

# AUSTRALASIAN BRYOLOGICAL NEWSLETTER

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Participants at the 24<sup>th</sup> John Child Bryophyte Workshop, Tautuku Bay, Catlins, New Zealand. 12<sup>th</sup> – 17<sup>th</sup> December 2008

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**Standing left to right:** Rodney Lewington, Pascale Michel, Ben Myles, Peter Beveridge, Max Crowe, Pamela Atkinson, Bill Malcolm, Allison Knight, Toni Atkinson, Lynette Fischer, David Glenny, Eric Whiting, Owen Spearpoint, Geoff Spearpoint, Susan Hansard, John Whitehead, Barbara Beveridge, Rowena Whiting, Barbara Parris, Lyn Cave, Jessica Beever.

**Sitting left to right:** Helen Jolley, Paddy Dalton, Pina Milne, Allan Fife, Barbara Polly, Maia Mistral, Endymion Cooper, Diana Behr and Elizabeth Brown in front.

“Behind the camera” John Steel

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# Nematode galls on a tiny moss.

## The moss

The minute Australian endemic moss *Stonea oleaginosa* was discovered by accident in 1969.



Illustration of *Stonea oleaginosa* by Rod Seppelt

It grows in semi-arid and arid areas of salt bush and mallee country across Southern Australia (fig. 1). *Stonea oleaginosa* may be easily overlooked as it reaches only 1 mm in height; it is usually half-buried in the soil and also resembles the iron-stained sand grains amongst which it grows.

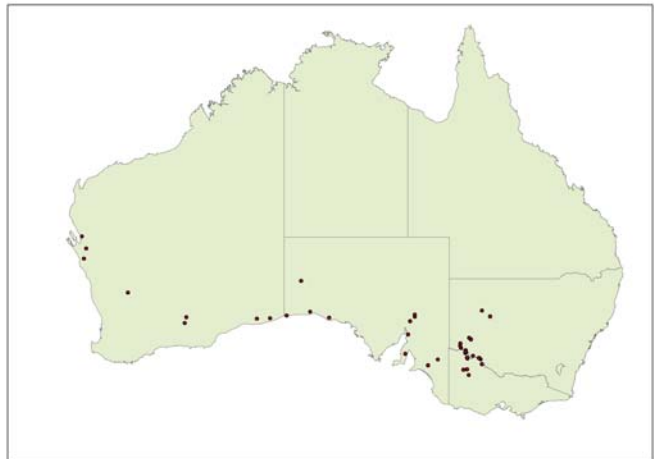


Fig 1

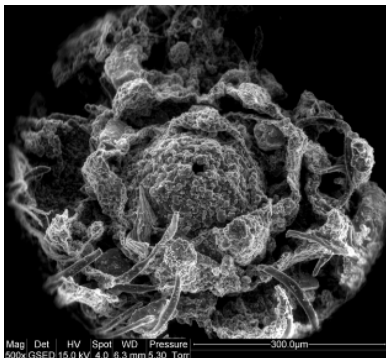
In the original species description, it was reported that plants were found with abnormally elongated stems; this was attributed to infection by nematodes (fig. 2). The affected plants had ‘hollow and necrotic stems’ [1], however, there was no reference to nematode galls in this paper.



Fig 2  
Photo of the habit of *Stonea oleaginosa* on the left and nematode galls are shown on the right

Although free-living nematodes have been commonly reported from the water films surrounding moss cushions [2], the gall-forming nematodes which parasitise mosses are not as well known. The earliest published records of nematode galls on mosses are from the beginning of the 20th Century [3, 4, 5]

## The nematode



Whilst examining recently collected specimens of *Stonea oleaginosa*, galls which resembled moss capsules were found in the apices of several moss plants. On dissection they were found to contain nematodes (fig.3).Our preliminary investigations indicate that the nematodes are a new species of *Nothanguina* (fig. 4).

Fig 3

The ability to modify plant tissues into galls is an economically important characteristic of certain nematodes, as, for example, in the Root Knot Nematodes (*Meloidogyne* spp.) which are estimated to cause millions of dollars of damage to crops. Some Neotylenchidae and Anguinidae form galls on the aerial parts of plants, and recent studies have identified considerable evolutionary radiations in some of these groups. Sometimes there is almost perfect congruence, between nematode and host species, but sometimes the congruence is much looser.

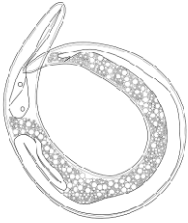


Fig 4.  
A drawing to show the detailed appearance of the new species of the nematode *Nothanguina* sp.

The evolution of the ability to form galls is important in understanding these radiations and the process of gall formation. Key questions are: how has gall forming evolved and how many times?

Within Anguinidae several genera form galls. The genus *Nothanguina* is monospecific, and is characterised by lack of a median oesophageal bulb. The only described species parasitises leaves, stems and inflorescence axes of a south Indian grass. It forms galls with up to five adult females, a similar number of males and numerous eggs and juveniles.

In the new species males are yet to be found and the galls appear to include only females. The nematode species occurs on a number of moss species including *Stonea oleaginosa* and *Phascopsis rubicunda*.

#### **Their relationship**

The nematode galls are usually surrounded by female reproductive structures (archegonia) and it is postulated that the nematodes are modifying the archegonia and inhibiting fertilisation from occurring.

It is interesting to note that male plants and sporophytes have never been observed in this moss species. The relationship raises the possibility that Anguinidae are closely related to the moss-inhabiting Tylenchidae, and are a very old group with a long association with mosses and one or more features which allow the frequent evolution of gall formation. This fits with the frequent but not universal occurrence of gall-forming species within the Anguinidae.

The alternative hypothesis that the relationship with the moss is more recent raises questions about ability to evolve the gall-forming habit in new hosts, as well as questions regarding the evolutionary origin and likely fate of the moss, given the effective cessation of sexual reproduction caused by the nematode.

#### **Acknowledgements**

Thankyou to Rod Seppelt for the excellent illustration; Roger Curtain (Bio21 Institute) for assistance with the ESEM; Alison Vaughan for preparing the map and Pina Milne for comments on an earlier draft.

#### **References**

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**Helen Jolley, Royal Botanic Gardens, Melbourne & School of Botany, The University of Melbourne, and Mike Hodda, CSIRO Entomology, Canberra**

## Four Australian liverwort species new to New Zealand

### *Kurzia dendroides* (Carrington & Pearson) Grolle

Known at present only from the Chatham Islands, the most easterly extension of the New Zealand Botanical Region. New Zealand had six recorded species in the genus *Kurzia* (Engel & Glenny 2008, p. 361) including one dendroid species, *Kurzia tenax*. *Kurzia dendroides* is extremely rare in Australia, known only from the type collected in New South Wales by Whitelegge in 1885 (Schuster 1980) and a recent specimen from a locality about 100 km from the type locality (Heslewood & Brown 2007).

#### RECORDS

AK 302550, P. J. de Lange CH1152 & P. B. Heenan, 13 Sep 2007, Rekohu (Chatham I.), Southern Tablelands, Tuanui Farm, Tuku-a-Tamatea, near Taiko Camp, NZMS 260 CI2 389415, 44° 04' S, 176° 38' W, ca. 180 m a.s.l., in boggy, cattle-pugged ground growing amongst *Carex chathamica*. Duplicate at F.  
AK 302657, P. J. de Lange CH1239 & P. B. Heenan, 17 Sep 2007, Rekohu (Chatham Island), Southern Tablelands, Lake Rakeinui Clears, NZMS 260 CI2 437390, 44° 05' S, 176° 34' W, ca. 260 m a.s.l., in dense restiad bog, threaded through *Riccardia cochleata* (AK 302658).

NOTES: Abundant in the two places where it was found on the Southern Tablelands of Rekohu (Chatham Island). Well marked in the field due to its distinctive erect growth habit and yellowish colour which allows it to stand out from the dark emerald green of a turf of *Riccardia cochleata*. On Rekohu (Chatham Island) *Riccardia cochleata* typically forms a thick crust in any open site within the *Sporadanthus traversii* – *Olearia semidentata* – *Dracophyllum scoparium* bogs. Its associates in this turf are *Riccardia crassa*, *Campylopus acuminatus* var. *kirkii*, *Telaranea* spp. *Kurzia calcarata*, *K. dendroides* and *Utricularia delicatula*.

### *Lopholejeunea muelleriana* (Gottsche) Schiffn. var. *muelleriana*

Known at present only from the Chatham Islands, the most easterly extension of the New Zealand Botanical Region. The species is most similar in New Zealand to *Lopholejeunea plicatiscypha*, and differs in having the lateral leaves less widely spread, the lobules larger relative to the main leaf lobe, there are two lateral perianth wings which are deeply toothed to the wing base whereas in *L. plicatiscypha* there are four perianth wings and they are only shallowly toothed (Thiers & Gradstein 1989).

#### RECORDS

CHR 530819, D. Glenny 7148, 9 Dec 1997, Rekohu (Chatham Island), Nikau Bush Scenic Reserve, NZMS 260 CI1 440764, 43° 45.5' S, 176° 34.5' E, 50 m a.s.l., *Corynocarpus laevigatus* – *Pseudopanax chathamicus* forest, on trunk of *Corynocarpus*. With perianths.  
AK 301092, P. J. de Lange CH1021, 28 June 2007, Rekohu (Chatham I.), Nikau Bush Scenic Reserve, NZMS 260 CI1 448754, 43° 46' S, 176° 34' W, ca. 60 m a.s.l., growing on exposed mid-trunk section of *Rhopalostylis sapida* and associated with *Frullania patula*, *F. pycnantha*, and *F. squarrosula*.

NOTES: Nikau Bush Scenic Reserve is one of the better protected forest remnants in the northern two-thirds of Rekohu (Chatham Island). The forest is well endowed with epiphytic liverworts, mosses, and lichens.

The genus *Riccia* had eight species recorded from New Zealand (Campbell 1975, 1977), some like *R. ciliata* from few records. No further species have been reported for New Zealand since then.

***Riccia nigrella* DC.**

**RECORD**

CHR 602520, D. Glenny 10251 & M. Renner, 6 Sept 2008, Banks Peninsula, Port Hills, valley north of Gibraltar Rock, NZMS M36 785281, 43° 39.5' S, 172° 36.3' E, 220 m a.s.l., soil bank in *Dactylis glomerata* grassland surrounded by *Kunzea ericoides* scrub, with *Plagiochasma rupestre*, *Riccia sorocarpa*, *Riccia spongiosula*, and *Stellaria media*.

NOTES: *Plagiochasma rupestre* was also found at this site, and has been collected on Banks Peninsula twice previously, in 1941 (by Amy Hodgson, CHR 577766) and 2003 (by Kate McCombs, CHR 565006).

***Riccia spongiosula* Na-Thalang**

**RECORD**

CHR 603074, D. Glenny 10266, 14 Sept 2008, Banks Peninsula, Port Hills, valley north of Gibraltar Rock, 350 m, NZMG 2478655E, 5727787N, 43° 39.5' S, 172° 36.6' E, 350 m a.s.l., soil bank in *Dactylis glomerata* grassland among *Ulex europaeus* scrub, with *Bryum argenteum*, *Cerastium fontanum*, *Fissidens bryoides*, *Fossombronia pusilla*, and *Riccia nigrella*.

NOTES: The specimen has ripe capsules and the spores match those described by Seppelt (1998). The taxonomy of *Riccia* subgenus *Ricciella*, that this species belongs to, is not well understood in Australia (R. Seppelt pers. comm. 2008) and may be changed by a future revision of the subgenus in a way that affects the name that applies to this species.

**Acknowledgements**

To Rod Seppelt and Karen Beckmann for help with identifying the two *Riccias*. To Matt Renner for company in the field at Gibraltar Rock.

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**David Glenny, Allan Herbarium, Lincoln, New Zealand, Peter de Lange, Ecosystems and Species group, Department of Conservation, Auckland, New Zealand.**

## ***Calomnion complanatum* – the first bryophyte to be classified as an endangered species in New South Wales.**

*Calomnion complanatum* first came to our attention during the 2001 Australasian Bryological Workshop held in the Blue Mountains. There was great excitement when a few tiny mats were found on one tree fern trunk in closed forest near the base of the waterfall in Waterfall Reserve at Mount Wilson. Later that day, Allan Fife and Alison Downing found a few more specimens growing on sandstone rock in another deeply shaded gully at Zircon Creek, not far from the first site. The discovery was timely, as Graham Bell, present at the discovery at Waterfall Reserve, was at that time writing *Calomnion* for the *Flora of Australia*.

For a number of years we have been assembling information on the distribution of bryophytes in the Blue Mountains, from herbarium collections including MEL, NSW, CANB, SYD and the Downing Herbarium (Macquarie University) and from years of bryophyte collecting for classes and research. From these records it appeared that, other than Mount Wilson, *Calomnion* had only been collected from two other locations in the state, Rocky Creek Canyon in the Newnes Plateau (Blue Mountains) by R.Coveny 14136 & P.D. Hind, (4.iii.1990) and the original collection by W.W. Watts 6408 (22.iv.1903) from Cambewarra Mountain Road which climbs the escarpment north west of Nowra.

The rarity of the species suggested to us that it should be nominated for some form of level of protection as an endangered status. In terms of classification of bryophytes as protected species, New South Wales falls well behind Victoria and New Zealand. The web page of the Department of Environment and Conservation (NSW) read: *There are 1 threatened algae, mosses and lichens in NSW.* That species is the green alga, *Nitella partita*, which is listed as *Endangered*. We had no experience of the processes necessary to nominate a plant as an endangered species and the nomination became a very steep learning curve.

In October 2006, Elizabeth Hodsdon from Robertson in Southern highlands, helped us locate appropriate habitats in the Nowra area. We concentrated our efforts on Cambewarra and Barrengarry Mountains, but without success. We believe that the drought had had a considerable impact on delicate epiphytic species such as *Calomnion* and the tree ferns themselves were in very poor condition. In 2007 we went back to Mount Wilson to confirm the presence of *Calomnion* in Waterfall Reserve. In spite of the prolonged drought, it was still growing on the same tree fern where it was found in 2001. We were unable to find it in Zircon Creek or anywhere else at Mount Wilson.

Probably the most difficult part of the exercise was to understand the legislation. Bob Makinson from NSW was extremely helpful and summarised for us the two relevant pieces of legislation. The first (and oldest) piece of legislation deals with *Protected Plants*, and Bob explained this was more to do with limiting exploitation of native plants by the horticultural industry. *Protected Plants* are listed under Schedule 13 of the National Parks and Wildlife Act 1974. The Act primarily deals with species picked for the cut flower industry. *Sphagnum* is included in this list, probably because it was used extensively to pack potted plants to keep them moist during long periods of transport.

The second relevant piece of legislation deals with *Threatened Species* which are scheduled under the Threatened Species Conservation Act 1995 (TSCA). Schedule 1 of the Act covers **endangered species, endangered populations and endangered ecological communities**, Schedule 2 lists **vulnerable species** and Schedule 3 lists **key threatening processes**. Prior to the nomination of *Calomnion*, there were no bryophytes listed as *Endangered Species* in NSW, although the Ben Halls Gap National Park *Sphagnum* moss Cool Temperate Rainforest (in north-eastern NSW) had been listed as an endangered ecological community.

The information required for assessment was very far reaching and included: Description of the life cycle; Species abundance, geographic distribution, habitat quality and genetic diversity; Threats to the species; survey methods supporting the nomination; Information sources, including scientific literature, maps, databases and names of experts familiar with the species.

We found the task quite daunting and the wording intimidating. On 21<sup>st</sup> June, 2007, we tentatively forwarded our submission to the Scientific Committee, written simply in everyday language. Fortunately for us, Lesley Hughes, Chair of the Scientific Committee, edited our work so that it could be presented using the appropriate terminology. Luckily *Calomniaceae* (David Catcheside and Graham Bell) had just been published in the first moss volume of the *Flora of Australia* and Paddy Dalton, David Meagher, Jessica Beever, Helen Ramsay and Robert Coveny provided copies of other relevant and necessary publications.

There followed further requests from the Committee for additional information, concerning the extent to which *Calomnion* had been sought, including the amount of time spent searching, the number of people involved and the expertise of those people. Finally, the committee wanted to know which species of tree fern? We sent out an email to colleagues in Australia and New Zealand. Thanks to information from Paddy Dalton, Graham Bell, Jessica Beever, David Meagher, Allan Fife, Neil Klazenga and Val Stajsic we discovered that *Calomnion* grew on the trunks of a number of species of tree ferns, also *Blechnum fraseri* (in New Zealand), on the palm *Rhopalostylis sapida* and occasionally on rock. By this time, the nomination had truly become a group effort!

In January this year (2009), we received a final letter from Lesley Hughes, confirming that a final determination had been made to list the moss *Calomnion complanatum* (Hook.f. & Wilson) Lindenb. as an **endangered species**. Although this might not seem to be a world shattering event, *Calomnion complanatum* is the first **bryophyte** to be listed as an endangered species in NSW. We hope that this successful nomination will have a number of outcomes, firstly to provide protection for the species, secondly to protect the few locations in which it has been found and thirdly, and most importantly, to bring bryophytes to the attention of the rest of the world.

We would like to thank all those who helped us with this project. The support we received has encouraged us to look at other bryophytes for which some level of protective status in NSW is warranted. Currently *Haplomitrium intermedium* is top of our list.

**Alison Downing, Ron Oldfield and Suzanne Kinsley, Department of Biological Sciences, Macquarie University, NSW, 2109**

## Using Environmental SEM for minute mosses...

In February 2008, with assistance from a student bursary from the Australasian Microscopy & Microanalysis Society, I attended the 20<sup>th</sup> Australian Conference on Microscopy & Microanalysis in Perth. Apart from spending a week in sunny Perth, this was a fantastic opportunity to attend courses, meet experts in biological microscopy, technicians and students and also see the latest technology & techniques in microscopy. The Scanning Electron Microscope (SEM) and more specifically the Environmental Scanning Electron Microscope (ESEM) were particularly interesting as I had already used an ESEM at the Bio21 Institute at The University of Melbourne in 2007 at the suggestion of Prof. Rod Seppelt.

The conventional SEM operates in a vacuum and subsequently biological samples need to be either dried or cryogenically frozen. This is a lengthy process which also involves coating the samples in gold. There is very little sample preparation required when using an ESEM as it allows imaging of almost any specimen under any gaseous conditions. This is one of the main advantages of using this instrument. This is achieved by using a secondary-electron detector capable of operating in the presence of water vapour. The sample can be placed directly onto the carbon stub, even whilst still attached to the substrate. The specimen will still need to be cleaned and as much dirt as possible removed from the moss itself to ensure a clear image is captured. However, this preparation is minimal compared to the lengthy procedures required when using a conventional SEM.

The second and main benefit of using this instrument is that images can be taken of the moss samples in a hydrated state. As seen in Figure 1 micrographs may be obtained of both dry and wet specimens. By obtaining a hydrated image of small mosses such as *Stonea oleaginosa* and *Pterygoneurum ovatum*, the

overall shape of the plants may be clearly seen as well as features such as papillae and lamellae on the leaf surfaces (Figs. 2 & 3). This is achieved by gradually increasing the pressure inside the chamber until condensation forms. As the mosses are ectohydric, the uptake of water can be quite rapid, depending on the age and condition of the specimen. The really exciting feature of this instrument is its ability to capture the images in a video format. With the assistance of technician Roger Curtain (Bio21 Institute) we were able to video the moss *Stonea oleaginosa* as it rehydrated. Although there is a reduction in resolution as the sample becomes hydrated, the ESEM is still a valuable tool for obtaining high magnification of mosses and should be considered as an alternative to conventional SEM.

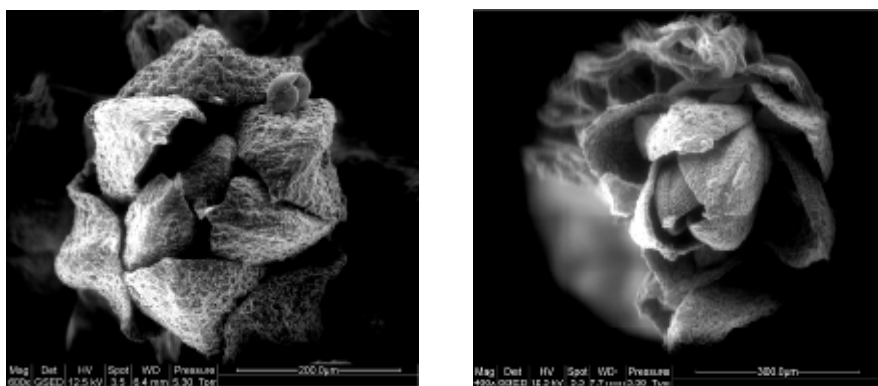


Fig1.  
*Stonea oleaginosa*, dry (left), hydrated (right)

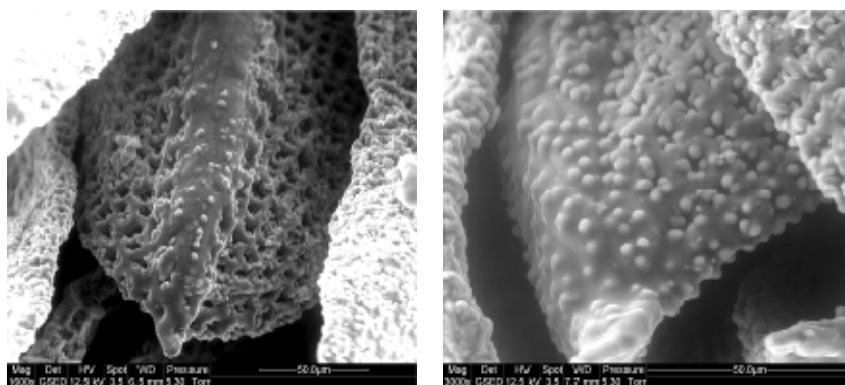


Fig 2.  
*Stonea oleaginosa* abaxial leaf surface, dry (left), hydrated (right)

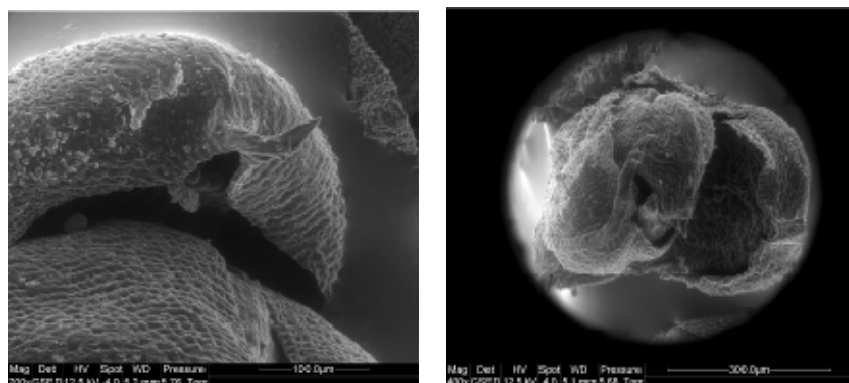


Fig 3.  
*Pterygoneurum ovatum*, hydrated leaf (left), hydrated plant showing lamellae on adaxial leaf surface (right)

**Helen Jolley, Royal Botanic Gardens Melbourne & School of Botany, The University of Melbourne**





## WILF SCHOFIELD'S CONTRIBUTIONS TO AUSTRALIAN BRYOLOGY

Although Wilf's love of bryophytes concentrated on North American species of both mosses and liverworts, his interests were much broader encompassing the ecology and geographical distribution of species worldwide particularly between the western American and east Asian species and the bipolar disjuncts of the northern and southern hemispheres. These interests led him to visit Japan several times and work with prominent Japanese bryologists. In addition he undertook a trip to work in New Zealand in 1973 to refine his concepts of bipolar distribution

Prior to Wilf's visit to New Zealand George Scott had worked in New Zealand from 1961-1970 at Otago University. They had obviously corresponded during this period and again once George moved to Australia (Monash University, Melbourne) in 1970. After the trip to New Zealand in 1973 Wilf came across to Australia to visit George. He participated in the first Australian Bryological Meeting held in conjunction with the ANZAAS Conference at the University of New South Wales in Sydney that year. We had a series of short papers by Helen Hewson, Helen Ramsay, David Catcheside, Rod Seppelt, George Scott, and Patricia Selkirk, and Wilf spoke of his Bipolar Distribution data.

It was my good fortune to drive him to his hotel that day and from that a friendship and collaboration spanning many years began.

In 1977 we worked for several months together in Vancouver, collecting mosses in wonderful locations for chromosome studies. During this visit Wilf sent me to Edmonton to visit Dale Vitt who later (1981) came to Australia and worked with me on *Macromitrium*. Two of Wilf's students whom I met at that time were later to collaborate with me on producing taxonomic revisions for the Flora of Australia :Bryaceae- John Spence and Sematophyllaceae – Ben Tan with Wilf. The *Macromitrium* work and other work on the Orthotrichaceae also appeared in the first Flora volume (2006).

In 1983 Wilf returned to Australia to take time to complete the manuscript for his famous and beautifully illustrated book 'An Introduction to Bryology'. On a third visit in 1987 the planning for the Sematophyllaceae work began, commencing with field studies and collecting trips from North Queensland to southern New South Wales. He and Peggy, his wife, spent several days with Ilma Stone in North Queensland and collected many of the species she had found and recorded previously as well as many specimens now deposited at NSW and some in BRI. It was happy time for them both as they sat on the floor surrounded by packets, sorting them and having continuous cups of tea in a flat at Macquarie University. At this time we also borrowed and examined types for Sematophyllaceous names. During this leave he also was able to spend time with Patricia Selkirk and Alison Downing in the Blue Mts. area of Sydney.

During the intervening years we corresponded regularly and I attended one or two conferences in Canada. In 1997 I attended his surprise 70<sup>th</sup> birthday celebrations in Vancouver where I again met up with his former students and Canadian colleagues as well as spending some time in the field. We also shared the loss of my husband Frank and Wilf's wife Peggy within two years of each other and received much comfort from each other in corresponding and sharing sorrows.

In 2007 Wilf, who hated long distance air travel, made the long journey to Australia and we met up in Sydney for a few days before travelling to Tasmania to attend the IXth Australasian Bryophyte Workshop 3<sup>rd</sup> -8<sup>th</sup> December. There he renewed contact with Australians such as Rod Seppelt, Alison Downing and Paddy Dalton, New Zealanders such as Jessica Beever and Allan Fife and met the newer, younger bryologists from both countries. The Americans who came such as Bill Buck, Jon and Blanka Shaw, Jim Shevock, marvelled at his energy, agility and continued desire to make collections and explore wherever he could. He had never visited Tasmania before and it reminded him of his time in New Zealand. After a short revisit to Sydney he returned home for Christmas with his children for he was a close family man. It was a really happy visit for us all, none of us realising it would be his last.

As others have also expressed, Wilf was renowned for his friendliness, his cups of tea, his lively conversations on many subjects, his wonder and excitement when he found something exciting, the adventures in Alaska and the Aleutian Islands he wrote about in his many letters and his fascination with

*Takakia* in the field. He was a dedicated teacher who loved to be out with like minded bryologists and he attended a number of workshops in North America prior to his death. His published contributions to Australian Bryology include the taxonomic studies on Sematophyllaceae with Ben Tan and myself and small papers on Blue Mountains mosses. A lasting and for ever valuable contribution are the hundreds of specimens of both mosses and liverworts donated to NSW and BRI. His books have been valued by us as has the knowledge he has passed on to us in conversations and letters, for he was an avid correspondent to an extensive list of colleagues worldwide. Over the years he provided hospitality to a number of Australasian visitors to Vancouver and shared so much of himself with us. I will remain immensely grateful for all that he and I shared during the years we worked, collected, wrote to each other and talked together.

**Helen Ramsay, Sydney, Australia**

## **24<sup>th</sup> John Child Bryophyte Workshop Catlins, Otago, New Zealand, 12th to 17th December 2008**

New Zealand! A bryophyte workshop! What a wonderful job I have! It doesn't always seem like it, but occasions such as bryophyte workshops in places such as the Catlins makes the marking of exams and assignments a little easier.



The Catlins was a wonderful place to hold this workshop, organized by John Steel, Maia Mistral and Allison Knight, Botany Department, University of Otago. The Catlins takes its name from the Catlins River, which was named after Edward Cattlin who was an early whaling captain. The Catlins is a region in the southeastern corner of the South Island and lies between Balclutha and Invercargill. It is a rugged, sparsely populated area and includes the South Island's southernmost point, Slope Point. One of the features of the Catlins is dense temperate rainforest (photo on left) dominated by podocarps.

On the Friday, some of us took the scenic route from Christchurch to the Tautuku Outdoor Education Centre just 5 km south of Papatowai, sharing a picnic on the way and having leisurely coffee stops. When we reached the centre a lovely meal and glass of wine awaited us. This set the mood for all future meals at the workshop where all specialty diets were taken into account. Generous packed lunches with home-made cookies and cake ensured we would have to work hard to maintain our trim and taut physiques, especially after extra helpings of Maia's freshly made muesli. The education centre was backed by rainforest and only a short walk, through more rainforest, from the coast, so there was plenty of time for bryologising between organized excursions.



Overlooking Tautuku Bay

Saturday morning saw us dispersed in a mixture of vehicles and off we went to Thisbe Stream but, alas, the farmer who was to allow passage through his land did not show up and the access gate was solidly padlocked; however, bryologists are of stern stock. Some went over the fence while others went under the

fence and then off we scampered to our goal, which was the beech forest by the stream. Here we found some of the magnificent *Dendroligotrichum dendroides*. In the afternoon we wandered the Catlins River Walk with stops at Wisp Stream carpark for lunch and Wallis Stream where some got 'lost' and went to the coast while others explored the forest. Our final stop for the day was at Frank Creek where there was a steep drop down to the river.



The next day we tripped into the Hunter Hills in the Catlins State Forest Park, which is under the control of the Department of Conservation. This area currently forms part of Operation Ark, a project that aims to preserve the native moehau or yellowhead, a rare and endangered bird. Here we followed a well marked stoat-trapping track through some pristine native beech forest to the summit. Along the way we found species such as *Pohlia camptotrachela*, *Canalohypopterygium tamariscinum*, *Notoligotrichum crispulum*, fruiting *Treubia lacunosa* (photo on left) and much more.

An alternative trip to the summit was Peterson track, which ventured through mixed southern rata forest with podocarps and an understorey of broadleaf shrubs and ferns. Here was found *Cladomnion ericoides*, a New Zealand endemic.

As the workshop continued, the bryologists began to wither a little and breakfasts became a little later but the smiles were still there and on Monday, off we went to Picnic Point track, through regenerating cut-over podocarp forest with plenty of tree ferns and broadleaf trees. Here we found *Calyptrochaeta apiculata*, *Pogonatum subulatum* and *Pallavicinia tenuinervis* and much more. This was followed with a trip to the Old Coach Road which was described as 'an easy loop track', just a 'short' one, through varied forest including a small swamp forest, that led to coastal dune forest dominated by podocarps, a disturbed coastal strip of frontal dune with some old totara and the occasional kahikatea and then a quick stroll along the beach back to the track through coastal manuka/totara forest. The swamp had to be negotiated by balancing along conveniently placed but slippery logs, and taking the odd leap or two from them to drier ground. Some of us, of course, couldn't resist finding out how deep the mud was so left our conveniently placed logs!

Other trips were Old Possumers track, Gorge Stream Walk and Lenz reserve. There were a number of independent trips as well, including Lake Wilkie, Romahapa Cemetery, Tautuku Nature Walk and Tautuku Beach. Allison Knight (pictured on the right) who co-convoked the workshop, has lists of the liverworts and mosses collected at the workshop and a reference collection has been given to the Department of Conservation ranger at Owaka.

But the workshop is not only about going out in the field. In the evenings a number of very interesting talks were presented. On Saturday evening, David Glenly summarized the problems in identification of *Plagiochila* in New Zealand and provided insights into how to come to grips with learning about the genus. Allan Fife spoke of coastal mosses of Otago and explained there was a moderately rich flora of salt tolerant moss species, some of which seemed restricted to southern coastlines while others were more widespread



Anne Gaskett described her hunt for entomophilous mosses, particularly *Tayloria* in New Zealand. She hopes to identify insects attracted to *Tayloria* and investigate the odour and colour signals used to lure insects to these mosses. On the Monday evening we had Endymion Cooper and Helen Jolley vying for the inaugural Tom Moss Award. Helen won for her unraveling of *Crossidium davidai* and the tortuous *Tortula atrovirens*. Endymion presented the systematics of the Lepidoziaceae: understanding relationships, biogeography and morphological evolution in this hyper-diverse family of Gondwanan hepatics. Maria

Gibson queried whether or not Ecological Vegetation Classes were good surrogates for Bryophytes in Box-Ironbark forests.

As I said earlier, Bryologists are made of stern stock. We were out in the field during the day and listening to talks some nights. Conveniently the 'lab' included an area for socialization, so some drank a merry brew while others worked into the wee small hours sorting, packaging and identifying their finds. Exchange of information is one of the most worthwhile outcomes of any workshop. This was no exception. Many bryologists are keen photographers and it was wonderful to see that advice was given readily. The guru, Bill Malcolm, was almost invisible one evening as he demonstrated some of his techniques. The workshop attracted not only bryologist but also those of other "denominations": Barbara Parris, lead some of us astray into the lush world of pterophytes and Toni Atkinson and her mother reminded us that the Catlins was a wonderful theatre of Natural History and engrossed us with some of their fungal finds. I came away from the workshop with my mind full of ideas to tempt students into the world of bryophytes. A heartfelt thanks is due to the organizers, Allison, Maia and John!

**Maria Gibson, School of Life and Environmental Science, Deakin University, Victoria.**

## Forthcoming Conferences and Workshops



### International Association of Bryology 2009

The next meeting of the International Association of Bryologists will be held in the Western Cape Province of South Africa, August 16th to 21st 2009. This meeting provides a forum for bryologists to share research with colleagues from around the world. The conference will feature symposia, contributed papers and posters. Major themes are; African bryology, Bryophyte biology, Conservation biology, Evolutionary Community Ecology, Phylogeny & Systematics, Phylogeography & Biogeography.

**For further information including registration: Prof. Terry Hedderson or visit the IAB website.**

### 25<sup>th</sup> John Child Bryophyte Workshop

This will be held from Thursday 15<sup>th</sup> to Tuesday 20<sup>th</sup> October 2009 at Waipukurau, Hawke's Bay, central east coast North Island, New Zealand. Accommodation with laboratory facilities will be based at the Pukeora Estate, an award-winning winery which overlooks the southern Hawke's Bay plains to the Ruahine Ranges. Field trips will likely include lowland podocarp forest, montane forest to alpine zone in the Ruahine Ranges, a mixture of dry and wet forest on limestone and semi-swamp forest.

**For further information and interest in attending contact: Leon Perrie ([leonp@tepapa.govt.nz](mailto:leonp@tepapa.govt.nz)), 04 381 7261, or Leon Perrie, Te Papa, PO Box 467, Wellington, New Zealand.**



### Xth Australasian Bryophyte Workshop

**Manjimup, Western Australia**

**Sunday 30<sup>th</sup> August to Saturday 5<sup>th</sup> September 2009**

Accommodation will be in shared style facilities at the Perup Ecology Centre found in the heart of the 52,000 hectare Tone-Perup Nature Reserve. There will be daily field trips to vegetation types ranging from granite outcrops, wandoo woodland, lakes and swamps and jarrah forest. A slightly longer drive will reach tall karri forest. Time will be set aside for microscope work, special interest groups and evening talks and poster sessions.

**For further information and expression of interest please see the enclosed flyer.**

**Conveners:** Louise Biggs: [Louise.Biggs@dec.wa.gov.au](mailto:Louise.Biggs@dec.wa.gov.au) & Lachie McCaw: [Lachie.Mccaw@dec.wa.gov.au](mailto:Lachie.Mccaw@dec.wa.gov.au)