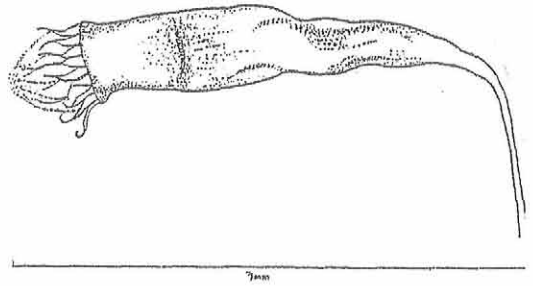


Botanical Society of Otago Newsletter. Number 21, August 2000.



Botanical Society of Otago Meetings

Sunday August 27th **Algae Workshop.** With Catriona Hurd and students, a short collection foray (St Kilda, Lawyer's Head) followed by morning tea. Then Catriona and students will show us how to identify and preserve algae specimens for the herbarium. **Meet:** Botany Department carpark, 464 Great King, 7.00am. Further information contact Barbara.

Sunday September 17th **Garden visit.** With Professor Geoff Baylis. Prof. Baylis's garden provides a wonderful opportunity to see specimens of many species most of us would otherwise never have the chance to see other than in slides and books. His great love of the Three Kings Islands, a focus of his early Botanical work, is obvious in the many rare and wonderful specimens from these islands.

29th December – 7th January. **Summer trip.** With the **Wellington Botanical Society to Borland Lodge.** The lodge has been booked for a botanical feast of outings in and around our fabulous Fiordland rainforests. Keep these dates free. Look for more details in the next months issue.

Cancellations will be broadcast on Radio 4ZB and 4XO cancellation service!

Cover picture: *Bryum billardierei* Schwaegr.

The cover picture for this issue is another inspiration from Inge Andrew and also features as our plant profile this month.

Note from Branch Office

You will have noticed this is a big issue due to the *Ferns of Dunedin* key. Adapted from Patrick Brownsey and Smith-Dodsworth's *New Zealand Ferns and Fern Allies* by John Steel and Bastow Wilson. I'm sure this will prove very useful in the field, as it did at the fern workshop (June) and at the Peggys Hill trip (July). John is keen to keep improving it so any additions to the species found around Dunedin or modifications to the couplets are always welcome.

Thanks to all those who have been supporting our activities – it's always nice to see new faces at the field trips and talks.

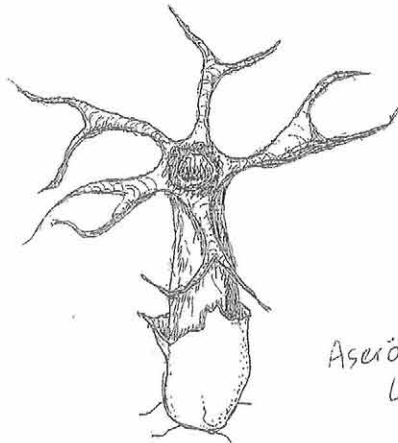
Barbara and Bastow

**Comments on: “*Reconstructing eastern Otago's natural forest communities*” by Ralf Ohlemüller and Bastow Wilson (Newsletter No 20).
By Geoff Baylis & Alan Mark, Professori Emeriti.**

We wish to challenge the claim that “The top of Maungatua ... climatically perfectly suitable for silver beech ...” There are several lines of evidence, not all transparently clear in the literature, that justify our view. One of us (GTSB) described serious winter injury to the uppermost stand of silver beech on the Range, at c. 750 m, back in 1957 (Proc. N. Z. Ecol. Soc. 6: 21- 2; 1958), which suggested that this stand was probably close to the species' upper limit here. In addition, AFM's paper of 1956 with Peter Wardle (Trans. Roy. Soc. N. Z. 84: 33- 44) mapped the subfossil wood remains and "forest dimples" on the range which showed that the pre-human cover on the crest had been a low woodland of mixed bog pine and pink pine, with mixed silver beech and Hall's totara forest below. The map also showed a few

remaining stands of silver beech on the drier north-west slope of the Range (contrary to the authors' claim for its current restriction to the moister south-east slope. The seedling silver beech of local stock, which AFM planted on the summit during his MSc project in 1954 (mentioned in the GTSB article and in another by AFM in a 1955 article: (N. Z. J. Sci. Tech. A37:350) soon succumbed to frost damage (though not in time to be reported in either of these articles).

The prevailing summer temperatures on Maungatua summit are too low for silver beech, or any other indigenous forest, to survive, with a mean midsummer air temperature of *c.* 8.8 deg. C. (see N. Z. J. Bot. 3: 80; 1965). This value suggests, with conventional lapse rates, an equivalent value at the species' current upper limit, close to the generally accepted mean summer isotherm for treelines of 10 deg. C. AFM presented evidence in his 1955 paper that the natural (i.e. climax) plant cover on the Range crest is *Dracophyllum longifolium* - dominated shrubland with minor narrow-leaved snow tussock, and localised areas of cushion bog in permanently wet depressions. Such shrubland is currently re-establishing here in reserved areas under conservation management.



Aseröe rubra
La Bill. ex Fr.

Plant Profile: *Bryum billardierei* Schwaegr.

By John Steel

Order: Bryales Family: Bryaceae

The name is from the Greek, *bryon*, meaning moss. *Billardierei* is in honour J.J.H. de la Billardière, a French botanist and traveller who visited New Zealand in the late 1700's and after whom a number of plants have been named.

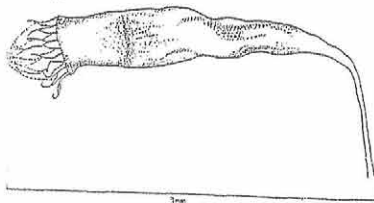
I suppose this genus matches most peoples idea of a moss and when it came to naming it the Greek word for moss was the natural choice. For the uninitiated, moss identification in the field can be difficult, even with the aid of a hand lens. *Bryum billardierei* is a handsome, small moss up to 6 cm tall, often in small clumps at the base, or in the shade, of larger plants. The unbranched, sturdy, reddish stems are crowned with a tuft of leaves with progressively smaller ones beneath. Below, and amongst the lower leaves, can be found a brownish, and often quite dense, matting of fine hairs (rhizoids). Our *Bryum* is dioicous (male and female organs on separate plants) so it is possible to find groups of plants close together, some with, and some without the distinctive sporophyte which ends in a cylindrical capsule pointing downward from the top of a hooked seta (stalk). The seta is reddish becoming paler above. The leaves are wide spreading when moist but close up, and may even twist slightly, when dry. They tend to be broader away from the stem and are toothed (lens needed) towards the tip. There is a central vein (costa) which can be seen without a lens and this projects from the leaf tip and is usually bent backwards slightly. The leaves have a border of several rows of long cells (lens needed) which are quite different from those of the rest of the leaf. *Bryum* can have small tubers under the soil and these can be found by carefully washing away the dirt in a small dish of water. They appear like tiny, dark red or orange potatoes and can be important aids to identification.

Bryum is a large, and problematic genus with thirty species, four of them endemic to New Zealand (Fife, 1995). *B. billardierei* is found throughout the Pacific islands, Australia, Chile, Argentina, the islands of the South Atlantic and the Galapagos Islands (Mohamed, 1979) and Japan (Ochi, 1970). It is common throughout New Zealand where two subspecies, *platyloma* (Gk. *platy-* = broad, and *-loma* = border, referring to the leaf border of at least four rows of long cells) and *billardierei* (leaf border of never more than four rows of long cells) are recognised. The former appears to have been the more commonly collected in the South Island.

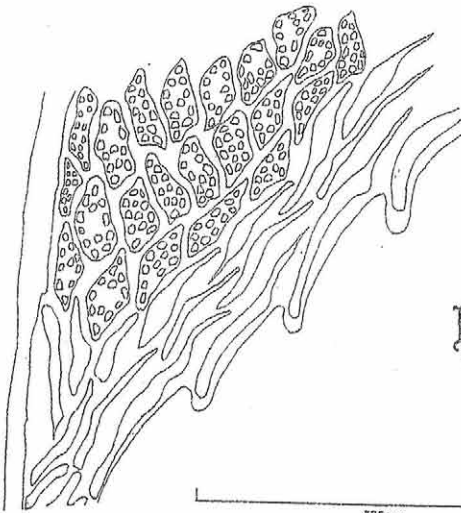
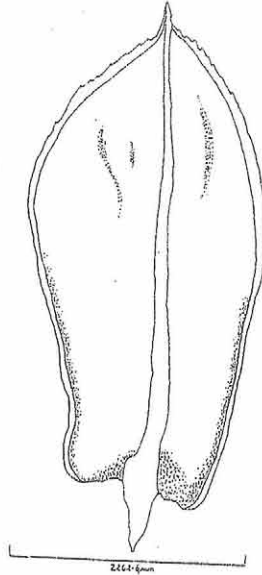
The collections in OTA are not identified to subspecies and only four have been made in the Dunedin area, from Swampy Summit to Kaikai Beach. It has a wide range of habitats from sand dunes and beech forest to boggy, snow-tussock grassland.

References:

- Fife, A.J. 1995: Checklist of the mosses of New Zealand. *The Bryologist*, 98: 313-337.
- Mohammed, M.A.H. 1979: A taxonomic study of *Bryum billardierei* Schwaegr. and related species. *Journal of Bryology*, 10:401-465.
- Ochi, H. 1970: A revision of the subfamily Bryoideae in Australia, Tasmania, New Zealand and the adjacent islands. *Journal of the Faculty of Education, Tottori University*, 21(1): 8-67.



22mm



Bryum billardierei

Fungal forays: Trip report.

By David Orlovich

We had two fungal forays organised by the Botanical Society earlier this year and I've compiled a short list of the specimens that we could identify from those trips. The first trip was to Sullivan's Dam on 19th March 2000. About 20 people attended and their very enthusiastic collecting saw us taking back a large number of collections to the lab, many of which we either didn't have time or were unable to identify. We realised at the time that to be most effective it is better to only collect enough specimens that can be identified in one day! Also some of the collections were of only one fruit body and some people discovered that by the time they had sectioned, drawn and dried their collection there was nothing left! The golden rule is to not collect anything unless there are at least three fruit bodies (preferably at different ages). The presence of *Pinus radiata* in the area probably accounts for the introduced species we collected (*Amanita muscaria*, *Tricholomopsis rutilans* and *Paxillus involutus*). The warm sunny day was a bit of a contrast to the day we had for the second foray, which was cold and very wet underfoot. On the 21st May we went to Silverstream and walked a short way along Raceman's Track. The hard-core enthusiasts were Alison Knight, Robyn Bridges, Barbara Anderson, Paul Dean, Penny Trevathan and me. We were rewarded with a great bounty of *Cortinarius* collections as well as the interesting "vegetable caterpillar" *Cordyceps sinclairii* and some beautiful small coral fungi (*Clavaria* and *Ramariopsis*). Watch out for another foray in the spring, as there are a number of fungi that prefer to fruit then rather than in the autumn.

Species lists:

Sullivan's Dam 19th March 2000: Unvouchered identifications

Phylum Ascomycota

Class Discomycetes

Order Pezizales

Family Otideaceae

Paurocotylis pila

Phylum Basidiomycota

Class Gasteromycetes

Order Lycoperdales

Family Lycoperdaceae

Lycoperdon ?perlatum

Order Phallales

Family Clathraceae

Aseröe rubra

Class Hymenomycetes

Order Agaricales

Family Strophariaceae

Psilocybe ?semilanceata

Hypholoma aurantiacum

Family Tricholomataceae

Laccaria laccata

Mycena interrupta

Order Boletales

Family Paxillaceae

Paxillus involutus

Order Cantharellales

Family Clavulinaceae

?Clavulina sp.

Order Cortinariales

Family Cortinariaceae

Inocybe sp.

Order Russulales

Family Russulaceae

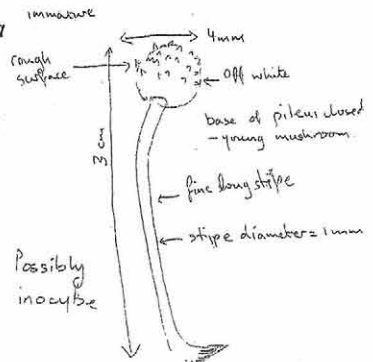
Lactarius glycosmus

Lactarius sp.

Order Tremellales

Family Tremellaceae

Tremella mesenterica



Sullivan's Dam 19th March 2000: Vouchered specimens

Phylum Basidiomycota

Class Gasteromycetes

Order Nidulariales

Family Nidulariaceae

Nidula candida (DAO1035)

Class Hymenomycetes

Order Agaricales

Family Amanitaceae

Amanita muscaria (DAO1032)

Family Tricholomataceae

Mycena epipterygia (DAO1034)

Mycena sp. (DAO1036)

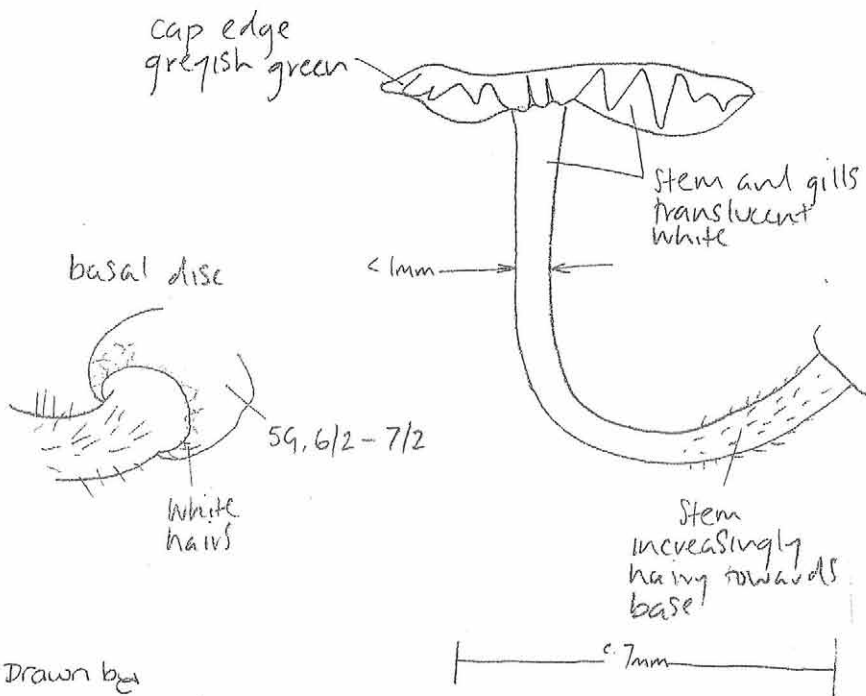
Tricholomopsis rutilans (DAO1033)

Order Cortinariales

Family Cortinariaceae

Gymnopilus sp. (AMO collection)

Mycena spp.



Drawn by

Matthew White

Silverstream 21st May 2000: Vouchered specimens:

Phylum Ascomycota

Class Pyrenomycetes

Order Hypocreales

Family Clavicipitaceae

Cordyceps sinclairii (DAO1083)

Phylum Basidiomycota

Class Hymenomycetes

Order Agaricales

Family Strophariaceae

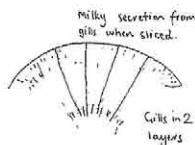
Hypholoma acutum (DAO1056)

Pholiota sp. (DAO1055)

Family Tricholomataceae

Mycena sub-viscosa (DAO1059)

Unidentified agaric with a lateral stipe
(DAO1057)



L.S. of fruiting body
(external view)

Order Cortinariales

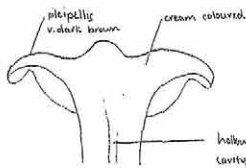
Family Cortinariaceae

Cortinarius sp. (brown) (DAO1061)

Cortinarius sp. (purple) (DAO1054)

Cortinarius sp. (small blue & green)
(DAO1060)

Cortinarius subgenus *Myxacium* sp.
(DAO1051)



L.S. of fruiting body
(internal view)

Family Crepidotaceae

Crepidotus sp. (DAO1052 and DAO1053)

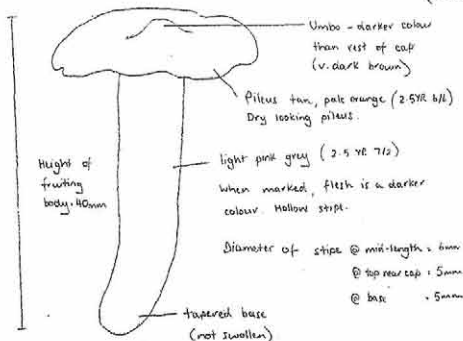
Order Cantharellales

Family Clavariaceae

Clavaria corallino-rosacea (DAO1058)

?*Ramariopsis* subgenus *Laevispora*
(DAO1082)

Pileus diameter = 20mm



Laetarius sp.

Maybe *L. glycymeris* ?

Collected from : Sullivan's Dam (north of Dunedin)

Date : 19th March 2000

Growth comments : Growing under *Arauc*

Collected by : Botanical Society of Otago

Odour : Mushroom smell (faint)

Otago Regional Council's "Consultative Draft Code of Practice for Vegetation Burning in Otago"- An invitation from Alan Mark

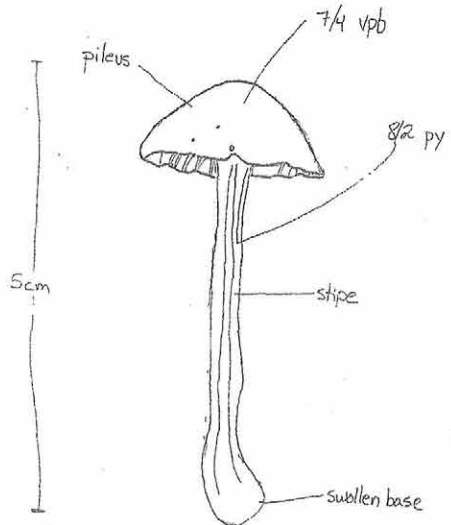
This document has been released for public comment. Submissions are due by **August 14th**.

Many Otago botanists will be aware of the importance and controversy associated with this issue, and should consider themselves one of the "stakeholders" in the Otago high country. The substance of the document has been prepared, it seems, in consultation with runholders alone.

Four Bot. Soc. members (Bill Lee, Kelvin Lloyd, Alan Mark and Susan Walker) will discuss this draft document at 5.00pm on Monday August 7th at 5.00pm in the Botany Department staff room (464 Great King Street). Any interested Botanical Society members who want to join us, particularly to canvass information for a submission, are welcome.

Copies of the document are available from the Council, free on request: Ph. 474-0827.

Contact: Alan Mark, Botany Department, Otago University, P.O. Box 56, Dunedin, New Zealand Ph: 479-7573, email: amark@otago.ac.nz



- under pine
- growing in moss
- found at Sullivan's Dam 19/3/00

Cushion bog at sea level – but for how much longer?

By Kelvin Lloyd and Molly Ward

The unique cushion bog vegetation growing at sea level in Southland is well known to southern botanists, however it appears that no quantitative description of the vegetation has been published. The most accessible cushion bog site lies at the base of the Tiwai Peninsula, just behind the Toetoes Bay beach. Here the cushion vegetation is dominated by *Donatia novae-zelandiae* and *Oreobolus pectinatus*, with many smaller species also present. The areas of cushion are not extensive, the largest being approximately 10m × 20m in size, but smaller areas are scattered nearby. All are surrounded by a shrubland which is dominated by *Leptospermum scoparium* (manuka), *Dracophyllum longifolium* (inaka) and *Gleichenia dicarpa* (tangle fern), growing to 1-2 m in height. We sampled the cushion bog vegetation in June this year, as part of a wider study comparing the Tiwai cushion vegetation with similar vegetation on the Blue Mountains.

We sampled using 1m × 1m quadrats, each subdivided into 10cm × 10cm subsquares that enabled us to record the shoot frequency of each species in each quadrat. Ten quadrats were randomly placed within a ¼ ha area that included both cushion vegetation and surrounding shrubland, and 12 additional quadrats were limited to the main cushion bog area. Within each subsquare we recorded the presence of all vascular plant species, plus occurrences of rabbit dung (as a measure of raised fertility) and the moss *Sphagnum cristatum* (as a measure of substrate saturation). We analysed the quadrat information by ordination.

Thirty-five vascular species were recorded in total. The ordination (Fig. 1) separates wetland species (*Sphagnum cristatum*, *Baumea huttonii* and *Carex appressa*) at the positive end of axis 1, from a large number of cushion species at the negative end (e.g. *Donatia novae-zelandiae* and *Oreobolus pectinatus*), with shrubland

species (*Baumea tenax*, *Coprosma* sp. aff. *intertexta*, *Empodisma minus*, *Gleichenia dicarpa*, *Leptospermum scoparium*) occupying the centre of the axis. The cushion vegetation supported a diverse array of species. Many of the smaller species were largely restricted to it, generally occurring only in quadrats where the dominant cushion species, *Donatia novae-zelandiae*, was present. These cushion specialists included *Actinotus novae-zelandiae*, *Drosera spathulata*, *Herpolirion novae-zelandiae*, *Gentianella lineata*, *Lycopodium ramulosum*, *Oreostylidium subulatum*, and *Stackhousia minima*. Some of the species in the cushionfield, including the only exotics sampled, are associated with the presence of rabbit faeces (Fig. 1), probably invading because of raised fertility. Five of these invading species, *Cerastium fontanum*, *Colobanthus muelleri*, *Hydrocotyle microphylla*, and *Lotus pedunculatus*, were restricted to a single quadrat that had a very high frequency of rabbit faeces.

In the 1980s there was concern that nesting behaviour by black-backed gulls was destroying parts of the cushionfield, via physical disturbance, raised fertility and invasion of weed species (Johnson, 1986; 1988). Five photo points were set up, on both disturbed and undisturbed sites, and have been monitored since 1984. During this time it became obvious that the gulls would have to be removed to prevent further destruction of the cushion vegetation. However, following removal of the gulls in 1987, the modified areas have not returned to cushionfield vegetation, and they remain dominated by exotic herbs and grasses, rushes, and the liverwort *Marchantia berteroana*.

The most striking event recorded in the photographic sequence is a dramatic increase in the height and dominance of *Leptospermum scoparium* and *Dracophyllum longifolium*. This trend is evident at all the photopoints, on both modified and undisturbed sites, and the largest increase seems to have occurred in the 1990s. However Johnson (1986) also noted that invasion by shrubs was reducing the cushion vegetation. Explanations for the recent

increase in shrub vigour at this site remain speculative, but perhaps hydrological changes, or the warming climate, have contributed. It could also simply represent the late arrival of a process that has already occurred throughout the rest of the area. Cushion vegetation has been lost from sites elsewhere in the Awarua wetland complex (Wynston Cooper, pers. com.), and it appears that without intervention, successional processes will eventually overcome it at the Tiwai Peninsula site.

Intact *Donatia novae-zelandiae* cushions have very close-packed stem apices and are remarkably solid. In the main cushion area that we studied, the *Donatia* plants tend to pack tightly together over a relatively large area, and this appears to have hindered shrub invasion. However our study found that *Leptospermum* and *Dracophyllum* were present in almost every quadrat, although sometimes their abundances were low. These shrubs appear to initially invade the cushion area where small gaps are present between *Donatia* plants, and expand laterally from these sites, overtopping the cushion plants. Interestingly, the tiny plant *Actinotus novae-zelandiae* was at its most abundant at the boundaries between *Donatia* cushions and *Leptospermum scoparium* shrubs.

What action should conservation managers take if, as we suggest, the cushion bog is being slowly overtaken by shrubland species? If the process is a natural one, should it be interfered with? We believe (as did Johnson, 1986) that the unique setting and importance for biodiversity of the cushionfield merit active intervention to save it. What sort of intervention would be required? Fire would clearly be an unsuitable tool for reducing shrub vigour, as it also diminishes the cushion vegetation (Johnson, 1986; Wynston Cooper, pers. com.). Chemical spraying would probably also be unsatisfactory, due to pollution effects and damage to non-target species. Unlikely as it may sound, perhaps hand pruning might be the best method of reducing shrub vigour while retaining cushionfield integrity. The area concerned is

small, and shrub growth rates may be slow enough to require only occasional trimming back. A complicating factor is the 'preference' of species such as *Actinotus* for shrub margins, but these could be retained while reducing shrub height. During any visit to the site, care should also be taken not to damage the cushion areas through trampling. We saw several damaged (not by us!) *Donatia* cushions during our survey, these generally being isolated plants or the edges of more extensive cushion areas. Finally, we owe Wynston Cooper a big thanks for facilitating our visit!

Species list

Act.nov: <i>Actinotus novae-zelandiae</i>	Gen.lin: <i>Gentianella linearis</i>
Bau.hut: <i>Baumea huttonii</i>	Gle.dic: <i>Gleichenia dicarpa</i>
Bau.ten: <i>Baumea tenax</i>	Gon.mic: <i>Gonocarpus micranthus</i>
Ble.nov: <i>Blechnum novae-zelandiae</i>	Gun.den: <i>Gunnera densiflora</i>
Car.app: <i>Carex appressa</i>	Her.nov: <i>Herpolirion novae-zelandiae</i>
Cel.grc: <i>Celmisia gracilentia</i>	Hie.red: <i>Hierochloe redolens</i>
Cel.grm: <i>Celmisia graminifolia</i>	Hyd.mic: <i>Hydrocotyle microphylla</i>
Cer.fon: <i>Cerastium fontanum</i>	Iso.auc: <i>Isolepis aucklandica</i>
Col.mue: <i>Colobanthus muelleri</i>	Lep.sco: <i>Leptospermum scoparium</i>
Copr.sp: <i>Coprosma</i> sp aff. <i>intertexta</i>	Lot.ped: <i>Lotus pedunculatus</i>
Cya.emp: <i>Cyathodes empetrifolia</i>	Lyc.ram: <i>Lycopodium ramulosum</i>
Don.nov: <i>Donatia novae-zelandiae</i>	Ner.dep: <i>Nertera depressa</i>
Dra.uni: <i>Dracophyllum longifolium</i>	Ore.pec: <i>Oreobolus pectinatus</i>
Dro.spa: <i>Drosera spathulata</i>	Ore.str: <i>Oreobolus strictus</i>
Emp.min: <i>Empodisma minus</i>	

References:

- Johnson, P.J. (1986). Waituna Lagoon Reserve: Botanical report on gull colony, bog vegetation, lagoon margin. Unpublished report, Botany Division, DSIR, Dunedin.
- Johnson, P.J. (1988). Waituna Lagoon Reserve: Gull colony: Botanical Report 5. Unpublished report, Botany Division, DSIR, Dunedin.

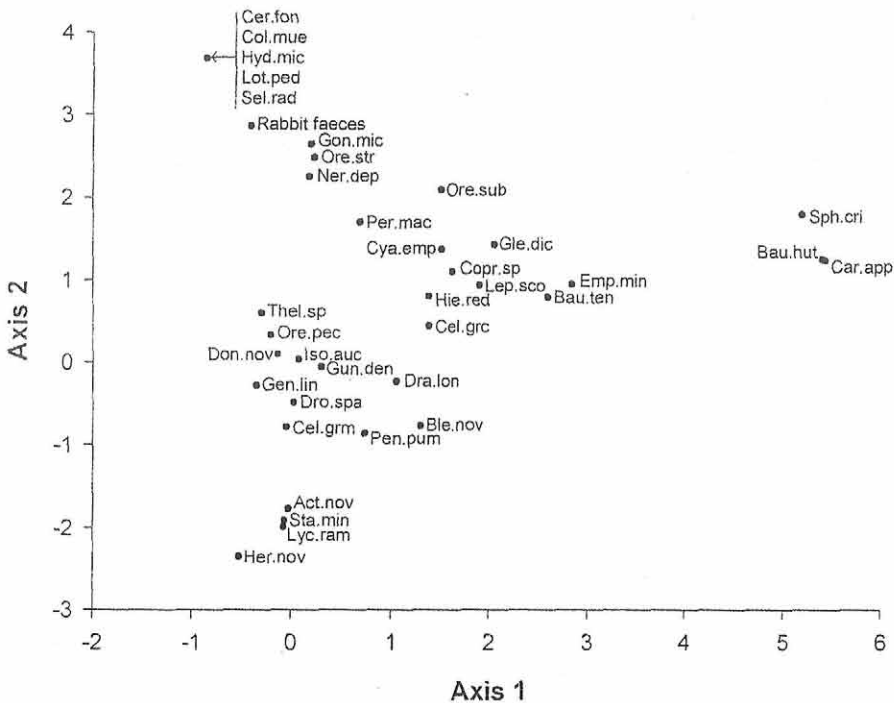


Figure 1. Ordination of species using detrended correspondence analysis (DCA). Species codes are explained in the species list. "Rabbit faeces" is included on the diagram because its occurrence was measured in the same way that plants were. An ordination is designed so that as far as possible, species that tend to occur together (e.g. *Baumea huttonii* and *Carex appressa*) are close together on the diagram, and those that tend not to occur together (e.g. *Carex appressa* and *Herpolirion novae-zelandiae*), are far apart.

Diary of upcoming events:

- 2nd August, Wednesday Botany Department Seminar at Botany School Annexe (upstairs), Cnr Union St West & Great King St., 12.00 - 12.50 p.m. Dr Janice Lord, Botany Department, University of Otago: *Fruit syndromes in New Zealand: ghosts of dispersers past.*
- 5th August Sunday, Canterbury Botanical Society field trip: Landcare Research gardens, Gerald Street, Lincoln. We should see the Kowhai in flower, a wide variety of native plants (many even labelled!), including an outstanding collection of *Hebe* species. Meet outside the entrance to Landcare Research on Gerald St, opposite Murray Place, at 10 am. Ring Peter Wardle for details (03) 348 9724.
- 9th August, Wednesday Botany Department Seminar at Botany School Annexe (upstairs), Cnr Union St West & Great King St., 12.00 - 12.50 p.m. Dr Philip Boyd, NIWA Research Unit, Chemistry Dept, University of Otago: *Can we predict the response of oceanic biota to global climate change?*
- 11th–13th August, Friday evening -Sunday afternoon. Forest & Bird's ecological restoration project, Jack's Blowhole (Tunnel Rocks) Scenic Reserve, Catlins. Bus departs Botany car park 5.30pm Friday and returns 6.00pm Sunday. Stay Pounaweia Bible Camp, near Owaka. Planting, etc.on Saturday; "Cook's" tour of Catlins ecological highlights on Sunday. F & B covers transport and accommodation costs, and provides tools. You provide only food (organise a small group). Contact Alan Mark (ph 479 7573 by day; 476 3229 evenings) by 1st August if you plan to come.
- 16th August, Wednesday Botany Department Seminar at Botany School Annexe (upstairs), Cnr Union St West & Great King St., 12.00 - 12.50 p.m. Dr David Orlovich, Botany Department, University of Otago: *Floral development in Myrtaceae*
- 20th August, Sunday: Nelson Botanical Society. Trip with Lisa Seckler to Mt Duppa.
- 21st August, Monday: Nelson Botanical Society evening talk. Shannel Courtney: *Threatened plants of NW Nelson, Nelson and the Sounds.*
- 23rd August, Wednesday Botany Department Seminar at Botany School Annexe (upstairs), Cnr Union St West & Great King St., 12.00 - 12.50 p.m. Dr Katharine Dickinson, Botany Department, University of Otago: *Alpine vegetation, plant distribution, life forms, and environments in a perhumid New Zealand region: Oceanic and tropical high mountain affinities*

- 24th August, Thursday: Entomological Society of NZ Otago Branch talk. Hutton Theatre, 7.30pm Dr Frank Wilhelm (Dept. of Zoology, University of Otago): *Life on top of the peaks - a look at amphipod adaptations along an elevation gradient in the Canadian Rocky Mountains.*
- 27th August, Sunday: **BSO Algae Workshop. With Catriona Hurd and students, (see front cover for details).**
- 6th September, Wednesday Botany Department Seminar at Botany School Annexe (upstairs), Cnr Union St West & Great King St., 12.00 - 12.50 p.m. Leigh Joyce, PhD student, Botany Department, University of Otago: *Kakapo home range and habitat use*
- 13th September, Wednesday Botany Department Seminar at Botany School Annexe (upstairs), Cnr Union St West & Great King St., 12.00 - 12.50 p.m. Dr Nigel Perry, Crop & Food Research Unit, Chemistry Dept, University of Otago: *Extracts from New Zealand lichens*
- 17th September, Sunday: **BSO Garden visit. With Professor Geoff Baylis. (see front cover for details).**
- 17th September, Sunday: Nelson Botanical Society. Trip with Cathy Jones to Delaware Bay, North along the coast.
- 18th September, Monday: Nelson Botanical Society evening talk. Andrea Brandon: *Native forgetmenots.*
- 20th September, Wednesday Botany Department Seminar at Botany School Annexe (upstairs), Cnr Union St West & Great King St., 12.00 - 12.50 p.m. BSc. Hons/Dip. Sci. students' presentations. Norman Mason, (BSc Hons): *Canopy structure and the light environment of a stable community*
Maia Mistral, (Dip. Sci.): *Lost and found in space: volume occupancy in grass and shrub communities*
Jessica Armstrong, (BSc Hons): *The role of the acf genes in flowering*
- 27th September, Wednesday Botany Department Seminar at Botany School Annexe (upstairs), Cnr Union St West & Great King St., 12.00 - 12.50 p.m. MSc research proposals. Stephen Belsham: *Development in the Myrtaceae*
- 28th September, Thursday Entomological Society of NZ Otago Branch talk. Hutton Theatre, 7.30pm. Dr Ian Jamieson (Dept. of Zoology, University of Otago); *Rock 'n rolling with the alpine tree weta: does size really matter?*

Membership form:

Title: _____

Name: _____

Address: _____

E-mail: _____

Phone: () _____

Family (2 adults + children) / **Waged** (salary)
/ **Student** (unwaged)

Please **e-mail** / **mail** my newsletter to me.

Donations are welcome (donations equivalent to the subscription rate will be treated as such after the General Meeting in February). Subscriptions are:

\$15 Family (2 adults + children) / \$10 waged (salary)
/ \$5 Student (unwaged).

Cheques to "Botanical Society of Otago".

Botanical Society of Otago: whom to contact

Information for the Newsletter or Diary to:

Barbara Anderson,
% Botany Dept., University of Otago, P. O. Box. 56, Dunedin
Phone (03) 479 5981
e-mail barbjade@es.co.nz

New members, Subscriptions or Donations to:

Paul Dean,
22 Nicholson Street, Forbury Corner, Dunedin.
e-mail: pauld@hotpop.com

Ideas for activities to:

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

For information on activities:

The trip leader
or Barbara Anderson (contact above),
or see our webpage: <http://www.botany.otago.ac.nz/bsa>

This Newsletter was published on the 1ST September 2000. ISSN 0113-0854