wettest of conditions.

Ok, just started a little germination experiment. I only have 74 seed in all so it's not entirely comprehensive. 37 are being soaked for 48 hours and the other 37 I have planted into well watered soil without any pre-treatment. I'll let you all know how it goes....

May 2005

Well after approx 60 days we have some results. These guys are slow to germinate, well compared to the Acacias I have been growing.

Just a reminder, I had two treatments - seed placed directly in soil and kept well watered (non-soaked), and seed soaked for 48 hours then placed in soil and kept well watered (soaked).

Each treatment had 37 seeds at the start of the experiment.

Germination was defined as the development of the cotyledons.

Non-soaked germination = 18 (48.65%)

Soaked germination = 7 (18.92%)

A stats test was carried out on these results and it was found that these two germination rates were significantly different (Chi-Square = 7.31, $p < 0.05$, d.f. = 2).

Concluding, *Petrophile pulchella* had a statistically greater chance of germinating if the seeds were sowed directly into soil and that soil was subsequently kept well watered.

ISOPOGON DAWSONII R.T. Baker

This species is the largest of all the *Isopogons* and *Petrophiles* reaching a height of up to 5-6m. It is named after its discoverer, James Dawson who was a 19th Century surveyor and botanical collector and was first described in 1895. This spectacular plant is found growing naturally in the Goulburn River Valley, Nepean River Valley, and the central coast, tablelands and western slopes region of NSW, down to Lithgow. It is found in dry sclerophyll forest and on cliff edges, and is often locally common. The soil types are usually very well drained, either gravelly or sandy. Surrounding vegetation has an influence on its growth habit. Where there is thick undergrowth the plant has a taller upright growth pattern, whereas more sunlight results in a bushier shorter habit.

It does not develop a lignotuber. The leaves are up to 13cm long and are mid grey/green to deep green in colour. The new growth can be bronze to red, as with a number of other members of the genus. The leaves are characterised by grooving of their upper surface, are flat in cross section and are usually undivided for about half their length. The distal portion is deeply divided pinnately to segments of 1-3mm in width. Some leaves (particularly those towards the ends of the branches) are simple. The branches are hairy at first but become glabrous. This soft foliage makes the plant attractive even when not in flower.



The 4.5 cm in diameter inflorescences, are usually terminal, solitary, and subtended by small simple or mildly divided leaves. The individual flowers are about 1mm long and are creamy, silvery or grey white. (This contrasts with most of the other eastern *Isopogons* that have yellow flowers.) They are covered in hairs especially at the tips. The pollen presenter is



yellow, ageing to orange and contrasts agreeably with the flower colour. The inflorescences are often profuse and well displayed, giving a magnificent display in August to November. When the flowers have finished, the fruiting cone is globose and about 2-2.5cm in diameter. Inside, the nuts are 2-4mm long and like most of the *Isopogons* are covered in hairs.

This marvellous *Isopogon* is becoming more common in cultivation, especially amongst Australian native plant enthusiasts. It can easily be propagated from



Isopogon dawsonii in cultivation near Canberra, ACT. October 2001.

As mentioned above the plant can grow up to 5-6m high but is usually about 1-3m tall and 0.6-3m wide.

seed, (although it can be slow to flower using this method,) as well as cuttings of firm new growth. It loves relatively well-drained slightly acidic soils, but is hardy in many soil and pH conditions. Low phosphorus fertilisers are recommended. The size in



Isopogon dawsonii in cultivation near Canberra, ACT. October 2001.

cultivation is usually less than that seen in the wild, especially if grown in the sun. It will tolerate some shade and responds well to (light) pruning. It can withstand light to moderate frosts and once

established is drought hardy. If grown in a sunny position, in well-drained soil, it is a rapid grower. This species has been used with some success as a rootstock plant for some of the desirable, but less adaptable, western *Isopogons*.

When in flower the profusely displayed cream flowers, with their orange pollen presenters, are stunning. It would be particularly good as a massed planting in a larger garden. I would really like to see this taxon grown more widely in both native and mixed gardens.



Distribution map for *Isopogon dawsonii*

If anyone has seed of *Isopogon dawsonii* they would like to donate to the study group seed bank, could they please mail it to me? Thanks.

(Map and drawing reproduced from Flora of Australia Vol. 16 with permission of ABRS.)

ISOPOGON DUBIUS WILL GERMINATE IN THE FRUITING CONE

During a recent trip to “The West”, I travelled along the Great Northern Highway towards Bindoon (about 85 Km north of Perth). It was early August and most of the *Isopogons* and *Petrophiles* I saw were in bud, rather than in flower. In a number of particularly sunny spots I saw *I. dubius* in full flower. Whilst examining one of these plants, I spotted a hint of green in a fruiting cone and found that two seeds had, in fact, germinated insitu. There had been good rain in the area over winter and

enough water must have lain in the flattened bottom of the fruiting cone to motivate the seeds to germinate. I rescued them, as they would surely have perished where they were. After planting out in pots they shot away, seemingly happy to get their roots into the potting mix, rather than the air. It was



The germinated seeds



Isopogon dubius

a similar observation in *Hakeas* by Paul Kennedy that led him to develop the bread bag method of seed germination. This method involves placing the seed within a folded up piece of damp paper towelling. This is then put into an empty (plastic) bread bag that is tied closed and placed in a sunny

spot. The seeds are periodically inspected and then potted once they germinate. In *Hakea* this method seems to have the advantage of increased speed of germination and decreased, in the pot, rot related seed loss. In addition, non-viable seed is found early and so pots are not wasted with infertile seed. As far as I know this method has not been explored in *Isopogons* and *Petrophiles*. When I got home I tried it with some seed of *Isopogon asper* I had collected on the trip. (They had no other pre-treatment- e.g. smoking.) I found that the seed did indeed germinate quickly (only about 2 weeks) and viable could be sorted from non-viable seed. It remains to be seen if the survival rate of these seed once potted up increases with this method, but it certainly looks promising. If anyone else has tried this method with *Isopogons* or *Petrophiles* please let me know what you think of it?

CULTIVATION OF *ISOPOGON* AND *PETROPHILE* IN GREAT BRITAIN IN THE 19TH CENTURY- TONY CAVANAGH.

It is not widely known that at least 1200 species of Australian plants (and possibly as many as 2000) were grown in Great Britain in the 18th and 19th centuries. Because of the rigours of the climate,



Isopogon baxteri from Curtis' Botanical magazine 3539, 1836

nearly all were grown in pots in glasshouses but occasionally, plants from cold climates such as Tasmania survived in sheltered positions outdoors. In addition, in areas such as the Scilly Isles, the climate is mild enough for Australian plants to flourish outdoors

and in recent years both *Banksia coccinea* and *Dryandra formosa* have flowered outdoors there in the famous gardens of Tresco Abbey. Neither *Isopogon* nor *Petrophile* in general is hardy enough to survive outdoors, but

from 1790-1 when *Isopogon anemonifolius* and *Petrophile pulchella* were raised from seed received from Port Jackson, to late in the 19th century, some 12 *Isopogons* and 7 *Petrophiles* are recorded from the British Isles, many of them being grown to flowering stage. In this article, I will list these



Petrophile pulchella. Curtis' Botanical Magazine 796, 1805

plants and discuss their origins where we know them and the suppliers of seed. It is almost certain



Petrophile acicularis Curtis' Botanical Magazine 3469, 1836

that these genera were also grown in Continental Europe where like Britain, there were major botanic gardens and extensive exotic plant collections on large estates, but the research on Europe has not yet been completed.

There are a number of sources that can be used to locate the names of Australian plants grown in Great Britain including the two editions of the multi volume *Hortus Kewensis*, which listed specimens in cultivation at the Royal Gardens at Kew. This is particularly useful for the period up to 1813, as it usually includes details of the supplier of plants or seeds, dates of introductions and country of origin. As most introductions of new species found their way to Kew through the influence of Joseph Banks, it is quite comprehensive. However, right from the founding of the Colony of New South Wales in 1788, there existed an extensive clandestine trade in seeds, live plants and animals (both live and stuffed) to private individuals and nurseries in Britain and other sources are needed to track these. One of the main ones are the many horticultural and gardening magazines, which began with William Curtis's *The botanical magazine* (often known as *Curtis's botanical magazine*) in 1787. His format was to provide a

concise botanical description of newly introduced "ornamental foreign plants", cultivation information and to illustrate each with a full page hand-coloured plate. Some of these plates are used in this article and many are remarkable for their botanical accuracy and detail. Other journals quickly followed, Henry Andrews' *The botanist's repository* in 1797 and Sydenham Edwards' *The botanical register* in 1815 being two of the better known. These journals of course covered plant introductions from all countries, not just Australia. Fortunately, there is an index to many of the illustrations that appeared in these journals, *Index Londonensis*, which is extremely useful for locating coloured plates from a wide range of sources without having to go laboriously through large numbers of issues of many journals. But the most comprehensive sources are the horticultural dictionaries and encyclopaedias, which

began to appear in the 1820s. Claiming to provide details of "all the plants cultivated in Britain", they hardly make inspiring reading, listing in tabular form information for upwards of 30000 plant species. Today, they are an invaluable record of just what was



Isopogon sphaerocephalus Curtis' Botanical Magazine 4332,

cultivated in Great Britain in this period. I found John Loudon's *An encyclopaedia of plants* most helpful as it came out in several editions and supplements between 1829 and 1880. The *Isopogons* and *Petrophiles* listed in the table were extracted from the 1880 edition and are corrected for current names. Some early introductions were called proteas in the lists

and others were included for a time in a genus



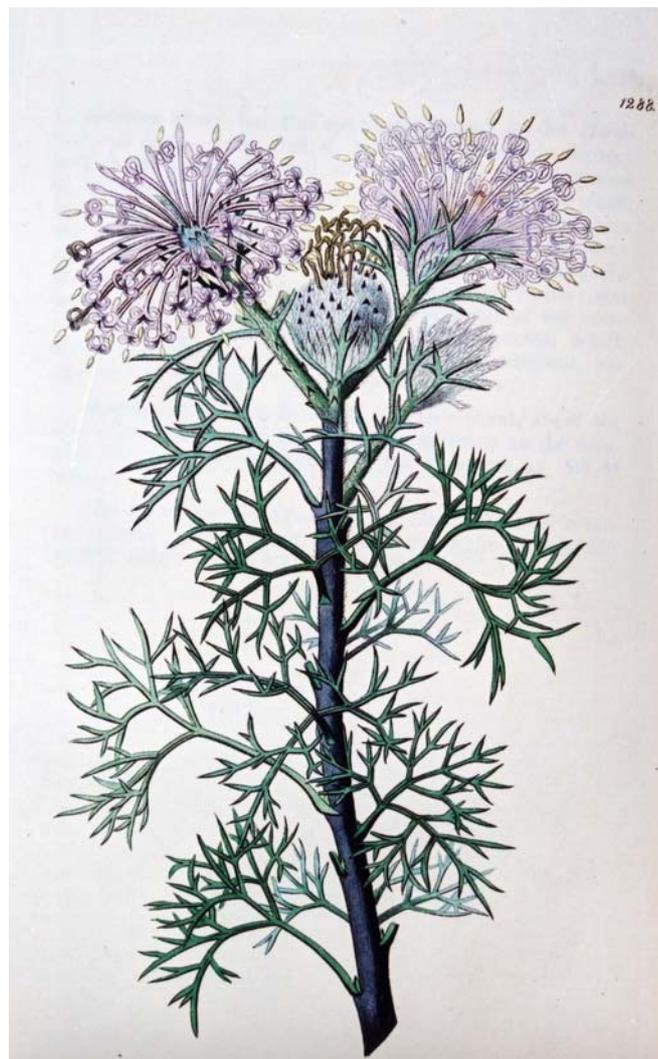
Isopogon dubius Curtis' Botanical Magazine 4037, 1843

called "Atylus" so these had to be looked for as well. My main means of identifying them as Australian plants was the country of origin, which was given in the tables for nearly every species as well as the date of its introduction into Britain. Between all these sources, what further information can we find out about the above species?

The plants were all grown in pots or tubs in glasshouses, which were usually heated by dry-heat stoves in the winter although many *Proteaceae* were found to survive temperatures down to 0 °C providing they had a dry atmosphere. Particular attention was paid to soil composition and drainage and plants were regularly repotted and pruned around May of each year. They were often taken outside over the summer following repotting. *Isopogons* and *Petrophiles* in glasshouse culture grew to between two and four feet and took about three to five years to flower. They were reliable, usually

being described as "free growing" and do not seem to have suffered from diseases. Flowering was mainly in spring, March-April, although *I. formosus* was later, in July, and *P. pulchella* flowered in August. I have no information on their life as pot plants although glasshouse *Banksias* are known to have survived 50 years in the right conditions. For information, I have summarised what we know of the cultivation of these species in the table.

It is always interesting to see what Australian plants were cultivated overseas. Indeed, some are still available from specialist English nurseries although relatively few are from the *Proteaceae* family. The above information does indicate that *Isopogons* and



Isopogon formosus Andrew's Botanists Repository 1288, 1829

Petrophiles are suitable for growing in pots and tubs and this practice may help those who wish to try some of the more touchy species, which sometimes are difficult to maintain in the ground.

Isopogon and Petrophile cultivated in Great Britain

Species	Introduced as	Date	Other introductions	Seed Supplier	Cultivation Notes
Isopogon					
<i>anemonifolius</i>	<i>Protea anemonifolia</i>	1791	c1800, Napier Nursery c1824, Loddiges Nursery	From Port Jackson	Flowered spring 1804 at Napiers
<i>anethifolius</i>	<i>Protea anethifolia</i>	1796		From Port Jackson	Raised by Richard Salisbury
<i>asper</i>	<i>Isopogon scaber</i>	<1842		James Drummond to Kew	Flowered April 1843 at Kew
<i>attenuatus</i>		1822	c1844, Kew Gardens	1822 to Kew, William Baxter. 1844 to Kew, James Drummond	Flowered spring 1847 at Kew, bushy shrub to 3 feet
<i>baxteri</i>		1831		Col. Lindsay ¹ to Edinburgh Botanic Gardens in 1830	Raised 1831, flowered in the greenhouse April 1835
<i>buxifolius</i> var. <i>linearis</i>	<i>spathulatus</i> var. <i>linearis</i>	c1830			Flowered 1835
<i>cuneatus</i>	<i>Isopogon loudoni</i>	1830		William Baxter, 1829, seed to Kew and Knight's Nursery	Flowered Kew, spring 1834
<i>dubius</i>	<i>Isopogon roseus</i>	<1840		James Mangles, probably ex Georgina Molloy	Robert Mangles, flowered c1840
<i>formosus</i>		1805	c1824, Mackay Nursery	1805 to Kew, Peter Good 1824 to Mackay, Wm. Baxter	Flowered Mackay's Nursery, Clapton in July 1829
<i>longifolius</i>		1823		Wm. Baxter to Colville Nursery	Flowered 1825
<i>sphaerocephalus</i>		1845		James Drummond to Kew	Flowered spring 1847 at Kew
<i>trilobus</i>	<i>Petrophile trifida</i>	1805	c1829, Loddiges Nursery	1805 to Kew, Peter Good 1829 to Loddiges, Wm. Baxter	Flowered 1832
Petrophile					
<i>acicularis</i>	<i>Petrophile filifolia</i>	1830		Col. Lindsay ¹ to Edinburgh Botanic Gardens	Flowered April 1835
<i>biloba</i>		<1849		?James Drummond	
<i>brevifolia</i>		1840		?James Drummond	
<i>canescens</i>		1830		?William Baxter	
<i>heterophylla</i>		1840		?James Drummond	
<i>longifolia</i>		<1849		?James Drummond	
<i>pulchella</i>	<i>Protea pulchella</i>	1790	c1800, Napier Nursery	From Port Jackson	Flowered Aug. 1804 at Napiers

¹ Colonel Lindsay was a Scottish military person who was acting Governor of New South Wales for a short period in the 1830s. He was a keen promoter of natural history and probably obtained the seeds for this W.A. species from William Baxter after his second collecting expedition.

ISOPOGONS AND PETROPHILES AT WANDIN-BOB O'NEILL

Katandra Gardens at Wandin, 50km east of Melbourne at approx 250 m elevation, has proven to be a most capable site for the cultivation of a vast array of plant species, including *Petrophiles* and *Isopogons*. The first *Isopogon* was planted here several years ago, lasting some years. A concentrated focus on growing these plants commenced in 2003 and has continued since.

In 2002, two plant beds were redeveloped using several loads of recycled potting mix that had earlier been used for the growing of bulbs. These beds were intended for plants that required an excellent drainage medium, such as *Eremophilas* and *Dryandras*, an experimental project to try things out and to extend the plant range in our gardens. Some of the *Petrophiles* and *Isopogons* were also planted in these beds on the basis that they would probably do better in the sandy soil than our reddish soil.

I was able to acquire cutting material of several species and luck favoured the novice in that I had an excellent success rate with striking the cuttings and later had extremely rapid growth rates. Most of these plants were put into our own soils, not the potting mix beds. All went well for about 2 years, until this last summer when we had several plants turn up their toes and die.

About the same time I purchased approx. 12 species at 6 inch pot size. These were the more uncommon species, quite well developed specimens, probably a little on the root bound side. I made the assumption that most of these were from the more arid areas and planted most of them in the potting mix beds. In the intervening 2 years I have lost a number of these plants and the balance have made fair to good progress. I feel that the soil type may not have suited the plants, contributing to the losses, and as I have not added fertilizer probably there is not enough oomph in the soil. Further, the advanced stage at planting may have been a factor. Shortly I will add some blood and bone to see what happens. My theory is that natural fertilizers should not be a problem, any more than a kangaroo doing what it must at the base of a plant.

Recently I bought another small batch of *Petrophiles* and planted them in both my own soil and the imported potting mix beds. I am confident that our climate here permits the cultivation of many species within this great group of plants, providing the site is sunny, well drained, open and with adequate

space, hence I will persist in widening our range and continue to adopt something of an experimental approach to their cultivation.

The summer was mild and we had 150mm of magnificent rains in Feb. The autumn has been dry and warm, so we have had the conditions in which plants could thrive and we could get a lot of work done. Nearing the last week of May we are looking for the approach of the rain clouds, but we have not done any watering of the established plants and really we have not suffered any ill-effects from dry conditions. One of the features of the garden are the carpet-like green lawns that have been trimmed almost weekly through most of the warmer months. We have been experiencing heavy dews and as I write misty rain is drifting down so for us we have a secure feeling, at the same time feeling for those who have suffered so long.

During the early months of this year we brought in 130m³ of mulch and have now come towards the end of the major new developments in the garden. 650 new plants have been put out this year, mainly in the lower parts of the garden, interestingly, with no more than one supplementary watering beyond that provided at planting, such has been the season and our conditions, especially where there is not a lot of competition. Most of our pathways are now mulched between the beds. In addition 350m of mulched pathway now permits access around the lower half of the garden.

For years we have had the difficulty of access across a sodden strip where water flows into the lake. We have just completed a 40m long boardwalk across this strip, flanking it with an assortment of reedy plants. It looks more impressive than the 2 days work entailed should entitle it to be and should be a help to increase our birdlife in the wetland area.

Drainage has been a problem in the lower areas. The soils are extremely fertile and there is optimum light, so quite some time has been spent in establishing drainage lines, allowing the lake overflow to flow on more freely. We have since finished of the beds and planting out here, giving the garden a more completed look.

We are never bored, work is never completed, yet things are more or less in hand and within reach. Fellow *Isopogon* and *Petrophile* enthusiasts are most welcome to drop in for a drink, chat and walk. Bob.

GLOSSARY

Cotyledon- a simple embryonic leaf, often the first leaf after germination.

Glabrous- without hairs, smooth

Hydrophobic- not mixing easily with water. Water repellent

Inflorescence- a group of flowers arranged as a distinct entity

Lignotuber- a swelling at the base of the stem, often underground, that contains dormant buds and energy stores. If the top of the plant is destroyed, it can regrow from the lignotuber.

Lobe- a leaf segment, usually rounded, that is not divided all the way to the midrib

Mycorrhiza- An mutually beneficial association between a plant root and a soil based fungus providing a nutrient exchange system.

Pinnate- has an appearance like a feather. The description of compound leaves where the leaflets arise from a spine and give this appearance.

Subtend- to lie underneath something and surround or enclose it

Simple (leaves)- entire without teeth or lobes

Taxa- (plural of taxon) comes from taxonomy, which is the science of classifying organisms into groups. A taxon is a group of plants sharing a relationship and so are categorised together. It is a unit of taxonomy.

Terete- circular in cross section.

Terminal- at the end of a shoot

ISOPOGON AND PETROPHILE STUDY GROUP BALANCE SHEET

Financial Year 2004-2005

Balance brought forward	\$404.41
Deposits	
Membership subscriptions	\$210.00
Sale newsletter back issues	\$10.00
	<hr/>
	\$220.00
Withdrawals	
Stamps & Postage	\$50.00
Stationery	\$18.44
NL Printing expenses	\$50.00
Storage box	\$22.98
	<hr/>
	\$141.42
Balance at June 30 th 2005	<hr/>
	\$482.99
Balance Bendigo Bank account	\$447.99
Cash at hand	\$35.00
	<hr/>
	\$482.99

Membership List

Jan & Julie Aamodt, Turner, ACT
Ken Arthur & Gwen Bakker, Tower Hill, Vic
Lynne Bilston, Ashfield, NSW
Barbara Buchanan, Myrree, Vic
Lloyd Carman, Eden Hills, SA
Robert Carroll, Doonside, NSW
Tony Cavanagh, Ocean Grove, Vic
Maryanne & Ashley, Macleod, Vic
Ian Cox, Kenthurst, NSW
Betty Denton, Eltham, Vic
Rodger Elliot, Heathmont, Vic
Murray Fagg, Canberra, ACT
Paul and Barbara Kennedy, Strathmerton, Vic
Cas Liber, St Pauls, NSW
Paddy Lightfoot, New Lambton, NSW
Patricia Lightfoot, Taringa, Qld
John Mahoney, Mt Duneed, Vic
Neil Marriott, Stawell, Vic
Max & Regina McDowall, Bulleen, Vic

Robin McKeown, Watson, ACT
Johanna Meyer, Tamworth, NSW
John Nevin, Armidale, NSW
Peter Olde, Illawong, NSW
Anthony Orchard, ABRS, Canberra, ACT
Marlee Petrie, Glen Waverley, Vic
Margaret Pieroni, Denmark, WA
Hugh Seeds, Beverley, WA
Kevin Sparrow, Warrnambool, Vic
Ross Sutherland, Shepparton, Vic
Jennifer Towell, Mullengandra, NSW
Phil Trickett & Catriona Bate, Belconnen, ACT
Marina Tyndale-Biscoe, Braidwood, NSW
Judy Whish-Wilson, Launceston, Tas
John Wrigley, Coffs Harbour, NSW
Graeme Downe, Endeavour Hills, Vic
Rosemary Whish-Wilson, Hillwood, Tas
Don & Joy Williams, Badgingarra, WA
Fiona McCallum, Greta West, Vic

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ANPS Canberra Region
APS NSW Region
SGAP QLD Region
APS SA Region
APS Tasmania Inc
APS Vic
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APS SA Region Newsletter Editor
Editor APOL
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ASGAP Newsletter Editor
The Secretary APS NSW

Warrnambool & District SGAP
APS Maroondah Inc
APS Blue Mountains Group

National Herbarium of Victoria Library
Western Australian Herbarium Library, Dept. of Conservation and Land Management
Australian National Botanic Gardens Library

SEED BANK

The following seeds are available for members. Please send me a stamped self-addressed envelope, containing your requests and a small seed-type envelope for each species. I have purchased seed from Nindethana seeds. (Nindethana have the largest range of Australian plant seed that I have seen. You can find them on the web at <http://members.iinet.net.au/~nindseed/> or order a catalogue by writing to PO Box 2121, Albany, WA, 6331.) Thanks to Maragret Pieroni and Phil Trickett for their donations to the seed bank. Please let me know which species you would most like to see in the bank. Donations of seed from any taxa will be gratefully added to the bank

Isopogon adenanthoides

Isopogon formosus

Isopogon scabriusculus

Isopogon trilobus

Petrophile antecedens

Petrophile biloba

Petrophile carduacea

Petrophile canescens

Petrophile circinata

Petrophile diversifolia

Petrophile drummondii

Petrophile ericifolia

Petrophile fastigiata

Petrophile filifolia

Petrophile heterophylla

Petrophile incurvata

Petrophile linearis

Petrophile longifolia

Petrophile macrostachya

Petrophile media

Petrophile pedunculata

Petrophile pulchella

Petrophile rigida

Petrophile scabriuscula

Petrophile semifurcata

Petrophile serruriae yellow & pink

Petrophile shirleyae

Petrophile shuttleworthiana

Petrophile striata

Petrophile teretifolia

REFERENCES

Banksias, Waratahs & Grevilleas and all other plants in the Australian Proteaceae Family by John W. Wrigley and Murray Fagg

Flora of Australia Volume 16 *Elaeagnaceae, Proteaceae I*. Melbourne: CSIRO Australia

Encyclopaedia of Australian Plants suitable for cultivation by W. Rodger Elliot and David L. Jones

The Proteaceae of the Sydney Region by Alec M. Blombery and Betty Maloney

Proteaceae of New South Wales edited by G.J. Harden, D.W. Hardin and D.C. Godden

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