



A.N.P.S.A. Fern Study Group

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From the Editor

In this newsletter, there are a number of interesting extra articles.

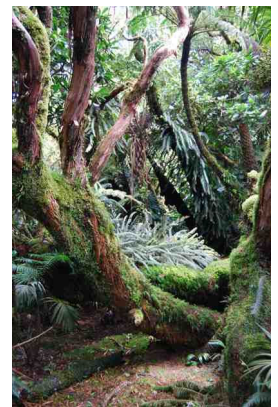
Ron Wilkins has contributed an article "Hidden Parts" with some good advice to assist in identification of our ferns with a little digging around.



See Ron's report "Hidden Parts"

The ferns of Lord Howe Island are again the subject of a report, this time by a far more expert group than my report earlier this year. Kylie Stocks has provided this report augmented with wonderful photos of the ferns.

Claire Shackel, as well as supplying SE Queensland trip reports, has contributed an item on her search for *Adiantum hispidulum* var. *whitei* on her family farm at Canungra.



Mt Gower, Lord Howe Island. See Kylie's report

My wife, Wendy, and I have been interested in the question of whether salts in bore water are likely to cause problems in growing ferns and I've included some correspondence with Peter Bostock on this issue which I hope members will find interesting. We'd also be very pleased to have any further input on this matter.

Thanks also to Peter Hind and Dot Camp for the Sydney area program and report.

At the back of the newsletter is Barry's spore list. Thanks Barry.

Program for South-east Queensland Region

Dan Johnston

Sunday 5th December. Christmas meeting and plant swap, Rod Pattison's home,

Sunday 6th February. Meet at 9:30am at Peter Bostock's home
be decided.

. Topic to

Forthcoming Events in the Sydney Region

Peter Hind

Saturday 20 November. This will be our end of year meeting. No study - just a garden visit to see the progress, particularly of the Fernery. Meet at Margaret and Peter Olde's

December and January. No Meetings—MERRY CHRISTMAS.

Saturday 19 February. Meet from about 11 am at the home of Peter and Margaret Hind, to study *Diplazium*. Phone (02) 96258705

Saturday 19 March. Meet about 10.30 a.m. at the fernery in the Royal Botanic Gardens, Sydney. Bring picnic lunch if you wish and it's best to use public transport. Martin Place and St James are the nearest Railway stations. I will be leading us around the fern collection. There has been much new planting and tidying up of the existing collection since our last visit. Contact me, Peter Hind on (02) 96258705 if you need more information.

Saturday 9 April. Meet from about 11 am at the home of Steve Lamont, We plan to view images taken on last October's Lord Howe Island trip. We also plan to feature "Tips for Growing Ferns" so please scribble down a few cultivation notes that you have found useful.

All outings are subject to weather conditions being favourable.

Sydney Meeting Reports

Strickland State Forest 23rd October, 2010

Dot Camp

After a quick morning tea at my new house in Narara & with storms threatening, our group of 11 headed for Strickland State Forest to explore 2 short walks in the lower arboretum area. On the drive into Strickland we were treated to *Doryanthes excelsa* in flower & lots of *Gleichenia* on the banks beside the road. Our pleasant cool walk was highlighted by Dwayne's find of a really nice form of *Blechnum cartilagineum* with crested edges. Fortunately we managed to miss the storm & returned to Narara for lunch.

Adiantum aethiopicum, Adiantum silvaticum, Arthropteris tenella, Asplenium australasicum, Blechnum camfieldii, Blechnum cartilagineum, Blechnum nudum, Blechnum patersonii, Calochlaena dubia, Christella dentata, Cyathea cooperi, Cyathea leichhardtiana, Diplazium australe, Doodia aspera, Doodia caudata, Gleichenia dicarpa, Grammitis stenophylla, Histiopteris incisa, Lastreopsis microsora, Lindsaea microphylla, Microsorium scandens, Pellaea falcata var. falcate, Pellaea falcata var. nana, Platycerium bifurcatum, Polystichum australiense, Pteridium esculentum, Sticherus flabellatus, Todea barbara

South-east Queensland Meeting Reports

Geographical Background

Dan Johnston

Our two visits in this period were to superficially very different areas but there is also much in common between the two. Both the top of Buderim and Goomburra are composed of basalt rocks produced in a volcanically active time in SE Queensland about 20 million years ago. In both cases there is a rather narrow plateau area averaging 1km or so in width where the relatively fertile basalt soils, together with rainfall resulting from the elevated positions, makes rainforest the natural vegetation. In the case of Buderim, the basalt cap is fairly thin, maybe averaging 20m thick. In the area we were visiting on its northern slopes, the basement rocks, particularly evident at the waterfalls and in slabby sections of creek bed, are sandstone, although the basalt influence is evident in the loose rock along the creek and in the soils spilling down from above, particularly in the upper parts of the park we visited. Whereas Buderim has an elevation of about 200m, Goomburra has an elevation of over 1000m and much of that 1000m is basalt. The places where we walked for the main meeting at Goomburra are at the junction of ranges. The section of the Great Dividing Range coming up from the south is known locally as Main Range. The Great Dividing Range turns sharply west and drops gradually for quite a distance. The Mistake range

heading north-west is more prominent, clearly leading to it being “mistaken” for the Dividing Range. The Little Liverpool Range goes north for perhaps 20km, dropping rapidly, with just one prominent rugged peak, Mt Castle, a couple of kilometres distant. The campground is at the base of the ranges about 5km south-west of the range junction. It is on Dalrymple Creek which flows to the Condamine, thence to the Darling, and finally to the Murray. Because of the lower fertility the slopes of Buderim principally support open eucalypt forest with some moister vegetation along the creek lines. At Goomburra, the eastern slopes are near vertical and support very interesting, if quite inaccessible, low vegetation, of which spear lilies, *Doryanthes palmeri*, and king orchids, *Dendrobium speciosum*, are the most spectacular members. I wonder what ferns lurk on those inaccessible cliffs! The western and northern slopes are, as at Buderim, mostly open eucalypt forest with moister creek vegetation, but in this case, it is probably more influenced by lower rainfall away from the eastern escarpment, and effects of fire.

At Buderim, the plateau area was cleared for farming in the 1870s and the small pocket of rainforest in the park we visited is probably the largest remaining remnant of the natural rainforest. In the last 50 years or so, the top of Buderim has been completely converted to a suburban residential area. By contrast, the first road was put up to the top of the range at Goomburra in about 1970 and despite selective logging in the 1970s, mature rainforest remains over most of the top areas today.

October 2010 meeting, Buderim Forest Park

Claire Shackel

For our October meeting, it was decided to return to Buderim and by using a car shuffle, walk down Martin’s Creek. On our visit in 2009 we walked the loop track around Serenity Falls. At the end of Harry’s Lane at the bottom of the park, there is an extensive board walk and picnic area where morning tea was consumed.

The Brisbane members left in pouring rain and it continued for most of the drive making any walk seem out of the question. On arrival at the picnic area the sky was overcast but there was only a slight drizzle. After morning tea the car shuffle was organised and it was a quick car trip to the top of Buderim and we began the downward walk.

In the rainforest at the beginning of the track the ferns were the same as last year: *Arthropteris tenella*, *Lastreopsis marginans*, *Doodia heterophylla*, *Adiantum hispidulum* var. *hypoglaucum*, *Christella dentata* and *Cyathea cooperi*. In the more open forest area *Asplenium australasicum*, *Adiantum silvaticum*, *Blechnum cartilagineum*, *Doodia aspera* and *Calochlaena dubia* were seen.

There was a lot more water falling over Serenity Falls and the *Adiantum diaphanum* and *Selaginella brisbanensis* were appreciating the wetter conditions. The *Crepidomanes saxifragoides* covering a rock at the bottom of the falls was showing its tiny green leaves in the moist conditions.

The track followed the creek down quite steeply and alternated between sides. The volume of water and moist conditions made the creek crossings hazardous but with a little help all made it safely to the board walk. The board walk meandered through a palm forest and the fern seen were *Christella parasitica*, *Arachniodes aristata*, *Adiantum formosum*, *Platynerium superbum*, *Hypolepis muelleri*, *Davallia pyxidata* and *Pteridium esculentum*.

Lunch was again eaten on Dan and Wendy’s extensive deck from which we could admire their colourful garden.

Main Range National Park, Goomburra Section

Claire Shackel

As with our previous visit in 2004, the weather did not appear to be promising for the road up the Main range but the escarpment had not received the amount of rain that Brisbane had experienced and the road was open. After morning tea at the picnic ground, there was a very steep ascent up the range and very large specimens of *Blechnum cartilagineum* could be seen on the slopes as well as a few specimens of *Cyathea cooperi*. These were not seen on the walks.

The first track visited was to Sylvester’s lookout. Ferns seen were *Adiantum formosum*, *Hypolepis glandulifera*, *Microsorium scandens*, *Dennstaedtia davallioides*, *Asplenium polyodon*, *A. australasicum*, *Lastreopsis microsora*, *L. decomposita*, *Cyathea australis*, *Davallia pyxidata*, *Pyrrosia rupestris*, *P.*

confluens, *Dicksonia antarctica*, *Dictymia brownii*, *Arthropteris tenella*, *Diplazium assimile*, and *Platynerium bifurcatum*. The lookout gave a good view from Mt Barney to Mt French and beyond.

A short drive along the road and there were a number of walks available. The first was up along the top of the Dividing Range to the west. The ferns seen were *Hypolepis glandulifera*, *H. muelleri*, *Lastreopsis microsora*, *L. decomposita*, *Adiantum formosum*, *Asplenium australasicum*, *A. polyodon*, *Cyathea australis*, *Pyrrosia rupestris*, *Dictymia brownii*, *Doodia aspera*, *Davallia pyxidata*, *Microsorium scandens*, *Diplazium assimile*, *D. australe*, *Dicksonia antarctica* and *Dennstaedtia davallioides*. From the lookout it was possible to look along the cliff line and see the red flower spikes of *Doryanthes palmeri*.

The track to Mt Castle Lookout took us past the following ferns- *Adiantum formosum*, *Lastreopsis microsora*, *L. Decomposita*, *Arthropteris tenella*, *Microsorium scandens*, *Asplenium australasicum*, *A. polyodon*, *Dictymia brownii*, *Pyrrosia rupestris*, and *Davallia pyxidata*.

The final walk of the day was on a forestry road along the Mistake Range. This was in a narrow strip of open eucalyptus forest along the cliff edge. Away from the cliff edge vegetation quickly turned to rainforest. As the beginning was in rainforest the first ferns were *Lastreopsis microsora*, *Hypolepis glandulifera*, *Adiantum formosum*, *Diplazium australe*, *Cyathea australis*, *Microsorium scandens*, *Dictymia brownii*, *Pyrrosia rupestris* and *Lastreopsis decomposita*. On the open forest margin, we saw *Pteridium esculentum*, *Doodia aspera* and *D. australis*.

Goomburra, Extended Excursion

Dan Johnston

Because the Goomburra section of Main Range National Park has so many walks to explore, some members extended the meeting (report above) into a weekend activity by travelling up on Friday and camping at the excellent National Parks camping area on Friday and Saturday, before the main meeting (reported above) on Sunday. As we were arriving around midday on Friday, we encountered the best part of an hour of quite heavy rain. However, it cleared and there was no more rain for the rest of the weekend. It has been an amazing spring and early summer around south-east Queensland, and probably most of central and eastern Australia, being uncharacteristically cool and wet. The ferns are loving it. Many ferns around Goomburra were responding to the conditions with prolific growth and there is spectacular red growth on some—notably the *Doodia*.

On Friday, we did a short walk on a graded track running up beside Dalrymple Creek and returning by a route further from the creek. The Goomburra campground and nearby areas are also a good bird watching spot, provided you don't mind the constant noise of bell birds. Satin bower birds are also common residents and we observed one near his bower at the start of this walk. The first ferns encountered were *Doodia aspera* with new red growth. On reaching the first creek bank, we found *Adiantum formosum*, *Pteris umbrosa*, *P. tremula*, and *Calochlaena dubia*. In the more open areas as we walked up beside the creek, there were thick areas of *Hypolepis glandulifera*, with their soft hairy new fronds reaching over 1.5m in height. There were some similar thick areas of *Dennstaedtia davallioides*. The occasional tree ferns in this area were *Cyathea cooperi*. Some of the trees had an extensive coverage of epiphytes, with *Dictymia brownii*, *Pyrrosia confluens*, and *Asplenium australasicum* being identified. Before leaving the creek to return there is a lookout platform and in the fading light we were able to identify *Dictymia brownii* again on the rock on top of the small cliff opposite as well as *Adiantum atroviride*. Occasional specimens of *Pteridium esculentum* were observed beside the track.

On Saturday morning, Julie Major, Sue Dowrie, Colin Hood (a visitor to the group), my wife Wendy, and I drove part of the way up the road towards the tops of the ranges to the start of Araucaria Walk. The road fords a pool in the creek (about 30cm deep) before the climb, and this might deter the drivers of small cars. The campsite is on the south branch of Dalrymple Creek, not far above the creek junction and the road runs up the spur between the two branches. Araucaria Walk is 1.8km each way and goes to Araucaria Falls on the headwaters of the north branch of Dalrymple Creek. The graded track crosses a small creek within the first 50m or so, and then is a relatively flat, easy walk for over a km, before descending rather steeply, but still as a broad dirt track, to the top of the falls. There is a little evidence of the logging here in the 1970s but it must have been rather selective as many very large trees remain and the understory is not obviously affected. We noted several ferns before even leaving the carpark including

Pyrrosia rupestris, *Doodia aspera*, *Hypolepis glandulifera*, *H. muelleri*, and *Lastreopsis microsora*. Along the track to the falls we also observed *Adiantum formosum*, *Arthropteris tenella*, *Asplenium australasicum*, *A. polyodon*, *Blechnum cartilagineum*, *Cyathea australis*, *Davallia pyxidata*, *Dennstaedtia davallioides*, *Dicksonia antarctica*, *Dictymia brownii*, *Diplazium australe*, *Microsorium scandens*, *Pellaea nana*, *Pteris umbrosa*, and *Pyrrosia confluens*. After reaching top of the falls, the track crosses the creek and continues a relatively short distance to the bottom of the falls, but is much rougher as it descends the rocky slopes. The environment is rather different, more open to the south but still very moist. Additional ferns identified in this area included *Adiantum diaphanum*, *A. hispidulum*, *Blechnum patersonii*, *Cyathea cooperi*, *Deparia petersenii*, and *Todea barbara*.

On Saturday afternoon, Julie, Wendy and I went on the Cascade Walk which goes up Dalrymple Creek from the campground. It is described by National Parks as a 6km, 3 hour circuit. It is generally a good graded track but there are many creek crossings where some rock hopping agility is required. The vegetation ranges from very moist rainforest to open eucalypt forest. The track eventually climbs quite steeply and descends by a much more direct route along an old logging road which contours down the ridge on the southern side of the valley through open forest. At the top of the walk, we observed a small number of specimens of the unusual branching form of *Cyathea australis*, which have been seen at a number of locations in south east Queensland but particularly in the Main Range area. The ferns identified on this walk were *Adiantum atroviride*, *A. hispidulum*, *A. formosum*, *Arthropteris tenella*, *Arachniodes aristata*, *Asplenium australasicum*, *A. polyodon*, *Blechnum cartilagineum*, *Calochlaena dubia*, *Cyathea australis*, *C. cooperi*, *Davallia pyxidata*, *Dennstaedtia davallioides*, *Deparia petersenii*, *Dicksonia antarctica*, *Dictymia brownii*, *Diplazium australe*, *Doodia aspera*, *D. caudata*, *Hypolepis glandulifera*, *Lastreopsis decomposita*, *L. munita*, *Microsorium scandens*, *Pellaea nana*, *Platyserium bifurcatum*, *Polystichum sp.*, *Pteris tremula*, *P. umbrosa*, *Pyrrosia confluens*, *P. rupestris*, and *Todea barbara*.

Other Articles

Hidden Parts

Ron Wilkins

We always seem to be admiring the visible or showy parts of things, but what is under the bonnet or inside the casing, or in the example of ferns – under the ground, is what makes the object work. So in one of our meetings this year we reversed the order of things, dug up some ferns from my garden and had good look at the less beautiful bits.

For ferns, two of the three most important parts (leaves, stem, roots) – are hidden from view and often given little attention. When the fern stem is horizontal as it frequently is, it creeps along or under the surface of the ground. We call it the rhizome. One of its primary functions is to bear the roots that scavenge the water and minerals the plant needs for growth. These two parts, stem and roots, are essential to the functioning of the plant, yet taxonomic descriptions often say very little, or dispose of them in a single line.

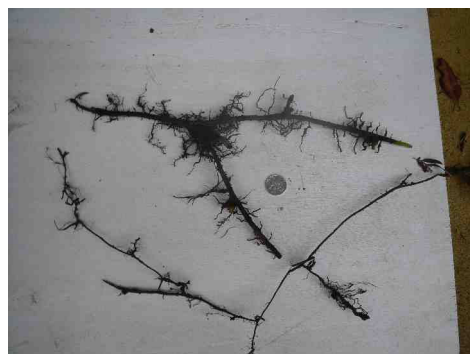
Go on. Dig up a bit of *Pellaea falcata*. Carefully wash the roots and rhizome with a spray of water. Note that the rhizome branches by forking of the rhizome at the apex. Now dig up a piece of *Dennstaedtia davallioides*. I'll bet the rhizome of this fern is creeping and invading other parts of your fernery and needs control so one piece will not matter. The rhizome is also branching, but in this example the buds arise in association with the bases of leaves. This is lateral branching. You might as well dig up a bit of *Hypolepis muelleri*, too. Mine came unwanted in a pot with another fern and it's spread widely now. Maybe you got it this way, too. It also has a lateral branching rhizome and in addition it is also a great example of a long creeping rhizome. On mine, the leaves appear approximately at 20 cm intervals along the rhizome. On my *Pellaea* the leaves are 2 to 3 cm apart so I guess that would be medium creeping. If you had a spare *Asplenium bulbiferum* to dig up you would find the leaves are very close



Pellaea falcata (editor's photo)

together on the rhizome so this is an example of short creeping. Many *Blechnums* are the same; short creeping, sometimes eventually becoming erect. Scratch around the base of your *B. cartilagineum* and you will see. Although the creeping habit is a characteristic of fern species I have never seen a precise definition. Of course, definitions breed exceptions. Maybe examples are good enough.

Look at the roots on these ferns. They are a miserable lot of dark brown wrinkly and branching fibres. There is never a decent tap root on a fern. It's hard to believe such roots perform such a vital function for the plant. What is even more surprising, it is only the growing tips of the roots that are active. As the roots extend they develop an internal ring of waxy substance called suberin that acts to prevent water collected into the vascular system at the tip of the root, from escaping during its transit to the rhizome and ultimately to the leaves. The root has a conceptually simple but amazing apparatus called an osmotic pump that actually drags moisture into the plant and assists in the transport of the fluids, but that is another story. It is always the hidden things that are most important.



Dennstaedtia davallioides (top) and *Hypolepis muelleri* (editor's photo)

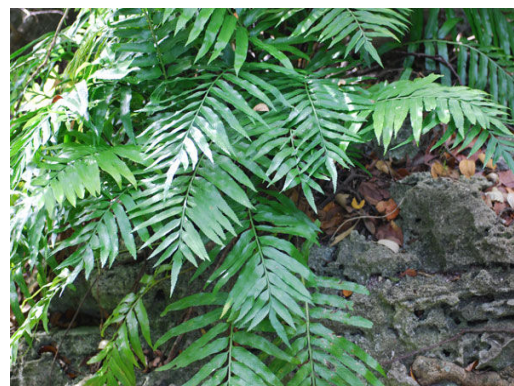
Oh, and if you ever have trouble distinguishing *Lastreopsis decomposita* from *Lastreopsis microsora*, forget the leaves. Dig up a bit of the rhizome. *L. decomposita* is short creeping and about 10 mm thick. *L. microsora* is long creeping (more like medium creeping in my garden) and about 5 mm thick. You will easily separate them this way with a bit of practice.

Lord Howe Island Trip

Kylie Stocks

Participants: Martin Rickard (BPS), Patrick Acock (BPS), Chris Goudey (Austral Ferns, Victoria) Steven Lamont (Fern Study Group, NSW), Barry White (Fern Study Group NSW, and Victorian Fern Society), Kylie and Dwayne Stocks (Fern Study Group, NSW)

On Thursday 14th October, led by Chris Goudey (after whom *Asplenium goudeyi*, the endemic Lord Howe Island bird's nest fern species is named), we met at Sydney airport. After a pleasant (if a little bumpy) flight to the island, we arrived at our accommodation, then set off. There were plenty of good examples of *Asplenium australasicum*, *Asplenium milnei*, *Microsorium pustulatum*, *Nephrolepis biserrata*, and *Platycterium bifurcatum* growing on roadsides and low growing trees. With no local predators, the endemic species can establish anywhere without fear of herbivory. However, we were after *Asplenium goudeyi*, so we set off for the Malabar.



Asplenium milnei

The Malabar was a steep hill climb to the south of the island, overlooking the ocean (the island itself is only 11km long).

Whilst walking, we found colonies of *Pyrrosia confluens*, *Pterostylis* orchids, and more of the species previously mentioned. We also found plants of *Adiantum hispidulum* and/or *A. pubescens*. *Asplenium goudeyi* was not easily found in this location. Mt Eliza was our next destination, south of the Malabar, and the location of a *Adiantum capillus-veneris* colony overlooking the ocean. This was another feisty half-day climb, and was not immediately rewarded by the discovery of any of the target plants, nor any of the elusive *A. goudeyi*! However, a small *Doodia caudata*, and some *Psilotum nudum* and *Pteris microptera* were found. In the afternoon we investigated the Valley of Shadows, finding a small colony of *Histiopteris incisa*, more *Asplenium milnei*, and *Platycterium bifurcatum* among the twisted boughs and roots of the large *Ficus macrophylla* and on the sea-facing rocks. We also encountered the fit and adventurous Barry who, not content with hiking since 6am, had decided to take an afternoon swim.

Saturday saw the arrival of a nasty storm, with hurricane strength winds and stinging rain. Perfect weather for a leisurely climb of Mount Lidgbird! Determined to find as many endemic species as possible we set off for the Goat House walk. We found impressive specimens of *Cyathea dealbata*, and *Cyathea macarthurii* in the lower creek area, as well as some *Arthropteris tenella* a little further up. We also found *Asplenium* hybrids (*A. milnei* × *A. surrogatum*), although no *A. surrogatum* was in evidence. Dwayne became expert at spotting *Diplazium melanochlamys*. The search was abandoned due to bad weather, and only 200m from the top. However, Barry later did some more investigating, and located *Marattia howensis* (as well as some barbed wire and an electric fence). Soldiers Creek, Little Island and Mt Lidgbird (again) were searched, revealing an interesting *Microsorium pustulatum* variant (Rick-goudeyi?) and *Polystichum whiteleggei*.



Cyathea robusta



Platyserium bifurcatum

On Monday, Mount Gower loomed. At nearly 1000m high, it was the goal of the day (and to be honest, the trip). We started out at 7am, keenly awaiting the arrival of the taxi to take us to the base of the mountain. Whilst advertised as a ‘walk’ or even a ‘trek’, the best description of our excursion was a ‘climb’. After first clambering over the seaside rocks, we then pulled ourselves up the lower segment of the climb, aided by thick ropes and safety helmets. To our surprise, there were huge colonies of *Platyserium bifurcatum* along the rock face, numbering thousands of plants. We also came across many *Asplenium goudeyi*, which is a very tough plant, and was easily found ensconced in the crevices of the basalt rock face towards the ocean. This species and *Asplenium milnei* are

obviously very hardy plants, as both were happy in these very exposed positions. While clambering up the mountain, we came across many attractive fern species, including *Polystichum whiteleggei*, *Cyathea dealbata*, *Cyathea macarthurii*, *Arthropteris tenella*, as well as some very attractive *Dendrobium* rock orchids, which happened to be flowering at the time. We stopped at Erskins creek for a drink/rest, and were rewarded with our first sighting of *Blechnum howense*. Then upwards we climbed (a total of 14km for the round trip). We found some *Hypolepis elegans* in a colony, and spotted some *Lycopodiaceae* and *Grammitis* species, although these were not formally identified.

The top of the mountain was what we were all clamouring for, and it did not disappoint! We were lucky to see it on a clear day, as it is covered in mist for up to 60% of the time – just like fern fairyland! The filmy ferns (*Hymenophyllum* species) were up to 20cm long, and the creeping *Blechnum contiguum* was simply magnificent. There were also fine specimens of *Cyathea howeana* and *Cyathea brevipinnae*, as well as *Blechnum fullagari* and *B. geniculatum*. But the most breath-taking of all the ferns was the *Leptopteris moorei*, with pinnules so thin they were virtually transparent. The most delicate and beautiful fern you can imagine!



Blechnum contiguum

The way back down was much more difficult! Our aching legs, knees, ankles, thighs and other previously unidentified muscles paid testament to this fact over the next few days. However, the summit was absolutely worth the effort.

In our final few days we visited the Lord Howe Island Nursery, which ships millions of *Kentia* palms to Denmark each year and is the island’s main industry other than tourism. We also made a couple of last visits just to make sure we had seen everything on offer. On Wednesday we made our voyage home – tired but satisfied.



In the 1970-80's Joan Cribb compiled a fern list for our family farm at Canungra and identified *Adiantum hispidulum* var. *whitei* as being present but no specimen was taken. As *A. atroviride*, *A. formosum* and *A. hispidulum* var. *hispidulum* were very common ferns on the property, this was quite likely. Since becoming involved with the Fern Study Group some 20 years ago I have kept a watchful eye out for anything in the paddocks that looked different among the *Adiantum* ferns. All the other ferns on the list were found and another four species were added.

In the early 1990's I grew *A. hispidulum* var. *whitei* from spore supplied by the spore bank but gave most of them away and lost the ones I kept.

Our home is on the southern side of Mt. Gravatt where it is supposed to occur naturally. About three years ago I became aware that at least two of the self sown *A. hispidulum* in my garden were var. *whitei* and have since found it occurring naturally about 300m up the gully in the reserve.

The family farm was sold in January this year and on the last nostalgic walk around the paddocks there was an *Adiantum hispidulum* that looked a bit different so I collected a piece. It appears to be a form of *whitei* and it was only about 30m from the house.

[Leader: I photographed this plant in Ravensbourne National Park in September 2006].

Query on the Use of Bore Water for Ferns

Wendy and Dan Johnston, Peter Bostock

This year, Wendy and I have been taking some responsibility for looking after the Fern Glade at the Maroochy Region Bushland Botanic Gardens at Tanawah on the Sunshine Coast, Queensland. This has been established for some years and the ferns are not as lush as we might have hoped. Correspondence with Peter Bostock on the issue is selectively quoted below:

Email from Wendy to Peter:

Can you help us with the question of fern tolerance to minerals and salts in bore water?

I received the following in an email from the MRBBG committee. I believe that some *Pteris* can tolerate arsenic but that is the extent of my knowledge.

'At a recent meeting there was some discussion about the fern glade.

Someone made the point that some of the ferns down there have never done much good - even after years of care, fertilising, watering etc.

Someone else made the point that bore water has always been used, and maybe that was a problem. That made some sense to me. ...

Someone thought that a bore water analysis years ago said the water was OK but had detected higher than normal amounts of magnesium. My experience with bore water from my farming days tells me that water test results can be inconsistent throughout the year, and over several years. Do you or Dan know if all ferns or specific ferns have intolerances to dissolved salts, even in minute quantities?'

Peter's reply :

'short answer - I would expect that most ferns would have poor tolerance to dissolved salts of the sort that your correspondent mentions, although that would really depend on other factors such as

acidity or alkalinity, type of salts etc. Among ferns, only *Acrostichum* and possibly some (mangrove) epiphytes are known salt tolerators, but that refers primarily to NaCl.

I did a literature search (google scholar) and found a few dozen papers for the search terms "ferns dissolved salts tolerance" and "ferns salt tolerance". None really addressed the question below - perhaps that can be taken as an indication that ferns are not good at tolerating 'salts'. *Pteris vittata* is known as a "hyperaccumulator" of arsenic, but that doesn't necessarily make it more tolerant of 'salts'.

There is a guide to commercial culture of Leather Fern (*Rumohra adiantiformis*), written for Florida, USA, which does indicate bad effects of high Mg and Ca ions—it is available as a free Acrobat document—see

http://www.floridaagwaterpolicy.com/PDF/Bmps/Bmp_LeatherLeafFerns1995.pdf.

Can anyone add any further detail on this issue? In particular, we would be very pleased to hear of any practical experience with bore water. Mail or email to me, Dan, (addresses at the top of the newsletter) would be great.

Spore List July 2010

Barry White

<i>Acrostichum speciosum</i> 4/09	<i>Diplazium australe</i> 5/10
<i>Amphineuron opulentum</i> 4/10	<i>Diplazium assimile</i> 6/09
<i>Angiopteris evecta</i> 11/09	<i>Doodia australis</i> 6/10
<i>Arachniodes aristata</i> 5/10	<i>Dryopteris sparsa</i> 8/10
<i>Asplenium nidus</i> 5/08	<i>Hypolepis glandulifera</i> 12/08
<i>Asplenium nidus</i> cv.5/08	<i>Lastreopsis acuminata</i> 12/08
<i>Asplenium milnei</i> 5/10	<i>Lastreopsis decomposita</i> 6/09
<i>Blechnum ambiguum</i> 1/08	<i>Lastreopsis marginans</i> 1/07
<i>Blechnum chambersii</i> 9/10	<i>Lastreopsis microsora</i> 6/10
<i>Blechnum gregsonii</i> 4/09	<i>Lastreopsis nephrodioides</i> 10/10
<i>Blechnum patersonii</i> 9/10	<i>Macrothelypteris torresiana</i> 6/10
<i>Blechnum watsii</i> 12/08	<i>Microsorium punctatum</i> 1/09
<i>Chingia australis</i> 6/10	<i>Ophioglossum pendulum</i> 7/08
<i>Christella hispidula</i> 1/09	<i>Platynerium bifurcatum</i> 'Hula Hands' 10/07
<i>Christella parasitica</i> 4/09	<i>Platynerium bifurcatum</i> 'Venosum'
<i>Christella subpubescens</i> 12/08	(Mt. Lewis) 10/07
<i>Cyathea australis</i> 9/10	<i>Platynerium superbum</i> 4/08
<i>Cyathea baileyana</i> 12/08	<i>Platynerium veitchii</i> 10/07
<i>Cyathea cooperi</i> 1/09	<i>Plesioneuron tuberculatus</i> 12/08
<i>Cyathea cooperi</i> smooth stipe Mt Lewis 11/09	<i>Pneumatopteris sogerensis</i> 12/08
<i>Cyathea cooperi</i> (blue stipe) 1/07	<i>Pneumatopteris costata</i> 12/08
<i>Cyathea cooperi</i> 'Brentwood' 3/08	<i>Polystichum australiense</i> 5/10
<i>Cyathea cunninghamii</i> 1/07	<i>Polystichum formosum</i> 6/09
<i>Cyathea felina</i> 10/08	<i>Polystichum proliferum</i> 11/08
<i>Cyathea howeana</i> 10/10	<i>Polystichum whiteleggei</i> 10/10
<i>Cyathea macarthuri</i> 10/10	<i>Pteris pacifica</i> 6/10
<i>Cyathea robusta</i> 9/10	<i>Pteris umbrosa</i> 6/10
<i>Cyathea rebecca</i> (crested) 9/10	<i>Revwattsia fragilis</i> 4/10
<i>Dicksonia antarctica</i> 6/10	<i>Sphaerostephanos heterocarpus</i> 7/08

Thank you to the following spore donors: Brenda Girdlestone, Don Fuller, Warren Simpson, Nada Sankowsky, Sheila Tiffin, Kylie Stocks, Neville Crawford, Wendy Johnston, Claire Shackel, Dot Camp, and Crosby Chase.



Selaginella brisbanensis in Buderim Forest Park (my partial thumb in the corner gives some idea of the small size of this plant).



Adiantum diaphanum growing with *Selaginella brisbanensis* in Buderim Forest Park.



Crepidomanes saxifragoides photographed in Buderim Forest Park in the dry (left) and when thoroughly wet (right). These images were taken almost exactly 1 year apart (photos on this page by Peter Bostock).