# NEW ZEALAND BOTANICAL SOCIETY NEW ZEALAND BOTANICAL SOCIETY NUMBER 49 SEPTEMBER 1997



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# CONTENTS

News	
New Zealand Botanical Society News	-
Call for nominations	3
Regional Botanical Society News	
Auckland Botanical Society	3 4 5 6
Congratulations Ella Campbell, Vivienne Cassie Cooper, Brian Molloy	7
Notes and Reports	
Plant Records	
Some additions and alterations to the liverwort and hornwort flora of the Kermadec Islands	8
Te Urewera	. 10
Comment	
Waitangi Tribunal Claim 262: Indigenous flora and fauna	. 12 . 13
Research Reports	
Stipa - a play in several Acts	. 13 . 14 . 16
Biography/Bibliography	
Biographical Notes (27): Thomas George Wright (?1831-1914)	. 19 . 22
Publications	
Publication announcement	. 23 . 23 . 23
Desiderata	
Request for material of Coprosma	. 23
Letter	
West Coast Forest Campaign	. 24

# **Cover Illustration**

Adult branch and foliage of kawaka (*Libocedrus plumosa*) in cultivation at University of Waikato, Hamilton. See article on kawaka on page 10. Illustration by **Catherine Beard**, Herbarium Keeper, Department of Biological Sciences, University of Waikato.

# **New Zealand Botanical Society**

President:	Jessica Beever
Secretary/Treasurer:	Anthony Wright
Committee:	Catherine Beard, Colin Webb, Carol West, Beverley Clarkson, Bruce Clarkson
Address:	C/- Canterbury Museum Rolleston Avenue CHRISTCHURCH 8001

# **Subscriptions**

The 1997 ordinary and institutional subs are \$16 (reduced to \$12 if paid by the due date on the subscription invoice). The 1997 student sub, available to full-time students, is \$8 (reduced to \$6 if paid by the due date on the subscription invoice).

Back issues of the *Newsletter* are available at \$2.50 each from Number 1 (August 1985) to Number 46 (December 1996) and \$3.00 each from Number 47 (March 1997) onwards. Since 1986 the *Newsletter* has appeared quarterly in March, June, September and December.

New subscriptions are always welcome and these, together with back issue orders, should be sent to the Secretary/Treasurer (address above).

Subscriptions are due by 28 February of each year for that calendar year. Existing subscribers are sent an invoice with the December *Newsletter* for the next year's subscription which offers a reduction if this is paid by the due date. If you are in arrears with your subscription a reminder notice comes attached to each issue of the *Newsletter*.

# Deadline for next issue

The deadline for the December 1997 issue (Number 50) is 24 November 1997.

Please forward contributions to:

Bruce & Beverley Clarkson, Editors NZ Botanical Society Newsletter 7 Lynwood Place, Chedworth, HAMILTON

Contributions may be provided on an IBM compatible floppy disc (in Word Perfect 5.1) or by e-mail (ClarksonB@Landcare.CRI.NZ).

# NEWS

# **New Zealand Botanical Society News**

# Call for nominations

Nominations are called for the following positions of Officers and Committee of the New Zealand Botanical Society for 1998:

President Secretary/Treasurer 3 Committee Members.

Nominations for all positions opened 1 September 1997 and close on 20 November 1997. Nominations shall be made in writing to the Secretary, and shall be signed by the Proposer, the Seconder, and by the Nominee to indicate their acceptance of nomination. If necessary, ballot papers for a postal election will be circulated with your December *Newsletter*.

Anthony Wright, Secretary, New Zealand Botanical Society, C/- Canterbury Museum, Rolleston Avenue, Christchurch 8001

# **Regional Botanical Society News**

# Auckland Botanical Society

### June Meeting

Ross Beever reported on a conference he recently attended in Chile, entitled "Southern Connections -Chile and New Zealand". From Chile the participants passed briefly into Argentina, onto the dry steppes, then north into a volcanic area with beautiful araucarias. The podocarp/broadleaf forests showed similarities to New Zealand forests, with the exception of the bamboo understorey. Some of the ten species of *Nothofagus* are deciduous and some are not. The weed problem, with largely the same weeds as we are burdened with in New Zealand, is not as positive a bond as is the shared *Sophora microphylla*.

# June Field Trip

Near Dargaville, igneous rocks stand out above the limestone country as erosion residuals, in the form of a conical hill (Tokatoka) and an andesite dike (Maungaraho). Maungaraho Rock is about 15 metres wide and 100 metres long and rises like a rocky shark's fin from a sea of pampas. On climbing to the summit with the aid of a wire rope, however, the botany improves greatly. *Hebe* "x" (of Eagle 1982) grows there, alongside *H. stricta*, and the tea-tree is sprinkled with *Korthalsella salicornioides*. A clump of *Psilotum nudum* was found just as the circumnavigation of the rock was completed. As we headed home, some could not resist making a quick dash up Tokatoka. Growing there is a healthy population of the fern named as *Asplenium bulbiferum* var. *laxum* in Dobbie and Crookes "New Zealand ferns" 4th edition. It seems now to be included in *A. gracillimum*. And some could not resist a quick dash into the pub nestling at the base of Tokatoka.

# July Meeting

A visit to the new premises of the herbarium in the Auckland Museum proved to be a good drawcard. The large crowd was accommodated without too many difficulties, and appreciated the treasures which were laid out on display. Chief among these must be the Banks and Solander specimens which have been returned to New Zealand via the British Museum, and the beautiful botanic paintings of Fanny Osborne. Rhys Gardner spoke of some of the interesting points that have cropped up during his research in the herbarium, and the computer database was demonstrated.

# July Field Trip

Despite a poor forecast, pleasant conditions prevailed for the ferry trip to Mansion House Bay on Kawau Island. The majestic trees and palms planted last century by Sir George Grey dominate this sheltered bay, while the hills on either side have been planted with pines. The sorry state of the understorey, however, can be attributed to "weeds and wallabies". The chief weeds of the cliffs and headlands are agapanthus and sweetpea shrub (*Polygala myrtifolia*). Tree ferns and kawakawa, obviously not palatable to the wallabies, have survived in good numbers. Some small herbs not common on the adjacent mainland have

escaped the browsing - Lagenifera Ianata, Parietaria debilis, Hydrocotyle heteromeria, and the ferns Hypolepis dicksonioides and H. ambigua. During the lunch break at the old coppermine a couple of plants of Asplenium haurakiense were seen in the cliff crevices.

# August Meeting

The flora of Turkey was the subject chosen for this evening's meeting by Mike Wilcox, forestry consultant and former Director of F.R.I. With c. 10,000 plant species in Turkey, compared with c. 13,000 in the whole of Europe, it is not surprising that there are 10 volumes of the Flora, and that it is very difficult for a visitor to name plants with any certainty. The rich flora can probably be attributed to the fact that Turkey has not been devastated by an ice age. The country can be divided into 3 floristic regions - Euro-Siberian in the north, Irano-Turanian on the central plateau with largely herbaceous and shrubby plants, and Mediterranean in the south. In the spring the wildflowers are overwhelming, with many grasses, lilies and bulbs on the plateau.

# August Field Trip

Sandra Jones, ever conscientious, was reconnoitring the Kura Track in the Waitakere Range a week prior to the field trip when she had a distressing experience involving a broken ankle, a stretcher party and a helicopter. So on the day of the trip Ewen Cameron stood in as leader. The walk to Whatipu, on a track that was rather slippery, and with a side trip to see some hard beech, took 7 hours. A live kauri snail was an interesting find, and matai, kawaka, mairehau (*Phebalium nudum*) and wharangi (*Melicope ternata*) were some of the more interesting plants to be seen.

# Forthcoming Activities

# Evening Meetings:

3 September - Reproduction biology of pohutukawa (Gabriele Schmidt-Adams)

- 1 October Population dynamics & ecology of Myosotis oreophila (Bec Stanley), and The facts of life in a New Zealand forest (Sandy Anderson)
- 12 November Lucy Cranwell Lecture. "What is pollen for? The rise and fall of the male gametophyte in seed plants" (Prof. Barry Tomlinson, Harvard University)

Field Trips:

20 September - Wairoa Valley, Hunuas (Steve McCraith)

- 21 September Hoteo River Cruise (Helen Cogle)
- 18 October Botanic Gardens/Totara Park (Steve Benham, Brent Torrens, Mike Wilcox)

15 November - Tawharanui Regional Park (Anne Grace)

13-18 November - Far North (Te Paki) (Maureen Young).

# Maureen Young, 36 Alnwick Street, Warkworth

# ■ Canterbury Botanical Society

# July meeting

Eric Godley brought to life many 19th century botanists of Southland, Otago and Canterbury. Donald Petrie and Peter Goyen, Inspectors of Schools who botanised in the course of their duties; Robert Laing who was taught by G.M.Thomson in Dunedin. Leonard Cockayne and Laing came to Christchurch in the mid 1880s. Here we met Thomas Beckett, Robert Brown, Samuel Barker and J.H. and J.B. Armstrong of the Christchurch Botanic Gardens. Barker was active in the Christchurch Beautifying Assoc. which planted natives on the banks of the Avon River in the 1890s. The identities of two W.S. Hamiltons who wrote in the Transactions of the N.Z. Institute, one of whom is commemorated in *Tetrachondra hamiltonii*, are being unravelled.

# July trip

At the Macmillan Brown Library, University of Canterbury, Bronwyn Matthews, Information Services Librarian, put on display many 18th and 19th century volumes which we were able to examine in detail. Some highlights were: Banks' Florilegium, colour engravings, Alecto Historical Editions 1983-84; Cook's Florilegium, engravings 1973; Voyage Round the World in the Resolution, by George Forster 1777; J. J. Labillardiere Folio Atlas Relation du Voyage de la Recherche de la Perouse 1800; Voyage de Decouvertes de l'Astrolabe, various parts, 1830s; E. Raoul, Choix de Plantes de la Nouvelle Zelande 1846.

# August field trip

On a changeable winter morning 8 people met at Otukaikina Wetland (formerly Wilson Swamp), Belfast. Surprisingly the sun came out and the bare boughs of the willows Salix cinerea and S. fragilis interspersed with cabbage trees and niggerheads surrounding shimmering pools, were at their best. We admired the work by D.O.C. conservation officers, P.D. workers, and the local Ngai Tahu runanga in clearing willows, constructing the boardwalk and streamside track, and planting, with the support of Lamb and Hayward Ltd. It was good to share this with Graeme Jane, visiting from Nelson. 35 naturally occurring native species have been recorded here by Colin Meurk. We added *Juncus pallidus*, and also *Potamogeton crispus* to the adventive list.

# August meeting

Ron Close and Peter Wardle talked about a Wildflowers tour to western Australia, that they had participated in during October 1996. This was led by the noted plant photographer and gardener Yvonne Cave of Wanganui, ably assisted by the driver Peter Davies who has a great knowledge of the local botany. It began with the annual native wildflowers display held at King's Park, Perth, and proceeded southwards to impressive forests of karri and jarrah. Next we visited shrubby vegetation along the south coast and on the Stirling Ranges, that were particularly notable for Proteaceae. Finally we struck inland to Kalgoorlie and westwards across the wheat belt to Perth. This country was very dry, but also provided a wealth of showy shrubs, with Myrtaceae and legumes providing a large share of the species. Other memorable plants include orchids, kangaroo-paws and, not least, the tree mistletoe *Nuytsia*. This southwest corner of the State is famous for its rich flora of some 4000 species, that probably refects the ancient landscape which, despite being subdued by New Zealand standards, provides a great range of habitats.

# Bryony Macmillan and Peter Wardle, P.O. Box 8212, Riccarton, Christchurch

# ■ Nelson Botanical Society

# June Field Tip Report: - Covenants, The Glen

Lisa and Rennat Nussbaumer led 25 members to look at the Kings covenant. We wandered past large pukatea with shiny epiphytic puka, wonderfully smooth-trunked tawa, titoki, tall nikau and mamaku, and massive lianes - passionfruit and three species of little white rata. Kawakawa was common in the understorey in some places as were *Coprosma areolata* and *C. rhamnoides* all with improved regeneration following fencing five years ago. Dry rocky slopes were covered in *Lastreopsis velutina* and *Arthropteris tenella*. Towards the top of the slope were kohekohe seedlings and a very large adult with a wondrous crop of flowers and fruit, near their southern limit here in Nelson. On the way down we admired the leafless bush lawyer, *Rubus squarrosus*, heketara, akeraho and akeake on the dry ridge and lower down, a dry knoll supported a small grove of black beech. At the end of the day we walked across paddocks to explore Lisa and Rennats garden and enjoy home made bread, cakes and hot roast chestnuts.

# July Field Trip Report: - Martin Conway Covenants, Brightwater and Waliti Domain

About 20 people turned up at Martin Conway's place for the visit to his and his neighbour's QEII covenants. Martin explained to us how he has transformed a few scattered groups of trees in pasture into a vigorous young stand and the techniques he has used to achieve this. Of particular interest in the remnants was one of less than half a dozen *Nestegis montana* known from the South Island. The track through the area led from areas treated first to those done in the last year and then finally a small area yet to be planted. Across a small gap to a neighbouring property (also covenanted) is dominated by mature totara and is probably a remnant of the original plains forest towards which Martin is trying to restore his area. Other significant plants here were tawa, another *Nestegis montana* and *Lastreopsis microsora*. The forest floor was a dense mat of wandering jew. This invoked a long discussion on the subject of how to get rid of it. After lunch we ventured into a stand of hill forest at Waliti Domain. Most of the lower slopes of the stand are dominated by dense pole matai (probably about 150 years old) while the upper slopes are in hard beech. On the edges young totara are pushing up through barberry over 3 m tall and old mans beard drapes many smaller trees. A highlight of the area is the high numbers of tuis, bellbirds and pigeons.

# August Field Trip Report: - Tapu Bay

Over 30 people turned out for the walk from Tapu Bay to Little Kaiteriteri. Along the coast there is a narrow strip of black beech and mahoe/five finger forest stretching from the shore (overhanging it) to the cliff tops. The white mistletoe (*Tupeia antarctica*) is quite common on five finger, with deep purple to violet fruit in prolific abundance and often within easy reach for study. Almost overlooked on the steep banks, the filmy fern *Hymenophyllum cupressiforme* is also abundant. Other plants of special interest are *Geniostoma rupestre* var. *ligustrifolium* (near its eastward extension here), the very local bamboo rice grass (*Microlaena polynoda*) and the commonly cultivated but also not often seen in the wild *Anemanthele lessoniana*. Further along the shore the forest is dominated by mahoe and rock ferns such as *Cheilanthes sieberi*, *Asplenium terrestre* and the little succulent *Crassula sieberiana* is more common. From Stephens Bay to little Kaiteriteri the first section looks down on similar forest to that seen earlier. Then at Little Kaiteriteri two small stacks beg to be explored. One is dominated by low kanuka often hosting the small

mistletoe (*Korthalsella salicornioides*). The other smaller stack is dominated by shags and scrappy vegetation but, remarkably, Les Moran found a stunted hinau (the only one for the day) on an almost inaccessible part. At the Kaiteriteri end of the beach the black beech forest on the headland provides more interest with many dry forest species such as prickly mingimingi (*Cyathodes juniperina*), mingimingi (*Leucopogon fasciculatus*) and inaka (*Dracophyllum longifolium*). As the road is approached jasmine, old mans beard, tecoma and other pests were disappointingly common.

Forthcoming trips September 21 - Abel Tasman - Bark Bay October 19 - Rameka Track November 16 - Howard Valley December 21 - Mt Riley

Graeme Jane, 136 Cleveland Terrace, Nelson

# Wellington Botanical Society

# Wellington Botanical Society Jubilee Award

Wellington Botanical Society now invites applications for an award of up to \$1000 to encourage and assist appropriate people to further knowledge of the New Zealand indigenous flora, and to commemorate the Jubilee of the Society.

- Purpose of the Award: The Award is open to anyone working in New Zealand and will be granted for: field work; artistic endeavour; publication; research; the propagation or cultivation of New Zealand native plants for educational purposes; or other studies which promote the better understanding of the New Zealand indigenous flora and vegetation. The interpretation of these conditions will be flexible except that the main criterion will be the furtherance of knowledge or promotion of the intrinsic value of the NewZealand indigenous flora and vegetation. The award may be used to defray costs such as travel, accommodation, materials or publication.
- <u>Applications for the Award</u>: Applications should be made in typescript to the Secretary, Wellington Botanical Society, PO Box 10-412, Wellington by 10 October 1997. There is no prescribed application form, but the following should be provided: the applicant's name, mailing address, telephone number, and any relevant position held; a summary statement of the applicant's accomplishments in the field of botany (no more than one page); the name, address, telephone number and designation of a referee who is familiar with these accomplishments; an outline and timetable for the proposed project for which the award is sought; and a proposed budget for the project.
- Selection: The Award will be made to one or more applicants selected by a subcommittee nominated by the general committee of the Wellington Botanical Society. An Award will be made, and applicants informed of the results in writing, by 10 November 1997. Successful applicants will be required to provide, at an agreed time, a short report on what they have achieved and an account of their expenditure of Award funds. The names of Award recipients, the value of the Award, and synopsis of the project provided by the recipients will be published in the Annual Report of the Wellington Botanical Society.

# Wellington Botanical Society Programme: October 1997 January 1998

# Saturday 4 October: Field Trip; Pipinui Pt and surrounds (Please note change of trip)

To look at *Pimelea aridula* and search for other rare plants. Meet 8.30am on Moorefield Rd opposite Johnsonville Station to share transport. Catch 8.02am train from Wellington Station.

Leader: Pat Enright 479 1208(h) 495 0966(w), Deputy Leader: Olaf John 479 7605.

# Monday 20 October: Evening meeting; The Story of Cuvier Island

How the island has been restored, step by step, beginning with the eradication of goats in 1960. How valuable and special the island is now.

Speaker: Ian Atkinson

# Saturday 1 November: Field Trip; Eastern Hutt River (Please note change of trip)

Botanise bush that has been closed to the public for decades. Maps NZMS 260 S26 Carterton, or Tararua Forest Park Map. Catch 8.05 train from Wellington arriving Upper Hutt 8.55. Meet Upper Hutt Station 9am to share transport. Take Waterworks Road, Kaitoke; park at entrance to Kaitoke Regional Park. A full day trip. Climb 300m on 4WD road, descend it to river c. 0.5km upstream of Hutt Forks. Co-leaders: Barbara Mitcalfe 475 7149 & Chris Horne 475 7025.

Monday 17 November: Evening meeting Seaweeds of the Wellington Region Speaker: Wendy Nelson

Saturday 6 - Sunday 7 December: Field trip Mount Percy\*, Castlepoint Reserve See Brachyglottis perdicioides var. (B. pentacopa) and B. compactus.

- Camp at Castlepoint Campground. Meet 8.00am at Platform 9 Wellington Station, 8.30 at Upper Hutt Railway Station carpark; to share transport, 9.30 on Castlepoint turnoff just beyond roundabout on SH2 on north side of Masterton. Catch 7.35am train from Wellington Station to Upper Hutt. \*Subject to permission to botanise new Mt Percy covenant including the summit.
- Leader: John Sawyer 384 1485(h) 472 5821(w) Deputy Leader: Tony Silbery (06) 375 8004(h) (06) 375 8288(w)

Saturday 27 Dec 1997 -Wednesday 7 Jan 1998: Field Trip West Taupo -Waikato (Note change of dates) Basecamp 1: Pureora area. Visit Pureora Forest, Pouakani Totara etc.

- Basecamp 2: Pirongia area. Visit wetlands, limestone formations, forest remnants. See Waikato endemics and threatened plants. Programme being planned with help from Waikato Conservancy, Department of Conservation and Waikato Botanical Society. More information in next issue.
- of Conservation and Waikato Botanical Society. More information in next issue. Booking Officer: Margaret Aitken, 4 Godley St., Waiwhetu, Lower Hutt. ph (04)566 2731(H), (04)8018838(W); fax (04)801 8848(W). Deposit: \$100 by 15 November. Late bookings may be accepted. Make cheques payable to M. Aitken.
- Transport: If travelling by car, please tell Booking Officer how many extra people you can take. If you have no car, make your own ride-sharing arrangement, or tell the Booking Officer who will try to find you a place. Passengers are expected to share the travel cost with car owners. Car owners may be asked to keep space available for party food and gear. Tranz Rail's "Northerner" and "Overlander" trains stop at Te Kuiti (55km from Pureora) and Te Awamutu (11km from Pirongia). Tell the Booking Officer if you are travelling by train, so that we can arrange to pick you up.

Pat Enright, Secretary, PO Box 10-412, Wellington

# Congratulations

# Ella Campbell, Vivienne Cassie Cooper, Brian Molloy

# Ella Campbell

Belated congratulations to Ella Campbell who became a Dame in the 1997 New Year Honours - the highest Royal honour bestowed on a New Zealand woman botanist and a fitting honour for a long-serving and pioneer university botanist.

Ella was appointed to Massey Agricultural College in 1945 and retired in 1976. Ella was born and educated in Dunedin and at the University of Otago one of her teachers was Dr J.E. Holloway (1881-1945). She graduated M.A. with First Class Honours in botany (1935).

Ella has wide interests in botany and horticulture, her specialist field of research being liverworts. A notable feature of Ella's long career in botany has been her active research into her 80s. (New Zealand Botanical Society Newsletter 44: 24-25, 1996).

Beyond botanical science, Ella was also a pioneer in women's sport at university and has had a long association with women's hockey.



# Vivienne Cassie Cooper

Dr Vivienne Cassie Cooper was awarded the Member of The New Zealand Order of Merit (MNZM) for "services to marine biology" in this years Queens Birthday Honours.

Vivienne, a Research Associate of Landcare Research at Hamilton, has made important contributions in her research on freshwater algae and phytoplankton. From 1951-53 she was a junior lecturer of botany at Victoria University. During the 1960s she joined the Botany Division, DSIR, as a botanist studying freshwater micro-algae, then she went on to study phytoplankton.

She has written many publications including her major achievement, the recently published book *Microgalgae: Microscopic Marvels* (1996), a book which fills an important gap in science literature in New Zealand.

# Brian Molloy

Also in this years Queens Birthday Honours, Dr Brian Molloy was made an Officer of The New Zealand Order of Merit (ONZM) for services to conservation. Brian, a Research Associate of Landcare Research at Lincoln, has played an important part in the development of Protected Natural Areas Programme in New Zealand.

His experience and knowledge of soil, vegetation history, taxonomy and ecology saw him become the South Island co-ordinator in preparation of ecological district maps and he was responsible for the establishment of many Crown reserves in the South Island. He was a representative for the Royal Society of the New Zealand Canterbury branch for 22 years, an honorary botanist of the Summit Road Society, and involved in management and restoration of many protected natural areas around Christchurch.

Brian has received many awards for his work and in 1990 was awarded the Loder Cup for his contribution to native plants and conservation. In 1995 he received the Sir Charles Fleming Award for environmental achievements presented by the Royal Society of New Zealand.





### Acknowledgements

A.D. Thomson kindly wrote the section on Ella Campbell, and Brian Ellison, Landcare Research, Lincoln kindly allowed us to use copy from Te Reo o Manaaki Whenua for the sections on Vivienne Cassie Cooper and Brian Molloy.

# Editors

# NOTES AND REPORTS

# Plant Records

# Some additions and alterations to the liverwort and hornwort flora of the Kermadec Islands

# Introduction

A list of liverworts and hornworts known from the Kermadec Islands was published by Campbell in 1977 as an appendix to the Kermadec Islands Flora (Sykes 1977). It was based on herbarium specimens at AK and CHR. However, several of these specimens are inadequate for accurate determination because they

are either scrappy or lack reproductive structures. Since that time much more information on the liverworts of the Pacific Islands and of New Zealand has been published. In addition, in November 1994, Ewen Cameron and Anthony Wright collected fertile specimens of several species from Raoul Island in the Kermadecs and deposited them in the Herbarium at AK. An examination of these new specimens and a rechecking of previous collections showed that some revision of the 1977 list was needed.

<u>New names are:</u> Chiloscyphus lentus (Hook.f. & Taylor) J.J. Engel & R.M. Schust. For Lophocolea lenta (Hook.f. & Tayl.) Tayl.

Chiloscyphus semiteres (Lehm.) Lehm. & Lindenb. For Lophocolea semiteres (Lehm.) Mitt. Frullania engelii S. Hatt. This is a new record for the New Zealand Botanical region. It was previously known for Tasmania.

# Frullania junghuhniana Gottsche

Replaces Frullania hypoleuca Nees

This is a new record for the New Zealand Botanical region. It was previously known for New Guinea, Sumatra, Java, Borneo, Philippines, and New Caledonia.

Heteroscyphus argutus (Reinw. et al.) Nees For Chiloscyphus argutus (Reinw.Bl. & Nees) Nees

### Marchantia pileata Mitt.

Replaces Marchantia foliacea Mitt.

These two species are closely allied, they grow in similar habitats and may even be intermixed. They have almost the same geographical range except that *M. foliacea* extends beyond the New Zealand and Australian Botanical Regions to Chile and Juan Fernandez Island.

### Phaeoceros carolinianus (Michx.) Prosk.

For Phaeoceros laevis (L.) Prosk. ssp. carolinianus (Michx.) Prosk.

### Additional localities are:

Frullania engelii and F. junghuhniana

Raoul Island, road between Fishing Rock and Hostel, common on pohutukawa bark; 21-11-1994, E.K. Cameron 7851: between Blue and Green Lakes, abundant on trunks of *Myrsine kermadecensis* open pohutukawa forest; 23-11-1994, E.K. Cameron 7905.

### Heteroscyphus argutus

Raoul Island, Denham Bay track near summit, on bank amongst other bryophytes, pohutukawa forest; 22-11-1994, E.K. Cameron 7866.

### Marchantia pileata

Raoul Island, Green Lake, north side, occasional on bare soil of lake shore, adjacent to steam vent; 23-11-1994, A.E. Wright 12449.

### Plagiochila obscura

Raoul Island, just east of Hutchisons Hut, common on mahoe trunk, ridge top, *Myrsine*-pohutukawa wet forest; 25-11-1994, E.K. Cameron 7949.

# Acknowledgements

The writer is indebted to E.K. Cameron and A.E. Wright for collecting the new specimens and to Dr. Y. Yuzawa for checking the identification of the Frullania species.

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Ella O. Campbell, Department of Plant Biology and Biotechnology, PB 11222, Massey University, Palmerston North

# **Kawaka** (Libocedrus plumosa) in the eastern Bay of Plenty and northern Te Urewera

Kawaka has a disjunct distribution, occurring in the North Island from latitude 35° S to beyond 38° S (Allan 1961). In the South Island it is restricted to the north-west corner, between Collingwood and Whangarei Inlet (Sampson 1979), reaching latitude 40°40'S (Wardle 1991). It is recorded, apparently incorrectly, by Sampson (1979) as occurring in Hawkes Bay and Taranaki. Allan (1961) notes kawaka is a tree "up to 20 m, trunk up to 1 m diam...". However Kirk (1889) noted that it could attain a height of 100 ft (30 m) and 2-5 ft (0.6 - 1.5 m) in diameter. He also recorded that it was often termed "the New Zealand arbor-vitae" by early settlers, and that it was "extremely rare in many districts, being represented by a single tree, and never forms any large portion of the forest".

# Northern Te Urewera - Waioweka

On a 1985 excursion with Pete Shaw and Sarah Beadel in the headwaters of the Pohatu Stream in Te Urewera National Park (Waimana Ecological District), we found a large specimen of kawaka. This tree was c. 30 m high X c. 1 m in diameter, on a ridge crest in rimu-rata/tawa forest, c. 380 m asl, at latitude 38°17'S. The foliage was finer than considered usual for kawaka, with some of the characteristics of kaikawaka (*L. bidwilli*), but the habitat, and bark colour and texture, are characteristic of kawaka (the nearest known kaikawaka are c. 30 km to the south). Another specimen was found in 1987, slightly to the south, at latitude c. 38°17.5'S.

Kawaka has also been recorded on the northern fringes of Te Urewera, in the Waiotahi Valley (Heginbotham and Esler 1985; Clarkson and Regnier 1989; also see voucher records below), and in the Waiohau Conservation Area in the south-west corner of Taneatua Ecological District (Beadel 1995). It had also been recorded at Wairata in the Waioweka Gorge (Heginbotham and Esler 1985).

# Te Urewera Herbarium Vouchers

Observer(s)	Year	Grid Reference	Notes
M. Heginbotham	1979	W16/765375 N78/61_09_	CHR 368628 Waiotahi Valley Domain area, near river, in lowland forest.
L.J. Daniel	1979	N78/608993 W16/761287	CHR 469903 Tukainuka Scenic Reserve, Waiotahi River. Two mature trees, some regeneration. Totara forest.
B.R. Clarkson and C. Regnier	1984	N78/606988	NZFRI 14288 Tukainuka Scenic Reserve, Waiotahi River. One large tree with c.10 saplings. River terrace in totara-matai forest.
W.B. Shaw	1985	W16/657173 N87/499866	NZFRI 15471 Headwaters of Pohatu Stream. Rimu-rata/tawa forest. Single large tree c. 30 m X c. 1 m dbh. Altitude 380 m. Latitude 38°17'S.
W.B. Shaw	1987	W16/653161 N87/495852	NZFRI 16562 Ngatamatea Stream. Rimu-kahikatea/tawa-kamahi-tanekaha forest. Small tree (10 m x 20 cm dbh); crown in canopy. Altitude 230 m. Latitude $c.38^{\circ}17.5^{\circ}S.$

The finds in Te Urewera National Park prompted collection of further kawaka site records in Northern Te Urewera, as follows :

Observer(s)	Year	Grid Reference	Notes
P.G. Shaw and G. Jones	1990	N78/706928	Waioweka Gorge, one tree, c. 10 cm diameter.
P.G. Shaw	1990	N78/368958	Mangahoanga catchment, 2 trees, both $c$ . 50 cm diameter, $c$ . 100 m apart.
G. Jones	1991	W16/544254	Mangahoanga catchment, 4 trees in area of $20m^2$ , diameters 5-c. 35 cm.
G. Jones	1991	W16/665198	Ureroa Stream, 2 trees, 40-50 cm diameter. On crest of side ridge.
P. Shaw and F. Clark	1991	W16/532275	Mangahoanga Stream, 2 trees, 1 x c. 7 cm diameter, 1 x c. 20 cm diameter.
R. Dahm	1992	W16/673198	Ureroa Stream, downstream of Moeroa junction.
R Dahm	1992	W16/677197	Ureroa Stream, downstream of Moeroa Stream.
R. Dahm	1992	W16/669198	Ureroa Stream, 2 large trees, $c$ . 50 metres apart on crest of side ridge.
J. Hudson	1992	W16/544277	Ohaua Stream headwaters. On crest of side ridge, large tree.
M. Woller	1992	W16/687184	Ureroa Stream, opposite Umutaoroa Stream junction. One very large tree.
M. Woller	1992	W16/673204 - 673210	Ureroa Stream, numerous trees of different sizes on crest of side ridge. Also grove of seedlings 1-2 m high. Older report by G. Jones from same locality.
M. Woller	1994	W16/674233	Whanganui Stream, Waimana Catchment.
M. Woller	1994	W16/747173	Te Toromiro Stream, Waiiti Catchment.

Other Bay of Plenty Records Various other records have been gathered over the years. Heginbotham and Esler (1985) noted: "Grows in forests in the Waiotahi Valley, in the catchments of the Te Waiti and Rawea Streams, and at Wairata."

Clarkson et al. (1986) record kawaka in the Motu Ecological District, and its North Island southern limit was recorded by Clarkson and Regnier (1989) in Whinray Scenic Reserve in the upper Motu catchment, at latitude 38°15'. It has also been recorded further to the east, in Pukeamaru Ecological District (Regnier et al. 1988). Some herbarium voucher details follow:

Collector(s)	Year	Grid Reference	Notes
J. Nicholls	1983	N71/355423 Y15/455660	NZFRI 13153 (CHR 409734 duplicate) Raukokore River, above stony river-bed in podocarp - hardwood forest. Sapling 2m. 213 m asl.
J. Herbert	1978	N70/990320	NZFRI 10296 3 km SW of Motu River mouth. Sapling under tanekaha poles. 60 m asl.
B.R. Clarkson	1984	N88/012887	NZFRI 14949 Whinray Scenic Reserve, upper Motu River. 487 m asl. Kamahi forest, on low ridge. Latitude 38°15'S.
S. Courtney	1984	N62/54_69_ Y14/63_90_	CHR 417600 Wharekahika River, Potaka. On alluvial terrace with kahikatea and matai.
S. Courtney	1985	N62/377524 Y14/477752	CHR 417599 Raukokore River. On narrow ridge with black beech. Many saplings.

# Discussion

Kawaka is widely dispersed in the northern Te Urewera and the eastern Bay of Plenty in general. Te Urewera sites extend from the Ikawhenua Range in the west to the Waioweka Gorge in the east, and from the northern fringes inland to latitude *c*. 38°17.5'S, the current southern limit in the North Island. There are a number of records to the north of this point in the park, with the two next records at exactly the same latitude (38°17'S), but more than 8 km apart. It is scattered throughout the East Cape catchments, with records from the Otara River, Motu River, Raukokore River, and the Wharekahika River. Sites are widely spread and local, consistent with Kirk's (1889) observations. It is likely that kawaka would have occurred closer to the coast in the Taneatua and Opotiki Ecological Districts, but that vegetation clearance has resulted in its loss from this area, particularly from alluvial terraces and valley floors. Most records are from lowland tawa-dominant forest, with some from matai-totara forest on alluvial terraces, one from black beech forest, and one from kamahi forest. Many of the records are individual trees, but there are records of saplings and seedlings, indicating that regeneration is occurring on suitable sites. Site suitability, dispersal and regeneration of kawaka in a relatively intact forest ecosystem would make an interesting research topic.

Many of the Te Urewera records were collected by Department of Conservation field staff engaged in wild animal control work or threatened species survey, illustrating the benefit of utilising experienced field staff engaged in conservation management programmes to collect natural history data to complement herbarium records. It is likely that other sites will be found scattered through these forests.

# Acknowledgements

Many of the Te Urewera records were collated and forwarded to me by Pete Shaw (Department of Conservation, Opotiki). Records from CHR were supplied by Euan Nicol (Landcare Research).

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W.B. Shaw, Wildland Consultants Ltd, 14 Foster Road, R.D. 4, Rotorua, Email: wildland@wave.co.nz

# Comment

# ■ Waitangi Tribunal Claim 262: Indigenous flora and fauna

The claimants from six lwi are seeking sovereignty rights, which will permit lwi Maori to conserve, control, utilize and exercise proprietary and ownership rights over natural resources, including indigenous flora and fauna.

All botanists in Aotearoa New Zealand should take an active interest in this claim. A copy can be obtained from: The Registrar, Waitangi Tribunal, PO Box 5022, Wellington.

Claim 262 consists of 29 pages. The first part of 9 pages outlines the background to the claim, as well as listing seventeen statements on the rights of Iwi Maori. Some of these are as follows:

3. the right of development which permits the lwi to conserve, control, utilize and exercise proprietary and ownership rights over indigenous flora and fauna.

- 5. the right to determine intellectual property rights in the knowledge and use of indigenous flora and fauna.
- 6. the right to participate in, benefit from and make decisions about ... breeding, genetic manipulation and other processes relevant to the use of indigenous flora and fauna.
- 7. the right to control and make decisions about the propagation, development, transport, study or sale of indigenous flora and fauna.

These are an indication of the requests by the claimants.

The second part of the claim provides information and requests about specific species.

Flora

a. kumara

- b. pohutukawa (Metrosideros carminea) (sic)
- c. koromiko (Hebe spp.)
- d. puawananga (Clematis spp.)
- e. indigenous forests

Fauna

- a. pupu harakeke (Placostylis hongii)
- b. tuatara
- c. kereru

All botanists should obtain a copy of Claim 262, study the issues, and make a submission to the Tribunal. The indigenous flora and fauna are taonga to both lwi Maori and non-Maori. The requirement now should be a partnership arrangement to enhance the protection and conservation of the indigenous flora and fauna.

Ron Close, 38 Hinau Street, Christchurch 8001

# ■ Maori customary use of native birds, plants and other traditional materials

In May 1994, the New Zealand Conservation Authority (NZCA) issued a discussion paper on this topic. Submissions were received and this led to the release by NZCA in September, 1995 of the summary of responses.

A further discussion paper has been released by NZCA, August 1997. Comments on this must be sent to the NZCA, PO Box 10-420, Wellington by 21 November, 1997.

Copies of the 1997 discussion document and the summary are available from NZCA, or from the local office of the Department of Conservation.

Ron Close, 38 Hinau Street, Christchurch 8001

# **Research Reports**

# Stipa - a play in several Acts

Dramatis personae: Various grass taxonomists of the New World and Australasia; users of taxonomy; herbarium staff.

Act 1: New Zealand Botanical Society Newsletter 47: 10-13 (1997).

Act 2: The Botanical Gardens, late in the day.

Enter Maria Amelia Torres (New World) right.

- Torres: "Las conclusiones que obtuve de este estudio, me llevaron a aceptar hoy el criterio de Barkworth (1990), sobre la delimitacion de Nassella (sensu lato), y a desistir de mi opionion anterior de no innovar los limites tradicionales de este taxon (Torres, 1993)."
- Taxonom. New World: And Achnatherum? Mary Barkworth believed it the other common genus in South America.
- Torres: "... se requiere un estudio mas complete sobre los limites y extension del grupo, antes innovar la sistematica de las especies sudamericanas"<sup>2</sup>

First Taxonom. aust.: Many species are still in Stipa, then?

Torres: Si; pero "... un nuevo taxon con caracteristicas propias e independientes del genero Stipa Linne. Estas cuatro especies junto o otras tres .... incluidas en un nuevo genero denominado Nicoraella."<sup>3</sup>

Second Taxonom. aust.; Those must be Parodi's Group Obtusae; that would make sense.

Murmurs off "Stable nomenclature", Stable nomencl.."; confusion among users and herbarium staff.

# Exeunt omnes

# Reference

- Torres, M.A. 1997. <u>Nassella</u> (Gramineae) del noroeste de la Argentina. <u>Stipa</u> (Gramineae) del noroeste de la Argentina. <u>Nicoraella</u> (Gramineae) un nuevo genero para America del Sur. <u>Ministerio de la Produccion y el Empleo</u>. Provincia de Buenos Aires (CIC) ser. Monografia 13: 5-75.
- 1 This first quotation (p.5) freely translated reads: "The conclusions obtained from this study now lead me to accept Barkworth's (1990) criteria for the delimitation of Nassella s.I., and to abandon my earlier opinion not to change its traditional limits."
- 2 This second quotation (p.47) again freely translated reads: "... that a more complete study on the limits and extent of this group is needed before there is any change in the systematics of South American species."
- 3 This third quotation (p.69) freely translated reads: "... a new taxon with characters of its own and independent of the genus Stipus L. These four species united with three others are included in a new genus given the name <u>Nicoraella</u>."

Henry Connor, Honorary Fellow, Department of Geography, University of Canterbury, Christchurch

# Further notes on the origin of plant names

Since drawing attention to the origin of the name *Olearia* (Godley 1989) I have noticed the following names that require further comment. Most of these refer to the pioneer work of Professor Arnold Wall and Dr H. H. Allan (W&A) on "The Botanical Names of the Flora of New Zealand" (1950).

- 1. Ackama "Formed from the Maori name, Makamaka by mutilation" (W&A). More helpful is Allan Cunningham's original explanation in 1839: "The name of this distinct genus has been invented by anagrammizing that given to the tree by the natives", and he gave the native name as Maka-maka (erroneously copied as Maha Maka in Hooker's *Flora Novae-Zelandiae*).
- 2. Alectryon "Gk alektruon, a cock, from the resemblance of the scarlet aril to a cock's comb" (W&A). I can find no evidence to support this statement which was first introduced to New Zealand in Hooker's *Flora Novae-Zelandiae*. I suggest that although Gaertner did not explain his choice of name, a glance at his original illustration makes this clear. He had available undehisced capsules, and these, with their crest and beak, are reminiscent of the head of a cock (Fig. 1).
- 3. avicularis "like a little bird, Lat adj: from aviculus, dimin. of avis, bird. In the case of Solanum aviculare it can only be guessed why Forster (1786) chose the name; probably he meant sought after by birds" (W&A). This is close to George Forster's intention. He wrote that the poroporo fruit was avidly devoured by the natives of New Zealand and was also extremely pleasing to the little birds ("ab incolis Novae-Zeelandiae avide vorantur, aviculus etiam gratissimae").
- 4. Agathis "From Gk. agathis, a clew of thread, referring to the shape of the cone scales" (W&A). But the original derivation is not from the shape of the cone scales. Salisbury (1807) wrote "Nomen dixi ab *agathis* glomus; floribus in glomos collectis." It was presumably the female cone (which he described as sub-rotund and the size of a goose's egg) which reminded Salisbury of a *glomus*

or ball of thread. Our kauri is not the type species. Poole and Adams (1963) wrongly derived the name from *agathos*, good.

5.

Elatostema "Projecting stamens. Gk elatos, elastikos, impulsive etc., and stemon, thread. Named from the projecting stamens" (W&A). I suggest that this interpretation hides important biological information and should be "elastic stamens". The Forsters (1776) explained the derivation of their name as "Elatos elasticus et stema stamen plantae; quoniam Stamina elastice profiliunt". This appears to be an excellent example of a plant with exploding flowers (Explodiflorae), as is typical of the Urticaceae. The Forsters were not describing the New Zealand Elatostema which I have not checked. The male flowers will probably be like those of Urtica ferox in which the straightening (or enlarging) of the infolded anthers pushes the bud open. The whole stamen then moves slowly upright, and then, with a last flick the pollen is flung to the wind. This is best seen under a dissecting microscope and can be started off by slightly opening a mature bud with a needle (Notebook, Sept. 1963).



# Fig 1. Gaertner's original illustration of *Alectryon* showing the crested and beaked fruits resembling the head of a cock.

- 6. Gastrodia. "From Gk. gaster, belly, and odos, tooth. Named from the shape of the top of the column" (W&A). Brown (1810) did not give the derivation of his name. He refers to a cavity at the apex of the column but his name would make more sense if it referred to the pot-bellied flower shape as given in Johns & Molloy (1983).
- 7. inversus. "Inverted. *Carex inversus* [*sic*], so named because the male flowers are at the lower end of the panicle, the less usual position." (W&A). But the epithet refers to the fact that the male flowers are at the bottom of the <u>spikelet</u> and not at the top, the usual condition known when Robert Brown described this species in 1810.
- 8. kaloides. "Rope-like. Gk. kalos, rope, and -oides, resembling. In *Carex kaloides* it is descriptive of the very narrow spike of the inflorescence". (W&A). But although Petrie did not explain this epithet, it seems clear that he was referring to the leaves. He wrote: "a very distinct species. The leaves have an extremely strong fibre." (TNZI 13, 1881).
- 9. mixtus. "Mixed or intermediate, Lat. ptcple of miscere, to mix. In the case of *Gunnera mixta*, the name implies resemblance to *G. prorepens* and *G. microcarpa* (W&A). But Kirk only stated: "A curious plant, resembling small states of *G. prorepens*" (TNZI 27 1895). However, he also wrote "staminate, pistillate, and hermaphrodite flowers intermixed", and I suggest that this situation, rather unusual for *Gunnera*, was the reason for his specific epithet.
- 10. Pratia "From the name of the French botanist, Prat, a naval officer " (W&A) I doubt that he was a botanist. Gaudichaud (1826) wrote: "M Prat Bournon, officier de marine, mourut á bord peu de jours après son départ de Toulon. Le genre *Pratia* lui est dédié".
- 11. quadridentatus "For *Erechtites quadridentata* the name seems inappropriate as no part of the plant is four-toothed. Probably the name refers to the 'few distant teeth' sometimes seen on the lower leaves which are mentioned in Kirk's description but not in that of Hooker or Cheeseman" (W&A). However, the epithet refers to the 4-toothed central hermaphrodite flowers. When describing his *Senecio [Erechtites] quadridentatus* in 1806, Labillardière wrote: "Corollulae hermaphroditorum tubulosae quadridentatae".
- 12. Tupeia "Latinized (?) form of the Maori name Tupea. According to Hooker, the name is that of a South Sea Island plant and was erroneously applied to the New Zealand plant" (W&A). But Hooker

15

is wrong. Chamisso and Schlechtendal (1828) dedicated their genus to Tupaia, the Tahitian whom Cook took to New Zealand on his first voyage and who died in Batavia on the journey home. They wrote: "TUPEIA antarctica N. [obis], nomine Taheitensis amabilis peregrinatoris, in primo Cookii itinere de scientiis bene meritii".

### Acknowledgements

I thank Dr Brian Molloy and the Library Royal Botanic Gardens, Kew for the original description of Agathis.

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E.J. Godley, Research Associate, Landcare Research, PO Box 69, Lincoln

# A guide to hand-planting of New Zealand mistletoes (Loranthaceae)

Mistletoes are curious plants. Their parasitic lifestyle means that a clump of mistletoe foliage can be very conspicuous, appearing to almost perch in a tree of another species. New Zealands five remaining species of Loranthaceae mistletoes, *Alepis flavida, lleostylus micranthus, Peraxilla colensoi, P. tetrapetala* and *Tupeia antarctica*, have all declined in abundance in recent decades. Three main reasons have been suggested for this decline. These are loss of habitat, decline in the numbers of dispersal agents (in particular frugivorus birds), and the detrimental effect of introduced herbivores, especially possums (Norton 1991; Ladley & Kelly 1996; Norton & Reid 1997; de Lange & Norton 1997). A number of people, motivated either by curiosity or by conservation, are interested in artificially establishing mistletoes on hosts. In some cases this is to cultivate the plant in a garden or farm situation; in others its to augment or establish a population in the wild. However there has been little published information on the best way to go about hand sowing of New Zealands mistletoes (Thomas 1987; Ogle 1988; Milne 1996).

As part of an ongoing research project funded by the PGSF into the reproductive ecology of these mistletoes, we have been attempting to plant and establish seedlings. We have managed to successfully establish a number of mistletoe seedlings, especially of *A. flavida*, *P. tetrapetala* and *P. colensoi*. Having been asked several times for guidelines on how to do this, it seemed worthwhile to document some tips that we have learnt over the last few years that seem to have increased the chance of successfully planting mistletoe seeds.

# Seed collection

First it must be stressed that removal of seed from Department of Conservation land requires a permit. On private land, the permission of the landowner would be required; some populations (e.g., on roadsides) may not require formal permission. As well as verifying that you have legal permission, ripe fruits should not be removed from any mistletoe population without being sure that this will not threaten the viability of the source population (Norton et al. 1994). In general, much greater care will be required in the North Island, where most sources will be a small population. In contrast, some South Island areas still have abundant populations of particular mistletoes. If in doubt and the landowner is unsure, check with your local DOC office. If you know what bare seeds look like after the fruit is removed (see below) you can sometimes find these on the ground where birds have excreted them; such seeds will never establish since they did not land on a host branch, and (if fresh enough) can be moved to another site without damaging the source population.

When collecting seeds, it is important to keep good records of where the seed was collected from including information on the site locality (preferably a grid reference), the extent and condition of the mistletoe population, and the host species parasitised. When the seed is later planted out, it is again useful to keep

good records of where the seed was planted, species planted on to and number of seeds planted. Growing mistletoes is still very much a learning exercise, so the more information the better. It is often suggested that it is best not to move plants too far from where they were collected from (e.g., within the same Ecological District). This suggestion is based on concerns about local adaptation and maintenance of genetic integrity of existing populations. Planting of non-local material may result in loss of local adaptations (e.g., to particular environmental conditions) and eventually could lead to loss of overall genetic variation within a species.

Fruits of the five mistletoes start to ripen from around April onwards. This does vary depending on where in the country the different species of mistletoes are growing. Most of the fruits are gone by mid-winter, although for *P. tetrapetala* and *T. antarctica* they may remain until well into the summer. Probably the best indication of whether or not the fruits are ripe is to check their colour, shape and firmness. When ripe, the fruits should look plump and feel soft when touched. Yellow is the most common fruit colour, with the fruits of *P. colensoi*, *I. micranthus* and *A. flavida* all being different shades of yellow, although a red morph of *A. flavida* also occurs. The fruits of *T. antartica* are usually white with varying amounts of purplish flecks over them. *P. tetrapetala* fruits are very different from those of the other species because they stay green when ripe; the easiest way to tell if these are ripe is to look for a darker green ring of colour around the top of the fruit.

The fruit should come away easily from its stalk on the branch as well. There is no point picking fruits prematurely because if the fruit is not properly ripe it will be difficult to remove from its fruit skin and is less likely to germinate. Another useful way of telling if the fruits have started to ripen is to look for frugivorous birds visiting the mistletoe plant, such as tui, bellbirds, silvereyes and New Zealand pigeons (Ladley & Kelly 1996).

# Selection of planting site

Once harvested the fruits should be planted as soon as possible. Although seed can be stored in a paper bag in the fridge for several days before being planted, it does appear that their viability decreases quite quickly with time so it is best to plant them as soon as possible. Our research on mistletoe-host relations shows that mistletoes establish best on the same host species they were collected from, and even within the same host species, they appear to establish best on host plants of the same provenance (source geographic region) as the host plant the mistletoe seed was collected from. This dependence on particular host species appears to be most important for the three beech mistletoes. A. flavida and P. tetrapetala are usually found growing on Nothofagus solandri trees, and P. colensoi on Nothofagus menziesii; while I. micranthus and T. antarctica are more eclectic in their range of host plant species, including a number of introduced ornamental trees and shrubs as well as native species. T. antarctica seems to do particularly well on tree lucerne (Chamaecytisus palmensis). A list of the known native and introduced host species was published in this Newsletter by de Lange et al. (1996) and is updated in de Lange & Norton (1997).

When choosing potential host plant look for appropriate planting sites. We have found that the highest success rate for establishment was obtained from planting seeds onto reasonably thin (between 3 to 5 mm thick) branches that have a thin bark layer that appeared to be actively growing. Other criteria for suitable sites include security of the site (since the mistletoes need at least 5-10 years to get large enough to reproduce); and reasonable exposure to sunlight seems to help (e.g., use the sunny side of the host, or use trees on the edge of a patch).

# Planting seeds

The seed must be removed from its fruit or it will not germinate. Gently squeeze the seed out of the fruit. If the fruit is not properly ripe it will be very hard to remove the fruit skin from around it and there will be a white milky fluid around the seed. For *I. micranthus, T. antarctica, A. flavida* and *P. colensoi* the seed will pop out the hole at the bottom where the fruit had been attached to the stalk. But for *P. tetrapetala* it is easier to gently scrape the top of the fruit away (where the darker green ring is) and then to gently squeeze the seed out the top of the fruit skin; it is very hard to get *P. tetrapetala* seeds out of the hole at the bottom. Be careful with this process as the seed is soft and relatively unprotected inside the fruit. Some overseas reports on planting mistletoe seeds recommend that you cut or scratch the host branch where you plant the seed, but New Zealand evidence so far suggests that this does not give any clear benefits (our work and that of Milne 1996).

Once the seed has been removed from its fruit skin you can see a sticky cloudy gel attached to the seed, this is the layer of viscin. Viscin is a glue like substance that helps to attach the mistletoe seed to whatever it lands on. Once dry it forms a very strong bond between the seed and the host branch. Gently smear the seed on to the branch, so that the viscin makes contact with the host branch. For the seeds of *I*.

micranthus and *T. antarctica* this is particularly easy as the viscin forms a complete layer around the entire seed. The viscin on the seeds of *A. flavida*, *P. colensoi* and *P. tetrapetala* is positioned in a ring at the base of the seed. There may also be a "tail" of viscin attached to the seed, if so it is a good idea to wrap this tail around the host branch. The seed should stay on the branch after you remove your hand. If it doesn't then reposition the seed again. It may be that the viscin is too wet and not sticking on the host branch properly yet. It may help to place the seed in the junction of a side branch, or at the base of a leaf to provide extra support. We usually attach a label (a twist tie) to the branch so that the seeds can be relocated later on.

The viscin around the seed dries in a matter of hours, but seems to be able to rehydrate if it becomes wet for several days after planting. So it is a good idea not to plant seed just prior to rain, as they have a tendency to slide off the branch and be lost. Some seeds which we planted on the upper side of branches later slid around to the underside, presumably during rain. A small proportion of seeds will fall off the branches and be lost even with the most careful planting.

If you are unable to collect the ripe fruits of the mistletoe all is not lost. By carefully looking underneath the mistletoe plant you may be able to collect freshly dispersed seeds. If they are very fresh the seed will look whitish and the viscin will not have dried. After a while the seed dries and loses the whiteness and it will look green. We have had some success at gluing dispersed seeds on to host branches. We have found that Weldwood (a water based glue similar to PVA) is the best. Superglue appeared to affect the growth of the seeds. For the seeds of *A. flavida*, *P. colensoi*, and *P. tetrapetala* place a dab of the glue at the bottom of the seed (where the viscin is) and attach to the branch.

Mistletoes are primarily water parasites and utilise much more water than their hosts. Successful establishment of mistletoes in the drier areas of New Zealand (eg., eastern Canterbury) may therefore be enhanced by ensuring that the host tree is well watered.

### The hard bit: waiting

Almost all live seeds germinate once the fruit skin is removed, but the length of time after planting to the first signs that the seeds have started to germinate varies for the different species. Seeds of *T. antarctica* start to germinate almost immediately after being planted, whereas the seeds of *A. flavida*, *I. micranthus*, *P. colensoi*, and *P. tetrapetala* take about four weeks. For seeds of *A. flavida*, *P. colensoi*, *P. tetrapetala* take about four weeks. For seeds of *A. flavida*, *P. colensoi*, *P. tetrapetala* the first sign of germination is the appearance of the green root-like hypocotyl, which emerges from the top of the seed and starts to grow towards the host branch (Fig. 1). At the tip of the hypocotyl is a swollen yellow area, the holdfast, which upon contact with the host branch glues itself to the branch and attempts to connect to the hosts water conducting cells (xylem). If successful, this forms the primary haustorium, but the process takes several months during which time there is no obvious activity. The first sign of a successful connection to the host xylem is that the hypocotyl straightens, pulling the two cotyledons out of the seed case; at this stage the seed can be said to have established (see diagram). Soon after the appearance of the cotyledons the first set of tiny (about 3-5 mm long) leaves appear (Fig. 1).



Fig. 1. (a) a germinating seed of *Peraxilla colensoi*, showing the hypocotyl growing down and attaching to the substrate. (b) A small established seedling of *P. tetrapetala* (age 10 months) showing the small leaves that are put out after establishment.

The seeds of I. micranthus and T. antarctica germinate in a slightly different manner to the other species. With L micranthus seeds the hypocotyl never emerges from within the layer of dried viscin that surrounds the seed (neither do the cotyledons). On close inspection you can sometimes see the green hypocotyl growing towards the host branch underneath the seed coat. At about the same time the first tiny leaves appear out of the seed coat, indeed this can even happen before the seed has connected with its hosts xylem. For T. antarctica after the hypocotyl has emerged from the seed coat and grown down towards the host branch the seedling starts to act very differently to the other mistletoe species. Once the connection to the hosts xylem has occurred the seedling seems to form a gall-like structure within the host branch and it is some time later that it starts to sprout leaves and branches (pers. comm. B. A. Fineran).

Most seeds will germinate for all the New Zealand species of mistletoe (up to 82% of those planted). However, virtually all will die before making a successful connection with the host plants xylem cells (less than 28% of those that germinated went on to establish in our trials; Ladley & Kelly 1996). Mortality appears to continue as the mistletoes grow. For example, for *Alepis flavida*, 91% germinated, 22% produced cotyledons, and 14% produced their first leaves, but only 2% went on to produce further leaves in the first year. Once established the young seedlings grow quite slowly, especially when compared to some tropical species of mistletoe that can be flowering 10 weeks after germinating (Room 1973). *Alepis flavida* appears to be the fastest growing of the beech mistletoes, with seedlings up to 30 mm long and with runners up to 50 mm long in the first year. In contrast after three years a *P. colensol* seedling planted onto *N. menzesii* in Nelson had grown to a length of 65 mm and had 12 small leaves, and after two years a *P. tetrapetala* seedling planted on *N. solandri* on the Canterbury University campus consisted of a main stem 130 mm long with 28 leaves. Less is known about the growth rates of *lleostylus* and *Tupeia* seedlings. However, while very little happens in the first 9-12 months after planting, growth is more rapid once good connection is made with the host xylem, and we hope that if they survive these seedlings will produce their first flowers sometime in the next three or four years.

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Jenny J. Ladley, Dave Kelly, Plant and Microbial Sciences, and David A. Norton, Conservation Research Group, School of Forestry, University of Canterbury, Private Bag 4800, Christchurch

# **BIBLIOGRAPHY/BIOGRAPHY**

# ■ Biographical Notes (27) : Thomas George Wright (? 1831–1914)

From the 1880s to the turn of the century three amateur bryologists were active in Christchurch: Robert Brown (1824–1906), a shoemaker who had come to New Zealand in 1876 and lived in Andover Street, Merivale (1); Thomas Wrench Naylor Beckett (1839–1906), an orchardist at the corner of Clyde and Ilam Roads, Fendalton, who had been a coffee planter in Ceylon and came to New Zealand in 1883 (1); and Thomas George Wright, printer and pressman, the subject of this note.

T.G. Wright was born in Surrey, England, the son of Thomas Wright, a printer, and his wife Ann (born Folo) (2). His early life was described in the "*Christchurch Press*" as follows: "He was trained originally as a compositor in the Old Country, but afterwards joined the Navy and served on the China coast during the troubles there, and also in the Crimea, where he was present at the fall of Sebastopol [Sept. 1855]. He was attached, while on the Crimean service, to the medical stores department, and in the course of his duties he was brought into contact with Florence Nightingale. Some of his most treasured possessions were orders for stores signed by Florence Nightingale, which he had carefully preserved" (3).

Wright spent the last 53 years of his life in New Zealand (2) and therefore must have arrived here in 1860 or 1861. At first he was employed as a compositor in the "*Lyttelton Times*" office, and then went to Dunedin and served on the "*Star*". On returning to Christchurch about 1870 he joined "*The Press*" as reader (3). On 3 July 1872, he was elected a member of the Philosophical Institute of Canterbury (*TNZI* 5, 1873); and on 31 January 1879, at age 45 [sic] he married Emily Reader at St Barnabas Church, Fendalton (2,4).

Our further knowledge of T.G. Wright comes from the 10 letters that he wrote to T.W.N. Beckett between June 1887 and July 1895. When Beckett settled down in Christchurch he wrote to various New Zealand botanists, including Wright, asking for information on the state of bryology in the Colony, and offering to exchange mosses (1). Beckett kept all the replies, and indeed all his botanical correspondence, local and overseas. This invaluable collection was originally presented to the Canterbury Museum, but is now held at CHR. From it I reproduce Wright's first letter to Beckett, which tells us much about the botanical scene in the 1880s.

	Gloucester Street East
Answered 23 June 1887	Linwood
	June 14, 1887

# Dear Sir

I have to acknowledge the receipt of your favr of the 10th, and its enclosures, for which I am much obliged. I am afraid that you will find me only a very indifferent bryologist, although I certainly possess a tolerably large collection of mosses, specimens good, bad and indifferent, raked up from all parts of N.Z. The point of identifying species to which you refer, is one which you will find crop up as soon as you set to work. There are but half a dozen books, as far as I know, which will help you - the Handbook N.Z. Flora, the three southern floras, the Musci Exotici, and a few scattered notices in the N.Z. Transactions. Of the mosses described in the Musci Exotici there can be but little doubt, the elder Hooker did his work well. In the others, especially the Handbook, there appears to have been too great a tendency to jump at the conclusion that our mosses are identical with European species. I believe (you must take my belief only for what it is worth) that in many points they differ. But to settle this requires a good series of European specimens <u>authenticated</u>. This I do not possess. At all events you will very soon find mosses which do not agree with any described in the works I have named. What is wanted for this country is a really good work on mosses (like Braithwaite's) but it would be an undertaking involving much labour, and would be a pecuniary loss, as its circulation would be mainly confined to presentation copies. As for localities, you will not find the plains guite as barren as you think. You will find some mosses in the ti hee scrub on the beach and in the old riverbeds. Our more secluded roadsides furnish us with a few, and Hagley Park by close search will contribute something. I have an Encalypta from under a tree in the Park that I have never been able to identify, or ever again able to find. Your best and nearest hunting ground you will find along the seaward side of the Port Hills near the summit. You will find many curious mosses up there, among them some Andreaes, there used at one time to be a good sprinkling of ferns, but fires and jobbing gardeners have nearly exterminated them - fortunately mosses are not saleable or they would have gone also. The bushes on Banks Peninsula will be found well worth working. Oxford Bush is rich in mosses but cannot be visited in one day with any satisfaction, it is too far off. If you have the requisite leisure, Mount Torlesse is very rich in mosses, especially high up. But the ranges are as yet unexplored, so far as the cryptogams are concerned.

With this I enclose half a dozen specimens –in the rough – as I generally keep mine. I shall have great pleasure in submitting all my collection for your inspection at an early date. At this moment my house is filled with great trouble – an impending death in my family – so I will write you again by-and-bye. Meantime, if I can in my small way assist you in your pursuit, please write again. If you get into conversation with the younger Armstrong of the Government gardens you will find he is well up on the subject. There is but one other person that I know in Christchurch who takes any interest in bryology – and he is an old shoemaker – who I really believe knows more about them than anyone else here in N.Z. unless it be Colenso. I will, with your consent, take an opportunity shortly of introducing you to him, when you willfind, if you will listen to him, he will "talk moss" for hours.

In the meantime D<sup>r</sup> Sir

I remain yours very ob<sup>dtly</sup> Thos Geo Wright

T. Naylor Beckett, Esq.

In his second letter to Beckett (received 11 August 1887) Wright encloses 23 packets of mosses. He writes: "I have been collecting and examining cryptogams in New Zealand for more than about 15 years, and I cannot yet determine in many cases what is a species and what not – that is quite independent of their names. I have a large collection of lichens, which are almost untouched by me, as I must confess myself fairly beaten. Any person who has a good collection of Parmelias, Stictas, Lecanoras, and Lecideas will, I think, corroborate what I say". He asks Beckett to address or leave any communications at the counter of the "*Press*" office, Cashel Street, "Because this part of Linwood is about the ultima thule of civilisation going eastward, and communication by post not too certain".

By March 1892, Wright's house at Linwood has received a number (172 under the old system). On the 11th he sends detailed comments to Beckett on 5 mosses, and it is clear that he also makes detailed drawings. He also sends "a few Coast mosses – from the neighbourhood of Greymouth – collected by Mr W.J. Gulliver, the prince of moss collectors – moss collectors like poets are born so – not made". He also asks to be excused "for the way in which I put my spec. up, but I have really very little time to devote to them".

On 25 July 1892, Wright wrote to Beckett: "Do you think it is yet possible to set up a "Synopsis of New Zealand Mosses" on the lines of Hobkirk. I spoke about it to Brown the other day, but he is not of opinion that it is possible. It would not be a very costly work nor possibly a very correct one, but unless someone makes a beginning it will never be done. I suggest that you should do it. Let me know some day what you think of it". Beckett does not seem to have understood Wright's suggestion (Letter of Sept. 10, 1892).

From Wright's letter to Beckett on 19 December 1892, it appears that Robert Brown and Beckett have fallen out. "The same plant being twice described and under different names". This led Wright to recall that he "was some years ago a member of the Phil. Inst. and had an intention of publishing some of these mosses myself. I have a large number (20 or 30) carefully drawn and described, only waiting to be named but felt so afraid of re-publishing as a new species that which had been before described that I threw my drawings aside and totally relinquished the undertaking. I shall certainly never now do any of that sort of work, so if you happen to find anything fresh among Gulliver's mosses you are quite welcome to them".

The disagreement between Brown and Beckett probably explains the following statement in Brown's first moss paper (*TNZI* 25, 1893). "I am with reluctance approaching this subject prematurely, much remaining yet to do, but from circumstances which have recently transpired I am forced to do so in order to protect my own rights; for, acting on the suggestion of the late Sir Julian von Haast, I presented nearly all my specimens and camera-lucida drawings to the Christchurch Museum, where they remain for anyone to describe who may think for to rob me of my hard-earned rights".

In 1893 Beckett proposed a "Cryptogamic Club" to Wright who replied on 10 July : "Your idea is a very good one. But we are too few in number. The only practicable thing is to borrow an idea from the Mutual Improvement Association and have a M.S.S. Journal to circulate among the half-dozen scattered over New Zealand who take any interest in so obscure a study. Would it be quite safe to get all the Cryptogamists together in one room?"

T.G. Wright retired from "*The Press*" in 1910 after "discharging his duties faithfully and well for a long span, covering nearly forty years" (3). And "*The Press*" continued: "He was an ardent horticulturist, and for many years contributed the Garden Notes to the "*Weekly Press*". He possessed a valuable collection of ferns and rare plants at his residence in Linwood, and his sole hobby was his garden".

Thomas George Wright, an acute observer of mosses, as his letters show, died on 2 June 1914, at age 83 and was buried in the Avonside Cemetery (2). His grave appears unmarked.

# Eponymy

1893 Andreaea wrightii "Dedicated to Mr Thomas George Wright, of Christchurch, an earnest cryptogamic botanist". R. Brown ter. *TNZI* 25: 279.

1894 Pottia wrightii. R. Brown ter. TNZI 26: 291.

1895 Grimmia (Schistidium) wrightii. R. Brown ter. TNZI 27: 413

### Acknowledgements

I am grateful to Dr Allan Fife (CHR) for allowing me to use the Beckett correspondence.

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(1) E.J. Godley, 1967 A century of botany in Canterbury TRSNZ (General 1); (2) Death certificate; (3) Obituary. Mr Thomas G. Wright. The Press 3 June 1914; (4) Church records, Canterbury Public Library.

E.J. Godley, Research Associate, Landcare Research, P O Box 69 Lincoln

# A significant addition to the collection of Leonard Cockayne's correspondence

Through the generosity of Mr Rolf E. Du Rietz of the Centre for Bibliographical Studies, Uppsala, Sweden I have recently received a collection of photocopies of the holograph letters from Cockayne to Rolf's father, Professor G. Einar Du Rietz (1895-1967). It is a notable collection and especially significant as an example of Cockayne's correspondence during his later years. The correspondence also relates to Professor and Mrs Du Rietz' visit to New Zealand in 1927.

The collection includes 26 letters written between 28 April 1925 and 23 April 1934, a few months before Cockayne's death on 8 July 1934. The latter letter was written by an amanuensis (Beddie) but signed by Cockayne and refers to the autobiographical book he had commenced writing "Random Recollections of a New Zealand Botanist". I referred to this MS on p.13 of my 1983 book (1). It was commenced at a difficult time for Cockayne - he was blind and Mrs Maude Cockayne was seriously ill; she died after Leonard on 24 December 1934. Despite all his problems, Cockayne took pleasure at commencing work on his autobiography (though not completed) and in his letter of 23 April 1934 to Professor Du Rietz he wrote,

"The last ten months have been to me a time of extreme trial and despondency, for my dear wife was suddenly stricken down at the end of June and has been in a most serious position ever since - in fact real recovery is hopeless. Still, she is alive and, at times full of brightness and pleasant memories. For example, she well remembers Greta [Mrs Greta Du Rietz] bringing her farewell gift of anemones in a little vase. It is also splendid that she does not know she is desperately ill, but expects, that each succeeding day will see her hale and hearty, or reading aloud to me, or taking me into the town, or crossing crowded streets.

As for me unable to read or to write but a few consecutive words, and having hardly anyone coming to see me who is interested in those branches of knowledge which interest me, my life has been exceedingly monotonous and lonely, but I try to keep the botanical flag flying. For months life was a most gloomy thing but, with the aid of some kind friends, I have changed all that and am not without my pleasures - In fact, I am trying to write a book entitled <u>Random Recollections of a New Zealand Botanist</u> and am doing this mostly by dictation - Beddie comes frequently and gives a hand, but also I have managed to write a page or two, and this latter method kills time better than most things".

The collection of letters also includes copies of 12 typescript letters from Professor Du Rietz to Cockayne from 9 February 1925 to 19 January 1934. Also included with the letters is a copy of Cockayne's MS "List of Species in Bealey Valley, Arthur's Pass and its Vicinity" (21pp.) and includes a record of hybrid swarms.

The letters provide data on Cockayne's election as an Honorary Member of the Swedish Phytogeographical Society. Unfortunately this honour was omitted from my catalogue of the honours awarded to Cockayne (1, p.47). Rolf Du Rietz in his letter of 7 August 1997 writes,

"...my father [Professor G.E. Du Rietz], immediately upon having returned to Uppsala in 1928 used the first opportunity to have Cockayne elected an honorary member of the Swedish Phytogeographical Society. I have enclosed a photocopy of his eloquent formal motivation (in Swedish) of this election".

Mr Du Rietz kindly included with the correspondence a copy of his 1995 book "Swansea: Swedish printed books and articles relating to Australia, New Zealand, New Guinea, Hawaii, and the Pacific Ocean with its islands. An open-ended bibliographical inventory" published by Dahlia Books, Uppsala. The section of this series sent by Mr Du Rietz was Series A Part 1 (1731-1850). The other series in "Swansea" are Series B (1851-1900), Series C (1901-1945), Series D (1946-1975), and Series E (1976-2000).

# Acknowledgement

I acknowledge the kind generosity of Mr Rolf E Du Rietz of Uppsala extending over many years.

Reference

1. Thomson, A.D. 1983: "The Life and Correspondence of Leonard Cockayne". Christchurch, Caxton Press. 55pp.

A.D. Thomson, Centre for Studies on New Zealand Science History, 5 Karitane Drive, Christchurch 2

# Publication Announcement

A catalogue of the eucalypts (ISBN 0-473-04 016-6. 1997. 114 pages, 8 photographs)

This book, compiled by Dr Mike Wilcox, an international forestry consultant and eucalypt specialist, is a new, authoritative, up-to-date guide of all 789 currently recognised eucalypt (*Angophora*, *Corymbia*, *Eucalyptus*) species, many of them newly described or re-named over the last five years. It is an indispensible reference for foresters, farmers, arborists, botanists, nurserymen, and students to correct names and classification of the species, and also includes notes on distributions, and a bibliography.

The book is available from Groome Poyry Ltd, Forest and Forest Industry Consultants, PO Box 73-141, Auckland International Airport, Auckland, New Zealand. Fax (09) 256 0000. Price \$27.95 including GST and postage. Overseas orders: Fax +64 9 256 0000, US\$20.00 or \$A25.00 incl. postage. Payment by money order or cheque, with order.

# Editors

# New Zealand's loranthaceous mistletoes

The large, leafy loranthaceous mistletoes of New Zealand are on the decline. Despite their former abundance, unusual lifestyle and often showy flowers, very little is known about their biology. During July 1995 the Threatened Species Unit of the Department of Conservation hosted a workshop to review the extent of knowledge regarding these attractive plants and debate their conservation. Papers covering their taxonomy, historical and current distribution, host specificity, reproductive biology, threats and interim conservation measures were presented. The majority of these papers have been compiled within a proceedings which is now available from Science Publications, Department of Conservation, P O Box 10-420, Wellington. Price \$20.00 (incl. GST) + \$3.00 postage & packaging within New Zealand.

Science Publication, Department of Conservation, P O Box 10420, Wellington

# Vegetative key

The third edition (1997) of Jack Rattenbury's *Vegetative Key to New Zealand genera of trees and shrubs growing naturally in northern New Zealand*, Auckland Bot. Soc. *Bulletin* 25, is available from me for \$3.00 + postage and packaging.

Juliet Richmond, 118 Market Road, Epsom, Auckland

# DESIDERATA

# Request for material of Coprosma

I am currently revising the New Zealand members of *Coprosma* and would be very glad to receive material for identification, preferable with flowers or fruit. Field notes should include observations on whether plants are prostrate or erect and the colour of any fruit. Because leaf size and shape are so variable, small pieces are often harder to identify than larger samples; it is usually best to collect pieces the size of a herbarium sheet.

Michael Heads, Department of Conservation, PO Box 842, Whangarei

# LETTER

# ■ West Coast Forest Campaign

# Dear Editors

People are still protesting in the Charleston Forest after seven months of intense campaigning to put an end to the logging of native rainforests on the West Coast. Timberlands West Coast (supported by its Minister, Jenny Shipley, and two PR companies) has been fighting aggressively to maintain native logging despite an Appeal Court ruling in June stating that the West Coast Accord obligations have been fulfilled.

The forests at stake include those surrounding the Paparoa National Park (e.g. Charleston), the beautiful beech forests of Maruia Valley and Victoria Range and the rich forests surrounding Okarito Lagoon in South Westland.

A government decision is expected sometime in the coming weeks. Native Forest Action (NFA), together with Forest and Bird is urging the government to protect all remaining publicly-owned native forests. A recent poll showed 3-to-1 New Zealanders want all logging of public forests on the West Coast stopped.

Timberlands have tried to sell their campaign as one of "sustainable management" but is it is based on an attempt to gain a sustainable yield. A move which will ultimately have a destructive effect on the forests' biological diversity and structure.

We are looking for the support of botanists and other related fields to help us debunk Timberlands' campaign. To help us put an end to Timberlands' logging, Native Forest Action is asking you to write letters to the editor and to members of parliament (particularly Bolger, L & N Smith, Peters, Shipley and Upton). For more information including how you can further help us or to send a donation, post to NFA, P O Box 11964, Wellington, Phone (04) 384 8301 or (04) 384 5074.

If you have got any questions give me a ring at (04) 476 3520. If you need to send a fax, you will need to ring through first as I will need to set up the computer.

Many thanks

Angus Macdonald

Acknowledgement: Thanks to Anna Clarkson, Manaaki Whenua - Landcare Research, Hamilton who typed the text, and to Antoinette Nielsen and Ewen Cameron who produced the camera-ready copy for the printer.

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