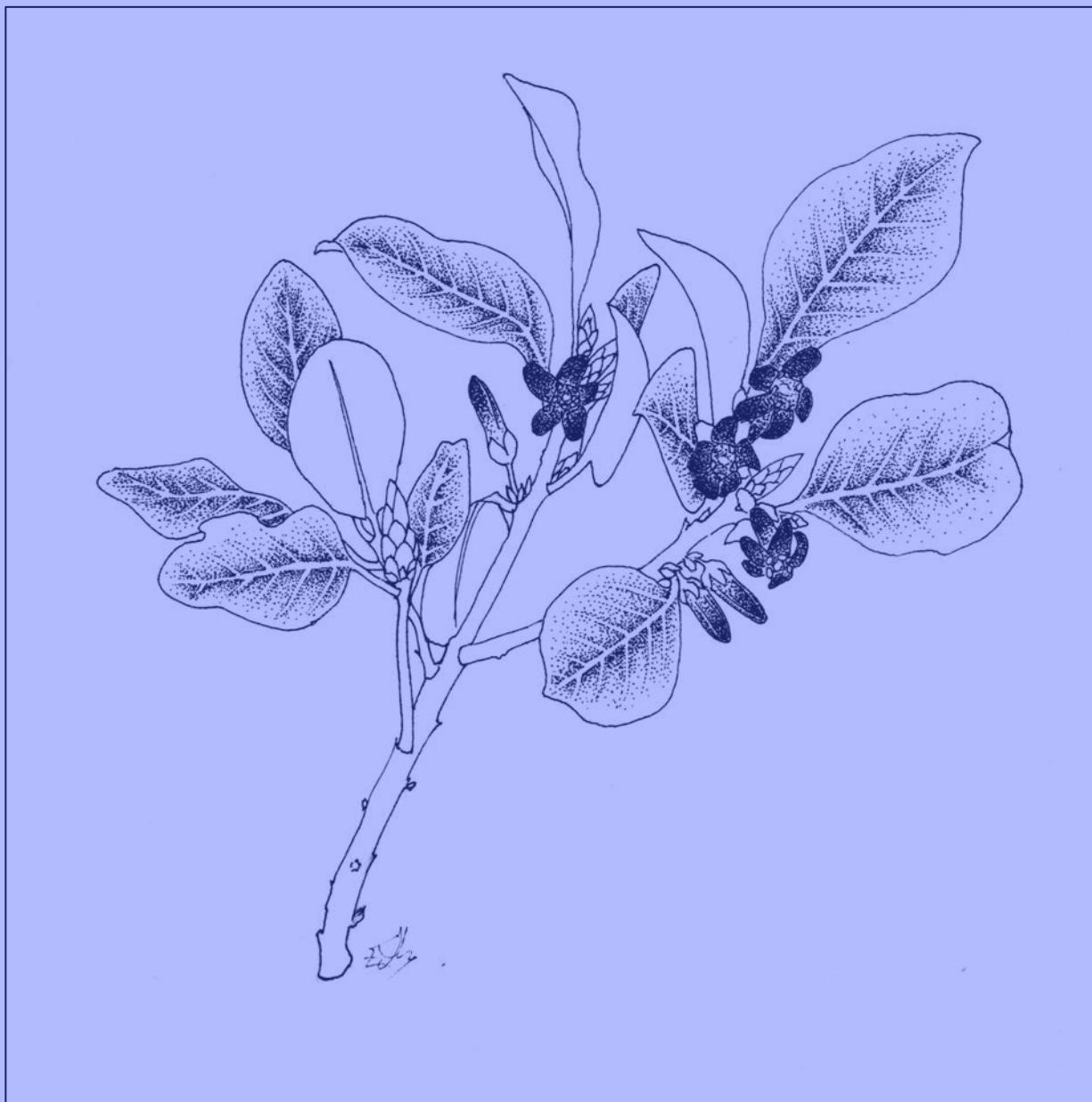


NEW ZEALAND BOTANICAL SOCIETY
NEWSLETTER

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New Zealand Botanical Society

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Subscriptions

The 2019 ordinary and institutional subscriptions are \$25 (reduced to \$18 if paid by the due date on the subscription invoice). The 2019 student subscription, available to full-time students, is \$12 (reduced to \$9 if paid by the due date on the subscription invoice).

Back issues of the *Newsletter* are available at \$7.00 each. 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 30 April each year for that calendar year. Existing subscribers are sent an invoice with the March *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 March 2020 issue is 25 February 2020.

Please post contributions to:

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Send email contributions to lara.shepherd@tepapa.govt.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

Pittosporum colensoi from near Ngarua Cave, Takaka Hill by Eleanor Burton.

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NEWS

New Zealand Botanical Society News

- **President's speech at presentation of Allan Mere 2019 to Darea Sherratt for the late Rodney Lewington, at Otari Wilton Bush, Wellington, 13 November 2019**

Tena koutou, tena koutou, tena koutou katoa
Nga mihi nui ki a koutou
Tihet mauriora!

I'm delighted to be here today to celebrate the achievements of the late Rodney Lewington and make the 2019 presentation of the Allan Mere posthumously to his wife Darea Sherratt.

To give a little background to the award, the Allan Mere was donated by Dr Lucy Moore in 1982 to commemorate the 100th anniversary of the birth of Harry Howard Barton Allan, first Director of Botany Division, DSIR, and author of Volume 1 of the *Flora of New Zealand*. The Allan Mere is awarded annually by the New Zealand Botanical Society from nominations made by Regional Botanical Societies or individual members to persons who have made outstanding contributions to botany in New Zealand. The Mere is housed at the Allan Herbarium at Manaaki Whenua Landcare Research in Lincoln, just south of Christchurch.

The New Zealand Botanical Society Committee has voted to award the Allan Mere for 2019 to the late Rodney Lewington. Whilst Rodney is sadly no longer with us in person, it is my pleasure to present this award to Darea today.

The nomination was made by Dr Lara Shepherd, for the Wellington Botanical Society and Eleanor Burton, for the Otari-Wilton's Bush Trust, and supported by the Otago Botanical Society. Further support came from Dr Jessica Beever, and a joint letter of support from Dr Patrick Brownsey and Peter Beveridge.

One of the pleasures of the nomination and award process is learning so much more about botanical enthusiasts I thought I already knew pretty well. Despite no formal botanical training, Rodney was a driving force for over five decades in the botanical world through his engagement with the Wellington Botanical Society and the Otari-Wilton's Bush Trust. Rodney joined the Wellington Botanical Society back in 1961, the same year he arrived in New Zealand from England. He developed a passion for bryophytes and alongside staff at Te Papa and Manaaki Whenua Landcare Research in the 1980s, began unravelling the many mossy mysteries surrounding the *Dicranoloma* genus. During this time, Darea was right there beside him acting as scribe, voucher maker, field and lab companion.

Over the years, Rodney contributed to the nationally significant bryophyte collections at the Te Papa Herbarium and the Allan Herbarium through specimen collection and identification – which I understand to be in the thousands. Rodney also amassed a personal herbarium in excess of 4,000 specimens that we hope will be incorporated into a herbarium or herbaria in New Zealand in the future.



Following retirement, Rodney was heavily involved with the Otari-Wilton's Bush Trust assisting with cruise ship tours, botanical talks, and walks for visiting scientists, tourists and locals alike. Rodney contributed significantly to the training of a new generation of bryologists who still admire and respect him for not only his knowledge but also his energy, commitment and passion. As a testament to his commitment, I understand he attended every single John Child Bryophyte workshop organised annually since 1984; an accomplishment that very few would be able to match. The timing of today's ceremony couldn't be better in that regard – I believe this year's workshop starts tomorrow in Southland!

Rodney's botanical legacy will be found not only in the papers he has published, the lists he has produced and the specimens he has identified and donated to herbaria, but also in the support and knowledge he provided to aspiring botanists and botany enthusiasts as he kept interest in the New Zealand flora alive and well.

Before making the presentation it's appropriate that we take a few moments to quietly reflect on Rodney's contributions and remember what he meant to us individually.

E nga Rangatira, moe mai, moe mai, moe mai

I'd now like to read out the formal citation entered into the Allan Mere Book of Record:

Rodney J. Lewington (1935 – 2018)

The late Rodney Lewington was a quiet leader and generous mentor in the botanical world and poured lasting energy into promoting the wonderful world of plants. He was a driving force for the Wellington Botanical Society and the Otari-Wilton's Bush Trust for over five decades. From the early 1980s, Rodney was a regular contributor to the John Child Bryophyte Workshops, developing a passion for bryophytes that continued for the rest of his life.

2019

At this point in the proceedings, I need to let Darea know that it was one of Lucy Moore's rules that the Mere be kept safe at the Allan Herbarium, and only "let out" for the presentation ceremony. However, Darea, you do get to keep a fine calligraphed certificate marking the award, as well as a bound copy of Rodney's nominators' and seconders' letters.

Whilst the award nomination is for Rodney, we mustn't overlook the assistance that Darea provided Rodney over the years. It was your shared dedication to botany that supported Rodney's botanical initiatives and achievements and I would like to acknowledge you personally for your commitment to the running of the Wellington Botanical Society, your tenacity on botanical field trips and camps and your love and dedication for the Otari-Wilton's Bush Native Botanic Garden. Congratulations to Rodney, and of course Darea, and I have great pleasure in presenting you with the Allan Mere.

Anthony Wright, President, New Zealand Botanical Society

Regional Botanical Society News

■ Auckland Botanical Society

September Meeting

This month's talk on *Rafflesia* by Pieter Pelser and Julia Barcelona was especially exciting for those few people who had seen this rare parasitic plant with the giant flowers growing in Borneo. Pieter and Julia have studied the biology of this genus in the Phillipines, with the aim of contributing to its conservation. A real surprise was the photos showing it parasitising vines, as well as being a usually ground-growing root parasite.

September Field Trip

Mike Wilcox and Bec Stanley led a large, mixed crowd of entomologists, Forest and Birders and Bot Soccers through the surprisingly large Totara Park in Manurewa. Once away from the parkland and

the mostly inappropriate plantings, the forest was largely weed free, and composed of impressively large trees. The several tracks followed the Puhinui Stream.

October Meeting

Yumiko Baba, whose studies centered around the *Elaeocarpus* genus, spoke about the two entities within *E. dentatus*. Is *E. dentatus* var. *obovatus* sufficiently different to warrant its separation from the species? The main talk was by Ewen Cameron, illustrating the exciting flora and fauna seen during a 4-week holiday in Costa Rica. He described, not only the extraordinary biodiversity of this small tropical country, but also how it is one of the leading nations of sustainability and other protections. This left us wondering how it is a beacon of light in such a troubled part of the world.

October Field Trip

A QE II covenant property of 190 ha at Wayby, south of Wellsford, was a new site for Bot Soc to explore. The property includes mature puriri/taraire forest, shrublands and a wetland. We spent the day largely in the shrublands, with an intention of checking out the wetland, but our slow botanical pace meant that we ran out of time to do this. The Hoteo River runs through the property, and the two species that commonly line the riverbanks, *Plagianthus regius* and *Pennantia corymbosa*, were present. The rarely seen *Coprosma rotundifolia* had nice thickets of young plants; a fallen tree fern was draped with *Metrosideros carminea*, and a single specimen of *Dicksonia fibrosa*, almost as far north as it grows, caused excitement. Although the owners are managing plant and animal pests, a flock of goats was seen from the long driveway.

November Meeting

The Plant of the Month was *Schizaea bifida*. Jack Warden then spoke of his study of the flora of Rakitu (Arid) Island, off the eastern coast of Great Barrier Island. Rakitu has had a long history of farming and disturbance, but stock have been removed, and kiore and ship rats eradicated a year ago. Jack and his father, who lives on the Barrier, have carried out five trips since then to concentrate on what actually remains on the island. Many of the special plants found in northern coastal forests have been found to be present, the most exciting being the blue flowered and fruited herb, *Lobelia physaloides*.

November Field Trip

The Piggott Wetland, Buckland, Pukekohe, is a 56 ha property owned by Fish & Game NZ. It has the Waikato River on its southern boundary. Half of the property is in pasture with 6 ponds created for game-bird hunting. A line of *Taxodium distichum* has been planted near the ponds and seedlings were found. The ponds are predominantly surrounded by exotic species. Of interest to our group were *Lycopus europaeus*, *Cardamine pratensis*, *Ranunculus flammula* and *Alisma plantago-aquatica*, species that are found in the Waikato and are moving north. Half of the property has mature or regenerating kahikatea, with old trees having magnificent collars of *Astelia hastata*. Recently there has been a release of 'shinys' beetle to control the *Tradescantia*, particularly where the black shags roost.

Forthcoming Activities

December Christmas Function	Ti Point, Whangateau
January Camp.	Fiordland
February Field Trip.	Martins Bay
March Meeting.	AGM/ Lucy Cranwell Grant recipient, Grant Ryan Deregner.
March Field Trip.	Kaipara private wetland.

Auckland Botanical Society, PO Box 26391, Epsom, Auckland 1344

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■ **Rotorua Botanical Society**

May Field Trip - Mangakaki Valley

Starting from the top of Linton Park we had a leisurely ramble across fields and open spaces down the Mangakakahi Stream to Sunset Avenue with a detour up a side creek for casual lunch. In spite of this and various botanical discussions we did see a few native plants and quite a few ferns amongst a

wide range of adventives. Highlights were discussions on *Nyssa*, wild cherries, two galinsogas, and *Paulonia*, dawn redwoods in full colour shedding sprays of leaves, *Hypericum adrosaemum* vs *H. henryi*, the sticky leaf of *cornus* and the horrid pest of *Dryopteris filix-mas* (near old habitation) and *Pteris cretica/vitatta* and whether it was adventive or self introduced.

September Field trip - Aongatete forest

Our path took us into forest where volunteers of the Aongatete Forest Project have been controlling rats, cats, stoats and possums for 13 years. From the carpark a new entry track has been constructed around the Outdoor Education lodge to the swimming hole track. The lowland forest is dominated by tawa, puriri, kohekohe and pukatea with scattered rimu, kahikatea and miro. At one point we passed a pukatea embraced by one of the few surviving northern rata. The ferns were diverse, including a patch of *Asplenium lamprophyllum* and all four species of *Timesipteris*.

As we approached the Aongatete River the vegetation changed, perhaps as a result of earlier burning. Here, kamahi, tanekaha and kanuka became prominent with some very tall hard beech. Instead of the dense leaf litter and dim light of the forest, the habitat was drier, more open and sunnier. The understorey was sparser, with three species of lycopods, *Alseuosmia macrophylla* in flower, mingimingi, small saplings of northern rata (growing from the ground instead of as epiphytes) and a huge spread of giant moss, *Dawsonia superba*. At the river, *Lindsaea viridis* was growing on the rocks, quite a contrast to *L. linearis* we had seen further up the track on raw clay.

We returned via the old steep road from the lodge to the river. Initially it was open and somewhat overgrown but provided several additions to the list. A highlight was a patch of kumeraho in full flower. Towards the lodge the track was overhung by tall kanuka and mamaku and with few plants beneath. Some of the group diverted to an enclosure created three years ago. There, on a steep bank, fallen trees had protected king fern and other palatable plants, which had flourished. A nice lesson in the need for plant protection from ground browsers.

October - Whangapoua weekend

We visited two rather different areas within a kilometre of each other. On the first day we headed out from the Graeme's bach cutting through several remnant gullies across slope and gradually climbing to the ridge above at the property boundary, then descending steeply back to the bach. The gullies contained remnant puriri forest with nikau, the odd regenerating rimu, miro or tawa. The understorey was quite dense with mangemange and mingimingi and occasionally dense supplejack. On the intervening ridges tall kanuka prevailed with tanekaha, the odd kauri or totara. At one point there were hybrids of five-finger and lancewood. Lunch found us in the only clearing on an old midden site surrounded by kowhai, now almost finished flowering. After lunch we reached the main ridge where dense *Pinus pinaster* saplings and old trees on the neighbouring property marked the boundary. The vegetation was quite open from the gaps created by the felled pine trees, with only scattered mingimingi or short kanuka, *Pomaderris kumeraho* and *P. amoena* (both in flower). At one point there were a pair of adult *Pittosporum virgatum* in flower and fruit. The steep descent to the batch was mainly through tall kanuka with few new things except *Deparia petersonii* along the creek. Only a few species were added to the list provided by Meg Graeme, most notably quite a few orchids including spring flowering *Pterostylis banksii* and *P. alobula*.

The next morning we visited the lower part of a nearby QEII covenant, following an old bulldozer track to a solitary kaiwaka. The track was through tall kanuka with a wide variety of regenerating species, including kohekohe, matai, kahikatea and hinau. Understorey plants included akeake and *Brachyglottis kirkii*. Highlights were *Schizaea fistulosa*, *S. bifida* and *Caladenia atradenia* in flower. Weeds were much more prominent especially near the start and included the Australian sedge, mistflower and the blue iris, *Aristea ecklonii*.

After lunch many people departed but a smaller group visited Opera Point Historic Reserve, an early occupation site for Maori and a former kauri mill site, which was grazed till relatively recently. Much of the area is still open in kikuyu or *Vinca major* but there are large old pohutukawa, dense patches of *Pinus pinaster* and areas of kanuka only 4-5 m tall. We followed the shore track out to the dunes and spit near the harbour mouth. The initial part of the track was through pine forest with scattered *Pittosporum umbellatum* in flower, mingimingi and *Coprosma rhamnoides*. The track then descended to the shore where it was lined with pohutukawa then crossed the spit to the harbour mouth through *Vinca* and grasses to a spinifex-lined shore, with odd patches of planted pingao.

November Field Trip Toatoa Scenic Reserve

Toatoa Scenic Reserve stretches along about 3 km of the very windy Motu Road between Toatoa and Whitikau. The first stop provided a very rich area of ferns and shrubs at a road saddle. The forest was dominated by hard beech with many large emergent toatoa (of course), rimu, miro and kamahi. Shrubs included the rather local *Archeria racemosa*, *Alseuosmia pusilla* (both in flower), *A. macrophylla*, mingimingi, *Dracophyllum latifolium*, horopito and the occasional hangehange, pigeonwood, *Raukaua anomalous* and epiphytic *R. edgerleyi*. There were also many ferns including *Lindsaea trichomanoides*, kidney fern, *Hymenophyllum bivalve*, crown fern and *Dicksonia lanata*.

Our second stop was at a shelter for mountain bikers. Here two short forays off the road provided little new except to offer a chance to photograph *Alseuosmia pusilla* with masses of pink or white flowers. Along the roadside banks were large masses of *Selaginella kraussiana* and *Hypericum androsaemum* - the former in the most sheltered wet places, the latter almost continuously. We made a fourth stop but after the first, the roadsides provided the greatest interest. In several places *Clematis paniculata* was in full flower and *Olearia rani* was just starting to flower heavily. *Pterostylis montana* was present on several banks and forest edges and *Gunnera monoica* was in full fruit on one damp bank.

FUTURE EVENTS

December 1 Oruanui/Marotiri north Taupo

January 24-28 South Waikato

February 10 Maungawhakama

March 1 Atiamuri

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■ Whanganui Museum Botanical Group

For monthly meetings the Whanganui Botanical Group has merged with Birding Whanganui (local branch of OSNZ) and the Whanganui branch of Forest and Bird, under an umbrella name of 'Nature Talks'. Each group will arrange a speaker for about 4 meetings per year. Meetings will normally be on the 3rd Tuesday of each month. It is intended to continue with monthly botanical field trips to which members of the other two groups are invited.

President: Clive Higbie (06) 342 7857 clive.nicki@xtra.co.nz

Secretary: Robyn Ogle (06) 347 8547 robcoll.ogle@xtra.co.nz

■ Nelson Botanical Society

August Field Trip: Kelly's Bush

Seventeen members gathered on a sunny day to inspect this small remnant of tawa/tītoki/mataī forest close to Nelson City. The first part of the walk took us through native plantings that have been done to extend the bush area on the property. Along this track some of the weedy-looking species were of interest, as there were a number of native *Senecio* species, including *S. glomeratus*, *S. hispidulus*, *S. minimus* and *S. quadridentatus*. We continued into the mature remnant bush where canopy trees were *Beilschmiedia tawa*, *Prumnopitys taxifolia* and *Alectryon excelsus*. The understorey was sparse, but many ferns were identified, including *Polystichum neozelandicum* subsp. *xerophyllum*, *Pellaea rotundifolia*, *Blechnum filiforme*, *B. chambersii*, *B. vulcanicum*, *Microsorum scandens*, *Asplenium flabellifolium*, *A. appendiculatum* subsp. *appendiculatum*, *A. flaccidum* and the very small *A. hookerianum*, *Lastreopsis glabella* and the soft fern *L. velutina*, and locally uncommon *Diplazium australe*. Orchid species noted were *Pterostylis alobula* and *Microtis unifolia*.

September Talk: "On the Ashburton Plains"

Alice Shanks, a mid-Canterbury representative for the QEII National Trust, delivered a cautionary talk called 'Declines are not halted: The vanishing natural plants of the Ashburton Plains'. She painted a dismal picture of plains vegetation 'going down the gurgler' for a variety of reasons: grazing, by cows rather than sheep, on roadsides as well as behind fences; allowing weeds to take over; spraying; mowing; burning; irrigation; closure of water races; infestation by weeds, ploughing for crops; planting of hedges leading to increased humidity; spraying of hedges; draining of swamps and wetlands; coastal erosion; the grassing of natural coastal gullies called 'dongas'; and even grubbing out by conservation workers, mistaking tussocks for weeds. Her slides showed graphic examples of all of these, many with 'before' and 'after' shots.

Alice attributes some of the loss to a local 'tidiness ethic', a desire to eradicate 'scruffy' roadside shrubs. The dry grassland native species were never recognised as beautiful by early European settlers. They were generally seen as drab, brown and dry-looking. Forest patches on the plains were gone by the 1860s. The 1870s brought railway, fire, and rabbits. Swamps were drained with 'miles of tiles'. By the 1930s, the plains landscape was described as 'modified and biologically depauperate'.

When a 1990 botanical survey of 642 sites was repeated in 2014, 42% of the sites had disappeared. The 80 species hanging on included *Discaria toumatou* (matagouri, or wild Irishman), *Melicytus alpinus*, *Muehlenbeckia complexa*, *Coprosma intertexta* and species of *Carex*, *Cardamine*, *Juncus*, *Rytidosperma*, *Dichondra* and *Leptinella*. The spark of hope is a sea change in attitudes, with more people learning to love their vegetation. But Alice fears it is too late.

September Field Trip: Otuwhero, Nell's Bush

Sunshine on the day made the trip through Nell's Bush very enjoyable for the six members who were able to attend. Soon after we left the road to walk Reeds Track, we spotted *Clematis paniculata* in flower. Among the range of flora we observed from the wetland to the dry ridges were grand old *Dacrycarpus dacrydioides*, *Dacrydium cupressinum*, *Prumnopitys ferruginea* and *Prumnopitys taxifolia*. *Podocarpus totara* var. *totara* was also present. Throughout the walk were numerous ferns, the largest being the tree ferns, *Cyathea medullaris*, *Cyathea dealbata* and *Dicksonia squarrosa*. Few shrubs were flowering, with the exception of *Pittosporum divaricatum*, with its very beautiful deep red flowers. Of the large trees there were three different beeches: *Fuscospora truncata*, *F. solandri* and *Lophozonia menziesii*. There were many large *Kunzea ericoides*, a few *Leptospermum scoparium* and one *Laurelia novae-zelandiae*. Two other fascinating finds were two slime moulds – not really true fungi but with some fascinating animal-like characteristics. One looked like white cauliflower florets but no higher than a couple of millimetres – maybe *Trichia* sp.; the other was about the same size but looking like individual red dressmakers' pins – possibly the red slime mould called *Hemitrichia calyculata*.

October Talk: "Sexy Lichens: From urban to alpine, and from outer space to footpaths".

Dr Allison Knight, Otago University

True to the subtitle of her talk, Dr Allison Knight guided us through a grand tour of lichens. The first 'wow' of the evening was a single rose branch supporting 25 species of living lichen. New Zealand is a world hotspot for lichens, with 10% of all known species. The number of lichen species (2,000) nearly equals that of our vascular plants (2700+ species).



Pittosporum divaricatum in flower. Photo by Don Pitham

Not only can there be three kingdoms of life in one lichen (cyanobacterium, fungus and alga) but some ascomycete lichens contain two phyla of fungi, with a basidiomycete yeast hidden in the cortex. And that's without adding in a microbiome of 400-plus bacteria species. It's clear that a lichen is a co-operating ecosystem within itself. Only the fungal partner of the lichen has sexual reproduction. Lichens have a side bet on reproduction by forming vegetative propagules, which we see as surface bumps. These can be washed or carried off elsewhere to form a lichen clone. Lichens colours are startling and packed with meaning. Allison showed examples where the mineral substrate affects colour (e.g. red for iron), then there's the sunscreen (black, orange, yellow) made by the fungus to protect its photosynthesizing algal partner. Some lichens turn down the wavelength of UV light into less harmful visible light. Warfare between competing lichen species was shown with the production of fungicides and algacides. Allison led us through the main categories of lichens in her *Introductory Guide to New Zealand Lichens*. Lichens are quickly keyed to genus, if not species, by appearance, location (urban, coast/freshwater, forest/shrub, or alpine), then finally the substrate (tree, ground, or rock).

Most important is lichen appearance, and Allison showed us examples of **foliose** or leafy (undersurface especially important), **fruticose** or twiggy (from a Latin word meaning shrubby) and **crustose**. All but crustose can be gently lifted from the lichen's substrate.

FUTURE EVENTS

January 19 Field trip to Horseshoe Basin, Mt Arthur.
February 16 Field trip to Beeby's Knob.
March 15 Field trip to Ellis Valley.

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■ Canterbury Botanical Society

July meeting was a talk by Nick Dickinson from Lincoln about root architecture and function and reminded us of plant roots fundamental role in sequestering carbon in the soil. Nick's research has demonstrated that indigenous plants are efficient at extracting minerals at low levels in New Zealand soils, such as cobalt, molybdenum and the crucial plant element phosphate. He has used this knowledge to advocate for planting native plants for animals to browse in place of micronutrient tablets. New research has shown that kanuka strips nitrogen out of soil saturated with cow urine. He noted that some Canterbury plant species have unusual root systems. The evening concluded with a discussion about the restoration plantings on 7000 hectare, 14 000 cow, dairy farms owned by Ngāi Tahu Farming at Eyrewell. Under the guidance of Lincoln University, 150 hectares has been set aside for restoration and 100 hectares for planting shelterbelts. Nick has learnt a lot about establishing kanuka back onto dry, stony soils. The research discovered that moss was key to the germination and retention of moisture. Acidification of soil under native vegetation helps reduce grass competition.

July field trip to Brooklands lagoon was braved in indifferent weather by a few hardy souls. It contains extensive areas of salt marsh on the mudflats, sea rushland (*Juncus krausii*), marsh ribbonwood (*Plagianthus divaricatus*) shrubland, marram dunes, scattered ngaio and akeake, and a freshwater harakeke wetland in the southern reach. Areas of vegetation, some fenced from hares, have had varied success. Wildings from the historic pines planted to stabilise the dunes are controlled out on the salt marsh. The leaves of onion-leaved orchids (*Microtis unifolia*) and sun orchids (*Thelymitra* spp.) were just appearing in the pine needles. Progressive willow control in the fresh water harakeke wetland would improve the long-term sustainability of the wetland. The ubiquitous vehicular donuts were noted on the flat salt meadow could be very old. On the edge of the walking track we came across a well-trod sedge. After discussion we decided this was the threatened shore sedge *Carex litorosa* (At Risk-declining, 2018), minus its distinctive culm topped with compact brown spikes.

August meeting Professor Dave Kelly gave a very informative talk on mastling. He, along with colleagues, has spent over 32 years studying mastling in *Chionochloa pallens* and *Celmisia lyallii* high on the slopes of Mount Hutt. Mastling gives plants greater success of reproduction, as there is more pollen available for fertilisation and the percentage effect of predation is greatly lowered. The cost of

masting is that few plants are able to flower for one or more years afterwards. He and colleagues have spent many years trying to find out what are triggers for masting in New Zealand, experimenting with temperature and nutrient variables. The experiments showed while temperature increases can encourage more flower production it can also result in deformities in plants making them reproductively unviable.

August field trip was at Broadfields Garden with 3.5 hectares of formal and informal native trees and NZ raised varieties of azaleas, rhododendrons, camellias, cherry cornus, maples, peony perennials, daffodils, lily, and roses. It includes a kauri forest with over 100+ trees, cubs-canopy and ferns. There is also a large beech forest, 120 m NZ border, sedge pond, formal rose garden, cricket oval and more. All framed by 1.5 km of totara hedges.

September Meeting: Melanie Lapointe took us on a trip to discover the spring flowers that grow in the understory of Canada's sugar maple forests. After 4 months of being buried in snow, nature finally emerges from hibernation. Spring flowers have showy colourful flowers that last only for a short period of time. Although these herbaceous plants come from different plant families, they share similar adaptations, lifecycle, and reproduction strategies and face similar threats. We discovered the risky reproduction strategy of Wild ginger (*Asarum canadense*), the complex lifecycle of Trilliums (*Trillium spp.*) and Jack-in-the-pulpit (*Arisaema triphyllum*), and the roles played by ants in seed dispersal.

November meeting: Paul Maurice gave a talk on the flora of the Silk Road, in the Tien Shan mountains in Central Asia. Paul was fortunate enough to join a botanical tour of the Central Asian Tien Shan Mountains last year. He shared his experience of the varied and beautiful flora encountered and also provided a little background information about the three countries visited, Uzbekistan, Kazakhstan and Kyrgyzstan, all former republics of the Soviet Union

November field trip: Motukānuka Scientific Reserve (DOC), Eyrewell. We visited this newly gazetted Scientific Reserve with staff from the Department of Conservation (Mahaanui office). Kānuka forest used to be widespread across the Canterbury Plains but there are now very few areas left so this was a rare opportunity to visit an 11 ha remnant of this special lowland dryland vegetation. We compiled a plant and lichen species list for the reserve and discovered a few botanical gems.

FUTURE EVENTS

Saturday 7th December: Field trip to Rockwood near the Rakaia Gorge. Lead by Alice Shanks.

Changes to the programme are notified on: <http://canterburybotanicalsociety.org.nz/canterbury-botanical-meetings-field-trips>

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ANNOUNCEMENTS

■ **2019 Loder Cup awarded to Chris Horne.**

Wellington's Chris Horne has been awarded the 2019 Loder Cup. The Loder Cup is the Department of Conservation's premier plant conservation award, which aims to 'encourage and honour New Zealanders who work to investigate, promote, retain and cherish our indigenous flora'. The nomination was made by the Wellington Botanical Society and supported by letters from Dr Danielle Shanahan (Zealandia), Dr Philippa Crisp (Greater Wellington Regional Council), Clive Anstey (Wellington Natural Heritage Trust) and Peter Gilbert (Wellington City Council).

Chris is a legend in the Wellington region for his commitment to the protection of the New Zealand flora. He has been a highly active member of the Wellington Botanical Society (WBS) for almost 40 years. He has been on the WBS committee for 25 years and has been newsletter Editor since 1993. He also regularly writes articles for the WBS newsletters and Bulletin. Chris has led numerous fieldtrips for WBS and on all the fieldtrips he attends he takes the time to welcome, mentor and offer botanical identification tips to new members.

Chris has also been an active member of numerous other conservation groups, such as the Karori Wildlife Sanctuary Trust and the Natural Heritage Trust. Chris, and Barbara, were involved in the development of the Botanical Trail in Zealandia and have guided many botanical walks for the general public, as well as providing botanical training to Zealandia's guides.

As a passionate conservationist Chris regularly champions for the protection of the environment through letters to the editors of newspapers and magazines. Chris has contributed many written and oral submissions to decision makers, both as a representative of the Wellington Botanical Society and in a personal capacity. His submissions have provided an important viewpoint on the environmental effects of new policies and plans.



He is highly regarded as a botanist, despite no formal training, and has assisted with a huge number of plant surveys and planting projects, written numerous plant-related outreach articles and guided many botanical walks. Lastly, Chris leads by example – he doesn't just talk about conservation but is out weeding, planting and putting baits in predator bait stations.

During the presentation ceremony, Chris acknowledged his late partner Barbara Mitcalfe, with whom he shared many botanical adventures.

NOTES AND REPORTS

■ How do whau (*Entelea arborescens*) seeds disperse?

Lara Shepherd (Lara.Shepherd@tepapa.govt.nz) and Peter de Lange

Introduction

Seed dispersal has implications for the ecology, evolution and conservation of plant species and is predicted to play an important role in the origin of species diversity. Plants have evolved a range of possible mechanisms to assist with the dispersal of their seeds, including using wind, water and animals.

Our recent study of the phylogeography of whau (*Entelea arborescens*, Malvaceae) prompted this investigation of how whau seeds disperse. Our published study (Shepherd et al. 2019) indicated there were two genetic lineages within whau: one lineage was found predominantly down the west coastline of the North Island and the other down the eastern coastline (Shepherd et al. 2019). We postulated that this pattern may be a consequence of limited seed dispersal.

Whau seeds are encased in woody capsules with rigid, spinose hairs up to 25 mm long (Figure 1), which is an unusual feature for a New Zealand tree. Thorsen et al. (2009) suggested that whau seeds disperse through attachment of the spiny capsules to animals, but no supporting evidence was provided. The genetic patterns we observed are unlikely to have arisen by animal dispersal because animals, such as moa, would likely move between eastern and western coastlines of Northland.

As an alternative, we suggested that wind or water may instead facilitate the dispersal of whau and that the capsules have been observed to float and blow along the ground (Shepherd et al. 2019). Similar genetic patterns to whau have been observed in several marine species, which disperse via water currents.

Here we investigate whau seed dispersal through observations and experiments. Several plants in cultivation in Wellington were used as the source of seeds and capsules.



Figure 1. Spiny whau capsule encasing seeds.



Attachment to 'moa'

Whau capsules were detached and thrown at a model of a moa constructed with emu feathers (Figure 2). All capsules readily attached themselves to the feathers (Figure 3).

Floatation

Twenty whau seeds each were placed in containers of freshwater and seawater. All seeds immediately sunk to the bottom for both treatments. In contrast whau capsules did float in both fresh and seawater.

Figure 2. Moa model at the entrance to Te Papa's Tory St storage facility. The model is constructed using emu feathers.



Figure 3. Whau capsule clinging to emu feathers.

Conclusions

It remains unclear how the seeds of whau disperse. We observed whau capsules floating, adhering to feathers and blowing in the wind, so these dispersal mechanisms are all possibilities. However, whau capsules remain attached to the tree well after the seeds have been released. By the time the capsules fall off the tree to blow or float the seeds are often long gone. It is possible that birds such as moa may have brushed against whau capsules causing them to detach from the tree while the seeds are still encased. However, the trees grow to 15 metres tall and the tallest moa species only reached around 3 metres in height (Tennyson & Martinson 2007).

The Afro-Madagascan genus *Sparrmannia* is the closest relative of whau (Brunken & Muellner 2012), with the two genera estimated to have diverged around 11 million years ago. *Sparrmannia* seed capsules look extremely similar to whau (<http://pza.sanbi.org/sparrmannia-africana>). It is therefore likely that this shared fruit morphology evolved prior to the arrival of whau in New Zealand and in response to different selection pressures. It is even possible that the spines on the capsules do not relate to dispersal but protect the seeds from being eaten.

Acknowledgements

LS thanks the late Barbara Mitcalfe (1928-2017) for gifting her the whau plants that were used for these experiments.



Figure 4. Whau capsules remain attached to the plant after the seeds fall out.

Wind dispersal

Individual whau capsules were detached and placed on a flat surface outside during a windy day in Wellington. The capsules rapidly blew several metres along the surface like tumbleweeds.

General observations

Whau capsules are firmly attached to the plants and remain so well after the seeds have fallen out (Figure 4). Empty capsules were still present on our cultivated tree six months after the seeds had fallen out. Whau seeds themselves have no obvious dispersal mechanisms.

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- A historical collection of Chilean plants in AK (Auckland War Memorial Museum herbarium).

Rhys Gardner, rhysogardner@hotmail.com

Introduction

Two articles by Jeanne Goulding (1971, 1975) explain the ways in which Auckland Museum's Thomas Cheeseman enriched his herbarium, particularly before 1900, with specimens from overseas. Working at AK at a time when it held much less than it does today, Ms Goulding was well acquainted with the physical appearance of this material and had examined Cheeseman's letters in order to understand its various provenances.

I am writing here about a much more obscure set of foreign plants. They are nineteenth century in origin, at least as to their date of collection, but Cheeseman seems never to have examined them, and they are not mentioned by Goulding. No relevant correspondence has been located, so some of my conclusions must be regarded as tentative.

Goulding found that the great majority of foreign specimens that reached AK before 1900 came, through exchange or by gift, from North America, Britain, or Europe. Most are adequately labelled, being identified to species level and often having the location, collector and date too. In those cases where the label bore just the plant's name Cheeseman would add an origin: "Professor Balfour [Edinburgh], Dr. Muller, Geneva", etc.

In Cheeseman's time the herbarium was not numbered. Numbering was initiated in the mid-1940s and started with the native plants that Cheeseman himself had collected (Molesworth 1946). Some years subsequently, numbering began in the foreign part of the herbarium (starting with Magnoliaceae, the first family in AK's Hutchinson sequence). This was done with a hand-held stamper and red ink. So, if a packet of foreign specimens from various families had been mounted and distributed into genus-folders before that time their red-ink numbers would not run consecutively. The collection being discussed here has this character, so we cannot get an idea from its numbering of how many specimens it contains.

The collection: quality and quantity

Almost none of the collection in question (hereafter CQ) has been captured by AK's current data-basing program. So to understand its extent and composition I first made a sampling of the herbarium at large. It became clear that CQ comprised plants from southern South America, and, to judge from the names themselves, the species' distributions, and the very occasional reference to a locality, it appeared that they came mainly or entirely from Chile.

Then I went to the *Flora of Tierra del Fuego* (Moore 1983), the only relevant work in AK's library. It provided several hundred names to search under, including many older synonyms. The latter in fact provided the happiest hunting, supporting the probability that CQ was formed in the nineteenth century. An additional search was then done, of AK's Compositae holdings, within the genus-names in Claude Gay's monumental account of Chile's flora (Gay 1847, 1849). There are 145 such names, many long-superseded. This provided about twenty more sheets.

In total, up to the date of writing, more than a hundred and fifty sheets of CQ have been located. Dicotyledons are best represented. Oddly, considering their strong presence in Chile, grasses and sedges (*Carex*) seem to be lacking, and pteridophytes too. No attempt to work out the current names for CQ's specimens has been made, and in what follows here the names with their authorities are given just as they appear on the labels.

Now it is necessary to say something about the physical attributes of CQ, to understand why it is being referred to as a single collection. Firstly, the amount of plant material on each sheet is nearly always small and in rather poor condition. The mounting (at AK) of such material was mostly done onto sheets about half the standard size; just a few specimens were put onto the larger sheets. Consistently, cut strips of white or brown gummed paper were used to attach the specimens. I cannot give a date to this long-discontinued practice, but see the comment by curator Robert C. Cooper about the use of sellotape in the early part of his tenure, that is, in the late 1940s (Cameron 2004:100).

All the CQ sheets I have been able to locate bear an original label. They are rectangles of greyish white paper (no watermarks), approximately 7 x 5 cm, and, except for cushion plants and the like, carry a pair of slits, showing they originally sat on the stem of their specimens. None have been annotated by Cheeseman.

These labels are presumed to be that of the collector, or, at least, of the person who gathered them into his collection. The great majority simply carry the species-name and authority, handwritten in faded black ink. Four are shown in Fig. 1. It seems to me possible, from the rather consistent appearance of the writing, that this large part of CQ's labels might have been done within a fairly limited span of years, perhaps even all at once.

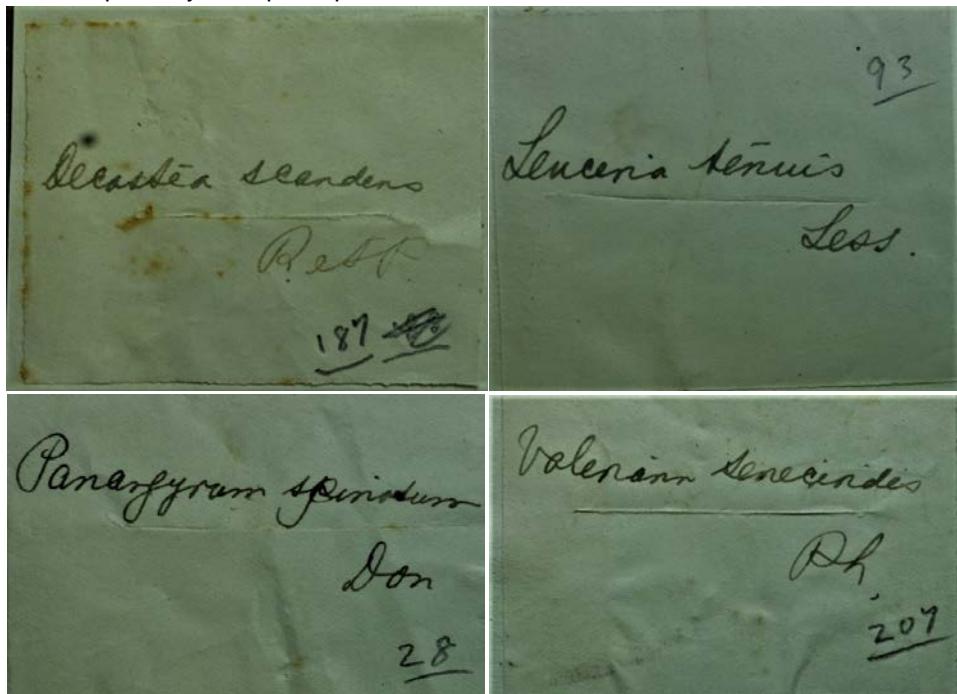


Fig. 1 Chilean specimen-labels, with names only
 (a) *Decastea scandens* R. & P.
 AK 33121 (b)
Leuceria tenuis
 Less. AK 90673
 (c) *Panargyrum spinulosum* Don
 AK 91171 (d)
Valeriana senecoides Ph.
 78075

In addition to this major part of CQ there are a small number of sheets (17 so far found) whose labels are in a slightly different format. They are on different paper, in rather smaller handwriting, and have some brief (often near-illegible) indication of date, locality, or collector. Five are shown in Fig. 2. The label of *Euphorbia collina* Ph. (Fig. 2a) has the most recent collection date so far detected, "II-[18]96".

Back to CQ as a whole: also marked on its labels, above or below the name and generally at a slant to it, is a pencilled number: "x", or rarely "no x" (Fig. 1, 2). This is a clerical enumeration rather than a collecting-number. The lowest pencilled number my sampling turned up was 3, for *Pinguicula chilensis* and the highest, 304, for *Ourisia poeppigii*. Obviously the order of this numbering follows neither the alphabet nor any traditional family sequence. The numbers tend to be consecutive within a genus though; that is, the specimens apparently were partially sorted before being given their number. However, this aspect of their curation is disturbed by the not infrequent instances (more than 20 found so far) where a number is duplicated or even triplicated. These replications are not confined to any one genus: "no 6", for example, belongs to *Eutoca pinnatifida* of the Hydrophyllaceae (in the Hutchinson arrangement) and "6" to *Plantago tumida* of the Plantaginaceae. Also, the use of "no" is not invariably associated with the duplicated material, e.g. "88" is the number for both *Pernettya leucocarpa* and *Lardizabala bibernata*.

The highest pencil number so far found to be duplicated is 248, and the highest in triplicate, 112. The possibility then, until every foreign AK specimen is data-based, is that CQ arrived at AK not as one consignment but as three, two of which had at least 248 specimens and one with at least 112. But because my sampling has turned up relatively few duplicated and triplicated numbers I think it more likely that this numbering was done by some intermediary herbarium, in their handling of three consignments from the one collector, before passing on a selection to AK. This selection seems to have been deliberate, since all CQ species so far located occur in AK just as single specimens

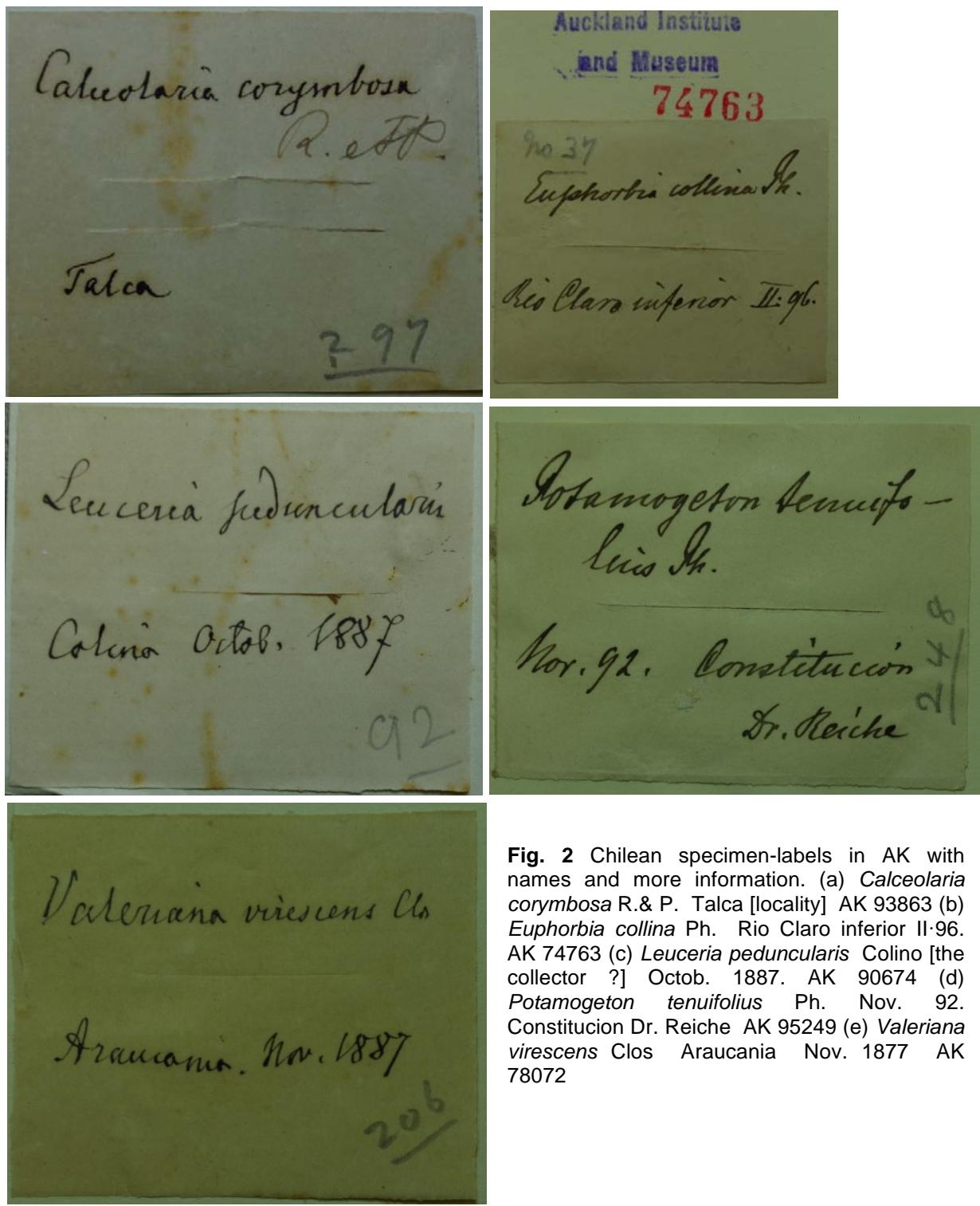


Fig. 2 Chilean specimen-labels in AK with names and more information. (a) *Calceolaria corymbosa* R. & P. Talca [locality] AK 93863 (b) *Euphorbia collina* Ph. Rio Claro inferior II:96. AK 74763 (c) *Leuceria peduncularis* Colino [the collector ?] Octob. 1887. AK 90674 (d) *Potamogeton tenuifolius* Ph. Nov. 92. Constitucion Dr. Reiche AK 95249 (e) *Valeriana virescens* Clos Araucania Nov. 1877 AK 78072

Who made CQ?

Who then is responsible for collecting CQ, or at least, for first getting its specimens together? Because the correspondence of Cheeseman and subsequent curators of AK has not been examined we can only work from the labels' names and their handwriting.

As noted, CQ's names are old ones, coming from 18th and 19th century works on the plants of southern South America. All except four were published before 1890, the exceptions dating to 1894 (*Senecio polygaloides* Ph., *S. williamsii* Ph.), 1897 (*Adesmia melanocarpa* Ph.), and 1905 (*Leuceria canescens* Reiche).

The authors of these four names are, respectively, Rudolf Amandus (later Rudulfo Amando) Philippi (1808–1904), and Karl Friederich Reiche (1860–1929). Both were German-born botanists. Philippi had a long career at the Museo Nacional in Santiago (SGO), while Reiche was also there for a shorter period at about the turn of the century. In particular, it seemed promising that Philippi was not just a prolific collector but had distributed his collections widely — Vegter (1983) indicates that at least 43 of the world's herbaria, including several of the largest, like the United States National Herbarium (US), have some of his Chilean collections.

Fortunately there is a good representation of imaged Philippi material in the US database, all indubitable as regards attribution, to judge from their printed US labels. Three are shown here in Fig. 3, selected for comparison with the relevant ones in Figs. 1 & 2. Note that Philippi used "Ph." when writing of himself; the modern abbreviation is "Phil.".

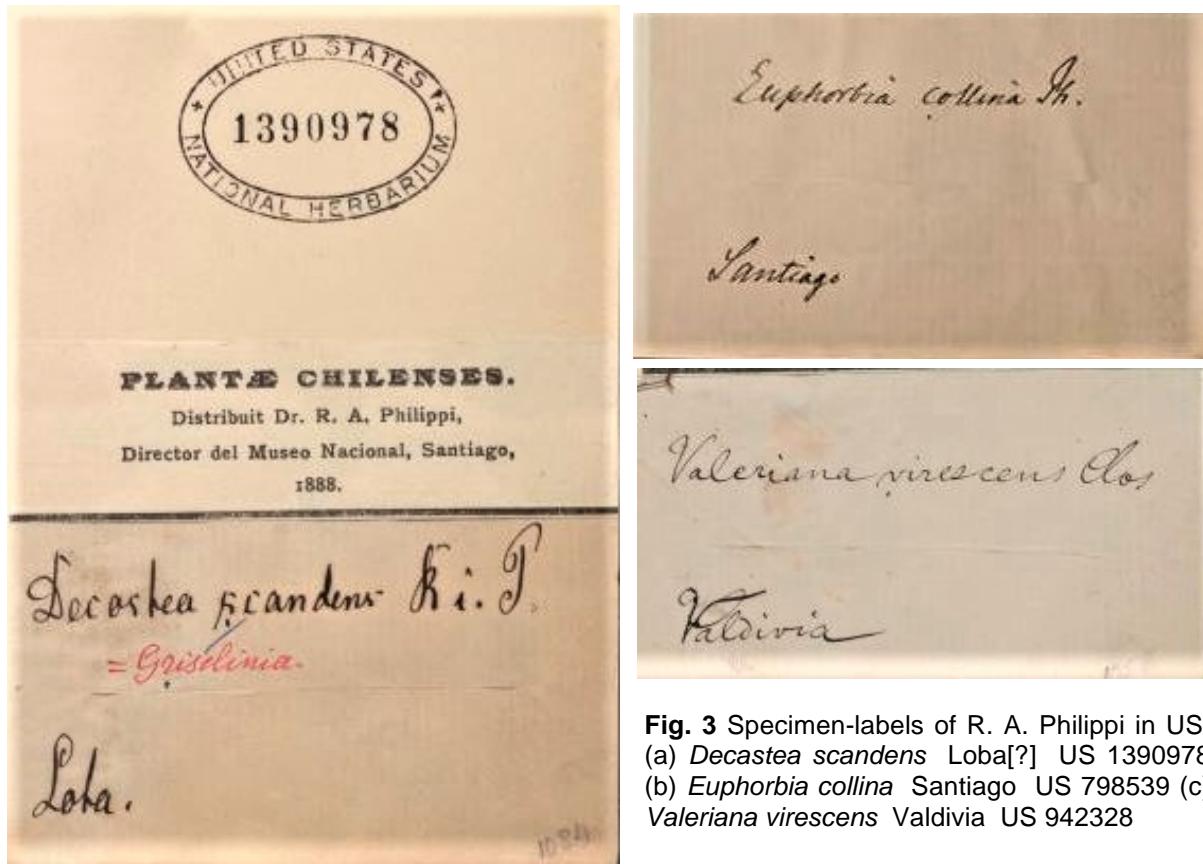


Fig. 3 Specimen-labels of R. A. Philippi in US.
 (a) *Decastea scandens* Loba[?] US 1390978
 (b) *Euphorbia collina* Santiago US 798539 (c)
Valeriana virescens Valdivia US 942328

I believe, then, that CQ was formed, and to a very large degree actually collected by, R. A. Philippi. This conclusion was independently reached by Ms Alicia Marticorena at Chile's University of Concepcion herbarium (CONC), to whom I showed several of CQ's labels. Also in favour of such an attribution is that in the twelve samples of Chilean botanists' handwriting illustrated by Muñoz-Schick et al. (2012), including one of C. F. Reiche, it is the two of Philippi that seem to be the best match.

Ms Marticorena also advised that in the case of the labels with more than just the species name, for example, that of *Potamogeton tenuifolius* Ph. (Fig. 2d) collected by Reiche, the handwriting seemed also to be that of Philippi. Note, for example, the similarity of the "Ph." in Figs 2b and 2d.

A list of the CQ sheets located so far, under the names written on them, has been deposited by the writer in AK's Reprints Collection.

In the age of the internet it seems superfluous to say something here about R. A. Philippi, but I want to mention a compilation of South American botany which has, in addition to a synopsis of the best 19th century natural-history travel books and optimistic post World War Two projections for research and sustainable agriculture across the continent, much of lasting value on the botanical history of each country (Verdoorn 1945, esp. pp. 48, 148, 234).

Afterthoughts

1. AK has very little 18th or 19th century South American material. The principal such collection, not data-based but likely to be much smaller than CQ, is that of Swedish botanist N. J. Andersson, who collected in the Straits of Magellan in 1852 during the Voyage of the *Eugenie*. And there are one or two orphans, like the *Abrotanella emarginata* got by J.D. Hooker from the Falkland and Hermite Islands in 1842.
2. Exchange and gift programs seem to be a thing of the past— so much easier just to ask for the images. Perhaps we will soon be taking photographs and throwing the specimen away (W.A. Whistler, pers. comm.).
3. Admittedly, the findings here about CQ will hardly bring George Smiley out of retirement, but now AK's data-basers can write something in their fields and somebody one day might be grateful.

Acknowledgements

Ms Alicia Marticorena (CONC, Universidad de Concepción, Chile) is thanked for her prompt response and for providing the Muñoz-Schick *et al.* article.

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BIOGRAPHY / BIBLIOGRAPHY

■ Biographical Sketch – Greta Sernander-Du Reitz (1897–1981).

Val Smith, 80 Mill Road, New Plymouth 4310.

Greta Sernander was born at Uppsala, Sweden, on 1 November 1897, the daughter of Johan Rutger Sernander (1866–1944), professor of plant biology (Växtbio) at Uppsala University from 1908 until 1931, and his wife Signe, née Lindhagen (1865–1940), a pastor's daughter. By the age of thirteen Greta had absorbed her father's botanical interests and his growing fascination with lichens, but apart from his guidance, occasional seminars and field trips, she had no formal education on the subject. Her first publication, in 1919, was a floristic account of an excursion to Jämtland in central Sweden. In her parents' home and at the university she met renowned lichenologist Gustaf Einar Du Rietz (1895–1967), a former student of her father, and after an engagement of five years they married in 1924. Then, although she still collected and made ecological observations, Greta's research was in support of and overshadowed by the work of her father and her husband.

After the loss of their first-born son, and with the enthusiastic support of New Zealand botanists Leonard Cockayne and H H Allan, Einar and Greta Du Reitz left Uppsala on 29 July 1926 for an extensive New Zealand tour, the focus of their "Swedish Botanical Australasian Expedition". They travelled widely in both North and South islands, Einar collecting copiously while Greta photographed the landscape and vegetation, and in the evenings she did most of the pressing and preparation of specimens. When he visited the subantarctic islands with Captain John Bollons on the government lighthouse steamer *Tutanekai*, along with W R B Oliver of the Dominion Museum, ornithologist H Guthrie Smith and others, she was left in Dunedin. After continuing on through Australia and also visiting Java, they arrived back in Sweden in November 1927 with an impressive collection of lichens, flowering plants, photographs, field notes and plans for publications. The latter did not eventuate, however, as Du Rietz became embroiled in negotiations to succeed his father-in-law at Växtbio in Uppsala.



Pseudocyphellaria gretae. Photo by Allison Knight

With the birth of their daughter Kerstin in 1928 and twins Ingrid and Rolf in 1935, Greta took no further part in her husband's botanical research, other than fine-tune his field diaries. Her interest turned to children's drawings (in relation to primitive art) and genealogy. However, after some difficult years and the couple's divorce in 1951, she resumed her lichen work with enthusiasm, publishing in 1957 on the fertility of the silver lichen *Parmelia tiliacea*, in relation to ecological factors. She continued to make new discoveries, of which her last and perhaps most notable find on a return visit to her original lichen haunts, was the powdered rosette lichen *Physcia magnussonii* (1977), new to Scandinavia.

Greta Sernander-Du Reitz remained lichenologically active until her death at Uppsala on 14 May 1981, aged 83, and in 1983 New Zealand lichenologist David Galloway named *Pseudocyphellaria gretae* after her.

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Pseudocyphellaria gretae

Pseudocyphellaria ("false cyphella") is a genus of about 170 species of large, leafy lichens sometimes known as "speckle belly" lichens. The genus has a wide distribution, especially in south temperate regions. *Pseudocyphellaria gretae*, a New Zealand endemic, is usually loosely attached to the bark of New Zealand beech species. The lobes are thin and delicate in texture, the upper surface green when moist and greyish when dry, and distinctly tomentose (with silky hairs), often with small, granular, coraloid, densely tomentose marginal isidia (vegetative propagules). The white to pale buff undersides, also tomentose, are scattered with minute pseudocyphellae (round to fleck-like gaps) in the lower cortex.

PUBLICATIONS

■ Publications Received

Nelson Botanical Society Newsletter September 2019: upcoming trips and talks, trip report for Kelly's Bush and talk report for Alice Shank's talk on the Ashburton Plains.

Botanical Society of Otago Newsletter 88 October 2019: upcoming trips and talks, obituary: Ian Atkinson, sexy pavement lichen, coproecology and the little bush moa, mycorrhizal fungi in central Otago, experimenting with bryophytes, moa and divarication, aeroplanktonic spiders, *Tupeia antarctica*, trip reports for Knight's Bush and Okia Reserve.

Canterbury Botanical Society Newsletter 2019 10: upcoming trips and talks, trip reports for Broadfield Garden and Te Piriti West.

Canterbury Botanical Society Newsletter 2019 11: upcoming trips and talks, school science fair, practical field botany course.

■ Book review - *Seaweeds of Auckland*, by Mike D. Wilcox. Auckland Botanical Society Bulletin No. 33, 2018. Auckland: Auckland Botanical Society. Cased with laminated boards, full colour throughout, 420 pp. \$150 + postage \$8

Available from Auckland Botanical Society, PO Box 26391, Epsom, Auckland 1344. E-mail enquiries: aucklandbotanicalsociety@gmail.com

Review by **Mike Bradstock**, 5 Leinster Ave Raumati South 5032. m.c.bradstock@gmail.com

Now that the seaweed flora of New Zealand as a whole is fairly well known, we need a book like this for every region in New Zealand.

Part One of *Seaweeds of Auckland* is a detailed, very readable tour of Auckland shores that will be historically very important as a record from a point in time when issues like biosecurity and climate change mean future ecological changes may be rapid and dramatic. To start with, in just 130 pages Wilcox explores practically every soft and hard shore throughout "Auckland city", from exposed to strongly sheltered shores and to the highest reaches of the most remote tidal inlets, and including the islands of the Hauraki Gulf. However, setting the geographic coverage this way means the scope is defined (not altogether satisfactorily) by political rather than natural boundaries. This means that Coromandel Peninsula is omitted (a great pity) while Great Barrier Island is well covered (a bonus) and the southern arm of Kaipara Harbour is included but not the northern one. Fortunately, the marine reserve at Goat Island Bay just manages to sneak in.

Setting that aside, it is difficult to stress just how valuable this book is as background for any ecologist, botanist or zoologist visiting or planning a study in any of these places. Even planners will find it insightful as well as descriptive (if only they will read it), thanks to the broad picture it gives of

Auckland's vulnerable coastal habitats. In a work like this it is often necessary to enumerate long lists of species with brief details, but Wilcox has the happy knack of keeping the language clear and vivid so the book is easy to learn from.

He not only describes the habitats and stands of seaweeds, but really takes us in to the places where they live, both getting in close with his camera and standing back for the larger view that is particularly useful for narrowing down species identifications and recognising associations. This is particularly true with the smaller algae, where some of the photos enable us to recognise some of the most nondescript filamentous, fine or turf species by seeing a whole stand of the species in its context, and then to proceed to a confident identification.

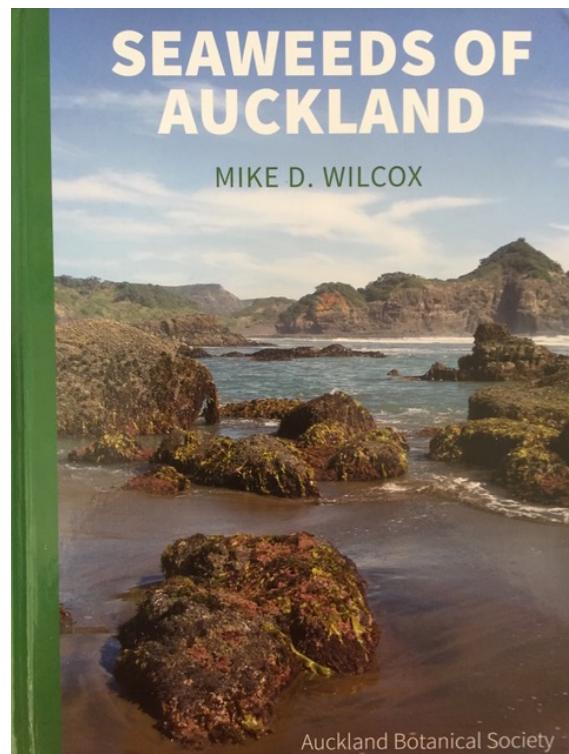
Part Two is a 230-page compendium of species (six major taxa of algae, plus lichens), thus providing a complete identification guide. Here the generous use of photographs has paid off, as algae are generally tricky to recognise, distinguish and identify to species. This is overall very well done, even if some scale bars are unreadably small, and opportunities have been missed to standardise scale in some groups of pictures. It's also often a bit of a chore matching things where groups of up to six photos have a long composite caption broken up only by semicolons.

Wilcox is a splendid photographer, from microscopic view to landscape, the photos being well lighted, composed and selected. The picture on p. 18 of an exposed coast at low spring tide is just one example of many exquisite grand views of a shore and again, such photos are useful as they will help increase the confidence with which we can identify species and recognise common associations. Of course it'd have been even better with more and larger photos. With the algae, field characters are often morphologically plastic or frustratingly lacking. There's virtually no limit to the number of photos that can be useful to sort this out.

It has always been a struggle to make big short-run colour books economically viable and I remember when any colour was a luxury in a short-run book for the NZ market. We publishers used to bung 8 or 16 colour pages in the middle of 200 black-and-white pages and call that generous. Placing any plain black text (other than any necessary captions) on pages printed in colour was "a waste of space". This was a fair argument as colour printing costs much more than black and white, and it is often a necessary compromise to arrange a book in separate colour and black-and-white sections, even though this means separating the pictures and the words.

Call me a philistine but it would have been better to dispense with the herbarium records, which when reproduced on colour pages in these online times are also "a waste of space". Such records could easily be made accessible online (and in that form they would also be easy to update regularly) and space for more pictures would be freed up (or pages and hence cost could be saved). Yes, the book is already well illustrated – but it could always do with more and larger photos that would be more valuable than screeds of location data (which in places takes up most of the page). Of course, it would rankle with some to see such data omitted, especially in a botanical society "bulletin" (terminology that rather undersells a substantial monograph that deserves the widest possible readership).

An index of localities would also have been a useful addition. But this is getting dangerously close to nitpicking: *Seaweeds of Auckland* is a very good, very beautiful and above all important book, a tremendously valuable addition to the literature. Wilcox has worked very hard and Foundation North has invested its money well in supporting publication. May we look forward to *Seaweeds of Northland* next?



Auckland Botanical Society



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