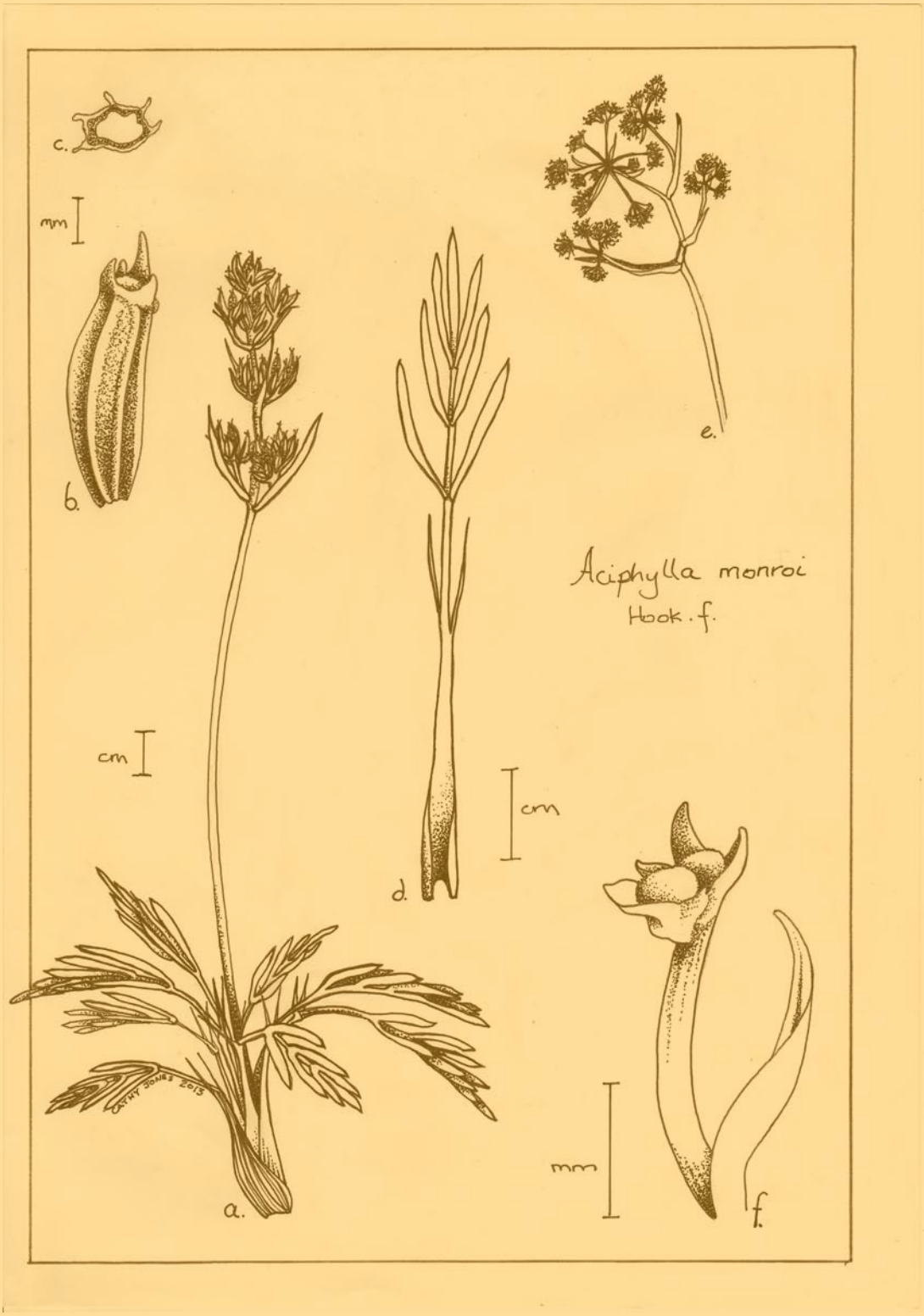
NEW ZEALAND BOTANICAL SOCIETY

NEWSLETTER

NUMBER 111 March 2013



New Zealand Botanical Society

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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 each year for that calendar year. Existing subscribers are sent an invoice with the December *Newsletter* for the next years 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 June 2013 issue is 25 May 2013.

Please post contributions to:
Lara Shepherd
Museum of New Zealand Te Papa Tongarewa
169 Tory St
Wellington 6021

Send email contributions to editor@nzbotanicalsociety.org.nz. Files are preferably in MS Word, as an open text document (Open Office document with suffix ".odt") or saved as RTF or ASCII. Macintosh files can also be accepted. Graphics can be sent as TIF JPG, or BMP files; please do not embed images into documents. Alternatively photos or line drawings can be posted and will be returned if required. Drawings and photos make an article more readable so please include them if possible.

Cover Illustration

Aciphylla monroi, drawn by Cathy Jones from a specimen collected on Altimarlock, Black Birch Range in the Awatere Valley, South Marlborough on 8 February 2013. a.female plant in seed, b.mericarp, c.cross section of mericarp, d.leaf, e.male umbel, f.male floret.

NEW ZEALAND BOTANICAL SOCIETY

N E W S L E T T E R

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Regional Botanical Society News

- **Auckland Botanical Society**

Christmas picnic
A sunny picnic in the grounds of the Auckland Botanical Gardens began our end-of-year function. This was followed by a short workshop, by Mike Wilcox and Terry Hatch, on the family Restionaceae, with New Zealand and exotic examples. A tour then took place around the Gondwana Arboretum and African Garden, where Terry pointed out the restiads growing there. Afternoon tea completed the outing.

Anniversary Weekend camp
The long drive from Auckland to Waikaremoana was well worth the effort for the 36 people who attended Camp Kaitawa on Lake Wherowhero. Three full days of botanising familiarised all with the diverse forest types present. Visits were to Lake Waikareiti, the Panekiri Bluff, Onepoto Caves, Ngamoko Track and two rather ephemeral lakes that provided many surprises in the turfs where the water levels were falling for the summer.

February Field Trip
The beach and headland of Te Muri have long been part of the Mahurangi West Regional Park. The adjoining farm has recently been purchased to add to the park, but is still closed to the public. ABS managed to get permission to explore part of this new area. The morning was spent in a large area of kauri/hard beech forest which is just beginning to recover from years of grazing. It was sad to see that the fence has obviously been breeched by cattle in recent times, but as it is early days in the Auckland Council's ownership, this will certainly be rectified in the future. The afternoon was spent following the stream towards the coast, and again the degraded state of the margins will bounce back when fenced. The highlight of the day was a good population of the Nationally Declining fern, *Thelypteris confluens*, and the lowlight was discovering *Clematis vitalba* in a gully in the forest.

Forthcoming Activities

6 March	AGM. Lepidium, speaker, Lucy Cranwell recipient, Esther Dale
16 March	Tapapakanga Regional Park
3 April	Flora of South Australia, Mike Wilcox
20 April	Shakespear Regional Park

Auckland Botanical Society, PO Box 26391, Epsom, Auckland 1344
President: Mike Wilcox **Secretary**: Kristy Hall aucklandbotanicalsociety@gmail.com

- **Rotorua Botanical Society**

November Field Trip: Waewaetutuki wetland

A select group of five headed out into showers to investigate a large area of willow carr, sedgelands, raupo and salt marsh on Maori land at the head of Little Waihi estuary. The area was unfenced and grazed around the margins but broken into large blocks by a network of drains (some long overgrown) and three causeways. We chose to start in the middle block where we were soon in dense *Carex secta* and *C. vulpinoidea* and began traversing the margins of ponds with patches of raupo and *Machaerina articulata* containing a mat of *Paspalum distichum, Ranunculus flammula* and grazed pasture. The areas of grey willow largely excluded stock and contained more native species including *Coprosma propinqua* and masses of *C. sinclairii*, *C. maorica* and the odd *C. fascicularis*. We crossed into the lowest block and found a maimai for lunch.

Then followed a brief (accidental?) local circuit where we stumbled on a lovely lot of *Cylclosorus interruptus* amongst pampas and *Muehlenbeckia complexa*, partly shaded by the willow. Our next piece of excitement occurred after several traverses of area of raupo and *Bolboschoenus fluitans*

and *B. medianus* and a push through coastal ribbonwood out on to a grazed saltpan where *Thyridia repens* was in brilliant flower amongst *Cotula coronopifolia*.

At this point we decided to cross to one of the areas of willow forest bounded by wide ditches. Very soon Sarah located a patch of *Pterostylis micromega* in bud and then we found good flowers. In an area c. 20 m x 20m we located over 70 plants, about a third in flower or bud. Disappointingly we found *Osmunda regalis* scattered sparsely in the same area. We gave up counting *P. micromega* at 200 plants and decided to test our luck in the adjacent blocks, soon locating groups of up to 30 plants in each block. The block furthest from the shore had much taller willow forest and weeds such as ginger, arum lily and water figwort but many more native species, especially ferns such as *Dicksonia squarrosa, Pteris tremula,* silver fern and mamaku.

FUTURE EVENTS

10 March	Galaxy Rd North Wetland (Combined with Waikato Botanical Society)
7 April	Crater Block, Rerewhakaaitu
12 May	Tarawera Trail to Hot Water Beach
9 June	Papamoa Hills Regional Park

President*:* Paul Cashmore (07) 348 4421 pcashmore@doc.govt.nz **Secretary:** Sara Crump

- **Taranaki Botany Group**

We would be delighted to welcome any visiting botanists, so please get in touch if you want to join us. Leaders are the co-convenors of the group, contact details at the end.

December 2012: Ahukawakawa Swamp.
Some of the group made it to the Swamp and enjoyed seeing *Melicytus drucei* growing happily outside the exclosure plots (as well as inside them) in a mixed shrubland including *Olearia quinquevulnera, Coprosma decurva* and *Aristotelia fruticosa.* Other group members botanised the Pouakai plateau. Plants of interest on the Mangorei Track on the way up included *Hymenophyllum malingii* growing on kaikawaka and *Cyathea colensoi*.

February 2013: Moumahaki Lakes & Catchment KNE near Waverley
Trip is postponed until 9th June

FUTURE EVENTS

1 March	East Taranaki Environmental Trust, Purangi. Has one of the southernmost stands of hard beech (*Nothofagus truncata*) in the North Taranaki Ecological District. It also contains a good example of the Urenui Siltstone steeplands and associated dry ridge forest type, in marked contrast to the adjacent beech forest ridges.
7 April	Upper Kahui Rd. An excellent example of young regenerating swamp maire. It is a low intensity grazing block that is gradually reverting to swamp maire forest.
2 May	Denbeigh Rd, Midhurst. Regenerating wetland forest, with low intensity grazing. There are strong populations of green mistletoe (*Ileostylus micranthus)* on this site which should be in fruit.
9 June	Moumahaki Lakes & Catchment KNE near Waverley. *Olearia townsonii* is near its southern limit here.

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Janica Amoore 06 7520830. Email: waiongona@clear.co.nz

- **Nelson Botanical Society**

November Field Trip: Editor Hill Track from the Tennyson Inlet road.
Ten of us set out from the Oupouri Saddle carpark on a beautiful, but chilly morning. After going into the bush next to a gloriously flowering *Olearia rani,* the track took us uphill. Our attention was taken early on by a sapling of *Raukaua edgerleyi.* The next plant to catch our interest was *Earina mucronata*, high in a tree and then non-flowering plants of *Earina autumnalis*, and a little further up

the hill, *Winika cunninghamii.* Lower on the slope there were large red and silver beech trees, while hard beech and, finally, mountain beech came in higher up. Southern rata trees were very common and Hall's totara occurred throughout as did kamahi. There were many *Astelia* plants which caused discussion. The smaller ones were *Astelia solandri* even though the leaves could be easily ripped across, which is not true of most astelias. Later we found larger plants which were *Astelia fragrans* with strong ribs which prevented the leaves from being torn. A range of coprosmas grew in the understory: *Coprosma grandifolia, C. robusta, C. lucida, C. rhamnoides, C. microcarpa,* and *C. colensoi.* Highlights were finding *Libertia micrantha* in flower and seeing many lovely specimens of *Chionochloa cheesemanii,* the graceful tussock which grows under forest. Filmy ferns found were: *Hymenophyllum demissum, H. bivalve, H. multifidum, H. villosum* and *Trichomanes reniforme*. *Tmesipteris tannensis* and *T. elongata* provided the usual lesson on sporangia shapes. Several blechnums were seen, as well as *Microsorum pustulatum, Pyrrosia eleagnifolia* and *Rumohra adiantiformis.* Most of the party climbed to the ridge-top from where they enjoyed a wonderful view over the Sounds to D'Urville Island before getting caught in a hailstorm and heavy shower and heading back to the cars.

<u>December Camp, Cobb Valley</u>

Day 1, Lake Sylvester

Eight of us stayed at one of the DOC houses at the Cobb Dam, and another two joined us for the day. It was fine and warm with little wind, ideal for botanising on the tops. The road at the start was lined with *Bulbinella hookeri* which was late, and not flowering in its usual abundance. We found *Pittosporum anomalum* in flower and *Olearia arborescens* was beautiful with lovely clouds of white flowers. *Pterostylis oliveri, P. australis* and *P. irsoniana* were also in flower, along with a tiny percentage of the *Nematoceras longipetala* plants in the ditches. On the first flat area above the bushline Sally found jelly bean plant (*Astelia linearis*) with flowers. Many plants of the sundew, *Drosera arcturi* and the orchid *Stegostyla lyallii* were also in flower. Lunch at the hut gave us an amazing vista of the surrounding mountains, with views all the way to Mt Taranaki. The areas above the track to Lake Sylvester yielded some interesting plants in flower – a penwiper (*Nothothlaspi australis*), a little eyebright (*Euphrasia cheesemanii*) and *Celmisia monroi*. There were *Ranunculus insignis* and *R. verticillatus* in flower, allowing us to see differences (former bright yellow with 5 petals, latter paler yellow with 10+ petals). On the stony ridge between Lake Sylvester and Little Lake Sylvester, there were a few plants of *Myosotis drucei* in flower.

Day 2, Alpine garden and magnesite area

Eight of us had a wonderful forage in the alpine garden on the western side of the Cobb Dam. Right at the entrance *Clematis forsteri* was in full bloom and just a few metres on, mature specimens of *Olearia arborescens* and *Gaultheria rupestris* stood adjacent to each other resplendent in their white flowers – a truly magnificent sight. Our next 'finds' were *Pittosporum dallii, Traversia baccharoides* and then a spectacular *Pseudopanax linearis* which stood alongside *Pseudopanax crassifolius* making quite a contrast. There were several specimens of *Celmisia spectabilis* and *C. monroi, Corokia cotoneaster* in flower and *Huperzia australiana*. As we entered beech forest there were several *Pittosporum patulum,* protected from possum browse by shiny collars and animal control. There were many other species and we were full of admiration for the vision of the people who planted this area about 20 years ago. Later we drove along the western side of the Cobb River to find a *Myosotis,* recently named *M. chaffeyorum,* sprawling under a large rock, and then continued on to the quarry where there was not much to be found initially……but after a scrabble up the side of the quarry face we were rewarded with beautiful flowering specimens of *Notothlaspi australis, Myosotis brockiei* and *Prasophyllum colensoi* which thrilled us all. We lunched in the shade and then wandered into lovely bush, where we saw a mature pokaka and seedlings.

<u>January Field Trip: Inwoods Lookout</u>

Thirteen people went on this field trip to Inwood's Lookout on a perfect day. A small group made a plant list over the first part of the track finding some lovely grasses: *Hierochloe redolens, Poa imbecilla* and *Anthosachne solandri*, plus one orange-stamened flower on a bristle tussock (*Rytidosperma setifolium*). *Gentianella tenuifolia* was common along the trackside in beech forest and clearings but not quite in flower yet. The main group botanised a little through the beech forest, seeing *Clematis forsteri* beautifully covered in fluffy seed heads, *Nematoceras trilobum* in seed, *Petalochilus nothofageti, Gastrodia cunninghamii* and *Microtis unifolia* all in flower. Up in the alpine area we saw a good variety of plants including *Ophioglossum coriaceum, Brachyglottis lagopus, Coprosma tayloriae, Melicytus alpinus,* and *Pimelea prostrata* subsp. *prostrata.* Further up we saw *Raoulia subsericea,* and *Viola cunninghamii*, then *Gentianella corymbifera* subsp*. corymbifera,* and

G. bellidifolia in flower. After lunch we re-joined Cathy's subgroup and learnt how to differentiate between *Geranium* aff. *microphyllum* and *G. brevicaule,* both of which were in flower and the characteristics of *Lagenifera strangulata, L. pumila* and *L. pinnatifida*.

FUTURE EVENTS
Field trips:
March 17 Whispering Falls and Chrome Mine. Leader: Susan Cook 03 544 6175.
March 28-April 1. Easter Camp at Collingwood, Golden Bay. Leader: Shannel Courtney 03 5469922
April 21 Otuwhero Wetland. Leader: Helen Lindsay 035284020
May 19 Archer Track, Penzance towards Elaine Bay. Leader Sally Warren 03 5466637

Meetings:
April 29 Annual Potluck Dinner, AGM, Arthurs Pass photos by Cathy Jones & Don Pittham
May 20 Workshop on Filmy Ferns. Leader: Shannel Courtney

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Botanical Society of Otago
Chairman: David Lyttle djlyttle@ihug.co.nz http://www.botany.otago.ac.nz/bso/
Secretary: Allison Knight, P O Box 6214, Dunedin North.

ANNOUNCEMENTS

- **2013 John Child Bryophyte and Lichen Workshop - Preliminary notice**

The 2013 workshop is to be based in Ohakune from Friday 22 November (arrival day) through to Tuesday 26 November (i.e. departing on the morning of Wednesday 27). Backpacker accommodation will be in the Station Lodge, Ohakune. Other accommodation is also available.

To receive further information as arrangements are determined contact Graham Pritchard at g.pritchard@inspire.net.nz

NOTES AND REPORTS

- ***Azolla rubra* revisited**

Pat Brownsey and **Leon Perrie**, Museum of New Zealand Te Papa Tongarewa, P.O. Box 467, Wellington 6140, patb@tepapa.govt.nz

Azolla rubra was described from Australia by Robert Brown (1810) and first recorded from New Zealand by Hooker (1855). The name was accepted by all later New Zealand Flora writers (Hooker 1867; Cheeseman 1906, 1923; Allan 1961).

The traditional view of *A. rubra* as a species indigenous to Australia and New Zealand was challenged in a review of the New World species of *Azolla* by Svenson (1944). He found that the minor morphological characters distinguishing *A. rubra* were also present scattered through the range of variation of *A. filiculoides* in North and South America. As a result, *Azolla rubra* was reduced to synonymy with *A. filiculoides* Lam. in several Australian State Floras and Censuses (e.g. Wakefield 1957; Smith 1966; Willis 1970; Chinnock 1978). The name *A. filiculoides* was adopted for the plant in New Zealand by Brownsey et al. (1985), and in Australia by Chinnock (1998).

Meanwhile, Saunders & Fowler (1993) accepted both species within their Section *Azolla*, albeit without providing any distinguishing characters for them. However, in a detailed investigation of the genus, Reid et al. (2006) showed that *A. filiculoides* and *A. rubra* can be distinguished on both morphological characters and molecular differences. The morphological differences include characters of stem vasculature, perispore structure, and the presence/absence of a filosum on the megaspore collar. Metzgar et al. (2007) confirmed that the two are closely related sister taxa which are themselves sister to a clade containing the remaining American species, *A. caroliniana*, *A. mexicana* and *A. microphylla.* The name *A. rubra* is therefore reinstated here as a species native to Australia and New Zealand, and sister to the North American *A. filiculoides.*

A further suggestion was made by Reid et al. (2006, Fig. 1) that *A. filiculoides sens. str.* had been introduced to New Zealand. However we know of no evidence to support this possibility.

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- ***Piptochaetium depressum* (Chilean rice grass) – a new naturalised stipoid grass in New Zealand**

Kerry Ford, Landcare Research, PO Box 40, Lincoln, 7640, New Zealand & **Carolyn Lusk,** AgResearch Limited, Lincoln, Private Bag 4749, Christchurch 8140, New Zealand

A new grass introduction to New Zealand has recently been found on a sheep runhold at Camp Bay in Lyttelton Harbour on Banks Peninsula (-43.623S 172.785E; Figure 1). AgResearch staff discovered a population of the then unknown grass in November 2011 while carrying out a survey of species around a nassella tussock infestation. The grass was found patchily distributed in a mixed improved pasture containing both native and exotic grass and legume species. The infestation is currently known to be spread within about 3 ha from sea level to approximately 80 m a.s.l. on a dry, north facing slope that is prone to erosion (Figure 2). A further survey is proposed (by Environment Canterbury) to determine if the infestation has spread beyond this area and the plant's grazing value is being determined by AgResearch. It is not known how it came to be there although the landowner recalls having first seen it after an extensive grass fire at the location about 5 years ago. A provisional identification was made at the Allan Herbarium, Landcare Research, and then a specimen was sent to Carol Hernández at the University of Concepción, Concepción, Chile for further inspection. The specimen was confirmed as *Piptochaetium depressum* a species endemic to Chile.

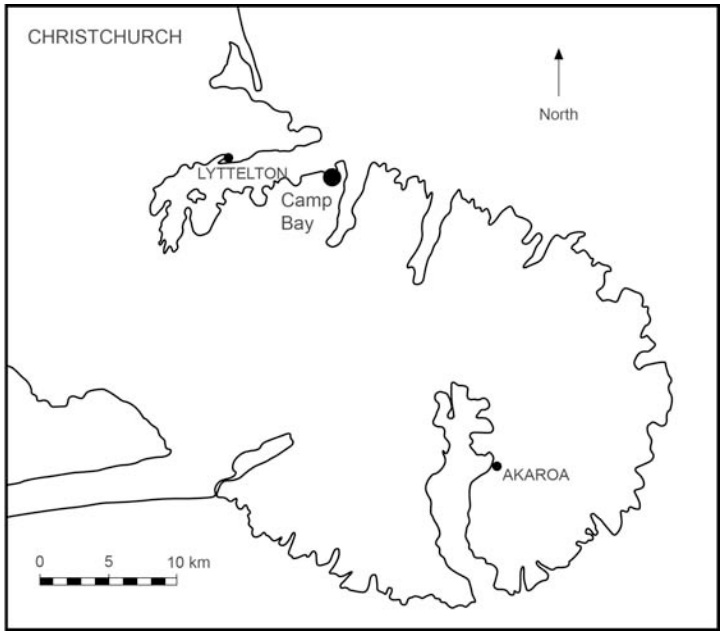

Figure 1. ● Locality of *Piptochaetium depressum* at Camp Bay, Banks Peninsula.

Piptochaetium depressum (Steudel) C.Peña has been recently described by Hernández et al. (2008). Plants included in this taxon were previously treated by Ciadella (1998) within a wider circumscription of *P. montevidense*, a species found in Bolivia, Brazil, Paraguay, Uruguay and Argentina, commonly known as 'Uruguayan rice grass'. Hernández et al. (2008) distinguishes *P. depressum* from *P. montevidense* by characters of the lemma and caryopsis.

In Chile *Piptochaetium depressum* is distributed between latitudes 31° 35'S and 40° 36'S, growing from near sea level to about 1500m, but most common in the coastal zone and central valleys and recorded as poorly represented in the Andes (Hernandez et al 2008).

This is the first record of a species from this genus in New Zealand, and adds to the seven genera and 19 species of the Tribe Stipeae present here, of which 16 are naturalised introductions from mostly Australia or South America (1 species from Eurasia). This new species is the fifth naturalised from South America, the others are three species of *Nassella—N. neesiana, N. tenuissima*, *N. trichotoma*, and one species of *Amelichloa—A. caudata* (Edgar & Connor 2010, previously *Achnatherum caudatum* Edgar & Connor 2000). The three South American species of *Nassella* are all considered a biosecurity threat in New Zealand: they appear on the NPPA list (National Plant

Figure 2. *Piptochaetium depressum* at Camp Bay, Banks Peninsula: **Left**, habit, November 2011 (photo C. Lusk, AgResearch) **Right**, early spring growth August 2012 (photo K. Ford © Landcare Research).

Pest Accord list; species banned from sale and distribution in New Zealand, http://www.biosecurity.govt.nz/pests/surv-mgmt/mgmt/prog/nppa/list), the Department of Conservation's consolidated list of environmental weeds (Howell 2008) and on the Regional Pest Management Strategies of affected regions.

Piptochaetium is a genus of 36 species found mostly in South America, from southern Chile and Argentina, northwards and reaching into the United States of America (Hernandez et al. 2008, Cialdella & Arriaga 1998). Its species are perennial caespitose grasses, found in temperate and cold-temperate grasslands.

Description of *Piptochaetium depressum* (based on New Zealand material)

A fine-leaved caespitose perennial about 15 to 60 cm high (including the flowering stem). The ligule is 1.0–1.8 mm long, membranous with a blunt apex and faintly scabrid on the abaxial side (Figure 3A). The base of the leaf-blade is pulvinate and white (this is less obvious as the leaf dries out). The leaf-blades are 0.4–0.6 mm wide and convolute with hispid hairs and minutely scabrid on both sides of the leaf and the margins. The inflorescence is a spike-like contracted panicle 3.9 to 7 cm long (Figure 3B) with numerous one-floret spikelets (Figure 3C). The glumes are ovate with finely tapering tips, glabrous, purple-suffused and about 3 to 4 mm long. The mature caryopsis, 1 to 2 mm long and 1.0 to 1.6 mm wide, is obovoid, brown in colour, with a short, white-haired callus - less than a third of the length of the caryopsis (Figure 3D). The surface of the caryopsis is coarsely tubercular-

Figure 3. *Piptochaetium depressum*: **A**, ligule (scale mm) note, swelling at the leaf-blade base **B**, flowering spikes (photo C. Lusk, AgResearch) **C**, spikelet **D**, and close-up of mature caryopses.

scabrid over most of the surface; the caryopsis has a weakly geniculate awn, which easily drops off, and is about 8 to 15 mm long. Flowering mid-October.

This new species of the stipoid tribe is easily distinguishable from all others here. It is the only species of this group to have a relatively short spike-like inflorescence (which is technically a contracted panicle) and relatively few florets. All other species have many long-branched diffuse panicles with seemingly thousands-upon-thousands of florets. The mature caryopsis of *Piptochaetium depressum* is similar in shape and texture only to that of *Nassella trichotoma*;

obovoid, glabrous and coarsely-tubercular (Figure 4). However, the caryopsis in *N. trichotoma* is more gibbous and has a longer callus, nearly half the length of the caryopsis, and a much longer and finer awn, 20 to 35 mm long.

Figure 4. Caryopsis of *Piptochaetium depressum* (right) compared with that of *Nassella trichotoma*.

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- **Charles Knight's letters to T.M. Fries (Uppsala) on New Zealand and Australian lichens, 1880-1883**

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In 1973 when I began work on a New Zealand lichen Flora at the Natural History Museum in London, I quite quickly came across packets or specimens of New Zealand lichens (always annotated simply as "Nova Zelandia") that Charles Knight (1808-1891) sent to Joseph Hooker at Kew. The reason for their being at BM rather than at K is that in 1969, the lichen herbarium at the Royal Botanic Gardens Kew was transferred to the Museum, under the provision of the Morton Agreement, where it is now on permanent loan (Brenan & Ross 1970). This collection is rich in foreign material, especially of collections accumulated by Sir William Jackson Hooker (1785-1865) and Sir Joseph Dalton Hooker (1817-1911), successive Directors at Kew, from their wide networks of colonial collectors and scientific contacts. Hence all the Knight lichens at the BM.

In the Northern Hemisphere autumn of 1974, the DSIR sent me on a study tour of six weeks round the major lichen herbaria in Scandinavia: Helsinki, Uppsala, Stockholm, Lund, Gothenburg and Bergen, and in all, except for Gothenburg and Bergen, I found further Knight lichen duplicates, very often in their characteristic blue, printed small envelopes that Knight had made for them. A rich vein of Knight letters (to Joseph Hooker) was discovered in the Kew Archives (see Galloway 1998), and additional Knight correspondence on purely lichen matters was later found in Helsinki, Geneva, Munich and Uppsala. It is with Knight's correspondence (seven letters) to T.M. Fries however, that this present note is concerned.

Theodore ("Thore") Magnus Fries (1832-1913) was the son of Elias Magnus Fries (1794-1878) widely acknowledged as the founder of modern mycology, Professor of Botany at Uppsala University, Head of the Botanical Garden and Herbarium and for some years Chancellor of the university (Arvidsson 1999). From this distinguished academic and botanical background, T.M. Fries became a renowned lichenologist and succeeded his father as Professor of Botany at Uppsala in 1862. His lichen publications are notable for their careful attention to microscopic details and some

are beautifully illustrated with his own drawings (Arvidsson 1999, Jørgensen 2001).

Charles Knight, for many years Auditor-General of New Zealand and the country's senior (and arguably the most influential) civil servant, developed a keen interest in lichens in the 1850's (Galloway 1990, 1998) and published 12 papers on his New Zealand collections (Knight 1860, 1871, 1875a, 1875b, 1876, 1877, 1880, 1881, 1883, 1884a, 1884b; Knight & Mitten 1860). From the correspondence recorded below it is apparent that Fries initially wrote to Knight asking for a set of named New Zealand lichens. Fries would no doubt have been familiar with Knight's interest in the lichens of New Zealand, both from Knight's publications with their careful drawing of microscopic characters, and also from Knight's close association with Joseph Hooker during the preparation of the latter's *Handbook of the New Zealand Flora* (Galloway 1998). Fries earlier described the dramatic subantarctic lichen *Argopsis megalospora* from Campbell Island material sent to him for identification by Joseph Hooker (Fries 1857, 1858; Galloway 1980, 2004). It is only natural therefore that he should seek to make contact with Knight, then New Zealand's only active publishing lichenologist. Their correspondence opens in 1880, two years after Knight's retirement from the onerous office of Auditor-General, having engineered for himself a handsome pension of £600 a year [about $40 000 in today's money] (Galloway 1985: xx).

Knight's letters and their enclosures are held in the T.M. Fries Correspondence which is kept in the Uppsala University Library. Fries's letters to Knight have not been located. Knight's letters are reproduced in full here, as they show something of his systematic approach to building a named collection of lichens, accumulating duplicates, and his eagerness to learn a new system of lichen classification. Interestingly too, they show Knight to be keen to collaborate with an established European lichenologist in a cooperation to which he would contribute specimens and microscopic drawings. Alas, nothing came of this proposal. Further, Knight's letters to Fries are much warmer in tone (which is revealing) than the rather cold and distant formality of his official correspondence, written (in his own hand mostly) during his long tenure of the Auditor-Generalship (1846-1878). At the beginning of this correspondence in 1880, Knight was 72 and Fries 47.

The Letters

(1)"…Wellington, New Zealand 24th April 1880

My Dear Sir

I have this minute received your Letter of the 17th February, and as the Mail for Europe leaves in a few hours, I reply immediately, and hope that this is the commencement of a correspondence which will prove agreeable and useful to each other; to me, indeed, it is gratifying to gain the cooperation of so distinguished a Lichenologist.

It is rather a curious coincidence that I have lately instructed my agents in London to procure for me your "Lichenes Arctoi"[1] with a view to adopt the classification partly of – what Nylander[2] would term – the "schola sporologica".

I shall at once set about preparing a collection of New Zealand Lichens, and will take an early opportunity of sending the parcel to my agents in London – (Messrs Henry S. King & Co[3], 65 Cornhill, London) at the same time informing them of the purpose of your request and instructing them to follow your directions for the transmission of the parcel to Upsala. Will you be good enough to send the promised collection of Scandinavian Lichens to the above mentioned agents for transmission to my address in New Zealand. A few days since I corrected the proofs of a Paper[4] describing about 40 new species of N.Z. Lichens – when published by the Philosophical Society here, I shall have much pleasure of sending a copy with a set of the Lichens described.

On the 4th of June next I propose visiting New South Wales, and hope to make a good collection of Lichens on the lofty Ranges of that colony. I intend afterwards to visit Tasmania and collect there. Surely I shall meet with novelties in both of these colonies.

It is pleasant to hear something of Dr Berggren[5] once more. I victimized him at an annual meeting of the Wellington Philosophical Society by a long Presidential Address[6] when he was present waiting to enliven us with a Paper on a subject[7] which our agriculturists took great interest in at the time. We are waiting here anxiously to learn the results of his botanical tour in New Zealand. I have not yet received the pamphlet which you kindly mention as having sent to me.

Your paper on the Lichens collected during the English Polar Expedition[8] is instructive. I regret you had no means of giving an analysis of the fructification of the unnamed species of Dermatocarpon. One is inclined to criticize Korber's[9] description of the genus "paraphysibus mucilaginosus" [Körber 1855: 326] On examining Massalongo's[10] specimen No 30 Derm.

ambrosianum I find no appearance whatever of paraphyses or of stratification of the contents of the nucleus – I find nucleus gelatinosus amphithecio viridulo-fusco oriundus e sphaericis cellis formatus, cellis diam. .0025 mm absque paraphysibus. Nor would I agree with Nylander in terming these cells "gonidies hyméniale". I send a tracing of the drawings I made. In earnest hope that I may soon hear from you again believe me, dear Sir,

Yours very faithfully
Charles Knight"

(2) "…Sydney, New South Wales
2 July 1880

My Dear Sir,

Before I had time to go through my collection of New Zealand Lichens, with a view to select a set for you, I had to leave Wellington for New South Wales where I shall stay for a few months. Immediately on my return to New Zealand, I shall arrange the whole of my plants and make up a set for you both of the New Zealand and New South Wales Lichens. In the meantime, I trust you will send at your earliest convenience the promised collection of Scandinavian Lichens[11]. I have this day written to my agents in London (Messrs Henry S. King & Co, 65 Cornhill, London) informing them of the probability of their receiving a collection of Lichens from Sweden, addressed to me to their care, and directing then to forward the Parcel by the first opportunity to New Zealand, so that I may be in receipt of them soon after my return from New South Wales.
I am, dear Sir
Yours truly
Charles Knight"

(3) "…Wellington, 10th April 1881

Dear Professor Fries

The valuable collection of Northern European Lichens sent thro' my agents, Henry S. King & Co, 65 Cornhill, London, arrived here in excellent order. Please accept my grateful acknowledgement of your kindness. They are the more valuable to me for the assistance they render in studying your late work on the Lichens of the North of Europe (Lich. Scand. Pars I & II[12]), for a copy of which (together with other publications of yours) I have also to send you many thanks. I shall look forward with anxiety for the completion of this valuable work.

I have this day completed the selection and packing up of the New Zealand Lichens. I regret that my collection is at present too scanty to give a choice of specimens. You will find many species are wanting. I have, however, kept a list of those now ready for dispatch, and will take an early opportunity of increasing my collection and sending you better specimens and additional species. I could even now have sent many duplicates of the Stictae, but I thought it likely that these and other more common N.Z. Lichens may have been contributed by our mutual friend Dr Berggren. As I have lately retired from the service of the N.Z. Government my time is now entirely at my own disposal, and it will be a pleasure to me to be a contributor to your collection of Lichens.

I have included in the package some of the Lichens that I have lately collected in New South Wales, you will observe that I have named them – I am afraid my determination of the Lecideae will be questioned; I shall be happy to receive from you any criticism that you may find time to give me. I shall shortly return to N.S. Wales and as my family will not accompany me this time, I shall do more work.

I do not know whether you are a family man, if you are, you will understand that when traveling with your family, your wife considers every hour given to Natural History is a dead loss.

I am not sufficiently acquainted with your views of classification to attempt to name Lichens in accordance with them; besides I see very plainly that you will be driven to add greatly to the present list of genera to enable you to classify the Lichens of Australia.

I should like to unite my name with that of some European Lichenologist in preparing papers on the Lichens of Australia, Tasmania and N.Z. for publication in the Linnean Transactions as without such co-operation, I fear much of my work will be useless. I enclose in the collection a hurried description of a Thysanothecium which I am certain will interest you[13]- it was collected on some debris on a Glacier about 4000 ft. above the sea level; I have put up a specimen for you – only two or three were collected and it may be years before more are seen. I would recommend you to study it and publish a paper in Flora, or if you prefer send a paper to Joseph Hooker who would, I am sure see to its proper publication.

I suspect that Nylander's Glossodium and Thysanothecium Berkeley & Montagne require further careful study – I give this as an instance of the impossibility of a person in a distant colony without the advantages you possess of extensive collections and publications, to do justice either to himself or the public. I would supply specimens, with microscopic drawings and such descriptions as to me appear sufficient, the descriptions to be completed by my "confrere" with additional notes either in Latin or English. What do you say to this? will you cooperate? and if so, on what business terms. That is how much for 50 Lichens together with full supply of duplicates would you consider a reasonable remuneration for your time and trouble.

I may mention for your guidance that it is best when sending parcels to a London agent to send an "advice" by post acquainting them with the dispatch.

Believe me dear Professor Fries
Yours faithfully
Charles Knight

This letter of course goes by post; the parcel by a vessel to leave Wellington for London – I see sails are being bent so that it is likely the parcel will have a quick dispatch…C.K."

In the early hours of Friday morning 29 April 1881, the passenger steamer *Tararua,* en route from Dunedin to Melbourne via Bluff and Hobart, ran aground on the Otara Reef near Waipapa Point on the south coast of South Island, with the loss of 131 lives. It was the worst civilian shipping disaster in New Zealand's history. Charles Knight had some minor (but nevertheless significant) involvement in this disaster, as we shall see below and accompanying his letter to Fries, he sent a clipping from the *New Zealand Times* for Saturday 30 April, under the banner " Loss of the Tararua. All the Women and Children Drowned. Great Loss of Life Besides." The immediacy of the report of this horrendous event is worth recording here:

"…The special correspondent of the *Southland News* writes from Toitoi as follow [sic]:- Arrived here from Wyndham at 2.30 this (Satuday) morning.

Tidings from the wreck are that a terrible disaster has happened. The Tararua struck the Otara reef about half a mile from the shore, at 5 o'clock in the morning, it is supposed in a fog. The captain and chief mate reported below at time when it struck. Engineer tried to reverse engine, but broke his leg.

The women rushed on deck in their nightdresses, and the heavy sea soon washed most of them away. Three boats were launched, but were swamped at once. Another got away seaward, and one came ashore, landing five or six men.

The steamer has parted amidships. Numbers of people have perished, and several are still clinging to the wreck. A man with a child in his arms is lashed in the rigging.

A great many settlers are on the beach anxious to render assistance, and many are turning heartsick at seeing their fellow creatures perish before their eyes, and they unable to help. The total number who are saved so far are twelve men.

It is supposed all the women and children have perished. The beach is strewn with the wreck and cargo. Several photos have been picked up, but only one body had washed ashore. Last night, it is said, the cries were heartrending when the people on the wreck saw those on shore leaving at dark to proceed to the wreck at daylight…"

A distressed Knight wrote at once to Sweden:

(4) "…Wellington N. Zealand, 2nd May 1881

Dear Professor Fries

I am writing in great haste to secure the Mail and to inform you that the vessel on which I dispatched a large box of Lichens for you was wrecked on the Southern coast of New Zealand. Not less than 100 lives were lost. I will immediately set about making a fresh collection, but it will be impossible for me to make any but a very incomplete set as a large number of species are wanting in my personal collection. I am sorry for the disappointment his lamentable disaster will cause you. I believe that no part of the Mail was saved.

Believe me, dear Professor
Yours faithfully

Charles Knight"

Several weeks later, Knight gave Fries further information on the lost lichens:

(5) "…Wellington, N.Z., 12th June 1881

My Dear Sir,

You will, I trust, be already in receipt of my Letter acquainting you of the safe arrival of the Lichens contributed by you. Indeed, I am extremely obliged to you for your kindness. I have this day sent to my agents, Messrs Henry S. King & Co, 65 Cornhill, London, the Bill of Lading for a Case of New Zealand Lichens shipped by me in the ship "Alastor"[14]. I have instructed them to redirect the Case and forward it to your address.

I have been most unfortunate with my N.Z. Lichens. Your set with two others – one for Dr Arnold[15] and the other for Sir Joseph Hooker[16], together with three sets of New South Wales Lichens – were all lost on board the Steamer "Tararua".

These losses had nearly exhausted my duplicates, so that I have had great difficulty in making up a proper set of Lichens for you in time for the "Alastor". I hope, in my hurry, that I have not made mistakes. Do not therefore suppose that I am niggardly in sending no duplicates and in most cases poor specimens – Many are missing. I have by me a list of those sent. I intend to go into the field and make additions to my collection, but necessarily this takes time to do. Many lichens are only found in the north of the North Island, and others only at the furthest south of the Middle Island. I will, however, as soon as possible make up a better set for you. As I have retired from the Public Service on the customary Pension, I have abundance of leisure for Botanical pursuits.

I do not know whether I am right in the supposition, but I suppose that Dr Berggren made a collection of Lichens in New Zealand[17], and that you are thus in possession of unworked materials. Perhaps it will be best that you should let me know, as early as possible, which N.Z. Lichens you have in abundance and which you need a greater supply of. I feel the greatest interest in your work on the N.Z. Lichens. I have long wished to see them arranged in accordance with the scheme so ably worked out in your admirable "Lichenographia Scandinavica"[18]. One must enroll oneself under one school or another; and I have, after much consideration, adopted your work for my guidance. Massalongo has gone to excess in the creation of new genera; Koerber is better, but I like your scheme the best.

Your collection of Scandinavian Lichens will be of great use to me. I have Schaerer's[19], Leighton's[20] (both British and Ceylon), Spruce's[21] South American, Massalongo's and many European species contributed through my late friend Dr Schimper[22] of Strasbourg.

My paper with drawings of the analysis of 50 new Australian Lichens[23] was also lost in the sad shipwreck of the "Tararua". I shall, at once, having dispatched your set of Lichens, recopy the Paper and Drawings for publication. The descriptions are far better worked up than any of my former papers, which were intended for local purposes only and are sadly deficient. I know, now, how very imperfectly the work is done. I congratulate you on obtaining Berggren as a coadjutor. Here in New Zealand we always speak of him as a most excellent friend and confrere. With kind regards to him and yourself,

Believe me
My Dear Sir,
Yours most sincerely
Charles Knight

My address is
Dr Charles Knight
Wellington
New Zealand"

On receiving Fries's letter of thanks for the safe arrival of Knight's parcel of New Zealand lichens, for which he made an offer of sending out Hepp's[24] lichen exsiccatae, Knight responded enthusiastically:

(6) "…Wellington, 3rd April 1882

Dear Professor Fries,

It is gratifying to learn that you were delighted with the New Zealand Lichens.

I am not the possessor of Hepp's Lichens. They would be extremely useful and would be received most gratefully. My agents in London are Messrs Henry S. King & Co, 65 Cornhill, who will forward any parcel you may be good [enough] to send me, and defray expenses to London.

Believe me
Yours very faithfully
Charles Knight"

The following January (1883), Hepp's exsiccati arrived and Knight gratefully acknowledged Fries's gift:

(7) "… Wellington 8th January 1883

Dear Professor Fries

I am infinitely obliged to you for the valuable Duplicates of many of Hepp's Exsae. with drawings of spores etc. They arrived in excellent condition. Your liberality quite surprised me.

Looking lately over my collection of New Zealand Lichens, I found two Ascidia which I may have carelessly distributed under Thelotrema, viz T. monosporum and T. Novae Zelandiae. I am in hopes, however, that the specimen of T. monosporum sent to you is correctly named.

If I can be of any use to you here in any way, pray let me know that I may discharge some part of my obligation to you.

Believe me
Yours very sincerely
Charles Knight"

In the 1970s when I started writing the New Zealand lichen Flora (Galloway 1985), I had frequent cause to consult the Knight lichen herbarium and in 1978 I prepared a brief account of the collection (which was then kept separate in cramped conditions in a storeroom) for the Museum of New Zealand (now Te Papa) about its condition and utility. I attach part of this report here as a conclusion to this note on Knight and Fries.

The Knight lichen collection at Te Papa (WELT)

After Charles Knight's death in 1891 his lichen collection was bequeathed to Victoria University College by his widow and in September 1938 was still housed in the Biology Department under the care of Professor Harry Borrer Kirk (see letter of Valerie M. Norman to I Mackenzie Lamb, 13 September 1938), but in August 1939 it was transferred from the university to the Dominion Museum (see letter of Primrose Self to Dr I. Mackenzie Lamb, 22 August 1939) where it has been housed ever since. I examined the Knight lichens carefully on 11-13 June 1978, making the following appraisal:

"…The Charles Knight lichen collection comprises 209 linen-backed quarto-size guard-books tied with calico tapes. Lichen specimens are, for the most part, mounted on card and the cards pinned or sewn onto the pages of the guard books, most volumes containing 20-25 pages and with 1-4 specimens to a page. In the case of New Zealand and Australian lichens particularly, dissections of fruiting bodies in pen and/ or pencil, often also in fully worked up watercolour drawings, with spore measurements and occasionally Latin descriptions accompany the specimens. Descriptions are usually written in ink on slips of paper headed with Knight's family crest [a fighting cock on a boot spur] embossed in blue. Less than half of the specimens are of New Zealand material - the greatest number of specimens being of European lichens deriving from the numerous lichen exsiccatae [dried collections of lichens, named and numbered, and issued periodically by a number of 19th century lichenologists - the process continues to this day] which Knight purchased [or was gifted from lichenological colleagues - T. M. Fries sending him Hepp's exsciccati (see above)] between 1870 and 1888. In addition to the bound guard books, there are 22 unbound books containing duplicates of lichens sent to Prof. Jean Müller Argoviensis in Geneva; 39 herbarium boxes of mainly duplicate New Zealand material, and 220 trays of rock specimens from European exsiccatae containing in excess of 2000 specimens and housed in four wooden cabinets made by Knight himself for the purpose. In the Australian and New Zealand collections (including the duplicate material) there are several type specimens. The European exsiccatae are very well preserved and an extremely valuable collection in virtually untouched condition. However, the collection as a whole is at present housed in an extremely precarious fashion (in a cramped store-

room) and cannot be used to any extent, even very carefully, without considerable damage to the specimens…"

It is a very happy outcome that the Knight collection, beautifully curated and adequately protected, is now an important part of the lichen collection at WELT, with many of the specimens and their associated Knight drawings and notes, also available on-line.

I gratefully acknowledge the help of my friend Prof. Roland Moberg (Uppsala University) for his help (in 1976!) in obtaining copies of the Knight letters held in the T.M. Fries Correspondence, Uppsala University Library; the kind and ready assistance of WELT Herbarium staff over the past 43 years (the late Bruce Hamlin, the late Nancy Adams, Fiona Pitt, Patrick Brownsey and Barbara Polly); and the help of Library staff at Victoria University of Wellington, during my ongoing researches into Charles Knight's lichen collection.

Notes

1 *Lichens Arctoi* (Fries 1860), a monumental work and the basis for all subsequent lichenological work in the Arctic region. For this Fries was dubbed "the Father of Arctic lichenology" (Jørgensen 2001: 539). (Arvidsson 1999; Jørgensen 2001). Knight's copy is held in the Library of Victoria University of Wellington. It has no annotations from Knight. It is part of a collection of Knight's lichen volumes purchased at auction by the University in December 1909.

2 Nylander, William (1822-1899). Finnish lichenologist resident in Paris (Ahti 1990), to whom Knight sent lichen specimens many of which he later described (Nylander 1888).

3 Henry S. King & Co, 65 Cornhill, London derived from Smith Elder & Co who had existed since 1816, trading as booksellers, stationers, East India agents, shippers and bankers. In 1868, the banking and India agency work were taken over by Henry Samuel King, and established as Henry S. King & Co. The firm was noted for the employment of women as typists, as early as 1887, whereas most banks resisted this trend until the First World War. www.banking-history.co.uk/king.html

4 Knight's third "Contribution to the lichenographia of New Zealand" (Knight 1880).

5 Berggren, Sven (1837-1917). Swedish bryologist from Lund who made an extended visit to New Zealand in 1874-1875 to collect lichens, mosses, seaweeds and flowering plants (Tibell 1999; Galloway 2011). His New Zealand lichens were published by P.J. Hellbom (1896).

6 Knight's Presidential Address was delivered to the Wellington Philosophical Society on 18 July 1874 (Knight 1875c).

7 After Charles Knight's Presidential Address, a discussion meeting introduced by James Hector was held on the topic, "On ergot in Rye Grass" (see *Transactions and Proceedings of the New Zealand Institute 7*: 491-492).

8 See Fries (1879)

9 Körber, Gustav Wilhelm (1817-1885). German lichenologist and author of an influential book on German lichens (Körber 1855).

10 Massalongo, Abramo Bartolomeo (1824-1860). Prolific Italian lichenologist who lived in Verona. Specimens from his lichen herbarium were also issued under an exsiccatae series distributed by Martino Anzi (Sayre 1969).

11 See Fries (1859-1865)

12 See Fries (1871, 1874)

13 Knight himself described the lichen as *Thysanothecium buchanani*, honouring its discoverer, John Buchanan (Knight 1881). It is now referred to *Psoroma buchanani* (C.Knight) Nyl. (Galloway 1985, 2007).

14 The barque *Alastor* was under charter to the Shaw, Savill Co. with Captain Glazebrook as master for the 19 voyages she made to New Zealand between 1877 and 1900, at which time steam began to oust sail (Brett 1924)

15 Arnold, Ferdinand Christian Gustav Arnold (1828-1901). German lawyer and lichenologist who amassed a vast lichen herbarium of 120, 000 specimens (now in M), and who wrote some 140 papers (Kärnefelt et al. 2012). He was also a prolific editor of lichen exsiccatae, distributing 3000 specimens in 5 series.

16 Hooker, Joseph Dalton (1817-1911). British botanist and Director of the Royal Botanic Gardens at Kew. Between 1862 and 1867, Knight oversaw Hooker's writing of the *Handbook of the New Zealand Flora* (Galloway 1998), and also sent lichen specimens for the Kew herbarium (now at BM).

17 Berggren's New Zealand lichen collections were worked up for publication by P.J. Hellbom (1896). In 1974, I discovered them as loose packets of specimens in a box on top of herbarium cabinets in the lichen herbarium of the Riksmuseet (S) in Stockholm, where they had been left by Hellbom, rather than being returned to Berggren in Lund. It is not certain that Fries saw any of Berggren's lichen material from New Zealand.

18 *Lichenographica Scandinavica* (Fries 1871, 1874). Knight's copy is held in the Library of Victoria University of Wellington and to it Knight has added a hand-written Index.

19 Schaerer, L.E. (1785-1853). Swiss lichenologist who published an enumeration of European lichens (Schaerer 1850). Charles Knight's annotated copy of this volume is in the Landcare Research Library at Lincoln. Schaerer also produced extensive sets of exsiccatae (Sayre 1969; Crundwell & Hawksworth 1974).

20 Leighton, William Allport (1805-1889). English lichenologist who was at school with Charles Darwin. He published profusely on British lichens (Hawksworth & Seaward 1977; Allen 2010) and also issued an exsiccatum in 13 fascicles, *Lichenes Britannici exsiccati,* between 1851 and 1867 (Hawksworth & Seaward 1977: 110, 219). The copy, held in the Library of Victoria University of Wellington, of Leighton's important work on British lichens (Leighton 1879) is extensively annotated by Knight.

21 Spruce, Richard (1817-1893). Botanist and explorer (Seaward 1996a). Sets of his "Lichenens Amazonici et Andini" (Sayre 1975: Seaward 1996b) are to be found in a number of herbaria. Spruce's personal lichen herbarium of some 2000 specimens is in the Manchester Museum (Edwards 1996).

22 Schimper, Wilhelm Philippe (1808-1880). French bryologist, who was Professor of Geology and Natural History in the University of Strasbourg, 1862-1879.

23 See Knight (1882).

24 Hepp, Johan Adam Philipp (1797-1867). German lichenologist, doctor and politician, most famous for his lichen exsiccati (*Die Flechten Europas*), that were complete with hand-coloured ascospore drawings (Hepp 1853-1867; Sayre 1969; Hawksworth & Seaward 1977: 213; Hertel 2012; Kärnefelt et al. 2012).

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BIOGRAPHY / BIBLIOGRAPHY

- **Biographical Sketch – Alexander McKay (1841-1917)**

Val Smith, 80 Mill Road, New Plymouth 4310.

Alexander McKay was born on 12 April 1841 in the isolated village of Carsphairn in the south Scottish uplands. His father William Sloan McKay, the son of a shepherd, became a joiner and wheelwright when he married Agnes McClellan; Alexander was the third of their ten children. During his early years he lived with his paternal grandparents; he later recalled making his first geological observations at the pool where she scoured wool. An indifferent scholar at the village school, but an avid reader with an amazing memory, he excelled at Scripture history. His formal education ended at the age of eleven when he began summer work as a cowherd and attended school only in the winter. In the evenings he had to knit stockings.

Argyrotegium mackayi

He emigrated at the age of 22 and arrived at Campbelltown (Bluff) on the *Helenslee* in September 1863. During his first year in New Zealand he walked the length of the South Island, earning barely enough, mainly from gold prospecting, to survive. In the diggings of outback Queensland the following year he got malaria, but little else! In 1866, his sights on the Otago goldfields again, he made an incredible winter traverse of the McKenzie Country on foot, and at Lake Ohau Station found shelter, work – and a wife! He married English-born Susannah Barnes on 24 August 1868, at Dunedin, where her sister lived. The next year their first son was born.

With little work available, McKay returned to prospecting, and in 1870 at Ashley Gorge a chance meeting with Canterbury provincial geologist Julius Haast changed his life. He was offered employment as a general field assistant, and was soon excavating moa bones and collecting saurian (reptile) fossils for the Canterbury Museum. Although his views frequently differed from those of Haast, he was recommended to James Hector, then director of the New Zealand Geological Survey and the Colonial Museum. In early 1873 McKay collected fossils at Amuri Bluff for both Haast and Hector, and he accompanied a large consignment to Wellington. Susannah joined him there a month later, and gave birth to their second son the following day.

In 1876 McKay was promoted to field geologist, and by 1885 he had made major surveys throughout the country, usually alone. On a particularly ambitious assignment, a traverse of the lower South Island, his colleagues James Park and John Buchanan accompanied him. Transferred to the Mines

Department in 1892, he was designated government geologist in 1897, a position he held until his retirement in 1908. Despite failing health, the death of his wife Susannah in 1906 and his remarriage less than a year later to Adelaide Dootson, he continued writing and enjoying music. On 8 July 1917, exhausted, he slipped into a coma and died.

His published reports are still valuable reference documents, and his findings on earthquake fault movements and the uplift of mountains pioneered modern earth science in New Zealand. He was elected a fellow of the prestigious Geological Society of London in 1888. During the 1880s he also expanded his interest in photography, and made the world's first telephoto lens. His name is perpetuated by a waterfall in Otago, the Alexander McKay Cliffs in Antarctica, two buildings in Wellington, the McKay Hammer Award and an alpine plant, *Argyrotegium mackayi.*

Argyrotegium mackayi **Asteraceae**

The genus *Argyrotegium* (Greek *argyreon,* silver; *tegium,* little mat) was created in 2003 for two mat-forming species that have long puzzled taxonomists. A perennial herb with creeping and rooting stems, *Argyrotegium mackayi* forms small, loose mats up to 20 cm or more across, with soft, overlapping, pale grey to almost white leaves. The small, usually single, flower heads are buried at the stem tips and emerge on stalks as the fruits develop. It is widespread from the Ruahine Range southwards, and also parts of Australia, in wet alpine and subalpine areas. Described as *Raoulia m'kayi* by John Buchanan in 1882, it was "Named in complement to Mr. A. McKay of the Geological Survey, as a successful collector, who discovered the present species on Black Peak Range, South Island, at 5,000' altitude."

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PUBLICATIONS

- **Book review: Field Guide to New Zealand's Native Trees.**

By John Dawson and Rob Lucas. Craig Potton Publishing, 2012.

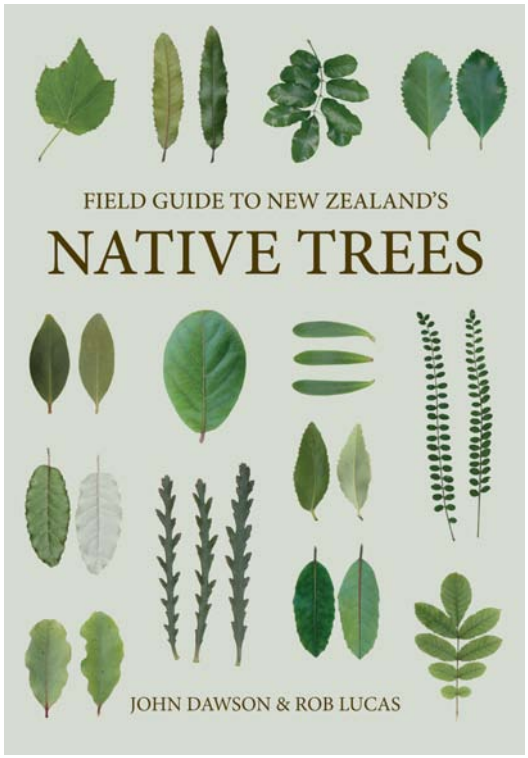
Reviewed by **Leon Perrie**, Curator of Botany, Te Papa, leon.perrie@tepapa.govt.nz

This is a smaller version of *New Zealand's Native Trees* by the same authors and publisher: 436 pages, 0.9 kg, $49.99 RRP (from publisher, 19th Jan. 2013) cf. 576 pages, 3.4 kg, $120.00. The 'big book' was Book of the Year at the *2012 NZ Post Book Awards*.

The introductions to the book itself and the conifer, tree fern, and flowering trees sections are all shortened. Apparently, the *Field Guide* features 209 species, but this too is a reduction from 320 taxa in the big book. Species of doubtful tree-status but nevertheless included in the big book (e.g., *Halocarpus biformis*, *Clianthus* spp., *Geniostoma ligustrifolium*) seem to be the principal casualties, along with very uncommon species (e.g., *Ackama nubicola* which gets a mention but no photos). Most species in the *Field Guide* get two pages, of which c. ¾ are colour photographs.

The text covers Distribution & Habitat; Size (of tree), Bark, Foliage & Habit, and Flowers & Fruit, sometimes with a box of bullet-pointed Distinguishing Features to separate similar species. The focus in the text is on the physical characteristics of each species. Gone are most of the ecological observations, detail of any cultural uses, and the ancillary text boxes of the big book (i.e., no Rimu & Kākapo, Epiphytes on Tree Ferns, etc.).

The selection of photos is also (much) reduced, but detail of habit, bark, leaves, and reproductive features for each species is still provided. Good botanical, technical drawings easily beat bad photos, but these are excellent photos – the diagnostic features used to identify a species are comprehensively shown. The set of photos for each species is much improved from Salmon's *Native Trees of New Zealand*. For many species the detail of flowers and fruit would often only have been previously available from the line drawings by Irwin in Moore's *Oxford Book of New Zealand Plants*, if anywhere.



The photographic 'key' to angiosperm leaves (pages 72-97), grouped by leaf characters, is superb. Scanning through images is, of course, how most people attempt to initially identify an unknown species. I think this kind of approach, providing easy and efficient comparisons, needs wider adoption in products facilitating identifications, be they print or digital.

Like the big book, there are lots of welcome tips for distinguishing related (e.g., *Nestegis cunninghamii* and *N. lanceolata*, *Ackama rosifolia* and *Weinmannia silvicola*, *Podocarpus cunninghamii* (= *P. hallii*) and *P. totara*) and similar-but-unrelated (e.g., *Ascarina lucida* and *Laurelia novae-zelandiae*) species; many of which I have not seen in print before (outside botanical society publications). Some of these are backed by side-by-side photographic comparisons. These tips are a fantastic feature of both books, representing a massive improvement on previous publications, but a few gaps remain: how would I know if I was looking at *Manoao* foliage?

Perfection is an impossibility in a work of this magnitude, and I did find a few issues while checking the general sections and the species I know best. The seedling leaves of *Dacrycarpus dacrydioides* and the leaves of *Prumnopitys ferruginea* are not "frond-shaped", as described in their distinguishing features boxes, although their *arrangement* might be described as frond-like. It is surprising that the more or less planar versus spiral leaf arrangement in *P. ferruginea* and *P. taxifolia* is not mentioned. The lack of a white underside to the frond of adult *Cyathea dealbata* extends beyond North Cape, as far as at least the Bay of Islands; rather than the intense white seen further south, these individuals have silver (or glaucous) frond undersides, and are in better agreement with the species's common name, silver fern! Presumably the palmate *Vitex lucens* leaf is on the "Compound leaves pinnate" page of the photographic 'key' only because of space constraints. While it is fantastic to see the clearly dimorphic male and female flowers of the dioecious *Pseudopanax arboreus*, *P. colensoi*, and *P. laetus*, I believe that *P. crassifolius*, *P. lessonii*, and their immediate relatives instead have hermaphroditic flowers (Perrie & Shepherd, 2011, *Wellington Botanical Society Bulletin* 53: 80-87). The leaf representing *P. colensoi* var. *ternatus* (bottom-left, page 362) lacks the marginal teeth I associate with that taxon (see the big book), and looks like (even if it actually is not) the northern form of *P. lessonii*. Pictures 5 and 6 of *P. discolor* are the commonly cultivated entity, which is not typical *P. discolor* but probably its hybrid with *P. lessonii*. These kinds of issues are minor, and this book is still excellent for its purpose: identifying native New Zealand trees.

Both books give distributions in words. I have a strong preference, instead, for maps, which I think are far more informative, based on herbarium specimens (or other authoritative observations). However, such data are not readily available, ashamedly even for some of our largest, most abundant, and iconic tree species. So this is not a criticism of the authors, but rather a plea for the New Zealand herbaria and botanical community to verify (and digitise) and complement existing collections (see www.virtualherbarium.org.nz) so that future works can provide mapped distributions.

At 0.9 kg, I will leave it to you to judge whether the *Field Guide* is actually a field guide; I will not be taking it on overnight tramps. But if you are not up for the $120 of the big book, the *Field Guide* is a cheaper option that still provides a wealth of information on New Zealand's trees. On this topic,

while I have not seen the recent *Wardle's Native Trees of New Zealand and their story*, the Dawson & Lucas books are otherwise quite clearly now numbers 1 and 2. True portability of such comprehensive content will presumably only come with migration to a digital medium, and/or by publishing for a limited geographic area (e.g., Northland). When this happens, a revision of Poole and Adams's *Trees and Shrubs of New Zealand* (which includes all woody species but only scantily so) might be contemplated. All woody species covered to the raised standards set by Dawson & Lucas would otherwise be a monstrous tome.

- **Publications Received**

Wellington Botanical Society Bulletin 54 November 2012 Latin names, ethnobotany, Mana Is diatoms and bryophytes, beach morning glory, Makara Foreshore Reserve, native plant propagation, Wellington nikau, Owhiro Stream vegetation.

Wellington Botanical Society Newsletter December 2012 Upcoming trips and meetings, Otari-Wilton's Bush report, *Elaeocarpus dentatus*, Restoration at Port Dorset, trip reports.

Rotorua Botanical Society Newsletter 59 December 2012 Sir John Smith-Dodsworth obituary, *Metrosideros excelsa* forest, Bay of Plenty collections, Fieldtrip reports and upcoming trips.

Auckland Botanical Society Journal Volume 67 (2) December 2012 Trip reports, Swamp maire forest, Margans Bush, Tuhua lichens, Matheson Bay, Alexanders, elephant-ear taro, *Macropiper*.

The New Zealand Native Orchid Journal 126 November 2012 Bruce Irwin, *Pterostylis foliata*, recording orchid locations, orchid photography.

The New Zealand Native Orchid Journal 127 February 2013 Stewart Island orchids, *Gastrodia leucopetala*, occasional contributions including *Nematoceras* aff. *trilobum*, online orchid key, *Pterostylis emarginata*, *P.* "Triplex", *Molloybas cryptanthus* and 2012 Eric Scanlen Hatch Medallist.

Canterbury Botanical Society Newsletter 1 & 2 January 2013 Upcoming trips and meetings, trip reports including the Tekapo region and Bank's Peninsula.

Canterbury Botanical Society Newsletter 3 March 2013 Upcoming trips and meetings, reports including digital flora of the Philippines and scree pea trip.