

ASSOCIATION of

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

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## **SUBSCRIPTIONS DUE FOR 2004.**

Please complete the attached form and return it together with your \$5.00 five dollars annual fee to the treasurer A.S.A.P. The form helps ensure we have current contact details.

In the treasurer's report earlier this year, Ron canvassed the possibility of a once off \$7.50 membership fee for 18 months subscription Ron reports that after much discussion it seems clear that there would be little to be gained from this, except for uniformity with the other ASGAP study groups, so we will just continue with a \$5 subscription due on the 1st January 2004.

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## **FORTH COMING EVENTS**

### **ASGAP FERN STUDY STH EAST QLD GROUP. PROGRAMME FOR 2003/04**

**Sun. 7th December Meet 9.30 a m.** at Wendy and Dan Johnson's home 14 Bank Road Graceville - for end of the year meeting. Bring ferns or suitable gift for Giant Plant Swap. Bring ideas for 2004s Programme

**Sunday 1st February 2004 Meet** at Peter and Pat Bostock's home 59 Limosa St. Belbowrie. Subject for discussion Cheilanthes

**Sunday 7th March Excursion to Cooloolabin Forest. Meet 9.30 am** at the Park 2.3 k from the lights in Yandina following the Old Gympie Road Park is on left. For late comers - turn left out of Park into Bunya Road then left into Lees Rd. 2.3 k on turn right into Browns Crk Rd A further 3.3 k park under the power lines. The track continues along the power lines

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### **Sydney Members ! Programme for 2004**

**Saturday 21<sup>st</sup> February,;** at 11 a.m. Meet at the home of Peter Hind 41 Miller St., Mount Druitt, Discussion subject is yet to be decided.

**March:** to be decided at our end-of year meeting

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THANKS TO THOSE WHO CONSISTENTLY SEND ITEMS FOR THE NEWSLETTER, HOWEVER, I ALSO APPEAL TO OTHERS TO CONTRIBUTE . OUR NEWSLETTER NEEDS A DIVERSE RANGE OF ARTICLES, IDEAS AND ANECDOTES FROM AS MANY MEMBERS IN DIFFERENT PARTS OF AUST. AS POSSIBLE. THIS IS FAIRER ON REGULAR CONTRIBUTORS, AND FURTHER, AS I LIVE IN BALLARAT I AM ISOLATED FROM OTHER FERN GROWERS, FERN AREAS, ETC. AND AS SUCH REQUIRE YOUR HELP TO PROVIDE A QUALITY NEWSLETTER. THANKING YOU IN ANTICIPATION. ....

**MIKE HEALY EDITOR. DEADLINE FOR MARCH 2004 IS FEB 15<sup>TH</sup>**

DR CALDER CHAFFEY'S BOOK ROYALTY DONATION  
- HOW SHOULD THIS MONEY BE SPENT?

by Treasurer Ron Wilkins

More than \$2500 was donated to the ASGAP Fern Study Group as a share of royalties during 2000-2002. At present it is in a term deposit at 4.5% interest, but we should be considering how it could be used to further fern study or appreciation in Australia.

The matter was discussed briefly at the September Sydney Meeting and the suggestion was raised that another donation to the Burrendong Arboretum would be a good use of the money. Many Sydney Group members have had a strong personal association with the establishment and maintenance of the fern gully at the Arboretum. The last donation from the group was for \$500 in 1998. Another donation would be timely. However, the Arboretum is somewhat isolated and it could be argued that a project closer to a large urban centre could better achieve our objectives.

You may have other ideas. Let Peter Hind know.

Thinking laterally, here is another idea for consideration. Our quarterly newsletter needs good articles. The income from the investment of the money would be more than sufficient to provide for a \$100 prize for the best article submitted to the newsletter each year. As I'm proposing the idea, naturally I would not be eligible, neither I suppose should those professional fern specialists among our members who have written some of the best articles in the past. Hopefully this would provide some incentive to members to get your thoughts down on paper so that we can all share them. Lets have your suggestions.

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S.E. QLD GROUP EXCURSION TO THE BUNYA MOUNTAINS 2-5 MAY, 2003

- Report by Merle Gynther.

Sincere apologies to Merle for delay in printing – the article arrived just after the June Newsletter had been sent and was unfortunately overlooked in Sept.

Eleven members enjoyed a weekend away to recharge their batteries - and saw lots of ferns as well. Sections of the Bunyas are a fern paradise, with slopes with an understory of ferns, e.g. *Pteris umbrosa* or *Lastreopsis sp.*, depending on the aspect.

It was a fruitful outing as well - the list now includes two ferns not previously known from the area. We found *Lastreopsis smithiana* growing close to the creek, in sections of the scenic circuit track from Dandabah. This track is very rewarding, as it moves from full rain forest to open country on the edge of a 'bald' and then back through rain forest. Although there was an abundance of moss, no filmy ferns were discovered.

The other new find was *Asplenium flaccidum*. Peter located it growing from an *Asplenium australasicum* on a tall grass tree on Mt. Kiangarow. Much of the Bunya area suffered from the long drought, and fire had encroached on some of the Western walks.

The fern list for the weekend is as follows:

<i>Adiantum atroviride</i>	<i>Cheilanthes sieberi</i>	<i>Lastreopsis decomposita</i>
<i>Adiantum diaphanum</i>	<i>Christella dentata</i>	<i>Lastreopsis microsora</i>
<i>Adiantum formosum</i>	<i>Cyathea australis</i>	<i>Lastreopsis smithiana</i>
<i>A. hispidulum var hispidulum</i>	<i>Cyathea cooperi</i>	<i>Microsorium pustulatum</i>
<i>A. hispidulum var hypoglaucum</i>	<i>Davallia pyxidata</i>	<i>Microsorium scandens</i>
<i>Arthropteris tenella</i>	<i>Dicksonia antarctica</i>	<i>Pellaea nana</i>
<i>Asplenium attenuatum</i>	<i>Dictymia brownii</i>	<i>Pellaea paradoxa</i>
<i>Asplenium australasicum</i>	<i>Diplazium assimile</i>	<i>Pteridium esculentum</i>
<i>Asplenium flabellifolium</i>	<i>Diplazium australe</i>	<i>Pteris tremula</i>
<i>Asplenium flaccidum</i>	<i>Doodia aspera</i>	<i>Pteris umbrosa</i>
<i>Asplenium polyodon</i>	<i>Doodia caudata</i>	<i>Pyrrosia confluens</i>
<i>Cheilanthes distans</i>	<i>Doodia sp dwarf</i>	<i>Pyrrosia rupestris</i>
	<i>Hypolepis glandulifera</i>	

## SYLVAN GROVE WILDFLOWER GARDEN

by Joan Moore

The visit of members of the Sydney Group to this garden was a most agreeable event. It is situated on high ground alongside the Georges River, separated from the river only by the road and a few houses built beside it.

The Garden belongs to Bankstown Council, which deserves congratulations, for its development. It has been a reserve for native plants for a long time: I do not know when the Council took it over but it must be about fifteen years since I first visited it. It was then a small area which had been cleared of the worst weeds: some years later I was there again: the area was clear of weeds but still quite small. Native plants only were to be seen, and were obviously being looked after. Now, the improvement is amazing.

The garden is extensive, covering much more ground than at the time of my last visit, and, thanks to lots of work by the several gardeners who over the years have been in charge of it, full of native plants in excellent condition, many in flower at this time of year. (October). There are safe paths to walk on, and no weeds at all! Not all plants had nametags, but this did not matter to us as Peter Hind guided us around, naming everything.

On the lower slopes there were quite a lot of clumps of ferns: we noticed *Lastreopsis marginans* and *Lastreopsis microsora*, and *Adiantum*, spp. appeared here and there. As the garden is extended down to the lower slopes more ferns will probably appear, as these are much wetter than the high ground. There were also some well-grown tree ferns, including *Cyathea leichhardtiana* and *C. cunninghamii* and *Dicksonia youngii*.

Our-many thanks to the Council, and especially to the gardeners who have created this beautiful place.

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### Report on Sydney Group Meeting, September 2003

by Ron Wilkins

Joan Moore, our usual correspondent being unwell on the day, I took a few notes instead. The meeting was held at Joan's home and it was attended by about 10 members. The main business was a discussion on *Lastreopsis* led by Peter Hind, and illustrated by potted examples of most Australian species from Peter's collection.

*Lastreopsis* species are typically rainforest understorey ferns. None prefer strong light. They may grow up to a metre in favourable sites, and they are mostly spreading, the rhizome being short, long creeping or tufted. Discussion centred on the Sydney species, and the use of the species identification key in the 'Flora (Vol. 48)'. Where there are a large number of closely similar species in a genus, keys tend to be difficult to use due to natural variation and sometimes insufficiently definite characters. However, the *Lastreopsis* species distribution diagrams in the 'Flora (Vol. 48)' show that in many major locations there are only small numbers of species. In the Sydney region, for example, only *L. hispida*, *L. microsora*, *L. decomposita* and *L. acuminata* (= *L. shepherdii*) are present. Therefore keys to local flora such as 'Flora of the Sydney Region' are much easier to use and more definitive for identification. For potted specimens, however, there is no escaping the use of comprehensive keys.

It is interesting as Calder Chaffey notes in 'Australian Ferns-Growing Them Successfully, p. 167', that *Lastreopsis hispida*, like *Rumhora adiantiformis*, produces a chemical that mimics a hormone and kills insects.

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### NOTES FROM S.E. QLD

The display that the S.E. Qld Group displayed at the Regions Annual Show was of high standard. Thanks to all who provided ferns and those members who helped erect the display

Septembers meeting at the home of Nev and Shirley Deeth's home in September was on Epiphytic ferns. This proved to be a most interesting discussion. There are few truly epiphytic ferns

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as so many can be both epiphytic and terrestrial. Following the discussion, we viewed Nev's ferns and propagation trials - then took a walk around their property.

At November's meeting at Claire Shackel's home, we discussed filmy ferns. Although we only had one well grown pot of *Crepidomanes bipunctatum sub sp bipunctatum* on display - the ensuing talk on the various forms of filmy ferns given by Peter Bostock was most informative. We always enjoy looking through Claire's two ferneries and viewing the very interesting shrubs she grows in her small allotment

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## REPORT ON THE OUTING TO MT MEE ON THE 5<sup>TH</sup> OF OCTOBER

Contributed by Claire Shackel

Fifteen members including Ron and Paula Wilkins from Sydney and Dr. Mary Dettman a Palynologist with the Botany Dept. University of Qld. meet for morning tea at the Gantry Picnic area. Most of the party went on the Piccabeen Walk, which was a round trip through magnificent *Eucalyptus grandis* into densely palmed areas and back. Ferns seen were:

<i>Adiantum formosum,</i>	<i>Davallia pyxidata</i>	<i>Nephrolepis cordifolia</i>
<i>Arachniodes aristata,</i>	<i>Doodia aspera,</i>	<i>P. superbum,</i>
<i>Asplenium australasicum,</i>	<i>Hypolepis muelleri,</i>	<i>Platynerium bifurcatum,</i>
<i>Blechnum cartilagineum,</i>	<i>Lastreopsis marginans,</i>	<i>Pteridium esculentum,</i>
<i>Calochlaena dubia,</i>	<i>L. microsora,</i>	<i>Pyrrosia rupestris.</i>

The party then moved on to the Mill Rainforest Walk in the Neurum creek area. This was a much moister area and had clear mountain streams flowing through it and was therefore more suitable for ferns including:

<i>A. diaphanum,</i>	<i>Arthropteris beckleri,</i>	<i>Diplazium assimile,</i>
<i>A. hispidulum var. hispidulum,</i>	<i>Asplenium attenuatum,</i>	<i>Histiopteris incisa</i>
<i>A. polyodon,</i>	<i>Christella dentata,</i>	<i>Lastreopsis munita,</i>
<i>A. tenella,</i>	<i>Cyathea cooperi,</i>	<i>P. paradoxa,</i>
<i>Adiantum atroviride,</i>	<i>Deparia petersenii,</i>	<i>Pellaea nana,</i>

The only ones seen on the Piccabeen track but not at the Mill Walk were *Nephrolepis* (probably not native) and *Pyrrosia*.

At lunchtime Ron produced his pictures of cross sections of fern stipes and these were admired and marvelled at by all those present.

On the return journey some of the party stopped at Bull falls. The track to the lookout was through dry open Eucalypt forest and the only fern was a small clump of *Pellaea nana*. A short walk to Bull Falls was an unexpected pleasure. As a result of the dry weather, a series of rock pools was all that was left of a mountain stream but the atmosphere in the area must be moist. A large rock was covered with *Dictymia brownii*. Also seen were

<i>Adiantum hispidulum,</i>	<i>Christella dentata,</i>	<i>Drynaria rigidula,</i>
<i>Asplenium australasicum</i>	<i>Davallia pyxidata,</i>	<i>Platynerium bifurcatum</i>

and *P. rupestris* were all seen in this little oasis.

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## ENJOY PYGMY PLANTS

By Roger Thomas 'Nature Notes' Ballarat Courier 31.10./03

At this time of the year there are many small plants that have short life spans. Small delicate annuals, they grow after the autumn & winter rains, then die off as soon as the soil gets dry.

One of several species seen in October was the pygmy clubmoss. Like most of the others, it is a tiny thing, only about half as tall as my little-finger. At its base there are several one centimetre narrow linear leaves with a stalk rising from their centre. At the top of this stalk is an oval, slightly scaly, seed-head with a pointed tip. This is the club from which the group of plants gets its name.

The clubmosses are a group of plants classified as fern allies because they are not true ferns, but share more features with them than they do with flowering plants...

## SPRING AT THE BURRENDONG ARBORETUM

Excerpt from above article by MARION JARRATT published in  
Newsletter of Aust. Plants Society NSW Ltd. July 2002

Spring at Burrendong Arboretum is a magical time and especially if you love our native plants. Come with me on a September Tour and together we shall explore what is on offer...

In the Fern Gully the shade and light change constantly so to walk there is like walking underwater with ripples eddying and swaying, reflecting and refracting the light from above. The huge blood red flowers and the strong clean lines of stem and foliage of the Gynea Lilies are in sharp contrast to the intricate and delicate fronds of the ferns and the rough, dark trunks of the cycads. Meanwhile the elkhorns and staghorns look for all the world like armorial emblems. And don't miss the Yellow Robin who considers the Fern Gully his domain and will come and carefully inspect all visitors....♦

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## INSIDE FERNS

by Ron Wilkins

So little is written in the standard texts about the vascular anatomy of Australian ferns that you could be forgiven for thinking it is of little real interest or value. The main exception is Duncan and Isaac's (1986) book on ferns and allied plants of Victoria. Also, Clifford and Constantine (1980) list the vascular characteristics of some genera of Australian ferns in an appendix. The little sketches of vascular bundles in stipe cross-sections in Duncan and Isaac (1986) made me wonder if the vascular system in ferns is more than a curiosity.

In fact, during the 19<sup>th</sup> and early 20<sup>th</sup> Centuries in Europe, the vascular anatomy of plants was regarded as central to classification. Bower (1923, p. 61) states "...the vascular tissue of stem and leaf affords perhaps the most reliable structural criterion of comparison of all those which lead toward a phyletic grouping of the ferns". Part of the reason for this conclusion is that these resistant tissues are commonly preserved in the fossil state. Indeed, modern texts on palaeobotany (e.g. Stewart and Rothwell, 1992) are full of references to the vascular systems of fossil plants. They show that there has been a remarkable degree of experimentation in the manner in which ferns transport fluids from one site to another. Another useful reference is Ogawa (1972) who gives charts of phylogenetic relationships of ancient and modern genera based on their vascular anatomy

In Australia, however, the period of intensive research on the vascular systems of ferns seems to have largely passed us by, and now there are more 'sexy' aspects of ferns to

investigate. On the other hand, some technological advances in the last decades, particularly the widespread use of computers and digital photography, have vastly simplified the collection of comparative information on vascular tissues so that now, I believe, even amateur 'botanists' in this way could make a significant contribution to our understanding of the Australian fern flora.

The apparatus I use has been described in a previous Newsletter (No. 101) but essentially the same details can be readily seen with a 10x, or better a 15x pocket magnifier. Sections are simply prepared by cutting across the rhizome or stipe with a strong single-edged razor blade, sold in hardware stores as scraper blades. The blade must be sharp or the tissue will be torn. The cut surface of a convenient 2 cm length of stipe or rhizome mounted vertically in plasticine can be observed under a microscope. As the section dries, the major conducting vessels (xylem and phloem) become clearly visible amongst the surrounding undifferentiated cells (parenchyma or pith). The surface can then be photographed in reflected light. Note that over-drying results in cracks in the pith, and a distortion of the shape of the section. The pastel colours and structural detail are quite beautiful to observe. This is, of course, a primitive method of observation compared with viewing stained microtome thin sections in transmitted light, but this is best left to specialist plant anatomists and physiologists. We can see enough for our purpose using the method I have described.

Two sections of the vascular system of ferns are of special importance. An internode

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section of the rhizome is of particular interest because the vasculature of this part of the plant tends to be conservative, giving information mainly relevant to the family level of classification. The other section of particular interest is the base of the stipe, which is the most complex part of the vascular system in the leaf. This part of the vasculature is more progressive because in evolutionary terms it has developed in response to demands of the leaf it supports.

There is particular information relative to family, genus and even species in the stipe vasculature. The three basic types of vasculature in the rhizome of modern ferns are termed protostele, solenostele and dictyostele. In the protostele, a central rod of xylem, which is the water-conducting element of the vasculature, is surrounded by a layer of phloem, the vessels that conduct the plant nourishment. The stele is embedded in a thickness of parenchyma tissue (cortex) which is in turn surrounded by a thin epidermal layer. The phloem is seen as a grey rim around the white xylem when the section is sufficiently dry.

The example I have chosen is the fishbone fern *Nephrolepis cordifolia* (Davalliaceae, Fig. 1). In the companion cross-section of the base of the stipe (Fig. 2) it is seen that the vascular system divides into as many as five bundles which both decrease in number and divide in the major and minor rachis and pinnae. The second type of vasculature in the rhizome or stem is the solenostele. The bats wing fern

*Histiopteris incisa* (Dennstaedtiaceae) has a stele of this type consisting of a central rod of pith surrounded by a ring of xylem margined on both sides by phloem. These in turn are surrounded by a second layer of parenchyma (cortex) and an outer epidermis (Fig. 3). Fig. 4 shows the vasculature at the base of the stipe. It consists of a very distinctive pattern of several ribbons which tend to join together farther up the stipe. The third type of stele in the rhizome is the dictyostele and an example is the fragrant fern *Microsorium scandens* (Polypodiaceae, Fig.5). The vascular system of the rhizome consisting of many vascular bundles (meristeles) seems to have been derived by fragmentation of the basic solenostele pattern. In *M. scandens* the most common number of vascular bundles in the stipe is two, but three (Fig. 6) and even four may be found.

My aim is to collect information on about 100 species of Australian ferns, then to make the digital images, and my analysis of them, widely available in a web site. The challenge is to devise numerical methods of distinguishing genera and even species based on measurements of characteristics of the vascular systems as seen in sections.

I would like to thank Trevor Clifford, Mary Dettmann and Peter Bostock for giving me leads into the literature, and Peter Hind, Calder Chaffey, Joan Moore, Steve Clemesha and Fred and Norma Johnston for kindly providing me with fern fronds for study.

## References

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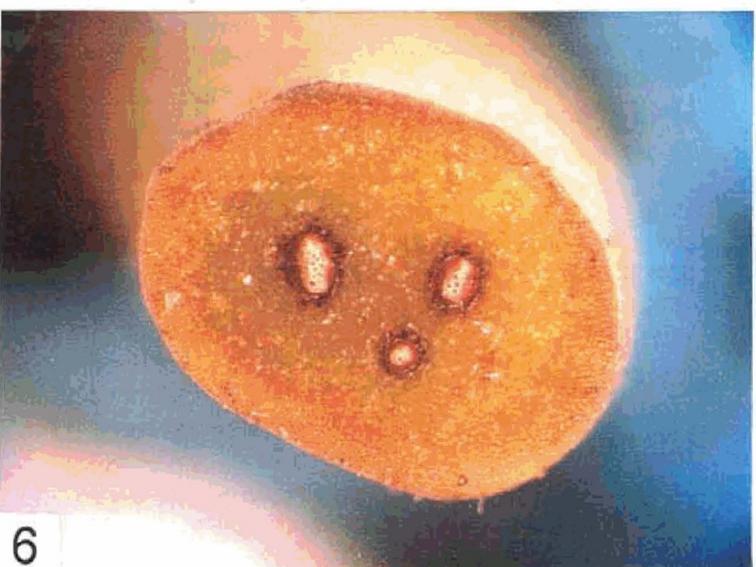
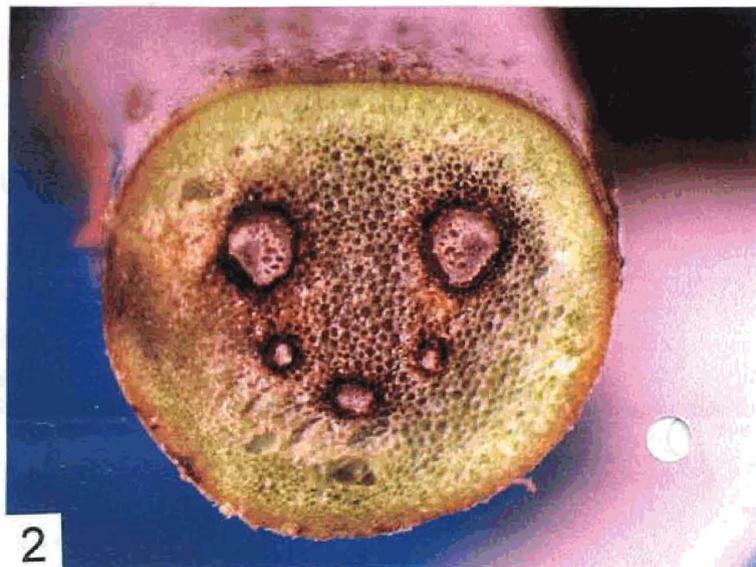
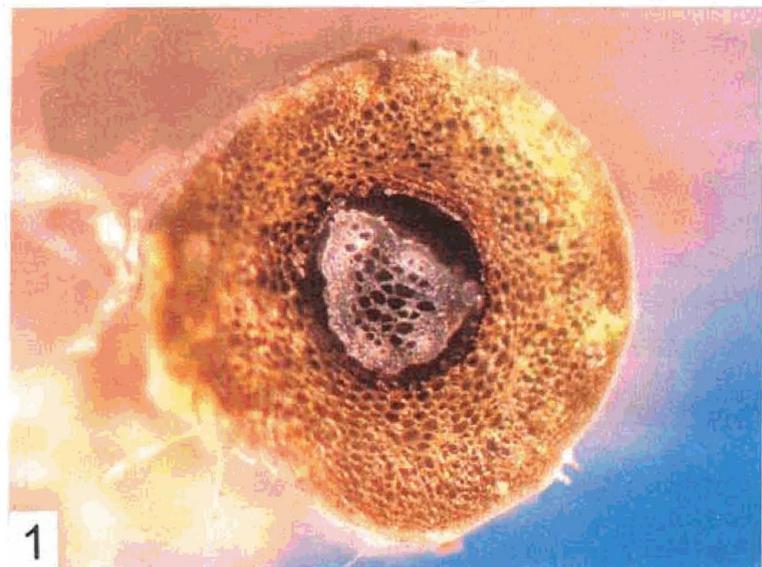
## ADIANTUM PUBESCENS

By Mike Healy

In the past quarter I received a query from Lorraine Deppeler which was interesting and the answer I feel may be appreciated by other members. To quote Lorraine "in regards to *Adiantum pubescens* which according to David Jones in his Encyclopaedia of Ferns is an Australian native. I have been unable to find any other references to this fern (although most of my books are fairly old). Perhaps you or one of the S.G.A.P. Fern Study Group members might have some information on this maidenhair and where it is found. It seems very similar to *Adiantum hispidulum*."

INSIDE FERNS PHOTOS

© PHOTOS RWT WILKINS



**HOW I GROW FERNS FROM SPORE (CONT)**  
spore, hence there is a very little of a very fine powder to plant.

The fertile fronds of *Blechnum* have indusium, which roll over the sporangia and stay tightly closed until mature. When a small gap has developed between the indusia collect the leaflets with the open indusia and the ones immediately above, which are still closed and you will have vast quantities of spore.

Some ferns seem reluctant to shed their spore. *Dictymia brownii* is one I have observed over a long period and have had no success with the selection of suitable material. Advice from the late Geoff Simmons was to scrape the sporangia on the propagation media. I now have a fine crop of prothalli and time will tell if it has been successful.

#### PLANTING THE SPORE

A 4/1 mix of peat and sand is saturated and pack into small seed trays. These are micro waved two at a time in a closed microwave container for 10 minutes and allowed to cool without opening the container. No attempt is made to separate the spore from the sporangia fragments or sterilise the mixture. It is important to plant the spore not the rubbish as the spore is very fine and slides down the paper last. Pure spore obtained from Barry is waxy and often adheres to the paper. The spore is then sprinkled on top and washed in with a gentle stream of water. The trays are placed in the bottom two thirds of a 2.4 or 3 litre fruit juice bottles lying on its side, that has been cut a third down from the top and the top third is pushed back inside to form a reasonable seal. These mini hothouses are placed in a well lit bush house.

The bottles are left until there is some evidence of prothalli developing. In hot weather the bottle cap is removed occasionally and the tray misted. Once there is a covering of prothalli, the tray is gently flooded every two or three weeks until plantlets appear. As all the business happens under the prothalli I feel this is preferable to misting over the top of the prothalli. There has been little trouble with mould or moss contamination. As the bush house is shaded by a tall *Cyathea cooperi* tree fern contamination is a problem with ferns I am not familiar with the plants juvenile form.

This brings me to another interesting topic. As many higher plants have characteristic

cotyledons and early growth, so do the fernlets. The tree ferns can be weeded out before their root system develops. *Asplenium polyodon* is a miniature of the adult plant, but *Asp goodii* and *Platyserium* have very similar plantlets in the early stages.

A wide range of fern spore has/is being tried with varying success. The source of the spore has been the Spore bank, Brisbane members, my own ferns and some wild collections. In most cases if the spore has germinated, plantlets eventually developed. At times, in fact at most times there is an extremely heavy prothalli covering, but attempts to transplant at this stage has been totally disastrous. Thinning the prothalli has not been attempted as in so doing the contact between the prothalli and medium is disrupted.

#### POTTING UP

It is the potting up of the plantlets where I have been having most trouble. Originally I was using 2 litre soft drink bottles with little headroom and tried to transplant plants with small root systems. A very high failure rate was the result. Transplanting in the Autumn was not successful as the plantlets were not established when the cold weather came. Also I was not hardening off the plantlets before transplanting.

This Spring the method has been to take the tray of well developed plantlets out of their cosy environment and leave them in a sheltered spot in the bush house for two or three weeks before pricking out.

Various potting mixes have been tried. The basis is a fertiliser free commercial product to which peat, absorbastone and/or charcoal has been added. The charcoal is mainly used in mixes for epiphytes. No fertiliser is added, but after a short settling in period the fernlets are watered regularly with quarter strength liquid fertiliser.

My first success was *Adiantum silvaticum* but it took 10 years to complete a life cycle i.e. spore to spore. *Todea barbara* has been going for 6 years and it is a long way from completing its life cycle. Most spores take 2 to 6 months to germinate and another 12 months to 2 years or more to produce plantlets of transplantable size. The fastest so far has been *Thelypteris confluens* which produced transplantable plantlets in 6 months from spore. ♦

## SPORE BANK

**ORDERING SPORE:** Spore is available free of charge from Barry White, 34 Noble Way, Sunbury. Vic. 3042 When ordering please include a stamped self-addressed envelope.

**Donating Spore** All types of spore are welcome, including fresher samples of ones already on the list. There is no necessity to separate the sporangia from the spore. The whole, or part, frond may also be sent in, all is acceptable. Please include date of collection and, if collected in the bush, the area. In the list, the month and year of collection is shown. The letter B indicates collected in the bush. The area of collection is available on request.

### CURRENT SPORE LIST

Arachniodes aristata 5/00  
 Asplenium aethiopicum 4/03  
 Asplenium australasicum 2/02  
 Asplenium milnei 5/03  
 Blechnum articulatum 1/02  
 Blechnum camfieldii 9/02  
 Blechnum cartilagineum 2/02  
 Blechnum fluviatile 5/03  
 Blechnum minus 5/02  
 Blechnum penna-marina 5/03  
 Blechnum wattsi 5/02  
 Blechnum wattsi (bifurcated) 5/03  
 Cyathea brownii 3/03  
 Cyathea cooperi 5/02  
 Cyathea cunninghamii 11/01  
 Cyathea howeana 5/02  
 Cyathea leichhardtiana 11/00

Cyathea robusta 4/02  
 Cystopteris filix-fragilis /00  
 Dicksonia antarctica 5/02  
 Diplazium australe 6/00  
 Doodia media 4/03  
 Histopteris incisa 5/02  
 Hypolepis glandulifera 1/02  
 Hypolepis rugosula 5/02  
 Lastreopsis acuminata 10/02  
 Lastreopsis decomposita 12/00  
 Lastreopsis microsora 12/00  
 Lastreopsis munita 8/02  
 Lastreopsis rufescens 12/00  
 Lastreopsis tenera 12/00  
 Macrothelypteris polypodioides 4/01  
 Pellaea falcata 3/03  
 Platycerium bifurc. cv German

### Contributed by Barry White

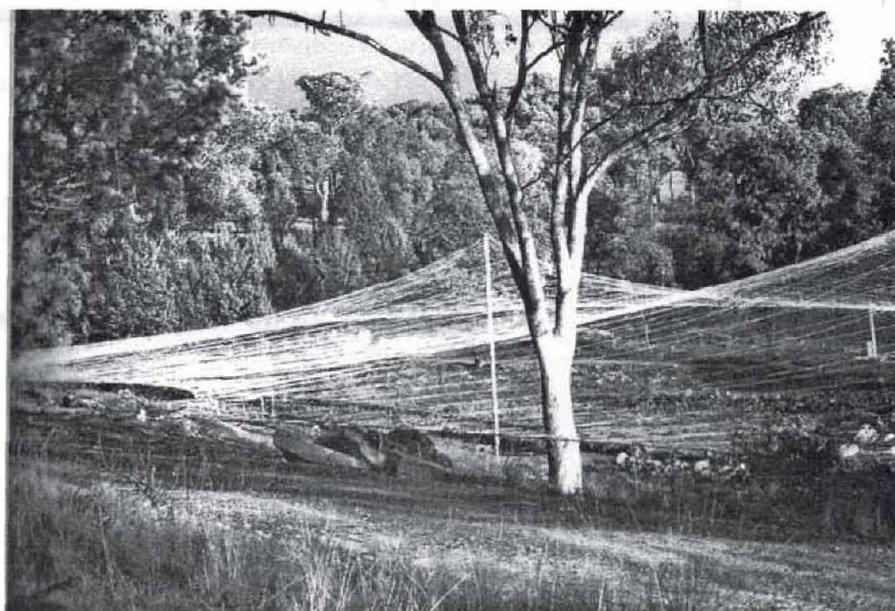
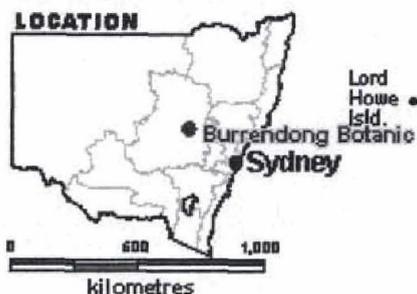
Hybrid 9/01  
 Platycerium bifurc. cv Lemoinei 9/01  
 Platycerium bifurc. cv Roberts 9/01  
 Platycerium bifurc. Mt. Lewis 9/01  
 Platycerium bifurc. ssp. veitchii 9/01  
 Platycerium bifurcatum 3/03  
 Platycerium superbum 5/02  
 Polystichum australiense 3/03  
 Polystichum fallax 4/02  
 Pteris comans 10/00  
 Pteris tremula 3/03  
 Pteris umbrosa 1/02  
 Pteris vittata 3/03  
 Sticherus urceolatus 5/02

### Spore donors - Lorraine Deppeler, Rod Hill

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**Burrendong Arboretum**, at Mumbil Via Wellington, NSW, started in 1964, A botanic garden of native plants, it has one of the largest collections of Australian plants in cultivation. Over 50,000 flowering plants, shrubs and trees from more than 2,000 species are growing on 167 hectares overlooking beautiful Lake Burrendong. Many rare and endangered species are being grown. There is a collection of sub tropical plants housed in a 1375 square metre area protected by a brush covered, suspended cable roof. which the Fern Study Group helped develop in the 1980s

Calder Chaffey refers to it as one of several sites that is an example of where, by creating special conditions, the numbers of ferns one might be able to grow can be greatly extended. Australian Ferns: growing them successfully p5.





*Season Greetings  
&  
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*Best wishes for the Holiday Season*

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