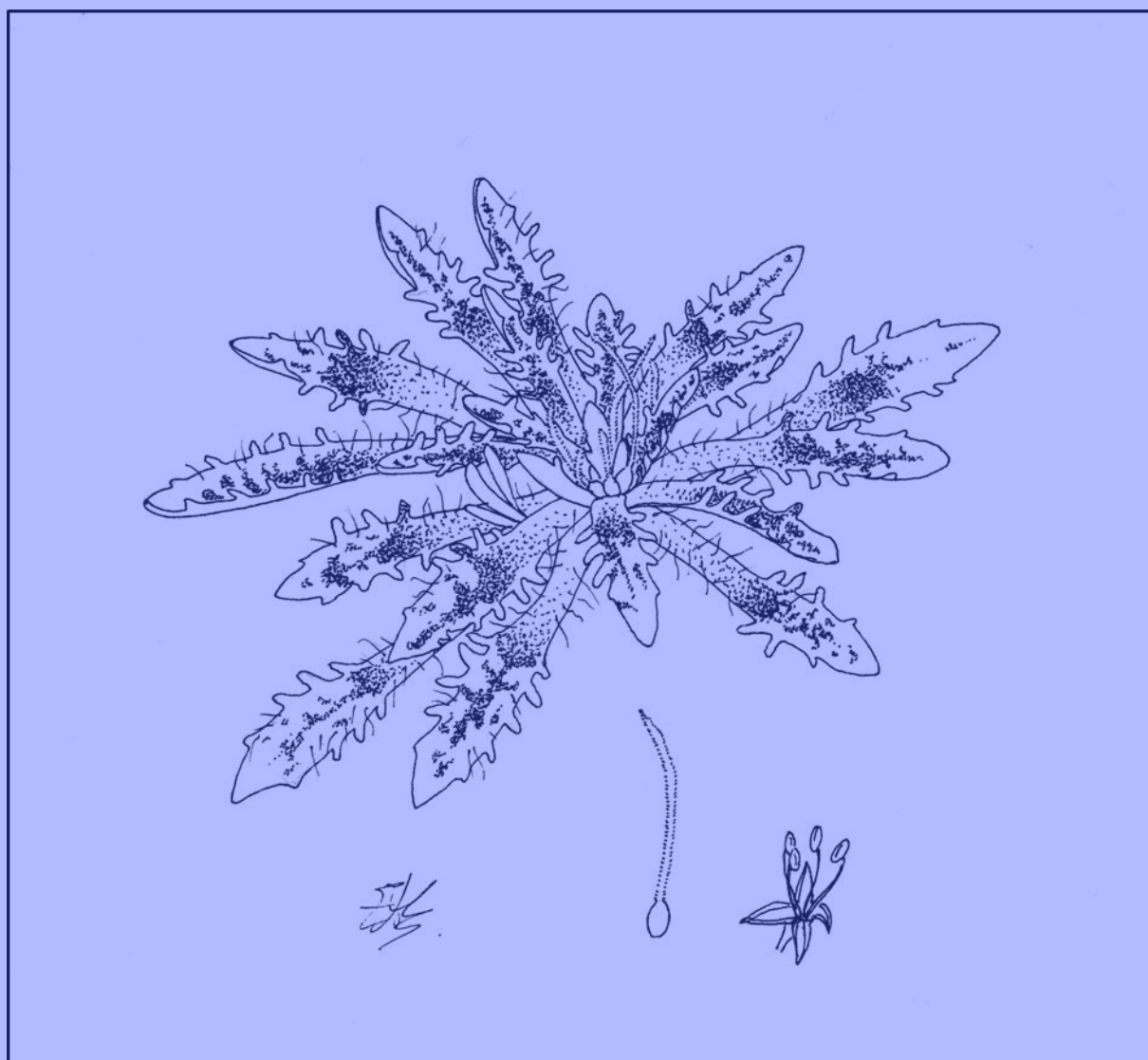


NEW ZEALAND BOTANICAL SOCIETY

NEWSLETTER

NUMBER 137

September 2019



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 December 2019 issue is 25 November 2019.

Please post contributions to:

Lara Shepherd

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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

Plantago unibracteata by Eleanor Burton.

NEW ZEALAND BOTANICAL SOCIETY
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NEWS

New Zealand Botanical Society News

■ Announcement of the Allan Mere Award for 2019

The NZ Botanical Society Committee is pleased to announce Rodney J. Lewington (1935-2018) as the recipient of the 2019 Allan Mere Award. Rodney was proposed by the Wellington Botanical Society (WBS) and supported by Patrick Brownsey and Peter Beveridge (Te Papa), Otari-Wilton's Bush Trust, Alison Knight (Botanical Society of Otago), and Jessica Beever.

The proposer and supporters included: "...Rodney was for over five decades a driving force in the botanical world through his engagement in the WBS and the Otari-Wilton's Bush Trust, his contribution to bryophyte systematics and distribution, and his everlasting energy to promote the wonderful world of plants. Through this nomination, we also would like to acknowledge Darea Sherratt, Rodney's wife, for her years of support of Rodney's botanical initiatives, her commitment to the running of WBS, her tenacity on botanical field trips and summer botanising camps, and her dedication to the Otari-Wilton's Bush Native Botanic Garden."

"From the early 1980s he was a regular contributor to the John Child Bryophyte Workshops, developing a passion for bryophytes that continued for the rest of his life. He devoted about 15 years to mosses, and then turned to the even more challenging group of liverworts. Rodney soon graduated to a level where he could disseminate new information about mosses and liverworts, compiling several reports and publishing ten papers, describing a new species, and cataloguing bryophyte diversity in areas around Wellington, Banks Peninsula and Fiordland. His entry into liverworts was particularly challenging because of the widely dispersed scientific literature and lack of a New Zealand Flora. To overcome this, he produced illustrated keys and compiled other information that he shared with professional and beginners on a website, and which is still in regular use today."

"In summary, over the last 57 years Rodney has been an integral part of nearly every Wellington Bot Soc trip and meeting, every John Child Bryophyte Workshop and numerous Otari – Wilton's Bush tours. He facilitated the running of many of these botanical activities. He always made a point of welcoming newcomers and has passed on his enthusiasm and wide knowledge of New Zealand plants to hundreds, if not thousands of people. In doing so he has made a very significant contribution to expanding the understanding of and enthusiasm for New Zealand Botany. Rodney is extraordinarily deserving of the 2019 Allan Mere Award."

"Above all, Rodney will be remembered for his quiet leadership, his generosity, his mentoring, and his willingness to take on new challenges."

Arrangements are underway for Anthony Wright to present the Allan Mere to Darea Sherratt, Rodney's wife, at an event in Wellington.

Ewen Cameron
Secretary, New Zealand Botanical Society

■ Call for Nominations

Nominations are called for the following positions of Officers and Committee of the New Zealand Botanical Society for 2019:

- President
- Secretary/Treasurer
- 3 Committee Members
- Editor

Nominations for all positions open on 1 September 2019 and close on 20 November 2019.

Nominations shall be made in writing to the Secretary, c/o Canterbury Museum, Rolleston Avenue, Christchurch 8013, and shall be signed by the Proposer, the Seconder, and by the Nominee to indicate their acceptance of nomination. If necessary, ballot papers for a postal election will be circulated with your December *Newsletter*.

Regional Botanical Society News

■ **Auckland Botanical Society**

June Meeting

Rising atmospheric CO₂ is warming our climate, but it also affects plants directly. Speaker Sebastian Leuzinger pointed out that the presumed benefits of higher rates of photosynthesis and less water consumption are slightly more complex than expected. The arguments that rising atmospheric CO₂ is only beneficial to plants were looked at more closely.

June Workshop

A Unitec lab was well equipped for the holding of a lichen workshop, with staff members, Dan Blanchon and Peter de Lange giving expert guidance to those attending. A clear explanation of the basics of lichen morphology was given for those unfamiliar with the complicated symbiosis between fungi and algae/cyanobacteria. With plenty of microscopes available the bold attempted to use a key to identify the specimens available.

July Meeting

A well-presented Plant-of-the-month talk by Ben Goodwin began with an overview of the *Drosera* species in New Zealand then concentrated on *Drosera auriculata*. Carlos Lehnebach, Curator of Botany, Te Papa Tongarewa, gave us a fascinating “peek into the secretive world of New Zealand orchids”. As one who has sat for long periods of time unsuccessfully trying to catch sight of a pollinating insect visiting an orchid, it was a delight to watch the video showing fungus gnats performing a mating dance around a *Corybas* plant prior to laying eggs in the fungus-look-alike flower. Carlos’s studies are concentrating on those cryptic features of orchid interactions with both fungi and insects. Taxonomy is also exercising his mind, and it was pleasing to hear that he takes variation into account before announcing a new species.

July Field Trip

A winter walk in Western Springs Lakeside Park was a popular option attracting a sizable crowd. There were many large exotic trees in the park, with a fruiting Podocarp, *Afrocarpus falcatus*, causing quite a deal of interest. For the fern-lovers, exploring the lava rocks was profitable, with a number of exotic ferns growing there, as well as the usual native rock ferns. The lakes attract large numbers of wetland birds – flocks of Australian coots were right at home.

August Meeting

Jack Warden introduced the rules for the upcoming photo competition. Nicholas Martin, entomologist, spoke on the mites and insects that he has found living on ferns, starting with *Pyrrosia elaeagnifolia* and *Asplenium oblongifolium*. He has produced Plant-SyNZ photographic-based identification guides that can be used on a tablet computer. An amazing number of invertebrates have already been found on ferns, and those of us who frequent the outdoors now have a further reason to closely observe what is occurring in the wild.

August Field Trip

Mangawhai Park is administered by the Kaipara District Council but has no special protection. Located on old dunes, with gumland habitat and excellent wetlands, it is a vegetation type that is fast disappearing under pressure from urbanization. The gumland scrub has a serious weed problem, with climbing asparagus and Kahili ginger growing rampantly. However, the wetlands look to be pristine, and deserve a closer inspection. Post-walk supping of tea, cake and smoked trout proved to be a pleasant way to interact with our cheerful Latvian leader.

Forthcoming Activities

September Meeting	Lucy Cranwell Lecture – Pieter Pelser. Senecio
September Joint Field Trip	With Waikato Bot Soc, Hapuakohe Ecological Area
September Field Trip	Totara Park, Manurewa
October Meeting	Costa Rica. Ewen Cameron
October Field Trip	QE II private land, North Auckland
November Meeting	Rakitu. Jack Warden
November Field Trip	Piggott Wetland, Tuakau
December Christmas Function	Ti Point, Whangateau

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

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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.

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■ Nelson Botanical Society

May Field Trip: Fungal foray, Six Mile beech forest, Red Hills

Ten hardy fungal foragers from the Nelson Botanical Society assembled at the Six Mile Bush carpark. Of particular note in the first section of bush were the slime moulds, the native bolete and a bright yellow *Cortinarius canarius*. As we moved to the drier parts of the forest, the species seemed to change, with a particularly impressive log covered in *Hypholoma brunneum* being a highlight. Around mid-morning we stopped in a patch of sunlight, spotting mistletoe and a few new fungi along the way. In the bush beside the cobb cottage purple pouch fungi were plentiful, as were yellow *Armillaria* species at the base of beech trees. As we were sitting down for lunch, a miro was spotted on the edge of the paddock



Insect-egg slime mould growing over a moss. Photo by Don Pitham

along with a *Peraxilla colensoi* with some of its sticky yellow fruit still on it. On our way back we found more interesting fungi and a gigantic specimen of scarlet mistletoe. Another highlight was huge patches of a bright white *Cortinarius* species, which seems to be common in beech forest.

May Talk: "Larger fungi and their diversity" Dr. Geoff Ridley



Favolaschia calocera (back-lit). Photo by Don Pitham

Geoff opened his talk describing the broad groups of fungi – just about any size and shape, from wee buttons, to cups, pouches, corals, jellies and brackets to what we know as mushrooms. Geoff warned about using the term mushroom for edibles and toadstools for those not edible. The genus *Amanita* has both edible and deadly poisonous species that are all 'mushroom'-like. He also stressed the importance for identification of always collecting the base of the stem of a fungus and noting whether it has gills or not and how gills are attached to the stem. Geoff then explained how fungi grow outwards, with examples in nutrient dishes over a few days to huge 'fairy' rings that can be hundreds of years old. What we see as a fruiting body is only a small part of the larger fungus. Fungi are now considered to be closer to animals than plants. He mentioned that the small orange pore on wood, *Favolaschia calocera*, originally from Madagascar, took only ten years to spread throughout the North Island and is now in the top of the South Island. When Geoff began his studies many common genera such as *Cortinarius* and the *Coprinus* (ink caps) were known here by only a few species. These genera can now have tens of species in New Zealand; *Cortinarius* now has around 200 species with more to come.

July Talk: "Natural history books in Nelson Public Library" Nicola Harwood

In this interesting talk, which took place in the Nelson Public Library, Nicola Harwood, Information Services librarian, showed us some of the key historical botanical titles in the library's Heritage Collections. Of particular interest to most of us was the beautifully illustrated volume by J. D. Hooker, *The botany of the Antarctic voyage of H.M. discovery ships Erebus and Terror in the Years 1839-1843, under the command of Captain Sir James Clark Ross (1844-1860)*.

FUTURE EVENTS

September 15:	Field trip to Nell's Bush Otuwhero.
September 16:	Meeting: 'Lichens in urban ecosystems; as pollution indicators and as rapid responders to climate change'. Dr Allison Knight.
October 20:	Wairoa Gorge weeding at Inch's Bush.
October 25-28:	Camp at Mangarakau.
November 17:	Field trip to Anchorage, Abel Tasman

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NOTES AND REPORTS

■ *Dicksonia* hybrids in New Zealand

Lara Shepherd and **Leon Perrie**, Museum of New Zealand Te Papa Tongarewa, lara.shepherd@tepapa.govt.nz

Ferns are well known for their ability to form hybrids. One fern group that rarely hybridises are the tree ferns; until recently no hybrids were known among the New Zealand tree fern species. Earlier this year, Shepherd et al. (2019) reported the first hybrids (Figure 1B) between the trunkless stumpy tree fern (*D. lanata* subsp. *lanata*; Figure 1C) and whekī-ponga (*D. fibrosa*; Figure 1A). Around 80 individual hybrid plants were found in Whirinaki forest. Genetic and morphological analyses showed these to be sterile F1 hybrids. Interestingly, the two parent species are not even each others closest relatives and are estimated to have diverged from each other 55 to 25 million years ago. For comparison, cattle and sheep are thought to have separated less than 20 million years ago.

Shepherd et al. (2019) hypothesised that hybrids between these *Dicksonia* species may occur elsewhere but have been overlooked. In July 2019 we found more *D. fibrosa* x *D. lanata* hybrids (Figure 2) growing next to the popular track to Rangiwahia Hut in the Ruahine Ranges. Both *D. lanata* and *D. fibrosa* were growing in the vicinity.



Figure 1. (A) Whekī-ponga (*D. fibrosa*) showing the trunk and skirt of dead fronds. (B) The hybrid *Dicksonia* at Whirinaki with its trunk and less-developed skirt of dead fronds compared with whekī-ponga. (C) Stumpy tree fern (*D. lanata* subsp. *lanata*) with its lack of trunk. Photos by Leon Perrie

We would like to hear of any other records of *D. fibrosa* x *D. lanata* hybrids, or any other suspected tree fern hybrids. *Dicksonia fibrosa* x *D. lanata* hybrids have a wide trunk similar to that of *D. fibrosa* and they both have skirts of dead fronds but the skirt is less well developed in the hybrid. The hybrid is most easily distinguished from *D. fibrosa* by its longer stipes, which are usually orange-brown, its wider fronds and the obtuse apices of its lamina segments. Also, unlike *D. fibrosa*, the hybrid has



sparse clusters of brown woolly hairs at the costae junctions on the underside of the frond. Similar hairs also occur in *D. lanata* subsp. *lanata* but the hairs are much denser than in the hybrid.

ACKNOWLEDGEMENTS

We thank Chris Stowe for initially bringing the Whirinaki plants to our attention and Patrick Brownsey for discussions about *Dicksonia* morphology.

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Figure 2. A hybrid *Dicksonia* (WELT P029457) next to the Rangiwahia Track, Ruahine Ranges.

- **Mrs Teremoana Katu, collector in the Cook Islands in 1970, and her fern *Microsorium katuae***

Rhys Gardner, Department of Botany, Auckland War Memorial Museum

In 1969, on the bicentenary of James Cook's First Voyage, the Royal Society of New Zealand sent an expedition to the Cook Islands. Its botanist, Professor W. R. "Bill" Philipson (1911–1997) of the University of Canterbury, made collections there that August, mainly on Rarotonga but also on the rather remote island of Atiu in the Ngaputuru Group.

Two publications resulted, one on the floristics of Rarotonga (Philipson 1971) and one on the pteridophytes of the "Southern Cook Group", that is, what are now called the Southern Group and the Ngaputuru Group. In the latter article (Brownlie & Philipson 1971) the senior author described a new species of fern, *Phymatodes katuii*. It was said to occur on three islands of the Ngaputuru Group, that of Mauke being where the holotype, "*Katu* 0017", was obtained.

The generic name of this fern has changed several times, first to *Polypodium* (Fosberg 1990) and then to *Phymatosorus* (Sykes and Game 1997). Currently, in Bill Sykes' *Flora of the Cook Islands*, it is known as *Microsorium katuii* (Sykes 2016: 114), with a distribution that includes Mangaia in the Southern Group, where it is said to be a relatively common fern of the sparse dry vegetation of the island's coral plateau.

The epithet is not explained in the protologue or in the subsequent literature. Its form would indicate that the collector Katu was a male (though *katui* would be the correct spelling in this case), and might

lead one to suppose him to be one of the Japanese fern-enthusiasts that collect in the Pacific Ocean region (cf. Nakamura 2008).

A search of the database of Landcare's Allan Herbarium (CHR, accessed 14 Jun '18) refuted that guess: through a lucky chance, the *P. katuii* holotype, and 52 other specimens, are entered as having been collected in 1970 by a "Teremoana Katu", that is, without doubt, by a Polynesian female. Of her 53 data-based specimens 33 came from Mauke ("22 March 1970"), and 20 from Atiu on the following day. The *Microsorium* is the only fern represented and in fact is the only collection of any particular interest – the rest are well-known native species or weeds and their label notes are quite uninformative.

One also sees that the *Katu* collection numbers of the 53 specimens are not consecutive. They begin at "0001" (*Guettarda speciosa*) and reach "00120" (*Geophila repens*). To the best of my knowledge there is nothing from this collector in any other herbarium, so we have to suppose that the balance has been mislaid, or, as can happen to inexperienced collectors in the tropics, was lost to fungi. I tentatively conclude, then, that Teremoana Katu was a person untrained in botany, and that she would have been recruited by Philipson on his 1969 visit to the Cooks.

No documentary material, such as Philipson's correspondence of the time, has come to my attention. An online search among the genealogical databases, however, yields an entry for a "Teremoana Katu (born Goodwin), 1945–2011" (MyHeritage.com, accessed 14 Jun '18). She was said there to have married a certain Tai Katu of Aitutaki, and to have had one child. (Another website (amemory.co.nz, accessed 14 Jun '18) says however that she was born 13 April 1941). She died in New Zealand, and is buried at the Porirua Cemetery, together with her husband, who predeceased her. According to a sister-in-law, Mrs Ina Katu (pers. comm. 4 July 2019), Teremoana Katu is likely to have been born in Rarotonga, in the village of Ngatangia.

The botanical interest of Mrs Katu is threefold. Firstly, her collection stands out as being the only one I know of, not just from the Cook Islands but from the southern Pacific Ocean region at large, that has been made by an indigenous person unconnected with government (and I find it not at all surprising that this person would be a female).

Secondly, this investigation would have stalled if the person in CHR who accessioned her specimens had written just "Katu" or "T. Katu" on their labels. Future historical researchers are not helped by the omission of a collector's full name and gender.

Thirdly, because Brownlie's new fern is named after a female it is required by the International Code of Botanical Nomenclature that its epithet be changed to *katuae*. This genitive is the correct and invariable spelling in *Microsorium* or any other genus.

ACKNOWLEDGEMENTS

I am grateful for assistance from P. Pelser (CANB), Ines Schonberger (CHR), Jean Mason and Gerald McCormack (Cook Islands), and Mrs Ina Katu (Porirua).

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BIOGRAPHY / BIBLIOGRAPHY

■ **Biographical Sketch – Joshua Morgan (1857-1893)**

Val Smith, 80 Mill Road, New Plymouth 4310.

At Tangarakau in eastern Taranaki in April 2014 Wellington bryologist Peter Beveridge collected a liverwort that did not match any known species. Five years later it was described formally as *Cheilolejeunea morganii*, after Joshua Morgan, who died in March 1893 while surveying the area.



Te Papa botany collection manager Ant Kusabs at Joshua Morgan's grave at Tangarakau, Taranaki.

In 1842 Joshua Robinson, a London carpenter, and his twin brother Caleb, with their wives and children, arrived in New Zealand on the *Louise Campbell*, bound for the settlement of Cornwallis, West Auckland. A decade later William Morgan, a strict Baptist and teetotaler from Leeds in Yorkshire, had been in the country just five months when, on 27 December 1853, he married Jane, the eldest daughter of Joshua and Elizabeth Robinson. They made their home in Wellesley Street in Freemans Bay, Auckland, and William worked as a schoolmaster and then as a compositor for the *Southern Cross*. During those early years their first four children were born: Thomas (1854), Nellie (1856), Joshua (1857) and Eliza (1859). William Morgan joined his father-in-law's family in a farming venture at Pukekohe East in 1859, and another son (Edward) was born in 1861. When the Land Wars forced them back to Auckland in 1863, William stayed on at Drury as War Correspondent for the *Southern Cross*. Soon after his return to the farm two years later he taught briefly at the local school. His sixth child, a daughter, survived only three months, and in 1870 his wife Jane became ill and died. Later that year William took a second wife, Rachel Emma Wells, who bore him ten more children.

Joshua Morgan helped on the family farm from an early age, was probably educated at home and at school by his father, and became an accomplished surveyor, fluent in Te Reo Māori. His older brother Thomas had left the farm in 1876 when he was twenty-two, after helping to break it in, and worked on a Canterbury sheep station for several years before moving to Taranaki. There the two brothers

joined forces and for seven years engaged in bush cutting, milling and other pioneering work in the central districts. When bush blocks became available for sale on deferred payments they bought adjacent sections on Kaimata South Road, near Inglewood, and in 1881 each was certified as having cleared and grassed more than one-tenth of the total area as required for first improvements.

During four years of survey overseeing in the Rotorua district, Joshua Morgan witnessed the Tarawera eruption in the early hours of 10 June 1886 and the following week inspected its aftermath. He was also a member of the first Pākehā party to cross Te Urewera from Rotorua to Waikaremoana. On 17 December 1888, at Whangarei, he married Annie Francis Dent, the eldest daughter of Samuel Dent, a farmer of Whareora. He wanted to give up surveying then, and develop the farm, but in 1890 was assigned to supervise a road party in Otago, working on a line from Te Anau to Milford. His Taranaki diary notes for 1891 include the weather (always the weather!), house building and the arrival of his wife, long hours at the sawmill and bookkeeping for the new owners, the orchard's productivity and the condition of his livestock (named individually). In August, on the recommendation of district surveyor George Frederick Robinson, he was charged with supervising and inspecting current bush felling and road making contracts, which entailed at least two multi-day trips around the mountain on horseback. His daughter Edith Leila was born in late December that year.

When the plan for a road extension to link Stratford and Taumarunui was released on 12 April 1892, Morgan's bush and surveying skills were again utilised. After five months in the bush he was home for his daughter's first birthday, and perhaps with his father in mind, he also "went to hear Dr Harrison lecture on sexual matters ... came out very strongly on preventing conception". Back with his team in the isolated Tangarakau camp, Morgan was struck by acute and worsening abdominal pain. Two of his men made an arduous trek out for medicine, but to no avail, and he died of suspected peritonitis on 3 March 1893, aged 35. He was buried at the junction of the Paparata Stream and the Tangarakau River near the line that he had marked – the road now known as the Forgotten World Highway. The government discharged the £100 mortgage on his farm as compensation to Annie Morgan, and it was transferred to her in 1895. She returned with Leila to Whangarei where on 4 April 1901 she married architect Archibald Arthur Mclan. She later lived for many years at Murray's Bay, Auckland, where she died on 13 April 1945 at the age of 86. At her request, her ashes were scattered over Joshua Morgan's grave. Leila did not marry, and died at Murray's Bay on 27 December 1966, aged 74.

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Cheilolejeunea morganii

New Zealand has the richest liverwort flora in the world for the size of the country, with more than 600 species of liverworts and 14 hornworts currently known. *Cheilolejeunea* (Greek cheilo 'lip'; lejeunea, after the Belgian botanist A L S Lejeune) is a pan-tropical genus of about 200 species or more leafy liverworts. *Cheilolejeunea morganii* plants are pale green forest bark epiphytes in a shallow procumbent growth of closely overlapping leaves, and have been collected in eastern Taranaki, the Coromandel, Tongariro and Tararua regions.

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PUBLICATIONS

■ Publications Received

Canterbury Botanical Society Newsletter June 2019: Upcoming meetings and trips; meeting report for talk on the genetic decline in afro-montane forest fragments in Nigeria.

Canterbury Botanical Society Newsletter July 2019: Upcoming meetings and trips; AGM meeting report and talk on curating botanic gardens.

Canterbury Botanical Society Newsletter August 2019: Upcoming meetings and trips; fieldtrip report for The Tors, Port Hills; proposed Chatham Island fieldtrip.

Canterbury Botanical Society Newsletter September 2019: Upcoming meetings and trips; meeting report on mast seeding talk.

Nelson Botanical Society Newsletter July 2019: Upcoming trip; trip reports for Six Mile Bush, Red Hills, Grampians, Takapourewa/Stephans Island; talk report on large fungi.

Nelson Botanical Society Newsletter August 2019: Upcoming meetings and trips; talk report on natural history books in Nelson Public Library.

Waikato Botanical Society Newsletter 44 2019: Trip report for Arnold's Bush (Piaere); DOC vegetation monitoring experience; talk report on mānuka, botany of Big Is, Hawai'i; upcoming meetings and trips; threatened plant garden, University of Waikato; trip report for Waingaro Landing Bush.

Botanical Society of Otago Newsletter June 2019: Upcoming meetings and trips; phytogeography of *Celmisia*; trip report for Chatham Islands; book reviews; trip reports for Taringatura, Southland, Otago Peninsula and Livingstone-Greene Reserve; talk reports on the Ring of Fire and willows for baskets.

■ Book review - A flora of the liverworts and hornworts of New Zealand by Engel JJ and Glenny D.

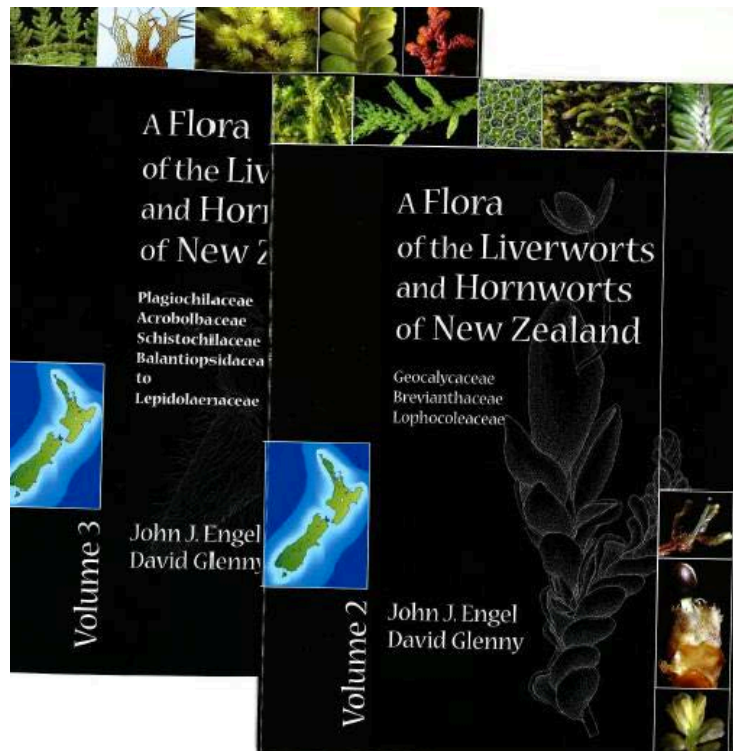
John Steel, Department of Botany, University of Otago

I have just received copies of these newest additions to our bryoflora literature – and what magnificent volumes they are! Photographs are all very well, but it is line drawings by Zorica Dabich and John Engel that are really essential for identification and it is the line drawings in these volumes that bring the plants to life: I can't wait for the final volume to bring this fine work to completion.

Engel, J.J.; Glenny, D. (2019) A Flora of the Liverworts and Hornworts of New Zealand, volume 2. *Monographs in Systematic Botany from the Missouri Botanical Garden*, 134: 1-739. ISBN 978-1-935641-16-2.

Engel, J.J.; Glenny, D. (2019) A Flora of the Liverworts and Hornworts of New Zealand, volume 3. *Monographs in Systematic Botany from the Missouri Botanical Garden*, 135: 1-636. ISBN 978-1-935641-17-9.

This is an illustrated guide to an important part of New Zealand's green plant flora. The liverworts and hornworts, together with the mosses, make up the bryophytes. Liverworts are morphologically a more diverse group than the mosses in that they have both leafy and thallose forms, the leafy forms often being mistaken for mosses. In New Zealand forests, they make up about half of the ground layer vegetation, but are also abundant as tree epiphytes. Currently 653 species of liverworts and hornworts are known from New Zealand.



Volume 1 of this flora was published in 2008. The authors have since then been working to prepare volumes 2 and 3, which are now published. A final volume remains to be written. When completed, this will be the first flora for these two groups of plants since Joseph Hooker's 1864–1867 *Handbook of the New Zealand flora*.

Volume 2 covers a single large family of leafy liverworts: the *Lophocoleaceae*, one of New Zealand's most important families and a conspicuous element of the terrestrial bryophyte vegetation. The family includes two large and confusing genera, *Chiloscyphus* and *Heteroscyphus*, which until now have been very difficult to identify because of a scattered and incomplete literature. 221 full pages of line drawings and 63 colour photographs comprehensively illustrate the species and will help considerably with identification of species in this family. Volume 2 also provides an update to the bibliography published in volume 1, with all new publications since 2008 that are relevant to New Zealand liverworts and hornworts. 739 pages.

Volume 3 covers three large families: *Plagiochilaceae*, *Schistochilaceae* and *Acrobolbaceae*. *Plagiochila* (28 species) and *Schistochila* (13 species) are an important element of the forest bryophyte vegetation. In addition, there are a number of small families, including one endemic family, *Herzogianthaceae*, and the Gondwanic family, *Lepidolaenaceae*, which has its strongest representation in New Zealand. The volume has 636 pages. 167 full pages of line drawings and 120 colour photographs illustrate the species.

Volumes 2 and 3 can be bought directly from the publisher, Missouri Botanical Garden Press:

Volume 2: <http://www.mbgpress.org/product-p/9781935641162.htm>

Volume 3: <http://www.mbgpress.org/product-p/9781935641179.htm>

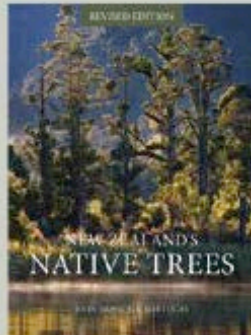
The price per volume is \$US95 (currently \$NZ140) and shipping is about \$NZ72, so the pair costs about \$NZ350. Shipping time is about 1 week. There is no tax to pay in New Zealand. David Glenny has bought copies at a lower, author's rate and is selling them at \$NZ272 per pair (email: glennyd@landcareresearch.co.nz).

Volume 1 is still available from Missouri Botanical Garden Press: <https://www.mbgpress.org/product-p/msb-110.htm>, also at \$US95.

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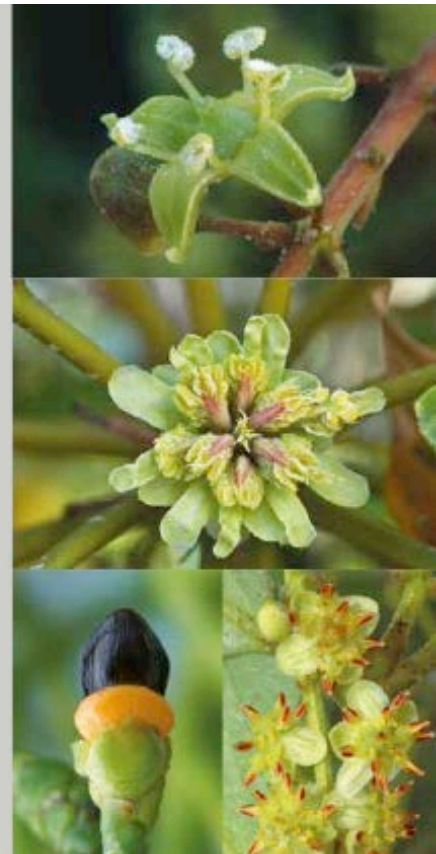
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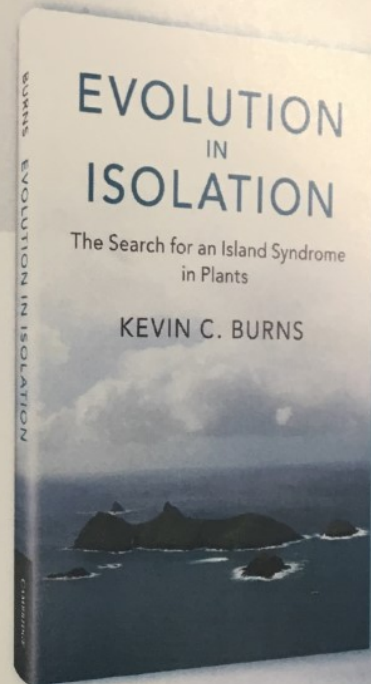
EVOLUTION IN ISOLATION

The Search for an Island Syndrome in Plants

KEVIN C. BURNS

Victoria University of Wellington

Oceanic islands are storehouses for unique creatures. Zoologists have long been fascinated by island animals because they break all the rules. Speedy, nervous, little birds repeatedly evolve to become plump, tame and flightless on islands. Equally strange and wonderful plants have evolved on islands. However, plants are very poorly understood relatives to animals. Do plants repeatedly evolve similar patterns in dispersal ability, size and defence on islands? This volume answers this question for the first time using a modern quantitative approach. It not only reviews the literature on differences in defence, loss of dispersal, changes in size, alterations to breeding systems and the loss of fire adaptations, but also brings new data into focus to fill gaps in current understanding. By firmly establishing what is currently known about repeated patterns in the evolution of island plants, this book provides a roadmap for future research.



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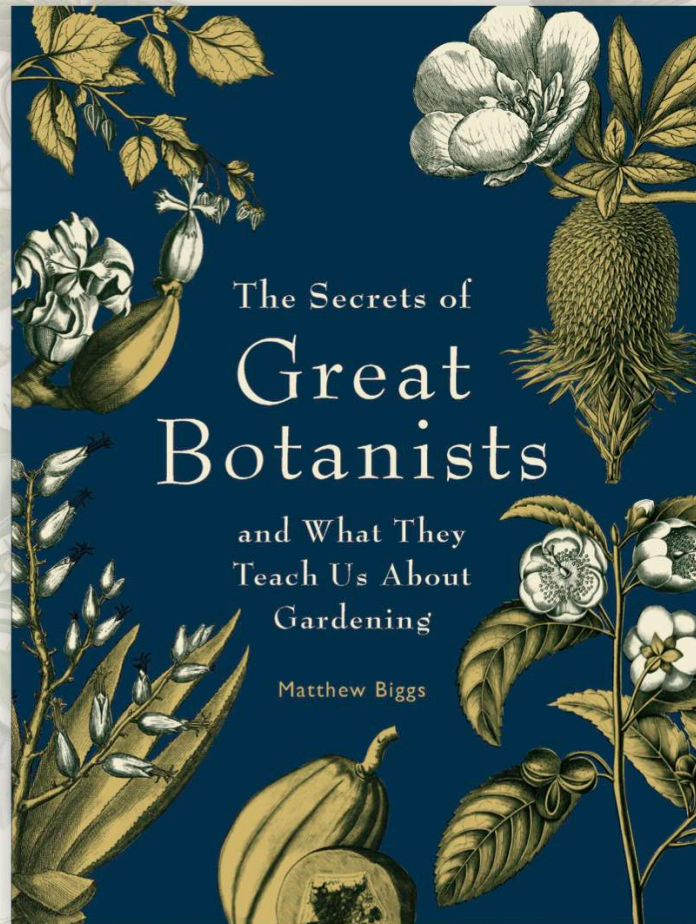
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