



ASSOCIATION OF

# *S. G. A. P. Fern Study Group*

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SPORE BANK:

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## PROS AND CONS OF SPORE CLEANSING

Contributed by Geoff Simmons

There appears to be two approaches to fern spore collection:

- (a) Putting the frond with sorus into a bag and allowing the spores to be shed, and
- (b) Scraping off sorus and manipulating the scraped material to separate spores from non-spore objects - stellate hairs, paraphyses and remains of sporangia belonging to the fern, as well as inanimate particles of dust, etc., and living organisms such as fungi or insects.

Even in method (a) some non-spore material may be present in the collection. Hence in both cases, the separation of spores from debris may be considered desirable.

This discussion is based on practices that may be used by the fern enthusiast. The scientist in a laboratory who wishes to study spore germination or other aspects of fern life will opt for an uncontaminated pure sample of spores and use a controllable growth medium such as sterile agar gel or liquid. Likewise the person interested in tissue methods of propagating ferns will do so under controlled laboratory conditions.

But returning to the amateur fern growers who do not have access to laboratories, they may wish to try their hand at growing ferns from spores. They face the problem of whether to separate spores from debris.

Consider Platyserium superbum as an example. A piece of the sorus is cut from a frond when spores are deemed to be ready for harvesting. The piece is scraped down to the depth when the green surface of the frond is exposed. On a piece of paper, the material scraped off will be seen as a mass of brownish particles. If left for a time such as overnight, release of spores from the sporangia is hoped to occur. The spores, unseen individually unless viewed under magnification of 20 X or so, are accompanied by stellate hairs, paraphyses and sporangial stalk and wall cells. Also there may be fungi, bacteria, insects or dirt. However, if collected at the appropriate time and with due care these unwanted items can be minimised.

The usual recommendation for the separation of the spores is to place the material on a piece of paper and tap lightly so that heavier material separates from the lighter spores.

Possibly some persons may also use a sieving technique. Is this separation worth the trouble?

For Separation:

- \* Debris may assist growth of unwanted organisms.  
Comment: Possibly
- \* More control over sowing.  
Comment: Only spores are distributed.
- \* Fungal load minimised.  
Comment: Doubtful.
- \* Insects less likely.  
Comment: Possibly.
- \* Debris may inhibit spore germination.  
Comment: Any evidence?

Against Separation:

- \* Extra work and time.  
Comment: Why do it, if not necessary.
- \* Debris may inhibit undesirables.  
Comment: Micro-organisms may be stopped as one could surmise a fern defence mechanism..
- \* Debris may supply spore growth factors.  
Comment: Is there any data that factors in debris or their breakdown products assist spore germination or growth of prothalli?
- \* Insulating effect.  
Comment: Does debris act as an insulating agent in regard to temperature or humidity?
- \* Protective action.  
Comment: Could the hairs act as a protective physical barrier for spores?
- \* How effective is the method in elimination of non-spore material?  
Comment: The tapping method may still leave debris although not viable.

Many other factors may be involved in spore cleansing. Some persons advocate disinfection of the separated spores. From my own experience I can only say, why bother to separate the spores from the debris?

Ed: Our thanks to Geoff for the above thoughtful article, Geoff wrote that he supposed that some members may query certain of the points and perhaps others may have evidence that can clear up some points. We hope that the article does provoke discussion. Any comments would be welcomed. Please inform the Secretary so that all members can have the benefit of your views.

## Angiopteris evecta

Contributed by Keith Rogers

Some eight years ago I was extremely fortunate to purchase an *Angiopteris evecta* the, *Giant or King Fern* which naturally occurs in Queensland and hopefully still in NSW. This tiny 100mm high fern was one of the rare nursery 'finds' whilst travelling around Victoria and took pride of place in my then tiny collection. They are very rare in SA collections.

With the cold and frosty winter, I initially placed it in the warmer, protected sleep-out, but soon realised my *Angiopteris* was a hardy fern and its needs in Southern Australia were really only some shade, water and humidity in summer.

Unfortunately so far there has been no fertile fronds on my fern to verify the labels correctness, but its fronds do not stain purple like in the species *Marattia*.

Over time, I faithfully repotted every two years or so and now it now stands with 1.5m fronds and a crown of 150mm diameter.

In South Australia because of the colder climate, most tropical and sub-tropical ferns are smaller than the those grown nearer to their original climatic situation. Being grown in pots, large ferns also grow smaller still. Perhaps this is an advantage, with this rather large fern specimen, which when fully grown naturally has five metre long fronds.

A number of times in the past five years, small new plants have emerged beside the crown. These have been carefully removed with a carving knife and successfully grown on. The first plant removed later produced another, which was also removed in the same manner. *Angiopteris* appear to be most reliant on the mycorrhizal fungus pre-existent around the parent plant, this fungus helps the plant take up nutrient.

*Angiopteris* is interesting in many ways, one, the new crozier emerges from the crown between two large ears called auricles.

Another is the unique action of the sap in the cells of the fronds. This is a system called "turgor". When there is abundant moisture the fronds are held erect, when lacking the fronds sag. When dry and then watered, the plant absorbs the moisture, pumps the sap into the fronds and up they return to normal. If the frond is immature, the stipe can expand dramatically leaving an enlarged area like an inflated innertube with a weak spot.

Yet another is the ability to propagate not only from spore but from the auricles. Hence my new growths developing beside the crown. Here possibly due to unintentionally repotting slightly lower in the mix. Normally, the crown, as it expands pushes the old auricles to or below soil level and over time enabling this unique fern to propagate by this unusual method.

I have tried this system of growing by removing the auricle and placing in sphagnum moss, but so far with no success, but like all fernies we try and try again. This time I will also remove some roots from the parent plant and place beside the auricles.

It would also appear liquid fertilizer is harmful and actually slows growth, therefore unnecessary. Organic mulches appear the only way to go.

Mycorrhiza is apparently not given very much credence with possibly all plant growth and especially with the majestic *Angiopteris evecta*. ☺

## **HAVE YOU MADE A CONTRIBUTION TO CALDER?**

Recent Newsletters have contained particulars of Calder Chaffey's efforts to complete "Growing Native Australian Ferns" a book that he is writing for the Study Group. Calder is seeking information on experiences growing Australian native ferns in a wide range of conditions. The March 1997 Newsletter contained a questionnaire that all members were asked to complete and return to Calder (or give to the Secretary if more convenient). If you have not returned your copy of the questionnaire it is still not too late to do so. If you have lost your copy please contact the Secretary who would be happy to provide another.

Calder also requires photographs of ferns and the June 1997 Newsletter listed those particularly sought. Modern printing techniques mean that coloured slides, negatives or prints are equally acceptable. If you do not have a photograph that may be potentially suitable, perhaps a photographer friend may be able to snap one for you. Please try to help. Advise the Secretary or Treasurer if you require any reasonable out of pocket expenses to be refunded.

Calder's address is "Red Fox", 13 Acacia St, Wollongbar, 2477. In order to discuss matters with Calder phone him on (066) 28 1553. Recorded messages may be left in his absence.

## **POSITION VACANT - SPORE BANK CURATOR**

Unfortunately, Kyrill Taylor has decided that the pressure of other commitments prevent him continuing as our Study Group Spore Bank Curator. In addition to his life outside of Australian Plants, Kyrill is President of a District Group and a Director of SGAP-NSW. Only in the position since the beginning of 1996, Kyrill made a useful contribution. One lasting memento of Kyrill's tenure is the sturdy, attractive case for housing the Group's microscope that he constructed and donated to the Group.

For full information about the position contact Peter (02) 9625 8705..

## **THE AUDIO VISUAL IS ON ITS WAY**

Now while mentioning contributions to the Group, a word of thanks to that indefatigable, quiet achiever, Fred Johnston. Fred has been patiently putting together slides and material for an audio visual for the Group. Not an easy task photographing ferns and Fred has taken many hundreds lugging camera and tripod to countless fern gullies and gardens. The photography and outline of the script are just about finished. He has persuaded a friend to give professional assistance completing the script and providing commentary. Thank you Fred for your outstanding efforts on behalf of the Group. We look forward to enjoying the fruits of your labour.

## FERNS IN GARDEN DESIGN

Further to the series in recent Newsletters, the following are further widely available ferns considered of value in gardens.

### Microsorium scandens (Syn. Phymatosorus scandens)

A fern that spreads by creeping rhizome usually over rocks or tree trunks. Tolerates low light levels. Native of Queensland, NSW and Victoria.

Form: Semi-weeping, dull green, thin fronds that are simple or irregularly lobed. Slowly spreads to form extensive dense clumps.

Size: Fronds to around 50 cm long.

Soil Type: Most moist soils suitable or epiphytic over rocks or logs.

Aspect: Needs a shaded position sheltered from wind

Water: Hardy but best kept damp.

### Nephrolepis auriculata (Syn. N. biserrata)

A large vigorous fern that spreads quickly by underground runners. In suitable climates should be planted in places where it can be controlled. From Queensland.

Form: Tufted, erect lime green fronds

Size: Fronds to 2.5 m long.

Soil Type: Tolerant of a range of soils.

Aspect: Appearance better in a lightly shaded area but is quite hardy.

Water: Seldom required. If watering, avoid misting that keeps fronds moist.

### Nephrolepis cordifolia

The Fish-bone Fern, one of the best known ferns. It is frequently cultivated because of its extreme hardiness to a range of conditions. Sometimes seen growing without any attention after the gardener had apparently, lost enthusiasm. Also used extensively as an indoors pot plant. Found in Queensland, NSW, West Australia and Northern Territory.

Form: Erect and tufted

Size: Pinnate fronds to around 1m long.

Soil Type: Grows easily in all but very poorly drained soils.

Aspect: Is hardy in even open positions but looks better when given some protection. It is popular as a hardy indoors potted plant.

Water: Not necessary under normal conditions.

**Oleandra neriiformis**

Although this is a North Queensland occurring species, and a rare one, it has proven to be hardy in open conditions at least as far south as Sydney. Fronds die back during winter months requiring some maintenance to keep tidy appearance.

**Form:** Simple thin lamina from long creeping and branched rhizome. The above ground rhizome is held on stilt-like aerial roots.

**Size:** Fronds to 50 cm long.

**Soil Type:** Best in composting leaf litter.

**Aspect:** Hardy and requires little attention when grown among rocks with at least some protection from sun and wind.

**Water:** Only required during dry spells.

**Pellaea falcata**

A hardy fern that spreads steadily by underground rhizomes. The pinnate, shiny green fronds (paler underneath) are not crowded. A better display is achieved if the fern's spreading habit is restricted. To enhance appearance, the persistent stipes should be cut off after the pinnae fall. Native of Queensland, NSW, Victoria and Tasmania.

**Form:** Erect pinnate fronds on long creeping rhizome.

**Size:** Fronds to about 60 cm long.

**Soil Type:** Hardy in a variety of soils but does best in well composted loamy ground.

**Aspect:** Grows happily in around 50% sun.

**Water:** Seldom required and should not be over watered.

**Polystichum proliferum**

A popular fern in cultivation. It is hardy and easily propagated using plantlets which form at the end of fronds. The growth of the plantlets can lead to large colonies of these ferns. Found in Queensland, NSW and Victoria often in mountainous situations. Also from Tasmania where these ferns are often much larger than those growing in the mainland States.

**Form:** Erect fronds in the form of a rosette.

**Size:** Fronds to around 1.2m long but shorter in less favourable.

**Soil Type:** Grows easily in all but very poorly drained soils.

**Aspect:** Needs protection from the sun. Will tolerate very cold conditions.

**Water:** Only required in dry spells or hotter weather.

## NSW MID NORTH COAST REPORT

### Visit to the Chaelundi Area & Mt. Hyland Nature Reserve

Contributed by Steve Clemesha

For the outing we camped at Chaelundi Rest Area at the end of Misty Creek Road in the Guy Fawkes River National Park. The area is not one where ferns on the whole are plentiful but the walks we did covered a variety of habitats, so 19 species were seen. By far the most prominent was Adiantum aethiopicum. It was very plentiful along the flats near the creeks and in other damp situations. Lastreopsis decomposita in that area was more hairy than that species usually is. Davallia pyxidata was seen high on some rocky mountain tops where frosts would not occur.

Mt. Hyland Nature Reserve mostly is covered with cool temperate rainforest and is better fern habitat. One plant of Asplenium australasicum was seen at probably the highest altitude where it can survive. At the Chaelundi area an unexpected find was Platycterium bifurcatum - another more at home in warmer climates.

Asplenium flaccidum was fairly plentiful - more so than at any other place that we have seen it. Some large plants grew fairly high in trees where there was more light and smaller ones were seen closer to the ground. Some Dicksonia trunks were covered in mats of Polyphlebium venosum. Lastreopsis decomposita was fairly plentiful but we did not see any plants of L. microsora at either locality. One patch of Blechnum wattsi we saw beside the road between the two localities had the base of all pinnules lobed as occurs in populations of B. camfieldii. Other colonies in the area were normal.

We saw a brushtailed rock wallaby near the top of a mountain at Chaelundi and a lyre bird nearby. On Mt. Hyland there were some very large trees of Banksia intergifolia ssp. montana. Almost all of the trees in the rainforest had relatives in South America and had a fairly small leaves and there was little undergrowth as is typical of cool temperate rainforests.

## SOUTH EASTERN QUEENSLAND REPORT

### Outing to Cedar Creek, Mt. Tamborine, 1 June 1997

Contributed by Merle Gyntner

Six members negotiated the circuit walking track at Cedar Creek Falls, on a fine sunny day. This area is at lower altitude than Mt. Tamborine itself and most of the walk, down below the Falls, crossing the creek and up the other Southern side of the gully, is in open forest. This Southern slope provided ideal habitat for a large fern population, but we did not see those species which prefer higher humidity and a rainforest environment.

Ferns noted included Adiantum aethiopicum, A. hispidulum, Cheilanthes distans, C. sieberi, Christella dentata, C. hispidula, Doodia caudata, Drynaria rigidula, Nephrolepis cordata, Pellaea sp., Pteridium esculentum, and Pyrrhosia rupestris.

One member suggested that the track should be renamed "Doodia Circuit". As there seemed to be a large range of natural variation in the Doodias and a few other species, further study may be warranted. It was interesting to see the scree slopes held together by Drynaria rigidula and Hoya. The ground orchids were just starting to flower. In all, it was a very enjoyable outing.

#### **Outing to Little Ugly Creek, 6 July 1997**

Contributed by Merle Gynther

This short excursion, to the Western section of Moggil State Forest in the outer Western Suburbs of Brisbane, was a fitting place for a mid-winter outing. Peter pointed out the two ferns which were the highlight of the day, the elusive Adiantum hispidulum var. whitei and tiny Selaginella brisbanensis, often growing on mossy banks. Other ferns noted included Adiantum aethiopicum (Northern form), A. hispidulum, Asplenium attenuatum, A. australasicum, Cheilanthes sieberi, Christella dentata, Doodia caudata, Drynaria rigidula, Nephrolepis cordifolia, Pyrrhosia confluens, P. rupestris and Platyserium bifurcatum.

As a bonus, Peter pointed out three species of ground orchid in flower.

#### **Report on Meeting at Algester, 3 August 1997**

Contributed by Irene Cullen

A small group of ten members discussed our plans for the Fern Study Display at the Region's Annual Flower Show. We were all relieved to know Cliff Ritchie had his ferns back in great condition but are dismayed to know that he recently suffered a stroke. He is still in hospital.

Once more we tackled the genus Lastreopsis. We have made progress. However, we keep coming up against the same wall, trying to follow published keys to Lastreopsis. As a group, we feel that more emphasis should be placed on the rhizome rather than on a venation plan.

We would really like to hear the opinion of our Leader or any other person who has studied this genus. A big problem in using potted plants is there is not enough space to enable long creeping species to grow to their full potential. Some comments please!

### **SYDNEY REGION REPORT**

#### **Outing / Planting Day at Bulli, 15 June 1997**

This day was organised by Ian Cox, a working bee to help embellish the Illawarra Grevillea Park. The Park's founder and driving force behind its development, Ray Brown, met us inside the Park, affording us only a glimpse of an amazing array of Grevilleas covered in blooms. Ray led us to the gully selected for planting. Then, in a flurry of activity, with our Leader pointing the way, 18 of us dug the dry earth with mattock and spade and by lunch had completed the planting of a large number of ferns that comprised

30 different species all donated by our members. A sizeable part of the site planted was liberally covered by Caloclaena dubia. However, the plants on site which aroused most interest were Botrichium australe noticed by our Leader growing in the midst of a grassy section. Other ferns in the area planted were Adiantum aethiopicum, Asplenium australasicum, Blechnum cartilagineum, Doodia aspera and Pteridium esculentum.

The rain commenced as we started our lunch, denying us an opportunity of a closer look at the Grevilleas but providing the best possible aid to the survival of the recently planted ferns. We look forward to their successful growth and hope that they prove to be an added dimension to the already brilliant Grevillea Park.

#### **Meeting at Kenthurst, 20 July 1997**

Our thanks to Betty and Eric Rymer for hosting this meeting in their home and for showing members their collection of ferns and large property. Thanks too to Fred Johnston for providing a public-address system on the day to help the Leader get his message across. Fred's initiative was warmly appreciated. A report of the Study Topic "Fern Identification Made Easier" was not ready for this Newsletter.

### **FORTHCOMING EVENTS : IN SOUTH EAST QUEENSLAND**

Friday 12 September 1997.

Set up Fern Display at Queensland Region Flower Show. To be held at Redeemer College, Rochedale..

Sunday 19 October 1997, Excursion to Ravensbourne National Park

Meet 9.30 am. at the top Carpark.

Sunday 7 December 1997, End of Year Break-up

Meet at Joy Ward's home, Fahey Road, Mt. Glorious at 9.30 a.m. Bring fern for a Christmas exchange and ideas for 1998 programme.

Sunday 1 February 1998, Meeting at Pullenvale

Meet 9.30 a.m. at Graham Nosworthy's home, 609 Grandview Road, Pullenvale. Discussion "North Queensland Ferns Growing in Brisbane."

For information regarding activities or meetings, please contact Peter Bostock phone (07) 3202 6983 or Irene Cullen on (07) 3273 1055.

### **FORTHCOMING EVENTS : IN THE MID NORTH COAST, NSW.**

For details of the above events contact Charlie Charters, phone (065) 86 1088.

**FORTHCOMING EVENTS : IN THE SYDNEY REGION**

Sunday 21 September 1997, Outing to Mt. Wilson

Drive past Mt. Wilson Post Office and take right hand turn. Meet at park opposite Chimney Cottage. Arrive from 9.30 am for start at 10 sharp. A short slow walk around the circular Waterfall Track. Lunch at cars. Enquires to Peter (02) 9635 8705.

Sunday 19 October 1997, Meeting at Como

Arrive any time after 11 am at the home of Moreen & Allan Woollett, 3 Currawang Place, Como West. The day's Study subject will be the NSW Cheilanthes spp. Meeting commences sharp at 1 pm. Enquiries to Moreen (02) 9528 4881.

Saturday 15 November 1997, Outing to Green Scrub

Fate in the form of rain, defeated out attempted visit in May. If travelling from Sydney along the Bells Line of Road, turn right into Mountain Lagoon Road, just before reaching Sabin. Proceed all the way to Mountain Lagoon (take right hand turn opposite water tank) cross Lagoon Creek and meet at corner where Road joins Fire Trail. A walk of moderate distance. Meet from 9.30 ready for start sharp at 10 o'clock.

Sunday 7 December 1997, End of Year Get-Together at Kenthurst

Tamara and Ian Cox will again host our end of year gathering at 5 Ivy Place, Kenthurst. Please contact Tamara (phone 9654 2533) as early as possible to advise what you will bring towards the pooled lunch. Bring own crockery and cutlery and in keeping with the festive season, a gift (limit \$5) or several according to the number in your party.

**DEADLINE FOR COPY**

Contributions to the Newsletter are more than welcome Copy for the December issue should be forwarded to reach the Secretary by no later than 15 November 1997.

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