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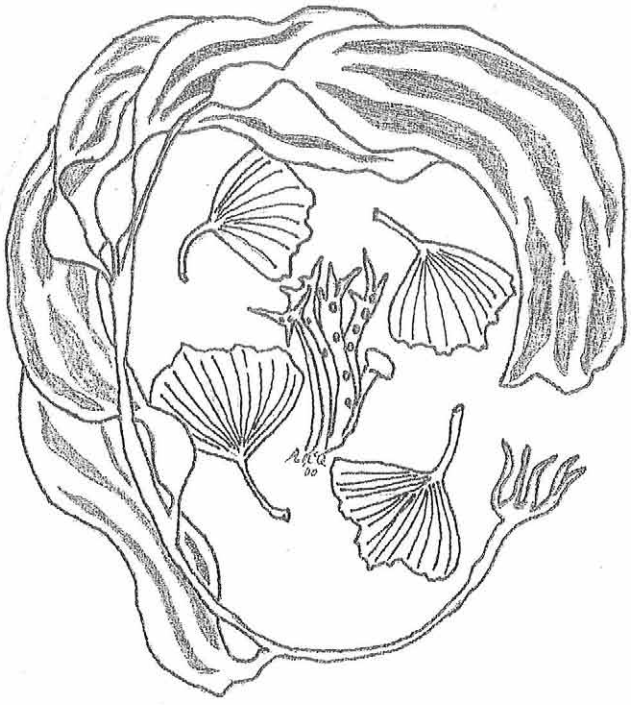
Botanical Society of Otago Newsletter. Number 24 November 2000.



Botanical Society of Otago Meetings

29th December – 7th January: **Summer field trip** with the Wellington Botanical Society to Borland Lodge. Spaces still available. Contact Allison Knight, 487 8265, email: alli_knight@hotmail.com

8th –9th January. **Lichen identification workshop,** Botany Dept, Otago University. With Jennifer Bannister and Allison Knight. If you would like to help identify Fiordland lichens from the summer field trip contact Allison as above.

14th February, 2001 7pm. **Annual General Meeting** and guest speaker Professor Alan Mark, '**New Zealand Alpine vegetation in a World Context**' Zoology Annexe Seminar Room.

Note from Branch Office

What a botanically rich year 2000 has been in Otago, with Barbara setting the pace and organising a feast of articles, talks, workshops and field trips. The best is yet to come with the summer field trip to Borland Lodge. There is plenty to look forward to next year, starting with the next newsletter, which will be in January. The AGM in February will be your chance to add your suggestions to our list of activities, so please keep this in mind. Meanwhile, Merry Christmas and Happy Botanising over the summer!

Allison and Bastow

Cover picture: This attractive logo was drawn by Amelia McQueen for the University of Otago Botany Colloquium. The lichen in the middle, *Ramalina*, represents the central role that cryptogams, such as ferns, mosses, liverworts, lichens, fungi and algae play in ecology. The 4 leaves of the ancient ginkgo, or maidenhair tree, *Ginkgo biloba*, which is still fertilised by motile sperm cells, represent the evolution of vascular plants, while the encircling seaweed, *Macrocystis pyrifera*, indicates the strength of marine science at Otago.

Botany Department Colloquium

The annual Botany Colloquium, held last month by the students and staff of the Botany Department, University of Otago was a great success, thanks to the students and staff who worked so hard to put it on. Congratulations to José Derraik, who won the Botanical Society of Otago Award for the best student presentation, and to Denise Paine, who won the Botany Dept prize for best poster. Winners were decided by student vote. Abstracts of papers and posters presented at the Colloqium follow.

Talks

The Cortinariaceae, a polyphyletic dumping ground for rough-spored mushrooms

David Orlovich

The families Strophariaceae, Bolbitiaceae and Cortinariaceae are all gilled fungi with brown spores, in the order Agaricales. Most members of these families are decomposers, living either on dung or dead wood, but the Cortinariaceae contains some important genera of mycorrhizal species - fungi that form symbiotic associations with plants. The Strophariaceae contains many hallucinogenic species like the 'blue meanies' (*Psilocybe* spp.) and also the common pouch fungi (*Weraroa* spp.). Some of the Bolbitiaceae are commonly known as 'dunce caps' (*Conocybe* spp.) some of which are poisonous, others are hallucinogenic and others edible. The Cortinariaceae contains species like the hallucinogenic 'big laughing gym' (*Gymnopilus junonius*), the necrophilic 'corpse finders' (*Hebeloma* spp.) and another genus of pouch fungi, *Thaxterogaster*. In a recent analysis of the evolutionary relationships within the order Agaricales (Moncalvo *et al.* 1997), the families Strophariaceae and Bolbitiaceae were found to be closely related to each other and to **parts** of the Cortinariaceae. The Cortinariaceae is an unnatural group comprising three different lineages, more or less corresponding to the three subfamilies proposed by Singer (1986). It is surprising that such basic information about evolutionary relationships in a large group of fungi is still unclear. I introduced these groups of fungi and outlined a plan to resolve the evolutionary relationships between and within the three families by analysis of DNA sequence data.

References:

Moncalvo, J. M., Lutzoni, F., Rehner, S., Johnson, J., and Vilgalys, R. (1997). Molecular phylogeny of the Agaricales based on 25S rDNA sequences. *Inoculum* **48**, 26. Available on the web at http://www.botany.duke.edu/fungi/mycolab/agarical.htm

Singer, R. (1986). *The Agaricales in Modern Taxonomy*. 4th Edition (Koeltz:Koenigstein.)

Stressing out seaweeds: *Stictosiphonia arbuscula*'s ecophysiological limits.

Abi Loughnan

Plants and animals inhabiting intertidal rocky shores around the world grow in distinct vertical bands. This region is considered to be the most stressful habitat to live in, as organisms inhabiting it experience both marine and terrestrial environments with each rise and fall of the tide. My research goal is to understand the physiological mechanisms that allow the common seaweed to prevent and/or recover from the stresses of its environment. An overview of current happenings with my research on *Stictosiphonia arbuscula* was discussed.

Trans-species sex and sullied genes: – the pitfalls of resolving a phylogeny for *Coprosma* (Rubiaceae).

Adrienne Markey

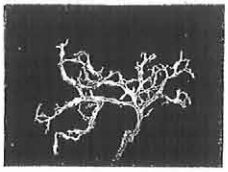
Molecular markers such as proteins or gene sequences have been used to reconstruct the evolutionary relationships of organisms since the mid 1960's. In 1992, Baldwin *et al.* used the ITS region of the ribosomal RNA gene (nrDNA) as a molecular marker, with astounding success, to resolve phylogenetic relationships within the Hawaiian silversword alliance (Asteraceae)[1]. This seminal paper initated a flood of phylogenetic research drawn from across the entire spectrum of eukaryotic organismal diversity. Generally, the ITS and ETS region of nrDNA has been noted for its phylogentic utility at low taxonomic levels, which has seen its use increase exponentially over the past eight years. However, it has become apparent that reticulate evolution, polyploidy, introgression and ancient hybridisation events pose particular problems for this technique, thereby providing additional insight on current theories on gene and organismal evolution. Using current research into evolution of the genus *Coprosma*, a cautionary tale was presented that outlined the pitfalls and power of phylogenetic inference using sequences from nrDNA.

1: **Baldwin, B.G. (1992).** Phylogenetic utility of the internal transcribed spacers of nuclear ribosomal DNA in plants: examples from the Compositae. *Molecular Phylogenetics and Evolution* **1:** 3-16.

Ecobiomechanics of *Durvillaea*

Deane Harder

This talk was a more detailed update on the ecobiomechanics of the bullkelp. As this term is still quite new, the different aspects and levels of analysis were explained and related to on-going projects. It involves the testing of biomechanical properties of tissue samples as well as a more general structural and morphological analysis of the plant, complemented by the estimation of the hydrodynamic forces actually acting on the kelp.



Ramalina unilateralis
A lichen found on twigs in high light habitats.

A Week in Doubtful Sound: Seaweed Taxonomy Workshop and Subtidal Survey.

Sheryl Miller

A workshop was held 1st – 7th October in Doubtful Sound where marine students were taught how to identify subtidal macroalgae. A subtidal survey was then carried out to determine:

- the number of alga species per unit area at different depths along Doubtful (modified) and Thompson (not modified) sounds. The depth strata were determined from a preliminary survey.
- percent cover of corallines and their distribution
- landscape survey with underwater video.

This is the first known subtidal survey to quantify algae in Doubtful Sound. Macroalgae were surveyed within four depths strata to a depth of 18 meters, using randomly placed quadrats (1m x 1m) at twelve paired sites throughout the two sounds. Unknown algae were collected and later indentified in the laboratory. Smaller seaweeds, including coralline algae were surveyed using a 25 cm x 25 cm quadrat, also randomly placed within the four depths strata. Students learnt how to identify macroalgae and to plan and implement an underwater field survey of macroalgae diversity.

Arthropod Morphospecies vs. Taxonomic Species: A Comparative Field Study with Araneae, Coleoptera and Lepidoptera

José Derraik

In times of "Biodiversity Crisis" there is an increasing need for faster and cheaper ways to perform species inventories. This situation is especially troublesome for invertebrates, a group as diverse as it is unknown, and whose taxonomy is a major barrier for conservation action. The use of morphospecies instead of taxonomic species has been proposed as a way around that problem. The present study was conducted in a modified native shrubland in New Zealand's South Island where Lepidoptera, Coleoptera and Araneae were sampled in autumn by beating and pitfall traps. All specimens were separated into morphospecies by a non-specialist and then identified by specialist taxonomists, and the results compared. Results were analysed with respect to correct separations (one taxonomic species to one morphospecies), lumping (more than one species classified as a single morphospecies) and splitting (one species separated into more than one morphospecies). Among the individual orders, Lepidoptera yielded very accurate results (91% correct separation) followed by Coleoptera (63%), while there was a poor result for Araneae (50%). The overall difference between the morphospecies and taxonomic species estimates for the site was only 3.3%, but that was actually caused by the splitting and lumping results often balancing each other. Morphospecies present a useful tool for invertebrate inventories

but their effectiveness varies. It is advisable to establish the morphospecies-taxonomic species relationship for a particular target group before adopting it in studies involving morphospecies inventories.

Epiphyte ecology: temperate and tropical rain forest affinities

Katharine Dickinson, Robert Hofstede, Alan Mark and Stephan Halloy

In tropical rain forests, epiphytes can contribute significantly to species diversity and biomass, a feature not generally associated with temperate forest systems. This study investigates lianoid-epiphytic diversity and biomass on three host trees (two species *Dacrycarpus dacrydioides* Podocarpaceae and *Nothofagus menziesii* Fagaceae) of varying height and architecture, in different positions in a South Island, New Zealand temperate rain forest 45° 43' S. Cover of epiphytic and lianoid species (vascular and non-vascular) was recorded in 5 m vertical height segments (trunk), on four aspects (north, south, east and west); and in three sections (inner, middle and outer branches) on four branch faces (positions: topside, both sides, underside) on each tree. Inclination, branch face, and diameter of branch/trunk substrate, height above ground, duff thickness and location on tree (trunkfoot, main trunk, inner branches, middle branches, outer branches, branch extremes) were all recorded in 359 samples. Epiphytic biomass was derived for one phorophyte. Sixty-one vascular and 96 non-vascular species were recorded. Eight communities associated with the highly vegetated inner branches and main trunk, and seven indicative of the less vegetated middle to outer branches, were recognised. Thirteen communities were present on a forest interior *D. dacrydioides* tree, nine on a riverside *D. dacrydioides* tree and seven on a *N. menziesii* tree. All measured environmental variables were statistically significant in relation to ordination analysis of the samples. Dry mass per unit area and dry bulk density recorded were 350 ± 125 g dm^{-2} and 118 ± 13 g dm^{-2}, respectively (trunkbase), and 206 ± 21 g dm^{-2} and 91 ± 4 g dm^{-2}, respectively (inner & middle branches combined). Epiphytic community analyses that do not include vascular and non-vascular flora are potentially flawed. Values for epiphytic dry weight for the trunkfoot of one tree appear to exceed comparable figures recorded from tropical rain forest systems. Within-tropics epiphytic comparisons potentially ignore significant conducive conditions for both epiphytic diversity and mass that may occur in equally perhumid climates of temperate rain forests. Comparisons are made with a comparable study conducted in Bolivian cloud forest.

Virus spread

Paul Guy

This was a litany of concerns about viruses as invaders of plant communities.

Seaweed hydrodynamics: research plans

Catriona Hurd

Seaweeds dominate coastal ecosystems world-wide and play an essential role in primary production and nutrient cycling. As in terrestrial plants, the control of seaweed growth and production rates is attributed to variations in light levels, nutrient supply and temperature. Of these factors, the role of nutrient supply is poorly understood because it requires knowledge of both nutrient levels in the surrounding medium and the rate of transport of those nutrients to the seaweed. The greater density of seawater compared to air means that transport rates of essential nutrients (carbon and nitrogen) in seawater are 10,000-fold slower than in air. This slow nutrient transport rate is exacerbated in habitats where seawater flows are low because a region of stagnant flow forms at the seaweed surface. In slow flows, the removal of nutrients from the seawater adjacent to the seaweed is greater than the rate of diffusion of nutrients through the stagnant region, resulting in the formation of a concentration gradient, termed the diffusion boundary layer (DBL). The supply of nutrients to a seaweed surface is thus controlled ultimately by transport across the DBL. My research goals in relation to DBLs and nutrient acquisition are to: 1. examine how DBL thickness varies with seaweed morphology and seawater velocity using oxygen microelectrodes; 2. determine if kelp production rates *in situ* are influenced by wave exposure and, 3. determine if levels of surface enzyme and microbial activity increase in slow flows thereby enhancing nutrient supply.

Fruit choice by common skinks (*Oligosoma maccanni* and *O. nigriplantare polychroma*: Scinicidae)

Jane Marshall

Fruit colour is one of a suite of traits that might reflect frugivory by particular types of animals. As part of a study on the evolution of fruit colour, fruit-colour choice tests were performed on common diurnal skinks. Both skink species are omnivorous and are known to exist sympatrically with many fleshy-fruited shrub species. Ten animals, housed individually, were offered dishes of two different coloured *Coprosma* fruits daily. The fruit was presented on a contrasting green background. The fruit was left and the animals' responses were recorded on video tape for three hours. The amount of fruit they ate, the colour of the first fruit they approached, and the colour chosen on return visits to the fruit were analysed and a chi-squared test of independence was applied to the results. When fruit colour is classed as red *vs* 'not red' (both blue and white) the number of 'not red' fruits consumed is significantly more than the number of red fruits consumed. The number of blue and the number of white fruits approached first are also significantly greater than the number of red fruits approached first. These diurnal skinks show a strong preference for pale *Coprosma* species over red species. These results contrast with a pilot study done in

1999 where fruit was presented on a pale background and red was found to be significantly preferred. These results have to be tested further and the effect of fruit smells examined.

Poster Session

Barley yellow dwarf luteovirus (BYDV) invasions of Australasia's native grass flora.

Davis, L.T. & Guy, P.L.

The introduced barley yellow dwarf viruses (BYDVs) have invaded native grasses in New Zealand. Virus incidence was significantly lower in the native species (2%) than in the introduced species (12%). Even though overall incidences were low, hotspots were found where incidences reached 30-40% in some species. Four different serotypes (RMV, RPV, PAV, MAV) were detected in the introduced grass flora but only two (RMV, PAV) were detected in native species. In experimental transmission tests the aphid vector *Rhopalosiphum padi*'s survival was variable on the 20 native species tested but this was not due to the presence or absence of endophytic fungi as none were detected in the New Zealand species. Aphid numbers increased and plants were killed when *R. padi* fed on *Agrostis muelleriana* and *Festuca multinodis*. *R. padi* transmitted a PAV isolate to these and six other native species. *Agrostis capillaris*, *Dactylis glomerata* and *Lolium perenne* were identified as the most likely reservoirs of infection for the native flora. *Anthoxanthum odoratum* was not infected but if the SGV serotype and its vector *Schizaphis graminum* were ever introduced, *A. odoratum* could form an effective reservoir from near sea level into alpine areas.

Six viruses in *Narcissus* spp. from New Zealand.

Clark, V.R. & Guy, P.L.

Narcissus spp. from Otago showing virus-like symptoms were surveyed for viruses using ELISA and mechanical transmission tests. High incidence of virus infection was detected at five sites. *Arabis mosaic virus*, *Cucumber mosaic virus, Narcissus latent virus, Narcissus mosaic virus, Narcissus tip necrosis virus,* and *Narcissus yellow stripe virus* (NYSV) were detected but not *Tobacco rattle virus*, the only virus previously identified from infected *Narcissus* spp in New Zealand. There was a high incidence of NYSV in infected plants both as single and mixed infections. This is the first record for each of these viruses in *Narcissus* in NZ.

What limits a rare alpine plant? Demography of *Myosotis oreophila* (Boraginaceae) in relation to two more common *Myosotis* species in New Zealand.

Alan F Mark[1], Katharine J M Dickinson[1], Dave Kelly[2] and Richard Clayton[1].

Plants may be rare through natural causes or habitat modification. An insight into the natural rarity of the extremely localised (*c.* 0.5ha) *Myosotis oreophila* has been assessed with an ongoing 8-year study in relation to the widespread *M. pulvinaris*, where their ranges overlap (Stanley *et al.* 1998; Arct. Alp.Res.), plus the localised *M. cheesemanii*, on the northern Dunstan Mountains, south-central South Island, New Zealand. This study confirms widely fluctuating populations in the first two species, as well as indicating significant differences in the demography of all three endemic, high-alpine species. Three permanent plots totalling 290m^2 (6.4% of the total population area of *M. oreophila*) are located near the centre and on two margins of the area. Two years of high recruitment, one of high mortality and four of general stability, have occurred while high turnover (Stanley *et al.* 1998) has continued, though 23% of the 612 plants recruited in 1993-4 have persisted for all seven years of the monitoring. Over five years, cumulative survival was 14-21% for *M. oreophila* but 47% for *M. cheesemanii* and only 3.6% for *M. pulvinaris*. Low adult survival is therefore unlikely to be the cause of rarity in *M. oreophila*. Its failure to spread beyond the current limits of its dense population (estimated at 13000 – 21800 plants over the eight years) does not appear to relate to lack of seed dispersal or poor seed production in the sparse marginal plants. These fringe plants had as many rosettes per plant and inflorescences per rosette, and had more recruits per inflorescence, than plants near the centre of the population, but these recruits had lower survival in their first year. Thus, despite high plant turnover, the *M. oreophila* population appears to be relatively stable. Its confinement, i.e. inability to spread, appears to be related to limited survival of new recruits along the margin. This is despite the presence of healthy *M. pulvinaris* populations beyond the margin of the *M. oreophila* patch. Some environmental factor, as yet unknown, appears to be determining the population pattern and demography of the rare *M. oreophila*

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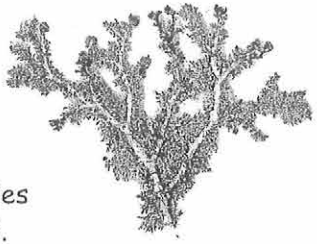
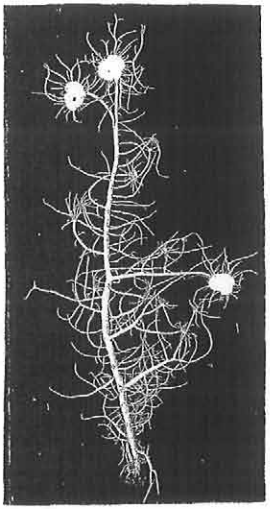


Sphaerophorus stereocauloides
A lichen endemic to New Zealand.
Found in *Nothofagus* forests at higher altitudes
This specimen from Borland Saddle, Fiordland.

Permanent photographic points for following vegetation trends: A 29-year record from Mt Aspiring National Park, New Zealand.

Alan F Mark, Otago University, Dunedin, New Zealand.

A vegetation survey of the extensive (287 200ha), generally mountainous and remote Mt Aspiring National Park in 1968-69 coincided with a drastic reduction in the uncontrolled feral red deer populations through commercial hunting using helicopters. The generally depleted vegetation was monitored with 88 permanent photographic points established in 1970-71 to represent the wide range of vegetation zones (lowland to high-alpine) and types (forests, shrublands, tussock grasslands, fellfields, snowbanks). They were marked on site (metal stakes) and on aerial photographs. Precise photographs and descriptions of local plant cover, using ranked values for species, with notes on any animal sign, were recorded. Sites have been remonitored four times up to 1999. Fourteen have been lost to date, mainly through snow removal of markers, but sufficient remain to provide a reliable record of trends. Vegetation condition has generally improved as animal numbers have remained very low. Numerous bluffs have provided refuges and seed sources for palatable species. Responses have varied with community type: subalpine scrub and low-alpine snow tussockland communities show the greatest recovery (they may now be close to their pre-disturbed state in many areas); forests have generally improved but high-alpine communities show little change. This monitoring information is valuable for park management and interpretation and, despite its high cost (*c.* NZ $10000), should be continued at about decade intervals while threats of exotic ungulates (and some aggressive exotic plants, e.g. *Hieracium lepidulum*) persist.

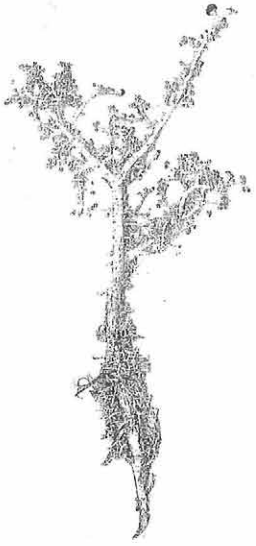


Usnea sp.
One of the 'Old Man's Beard' lichens that hand from branches in 'Goblin Forests'

Light quality can be used to regulate shoot formation from cotyledon explants of lettuce (*Lactuca sativa)*

Denise C. Paine and David J. Burritt

The effect of light quality (white, red and blue light) on organogenesis from lettuce (*Lactuca sativa*) cotyledon explants was investigated. Lettuce seeds were sterilised and germinated under continuous white light (PAR: 50 μmol m^{-2} s^{-1}). Cotyledons were excised, from 3, 4, 5, 7, 10, 14 and 21 day old plants, halved and placed on a shoot inducing medium (SIM) comprising Murashige and Skoog salts and vitamins, 30g L^{-1} sucrose, 8g L^{-1} agar, 0.44μM Benzylaminopurine, and 0.54μM Naphthalene Acetic Acid. The explants were cultured under continuous white, red or blue light (PAR: 50 μmol m^{-2} s^{-1}) for 28 days and the number of shoots formed on each explant counted. Explants taken from donor plants younger than 5 days old consistently produced more shoots if exposed to red light, than white light. As the age of the donor plant increased, explants exposed to red light produced fewer shoots than those exposed to white light. Blue light strongly inhibited shoot production regardless of the donor plant age. In a second experiment cotyledons were excised from 5 day old seedlings, placed on SIM, and grown under red, white or blue light for 1, 3, 7, 14 or 21 days before being transferred to another light regime. Blue light was only an effective inhibitor of shoot production if explants were exposed for 7 days prior to transfer to white or red light. Explants exposed to red or white light for 7 days, prior to exposure to blue light, produced normal shoot numbers. The first 7 days of culture are crucial for the production of shoot primordia and subsequent shoot development. Blue light inhibits critical processes that occur during this time period and irreparably damages the potential for shoot production.



Stereocaulon ramulosum.
A common lichen of disturbed areas such as roadside banks, slips and old watercourses

The colourful evolution of New Zealand *Coprosma (Rubiaceae)* fruit: a molecular approach

Markey, A.S[1]; Wichman, S.[2]; Gardener R.[2]; Wright, S.[2]; Burritt D.J[1]; Lee, W.[3], and Lord, J.M[1].

The genus *Coprosma* offers the unique opportunity to document the evolution of fleshy fruit traits within a phylogenetic group. One of the most speciose genera in New Zealand (c. 60 species), *Coprosma* exhibits a diverse array of fruit sizes, shapes and colours. Such a large variety of traits within one genus may reflect a number of dispersal syndromes, implying that fruit traits have diverged under selection from different guilds of frugivores, primarily birds and reptiles. Pigment analyses have found species differences in pigment composition, where several different anthocyanins are responsible for the red and blue colours observed in many species. In addition to their occurrence in red fruit, carotenoids are the predominant pigments in yellow and orange fruit. However, white fruit is lacking in both anthocyanins and carotenoids. Evolutionary relationships within *Coprosma* were inferred from sequence variation in the ITS and ETS regions of the nuclear ribosomal DNA. From this molecular phylogeny, fruit traits, notably colour, appear to have changed repeatedly as the genus has radiated in New Zealand. It is apparent that both allopolyploidy and reticulate evolution have occurred within *Coprosma*, and it is speculated that these have been potent mechanisms for generating change in fruit colour.

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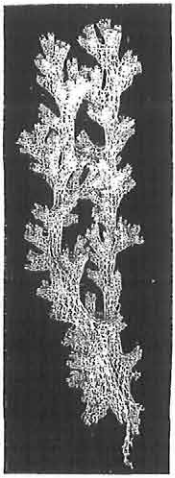


Cladia retipora
Also known as 'lace lichen' or 'coral lichen'
One of the most beautiful wetland lichens.

Gum trees, possums and high CO_2

Arlene McDowell[1], Bill Foley[2] and Ian Woodrow[3]

The predicted rise in the concentration of atmospheric carbon dioxide (CO_2), as part of the greenhouse effect, will have vital implications for the fauna that rely upon plants for food. Currently folivorous marsupials must compromise the necessity of obtaining sufficient energy from foliage with that of not consuming an excess of plant defence compounds. Increasing the amount of carbon available to plants enhances photosynthesis and changes patterns of resource allocation in leaves. There are two primary responses of plants to elevated concentrations of CO_2 which have the potential to influence plant-herbivore interactions. The first of these is that plants produce more secondary compounds and the second is a decrease in leaf nitrogen. Together these alterations to leaf chemistry will render leaves less palatable and less nutritious for herbivores. This project is specifically interested in the common ringtail possum (*Pseudocheirus peregrinus*), the smallest of only four mammals to regularly consume eucalypt foliage, and swamp gum (*Eucalyptus ovata*) which is a preferred food source of ringtail possums in Victoria, Australia. The primary aims of the research was to characterise changes to leaf composition, relevant to herbivory, under conditions of elevated CO_2 and to assess any changes in feeding preference and/or ability to digest foliage from conditions of elevated CO_2. *Eucalyptus ovata* individuals were grown from seed in glasshouses controlled for temperature, humidity, irrigation and CO_2 concentration. Analysis of leaf samples from these saplings has produced results consistent with predicted changes in leaf composition (*i.e.* phenolic concentration of foliage was greater and leaf nitrogen concentrations were lower in those plants grown under elevated CO_2 compared to ambient CO_2). The saplings were grown for 12 months in the glasshouse and then fed to ringtail possums. The animals did not appear to have a preference between *E. ovata* foliage grown at ambient or elevated CO_2, although there are metabolic costs associated with a diet of leaves grown at concentrations of CO_2 that are above ambient.

[1] Department of Zoology, University of Otago; [2] School of Botany, University of Melbourne; [3] Department of Botany and Zoology, Australian National University

This colloquium was held at Cargills Hotel, 13th October 2000. Support by the University of Otago Botany Department and the Botanical Society of Otago is gratefully acknowledged.

16th John Child Bryophyte Workshop, Blackball.

Report by John Steel

Thursday, 26th October, saw the Dunedin contingent of Allison Knight, Kelvin Lloyd, Maia Mistral, Anne-Marie Oliver, David Orlovich and John Steel head off for the annual bryophyte workshop this year held at the historic West Coast township of Blackball, famous for the 1908 Miners' Strike, communism, the New Zealand Labour Party, coal, gold but, most notably these days, sausages! First stop was at Timaru to view a fine *Drimys* in full bloom - and conveniently sited near the public loos! I found the new viaduct at Arthur's Pass a bit of a disappointment and was much more impressed by the continuing roadworks.

The evening was spent renewing old acquaintances and making new ones among the thirty-three participants, including several from Australia, in the bar of the Formerly the Blackball Hilton (subject of recent hostility from an international hotel chain with a similar name!). Blackball sausages were on the menu (and stayed there for the duration) and we were all well pleased with the service of our hosts, Linda and Jane.

Friday dawned bright and clear without a sandfly to be found and a great day was spent fossicking around the Croesus Track. An evening talk by Jessica Beever described the finding of a possibly rare species of *Tortella* at the nearby Brunner Mine remains as well as details of the problems of *Calyptopogon mnioides* var. *anguste-limbata* known from only the type collection from Pine Hill, Dunedin.

Saturday saw us at the top of a sunny Mt. Sewell where there was a great view of the Grey River Valley and its surrounds. One interesting find was the filmy fern, *Hymenophyllum malingii*, growing on an old stump, not *Libocedrus*, its usual haunt. On the way down, the Dunedinites stopped to hunt in the forest for fungi and some interesting finds were made to keep David happy. Then the group stopped at the Brunner mine site where it is proposed to clear the remains of any vegetation but thoughts were to be given to leave the area with the *Tortella* (which Jessica now thinks is *Tortella knightii* and not so rare after all) alone. While poking around there, the liverwort, *Asterella australis*, was found growing on some brickwork. This was a new record for it in the South Island so maybe the local historical society will be doing even less cleaning than they thought.

Sunday and again the sun shone for our trip to the limestone areas of the Bullock Track beyond Punakaiki. Philippe Gerbeaux from DoC gave an excellent talk in the evening on wetlands classification and conservation on the West Coast and mooted the possible use of bryophytes for identifying different wetland types.

The last day gave us a hint of the rain the West Coast is renowned for but by the time we arrived at the Moonlight Track it had eased and soon gave way to sunshine. We left earlier than the rest so we could help David examine some fungal processes in action - at Monteith's Brewery in Greymouth! David decided to finish the weekend in style so, after dark, we headed off up the valley and had our very own fireworks display - much to the bemusement of Mike, our local guide, who was

having a difficult enough job trying to understand why anyone would study mosses in the first place!

Tuesday saw our tired group wend its weary way home after a very pleasant and hospitable weekend. Next year, the workshop will held in the North Island so keep in mind this time next year.

Thanks To David Glenny, Geoff Spearpoint and Alan Fife for organising the workshop and to Professor Bannister of the Botany Department in Dunedin for the logistical support provided to enable Otago to be well represented once again.

Book review: Mushrooms and other fungi of New Zealand

Horne, D. 2000,
129 pp. Paper back.
Reed Books, Auckland. $14.95.

By John Steel

This latest in the Reed New Zealand Nature Series, a new series following the format of the old Mobil New Zealand Nature Series of the 1980's, which included Marie Taylor's 'Mushrooms and Toadstools', is also pocket-sized but without the plastic jacket for outdoor use.

That is not the only difference however. After a brief introduction to the fungi, their uses and classification, there follows descriptions of eighty of the generally more common species of New Zealand fungi. With only one species to a page, the book has a spacious, uncluttered feel to it. The descriptions are clear, concise and easily comprehensible to anyone lacking prior knowledge.

Below each piece of text is a half-page, full-colour photograph and occasionally a second, full-page one for good measure. These photographs are superb and a world away from Marie Taylor's delightful coloured drawings of the earlier series.

This publication comes at a good time, with the interest in fungi aroused by our recent fungal forays and illustrated talks by David Orlovich. I have already been able to put a name to *Peziza ammophila* found among the dunes at Long Beach, and the beautiful *Conchomyces bursaeformis*, which distracted me on the fern workshop. A fine little book and an excellent introduction to a fascinating part of our flora.

Visitors to Botany Dept, Otago University:

Assoc. Prof Christo Fabricius (Rhodes University, Sth Aftica). Williams Evans Fellow. Interest- Natural resource management in developing nations, social ecological systems, community conservation. 7 Dec 2000 – 20 Jan 2001.

Prof William Bond (Capetown University, Sth Africa). Hellaby Trust Fellow. Interest – Fire ecology, reproductive ecology, non-forest ecosystems. Dec 2000- Jan 2001.

Calendar review: Ferns, mosses, liverworts, lichens, fungi and algae

By John Steel

After the success of their 2000 calendar, Judith Curnow and Heino Leps have produced another for 2001, again featuring Australian and New Zealand cryptogams. The format is identical to last year's with A4 size photographs on one page opposite the calendar which is decorated with several smaller photographs and/or drawings.

As to be expected the photographs are excellent aids for helping to identify these often difficult non-flowering plants and fungi. The large photographs depict twelve species and the smaller, thirty-four, most of which are also present in New Zealand. An interesting purpose for the calendar is to enable those with no knowledge to identify species of fungi in the field and supply that data to a central database for mapping distributions of fungi throughout Australia (and New Zealand?). The accompanying notes are informative and easy to follow and I felt that their suggestions of cryptogamic wombats could lead to some imaginative discussions over a few beers.

The calendar costs $NZ17 and can be obtained by contacting vombatus@hotmail.com or direct from **P.O. Box 38, Belconnen, ACT 2616, Australia.** They will advise how payment can be made in New Zealand to avoid exchange costs

Visit Report: Threave, 367 High St – Sunday 17th September

By Mary Anne Miller

It was a sunny spring day for the visit to Prof. Baylis's garden and about 25 people took advantage to be guided by the owner through the extensive plantings. The house and garden were established by Watson Shennan, a pioneer runholder from the Manuherikia, in 1903. Trees dating from this period are copper beeches, cedars (although one recently came down in a storm, creating havoc amongst the underplantings), a *Sequoiadendron*, native beeches, a huge *Pseudopanax arboreus*, a Pohutukawa, ratas and cabbage trees.

Rhododendrons provide splashes of colour and it was a pleasure to see well established natives, including Three Kings endemics, interspersed in the otherwise European-like creation. One of these endemics, *Pennantia baylisiana,* was named after Prof. Baylis, and another, the fern *Davallia tasmanii*, growing beside the entranceway, is the only plant named after the explorer Abel Tasman. The many pathways and vistas were packed with such lovelies as Magnolias, Trilliums, Anenomes and Scillas plus the frost tender avocado and Pukatea.

This is a garden still in the making with new plantings gracing the slopes towards the east end of the property. Wherever one stood in the garden there was always the imposing view of the house and we had the privilege of being invited in to get an overview from the turret and partake in refreshments. Thanks Geoff for opening the house and garden to us and for the informative commentary as we toured around.

Plant of the month

By Allison Knight

Southern Rata, Iron wood, *Metrosideros umbellata* , family Myrtaceae.

A tui sitting among the bright red umbels of a southern rata growing near a coal mine above Blackball on the Bryophyte Workshop made me think of this spectacular summer-flowering plant.

Then I read Lady Barker's account of a magical boating trip to Lake Coleridge in February,1867. Her description in a letter back to England follows "....appeared a grove of rata trees growing by the water's edge. The rata only grows in the hills and near water; it is a species of broad-leaved myrtle, with a flower exactly like myrtle in character, but of a brilliant deep scarlet colour, and twice as large. When the bowsprit touched the rata-branches, which drooped like a curtain over the water, Mr H_____..sent us gently through the screen of scarlet flowers and glossy green leaves into such a lovely fairy cove!"

The southern rata, *Metrosideros umbellata*, grows from the ground to a tree up to 15 m high, unlike the larger northern rata, *M. robusta*, which usually starts life as an epiphyte, putting down aerial roots which ultimately surround the host tree. Together with the closely related, mainly coastal, pohutukawa, *M. excelsa*, these hard-wooded trees, with their brilliantly coloured flowers often decorating the water's edge, have become a symbol of our southern Christmas.

References
Lady Barker:. Station Life in New Zealand
John. Salmon: The Native Trees of New Zealand

Illustration from
Hugh Wilson:
Wild Plants of Mt Cook National Park

Metrosideros umbellata

Suggested Gear List for Field Trips

(based on lists in the Wellington Botanical Society newsletter)

Clothing
Sunhat, *balaclava or hat and scarf, waterproof parka and overtrousers, light long-sleeved shirt, *singlet, *thick shirt, *jersey, light shorts, *longjohns, *trousers, underwear, swimsuit, *socks x 4, sock liners, hut/car shoes, boots, gaiters, *mittens, handkerchief.
* = wool, polypropylene or polar fleece.

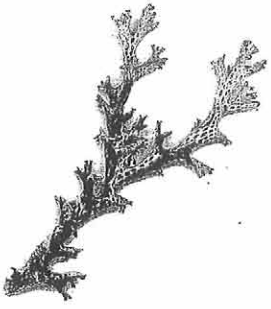
Day Trip Gear
Day pack, survival bag pack liner or safety blanket, personal first aid kit, compass, map, whistle, small torch, waterproof matches or lighter, sunblock, insect repellant, sunglasses, drink bottle, cup, thermos, lunch box, camera, binoculars, hand lens, note book, pen and pencil, field guides.

Overnight Trip Gear
In addition to all the gear above bring torch, spare batteries and bulb, candle, mug, plate, knife, fork, spoon, towel, soap, toothbrush and paste, sleeping bag and liner, pillowcase. If camping add tent, fly, poles, pegs, groundsheet and sleeping mat. For the long summer trip washing powder, pegs, clothesline and bucket could be useful, as could gumboots.

Food
Food for long trips is arranged communally. But you need to bring your own bread, butter/margarine, biscuits, snacks, fresh fruit and scroggin. SCROGGIN = Sultanas, Chocolate, Raisins, Orange peel, Glucose, Ginger, Including Nuts. (Dried apricots are recommended instead of Glucose, but would spoil the acronym!)

Those coming on the **summer trip to Borland Lodge** might like to bring a pillow as well as the items underlined. There will be opportunities to get fresh bread and fruit every few days.

Cladia sullivani
Another wetland lichen found in the Borland Bog along with *Cladia retipora* (page 12) and *Cladina confusa* (not illustrated)



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Botanical Society of Otago: whom to contact

Submissions for the diary and new members, subscriptions or donations to:

Trish Fleming
c/o Botany Dept., University of Otago, P. O. Box. 56, Dunedin
Phone (03) 479 7579
email trish@planta.otago.ac.nz

Submissions for the newsletter email: curator@botany.otago.ac.nz

Ideas for activities to:

Bastow Wilson,
c/o Botany Dept., University of Otago, P. O. Box. 56, Dunedin
e-mail bastow@otago.ac.nz

For information on activities:

the trip leader
or Trish (contact above),
or Bastow,
or see our webpage: http://www.botany.otago.ac.nz/bso

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