

NEW ZEALAND BOTANICAL SOCIETY

NEWSLETTER

NUMBER 148

June 2022



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

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Deadline for next issue

The deadline for the September 2022 issue is 25 August 2022.

Please post contributions to:
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Send email contributions to lara.shepherd@tepapa.govt.nz Files are preferably in MS Word, as a Microsoft Word document. 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

Olearia albida by Eleanor Burton.

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Regional Botanical Society News

■ Auckland Botanical Society

March meeting and AGM

At the AGM a change of leadership took place, with Bec Stanley becoming only the second woman President in our society's eighty-five year history. This means a well-earned rest for Ewen Cameron, after two 10 year spells in the role. One of our two Lucy Cranwell Grant recipients, Marley Ford, then spoke on his study of ramarama (*Lophomyrtus bullata*), the species most affected by myrtle rust. The meeting was on Zoom.

March field trip

The Waitemata Harbour edge at Te Atatu is the site of a 85 ha park known as Orangihina Park & Harbour View Beach Reserve. It contains salt meadows, mangroves, freshwater ponds, streamside vegetation, fields and mixed thickets. Local people are trying valiantly to tackle the many weeds in the park. With a spring tide on the day the salt marsh was rather hard to cross, and one group in trying to circumvent it found it difficult to avoid a freshwater wetland.

April meeting

Again on Zoom, Marley Ford's Plant of the Month was an update on the identification of one of the seven exotic species of verbenas in New Zealand. Evidently *Verbena incompta* has often been misidentified as *V. bonariensis*, and Marley's checking of herbarium specimens has proven that the commonest of the northern verbenas is actually the former species.

Yumiko Baba then spoke on the trip to Cuba undertaken by her and her husband, Cameron Kilgour. As it is a communist country there were difficulties with many things that we take for granted, such as plentiful goods on shop shelves, efficient ATM machines, and rental cars. Never-the-less they covered a good bit of the large island and got an overview of the many different habitats and different vegetation types. She spoke briefly on the geology, zoology and society, then showed pictures of the interesting flora, 50% of which is endemic. She showed plants growing on limestone, ultramafic, wetlands with a variety of large birds, uplifted reefs with fossilised coral, evergreen forests, dry plains and dune vegetation. Palms were to the fore in many of these habitats.

April field trip

In June of last year we walked the lower part of the newly upgraded Cutty Grass Track in the Waitakere Range. This month we started at the top of the track, on Scenic Drive, and enjoyed the freedom of being able to botanise once again with friends. *Quintinia serrata*, *Ixerba brexioides* and *Nestegis montana* were all plentiful, with the ixerba seen with capsules, buds and the occasional flower. Two plants of *Raukaua edgerleyi* were spotted, one a seedling that had germinated on a tree fern trunk, the second with adult foliage, the leaves of which were crushed and sniffed by those unfamiliar with it. A serious pest plant of the north, *Aristea ecklonii*, creeping in along the track edges, proved to be too plentiful for our weeding efforts.

May meeting

Unfortunately, ill health prevented Rowena Gilchrist from Auckland Council from giving her proposed Plant of the Month talk on low incidence pest plants. Gael Donaghy, backed by Graeme Jane, gave a beautifully illustrated presentation on their Naturetrek trip to Gargano Peninsula – the spur on the heel of the Italian “boot”. The peninsula is largely composed of limestone, - a substrate on which wildflowers thrive. It is a national park, but not as we know of national parks. Low impact farming is allowed, and as this keeps the grass grazed the wildflowers are not overwhelmed. Orchids proliferated, and identifying the several species of *Ophrys*, or bee orchids, each with its own pollinator, kept the botanists on their toes.

May field trip

Still abuzz with the freedom of being able to meet together, a good crowd drove up to Paparoa, on the road to Dargaville, where the local Lions have made a walkway through the bush just over the creek from the town. The bush varied, from scrubby vegetation to young kauri forest. The highlight of the day was to be the viewing of the Northland endemic *Lobelia physaloides*, many miles south of the known distribution, of which several plants are spaced along the track, some bearing the exotic-looking large blue berries. Much ooing and aahing and photography took place, until sensible Josh wondered out aloud whether or not they had been planted. Our leader, Jack Warden, then scratched around the roots and found potting mix with pumice in it. Daaaa!

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■ **Rotorua Botanical Society**

February Trip - Raparapahoe Falls

It was a hot day and by 10 am there were already people returning from a swim at the falls. Instead we first headed back up the road to the last house in search of a previous record of *Tupeia antarctica* on fivefinger at the edge of the lawn. It had grand gardens and a lookout platform over the gorge for an overview of the forest we would later visit. A wander along a track just below the edge of the lawn in kāmahi, rewarewa, kanuka forest with kauri, tōtara, mīro, rimu and many other trees planted over 30 years ago failed to find any fivefinger. A return along the rhododendron-fringed lawn spotted two old fivefinger but still no mistletoe. At this point the party split as the property owner had mentioned a very steep track to the river. The adventurous headed down that track with promise to rejoin the others shortly (within the hour) while the main group headed for the falls.

After the short, rough, steep initial descent the track sidled to an old road leading to old pump house and near the river. Initially garden escapes such as *Selaginella kraussiana*, *Asparagus asparagoides* and *Plectranthus ciliatus* were present under a rewarewa and kāmahi canopy. Several large trees of tōtara, tanekaha and tītoki occurred, then a large rewarewa-like macadamia fooled several of us. That confirmed suspicions that the similar sized large native trees were probably planted. As the track reached the old road, large old radiata dominated the canopy with kohekohe, tawa and mahoe and many tree ferns beneath. Here the sun highlighted a patch of *Peperomia tetraphylla* on a large tawa at near eye level. Nearby a patch on a fallen log was spotted that allowed close comparison with abundant *P. urvilleana*. Near the river, the forest became more scrubby with whau and tree fuschia amongst young mahoe. Along the river bank wandering Jew and montbretia were abundant with the odd *Austroderia toetoe*. On the river rocks, *Hydrocotyle pterocarpa*, *Epilobium nerteriodes* and *Anaphaloides trinervis* added native content. At this point the river was very narrow and deep. Any suggestion of heading upstream to the falls to join the other group was quickly rejected because of tall cliffs. On the opposite bank tawa forest with the odd pukatea could be seen and a swathe of Madiera vine was spotted by eagle eyes as we had lunch.

After lunch exercise followed, with an ascent to the house and then descent to the falls to meet the other group, which had had a swim and were by then (3 hrs later) ready to head home. The track down to the falls was quite different from the earlier route, initially through pines then steeply along a ridge through rewarewa, hīnau, kāmahi and tanekaha with matipo and mingimingi. Down stairs over the cliff there were good views into the canopy of tawa, kohekohe, tītoki with hanging supplejack and kiekie. On the terrace the understory of kawakawa, hangehange and *Alseuosmia macrophylla* was abundant. Ground cover included a good lot of ferns, especially filmy ferns. At the river's edge the same weeds as earlier were less evident because of tree overhangs. Along the forest margin rangiora and tutu were evident with native passionfruit hanging from them. At one point the sun highlighted a large patch *Peperomia tetraphylla* on a tawa that became almost invisible later when the sun moved on. For those who ventured to the falls a small patch of king fern was a botanical reward.

April Field Trip - Pukerimu

Pukerimu Ecological Area is a small piece of old vegetation on the western slope of the Mamaku plateau spanning the upper reaches of the deeply incised Pukerimu Stream. It was set aside as a reserve to preserve an ecological sequence, perhaps from a natural fire. It is now squashed between farmland and pine forest. The part north of the deep stream gorge contains open areas, monoao scrubland and low forest. The area we visited to the south contains tall kanuka, kamahī in a small area of old forest and an old clearing.

We entered the area from a farm track into tall kāmahi, mahoe and putaputaweta with lots of *Dicksonia fibrosa* and the odd old rimu. We were soon led to a large number of cages protecting the wood rose most of which had just finished flowering. A little searching found the last few fully open flowers to satisfy the photographers amongst us. From there we headed to a small stand of old rimu, huge tanekaha, mīro and mataī for lunch. After lunch we traversed tall kanuka with tanekaha and the odd toatoa along the top of the gorge. We then traversed a series of gullies, often in tall, grand, tawa forest before arriving at Dead Dog Clearing on north eastern corner of the reserve. Interesting plants spotted in the traverse included all the four main *Tmesipteris* species, tree fuchsia and *Brachyglottis kirkii* and *Pittosporum cornifolium*, hanging from *Astelia hastata* high in the canopy. The last three had not previously recorded for the area.

On the edge of the clearing we encountered more wood rose cages and a solitary large pokaka. Here on the edges of the clearing divaricating shrubs included *Raukaua anomalus*, *Melicope simplex*, *Neomyrtus pedunculata* and kaikōmako. The clearing was being invaded by *Erica lusitanica* and gorse but was still dominated by monoao. On the edges near the fence a variety of common adventives had arrived. We returned along the fenceline nearly 1 km to the vehicles noting many adventives including grey willow, silver birch and buddleia. Highlights here were a small patch of the local mat-forming endemic *Luzula decipens* and the round-headed *Melicytus lanceolatus*.

May Field Trip - Karaponga

To our great disappointment the planned trip to Motuhora was cancelled because the skipper had contacted Covid and could not be replaced. Instead we headed to a catchment reserve at Karaponga, set aside for hydo power regeneration in 1923.

The first track followed the northern boundary before descending to the dam then re-ascending to a spur with a recently fallen large rata. The initial part of the track under a kamahi and mahoe canopy was sporadically grazed and very weedy. This slowly changed to more mature forest with rimu, northern rata, tawa, kohekohe and tītoki in the canopy and nīkau, and heketara in the subcanopy as we reached the ridge. Initially there were few ferns but near the dam several filmy ferns were noted, especially *Trichomanes venosum* cladding *Cyathea smithii*. As we neared the rata *Phlegmariurus varius* and *P. billardiarei*, the latter typically on tree ferns, were found growing close together.

After lunch a forage around the fallen northern rata yielded little except *Metrosideros fulgens* in flower. We then retreated to the bottom of the hill and headed up the valley to the waterfall below the dam. Here the stock had not intruded and because the forest was damper, it was much richer. The canopy was mainly mahoe, pigeonwood, tawa and the odd tītoki or kohekohe with emergent pukatea. The subcanopy included patē, rangiora, and toropapa. Ferns included *Asplenium bulbiferum*, *Pneumatopteris pennigera*, *Deparia petersonii* and *Diplazium australe* with *Hymenophyllum flexuosum* on the rocks. Patches of *Elatostigma rugosum* had been planted by local enthusiasts. At the waterfall *Trichomanes enderlicherianum* was abundant on the rocks but as the area was in deep shade orchids and other usual plants were absent. The return down the stream noted a solitary large plant of *Pteris vittata*, which was noted for later removal.

FUTURE EVENTS

June 12	Waharoa QEII
July 9	Western Matata Dunes
August 6	Highlands Station remnants
September 4	Hormunga Bay
September 24	Handcock Rd Te Kopia

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■ Nelson Botanical Society

November Field Trip to Windy Point, Nelson Mineral Belt
After meeting at Third House we set off through the beech forest towards Windy Point, making it out into the open in time for morning tea. One of the first things noticeable was the abundance of *Exocarpos bidwillii* along the side of the track, which gave us a chance to examine this unusual plant close up. A patch of *Wahlenbergia albomarginata* subsp. *olivina*, was much photographed. Flowering orchids also attracted attention, including *Pterostylis australis*, *Earina mucronata*, *Thelymitra longifolia* and *Pterostylis oliveri*. Very obvious was the brown tinge on the majority of the vegetation on the hillsides, which in combination with the rust-coloured rocks gives the area its distinctive dun colour. One example was the brown *Dracophyllum filifolium*, growing with *Astelia* aff. *graminea* and *Anisotome filifolium*. We were lucky enough to see many of the rarer plants in flower, including the mineral belt endemic *Hebe carnosula* and *Euphrasia monroi*. Just after rounding Windy Point we spotted flowering the penwiper, *Notothlaspi australis*, *Myosotis monroi* and a good population of *Colobanthus* sp. aff. *wallii*. Many of these mineral belt plants are at risk because of their specialised habitat and limited distribution. We continued along the track finding *Montia racemosa* and *Clematis forsteri* var. *rutifolia*, hiding among *Ozothamnus vauvilliersii*, with flowers just about to open. We spotted one *Celmisia gracilentia* in flower and on the side of the track through the beech forest *Corybas trilobus* and *Chiloglottis cornuta* were noted.



Distinctive black dots around the leaf margins of *Gratiola concinna*. Photo taken by Jane Connor.

January Field Trip to Mt Robert

We started from the carpark shortly before 10 as a single group and I was pleased to find *Gastrodia cunninghamii* as our first plant of interest, just 50 m up the track, and not too much further along a colony of *Corybas vitreus*. This was a good start, and *Prasophyllum colensoi*, *Chiloglottis cornuta*, *Adenochilus gracilis* and *Microtis unifolia* were soon added. The *Wahlenbergia albomarginata* subsp. *decora* were prolific as always but we did not see any blue ones until we reached the summit tussock-lands. Up on the tops we spotted *Notothlaspi rosulatum*, but a non-flowering specimen. There they located a number of scree species among them some nice flowering and fruiting examples of *Lignocarpa diversifolia*. We subsequently found *Notothlaspi australe* in surprising numbers on another scree, with one or two still in flower. *Raoulia grandiflora* was beginning to disperse its wind-borne seeds while *R. subsericea* was in full flower. *Montia calycina*, *Donatia novae-zelandiae*, several *Celmisia*s and *Brachyglottis lagopus* were all nearing the end of flowering. Most of the willow-herbs were already in seed, but we spotted *Epilobium glabellum* in flower. *Gentianella vernicosa* just coming into flower seemed to increase in numbers with elevation. The *Veronica hectorii* subsp. *coarctata* and *V. macrantha* were making a lovely show of flowers. *Veronica hectorii* subsp. *coarctata* blooms were en masse on many plants. It was interesting that a larger species of tachinid fly was busy in the pollinator role.

February Field Trip to Angler's Track and Howard Valley frost flats

Fifteen keen botanists met at Lake Rotoiti's West Bay jetty to walk the Angler's Track beside the Buller River, starting at its outlet. We first looked at the uncommon species, *Gratiola concinna* and *Lobelia fatiscens*, which were growing close by in a wetland. The tiny pale blue stars of *Lobelia fatiscens* flowers were occasionally present. In addition to the above flora, *Stackhousia minima*, with its yellow round fruit, was also spotted on the dry land beside the road. Following the excitement of these finds, the whole group began botanising along the Angler's Track. Other finds of interest on this moss-lined track beside a fast-flowing Buller River were



Lobelia fatiscens flower. Photo taken by Jane Connor

Mazus radicans and *Brachyglottis lagopus* in flower. Of the trees, tōtara was a source of discussion as several species were present (*Podocarpus acutifolius*, *P. laetus*, *P. nivalis*), which may have hybridised! Some time was spent distinguishing the *Lycopodium* species, *L. fastigiatum*, with its more yellow appearance and branches at many angles, *L. volubile* and *L. scariosum* with its upright strobili. We adjourned to the West Bay Jetty and some time was spent poring over the lakeshore turf just west of the wharf. While the hunt was on for *Pilularia novae-hollandiae*, no convincing specimens were found. An interesting find for me was New Zealand's smallest rush, *Juncus pusillus*. Other components of the turf included *Myriophyllum votschii*, *Nertera depressa*, *Ranunculus amphitrichus* and *Plantago triandra*. Another marvel here was the diminutive mistletoe, *Korthalsella salicornioides*, growing on the lakeside mānuka.

The Howard Valley flats we visited are a small area of land conserved for their value as representative of frost-hollow vegetation – a particular microclimate that favours small-leaved, divaricating shrubs. The overall character of the reserve was a little unusual – most of it was rank grass (*Lolium arundinaceum*, *Festuca rubra*, *Holcus lanatus*, etc.), with a few forbs both native and exotic (e.g. *Acaena novae-zelandiae*, *Mycelis muralis*, *Achillea millefolium*). An early feature was *Podocarpus acutifolius*. We made our way carefully through the long grass to find *Coprosma obconica* and *Coprosma wallii*. A number of native vines twined through the lower shrubs and sometimes up into the trees, and included *Muehlenbeckia australis*, *Parsonsia* sp., and *Clematis forsteri*, often in indivisible tangles.



Stackhousia minima fruit. Photo taken by Jane Connor.

FUTURE EVENTS

June 19: Near Maitai Cave.

June 20: Evening Meeting, speaker Kath Ballantine on "West Australian wildflowers".

July 17: Happy Valley near Delaware Bay.

July 18: Evening meeting, Zoom talk by Ines Schonberger on the Allan Herbarium.
August 21: Sherry River Valley.
September 18: Weeding in Wairoa Valley.

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■ Canterbury Botanical Society

March Meeting Report: Monday March 7th India McJarrow-Keller on her MSc thesis on the Penwiper, *Notothlaspi rosulatum*.

India has recently completed her Massey University based MSc thesis on *Notothlaspi*, an appropriate topic for our meeting as it is the logo of the Canterbury Botanical Society. It also features on the cover photo on Mark and Adams, New Zealand Alpine plants. She spoke to an online audience of at least 35 people, including some from Wellington and Nelson Botanical Societies. *Notothlaspi* was chosen as it is a charismatic genus endemic to New Zealand that has only recently undergone speciation. Populations that have recently undergone speciation are more likely to undergo hybridisation, so this was an opportunity to see divergence in action. Apart from a small population in the Mt Cheeseman area most of the study was in Nelson hilltops. There are three species of *Notothlaspi*, *N. australe*, *N. rosulatum* and the very rare *N. viretum* that only grows in a hectare section of the ultramafic Red Hills.

Each species seems to have specific habitat preferences; *N. rosulatum* prefers shingle slides of greywacke or argillite on the east side of slopes. Most populations being annual or biennial. *Notothlaspi australe* prefers fellfields or rock ledges that are south facing on the northwest side of the Alpine fault and is happy to grow in all sorts of rock types, granite, sand, or even ultramafic rocks. Its habitats have a small zone of overlap with *N. rosulatum*. Within this overlap in the Red Hills is the main population of the nationally endangered *N. viretum*. The hot news of the evening was that India managed to find a new population in the weekend prior to the talk in a different area. *Notothlaspi viretum* is unusual in tolerating the low calcium levels and high magnesium, zinc, cadmium and cobalt found in this ultramafic zone. India had three main aims for this study:

1. To develop intra-species for populations by looking at patterns in the DNA.
2. To determine the distribution of genetic variations in the northern and southern populations.
3. Infer historical influences on adaptive and evolutionary changes.

To achieve these goals India took 3-5 leaves from up to 30 individuals (the plan was to take samples from 30 individuals in each area but the Canterbury and Cobb Valley sites had limited numbers of plants). The DNA from the samples was then extracted from the fine powder made from the dried and ground leaves. She then looked at molecular markers in the DNA sequences in the chloroplast and nuclear satellite markers. Chloroplasts have only one maternal copy of the genome and have a low mutation rate, while the twelve nuclear satellite markers have two copies of each gene with one each from paternal and maternal sources and a higher mutation rate. In total she did 500 genetic analyses using PCR isolates. From all this data she computer generated two main maps demonstrating genetic variations and similarities between regions. The Chloroplast DNA demonstrated *N. rosulatum* had more genetic variation than *N. australe*. This may be due to *N. rosulatum* being an annual or biennial plant. A further reason is that *N. australe* is mainly found in one area limiting chances for cross pollination. Despite this *N. australe* and *N. rosulatum* did share haplotypes as did *N. rosulatum* and *N. viretum* indicating some recent divergence or sharing of genes due to their proximity in the Dun Mountains. Data from the nuclear satellite DNA demonstrated *N. rosulatum* had very little intraspecies variation while more interspecies variation was seen in *N. australe* and *N. viretum*. *Notothlaspi australe* in NW Nelson demonstrating what may be a geographic or substrate variations. In the Richmond Ranges there was a zone of introgression where the three species live in close proximity with some common markers shared between *N. australe*, *N. rosulatum* and *N. viretum*. However location, substrate and cross pollination did not explain many of the shared genes or the differing

genes within species, leaving many unanswered questions. This was an informative and very well-presented talk enjoyed by all participants.

March Field Trip report: Saturday March 12th Recreating indigenous forest in Diamond Harbour.

The 1940 aerial of Diamond Harbour captures a bare, treeless land of wide spurs and gullies in the Diamond Harbour lava flow. The sub-division begun in 1914 for Lyttelton workers, linked by the ferry, had a cluster of new houses on Stoddard Point, already fringed with pines. As the housing expanded towards Purau and Charteris Bay gardeners brought in plants that could thrive in the hot, dry summers on baked loess soil, sourced from equally dry climates of South Africa and the Mediterranean.

A century later and these pretty flowers are today's weeds, growing in the gullies, around the clifftops, and blowing seeds further into Banks Peninsula. The tradition of locals and picnickers from Christchurch dumping garden waste hastened the spread. In 2017 Local Pete Ozich wrote that "Diamond Harbour has a big pest plant problem: banana passionfruit, climbing asparagus, prickly pear, elephant's ear succulent and more" (Diamond Harbour Reserves Management Committee blog). By then Peter had been tackling weeds for a decade. Pete cut through his first infestation of banana passionfruit in 2010. An outdoor instructor by profession Pete needed a track down a gully for coasteering trips. He was surprised by the mahoe that rapidly grew through what had been an enormous shade blanket of vines. That started the tradition of weed control while waiting for students to navigate rocks and waves. Half the BOTSOC members ferried to the start of the field trip to meet Pete at the jetty. From here we walked the coast Purau track through a stand of century-old radiata pines, with conflicting Council designations of heritage protection and weed tree. Pete pointed out logs lying to the north, blown over by the Wahine storm 50 years ago.

Along the Purau coastal track we noted the common widespread weeds of Diamond Harbour: radiata pine saplings, boneseed, banana passionfruit (*Passiflora tripartita* var. *mollissima* and a hybrid with narrow leaves), old man's beard, ivy, Pride of Madiera, wallflower, climbing asparagus, boxthorn, agapanthus, pigs ear, periwinkle, veldt grass, flowering currant, brier, spur valerian. Less common was polypodium fern (*Polypodium vulgare*), cotoneaster (*Cotoneaster integerrimus*), geranium (*Pelargonium* x *hybridum*), hoary stock (*Matthiola incana*), fairy stonecrop (*Crassula multicava*), Aeonium (*Aeonium haworthii*), smilax (*Asparagus asparagoides*), and ivy. The non-local indigenous trees *Hoheria populnea* and *Pittosporum crassifolium*, *P. crassifolium* hybrids with *P. tenuifolium*. Members pointed out inconspicuous native plants: plume grass (*Dichelachne crinita*), hedgehog grass (*Echinopogon ovatus*), *Pelargonium inodorum*, and *Senecio hispidulus*. Cyclone Lucy felled more pines in 2014, this time to the east. The new light and ground moisture released a daunting crop of broom and passionfruit. Pete recognised that these weeds could act as a "nurse crop" for a cohort of ngaio seedlings. By then a Scout leader, Pete had ready labour units to kill passionfruit, leaving the fire-resistant broom to suppress grass. A decade later he was able to show off a 2-3 metre canopy of ngaio that has shaded out the broom. Underneath there is a future forest of kōhuhu, mahoe, five-finger, red mapou, and kawakawa seedlings. This experience made Pete passionate about using weeds as a nurse crop. He has trials underway with boneseed and blackberry. From Purau we walked up the Old Stock Route and down Morgans gully. Here learnt that planting was hard work against grass, dry summers, and fast-growing black berry, broom and passion fruit. His "Pete's track" plantings will be future seed sources for totara, lancewood, tarata, manatu, but most of the regeneration is occurring naturally under poroporo, broom, and blackberry. One interesting weed he has had to cut out is cape honeysuckle (*Tecomaria capensis*). This trip was a masterclass in forest regeneration. By close observation and small trials of weed control techniques Pete demonstrated how he has used weeding, strategic planting, nurse crops, persistence and 4 patience to kick-start the return of a ngaio-kohuhu-mahoe-kawakawa canopy to sunny, dry coastal Diamond Harbour. Our thanks to Pete for a lively and enlightening 6 hour walk. He really does deserve a medal.

April Meeting Report: Monday April 4th Marley Ford on his MSc research into Mycorrhizal associates of ramarama (*Lophomyrtus bullata*).

Marley Ford, meeting with the Canterbury Botanical Society on Zoom due to the current Covid-19 pandemic, shared with us some fascinating insights he uncovered on the world of Mycorrhizal fungal associates hosted by the native small tree ramarama (*Lophomyrtus bullata*). This was work

undertaken for his MSc research, investigating the diversity of mycorrhizal species diversity associated with ramarama and comparing these between different ecosystems and soils. Mycorrhizae are soil living fungi that form mutually beneficial relationships with the roots of plants. An estimated 90% of plant species form such associations, providing photosynthetic sugars to the fungus and receiving enhanced uptake of water and mineral nutrients from the soils in return. Mycorrhizae form underground networks linking plants together. Endemic to Aotearoa New Zealand, ramarama is found throughout the North Island and at the north of the South Island. In Canterbury we are more likely to encounter the frequently planted ornamental varieties and hybrids. Myrtaceae such as ramarama are threatened by myrtle rust (*Austropuccinia psidii*). Ramarama is considered particularly susceptible to this pathogen, and is currently assessed to be Threatened – Nationally Critical under the NZ Threat Classification, despite being widespread. Marley took us on an enjoyable photographic tour of his three field sites in Northland, introducing us to orchids, lichens and bryophytes as well as the dominant tree species. He classified these sites as: montane, with a canopy dominated by tōwai (*Pterophylla sylvicola*) and kānuka (*Kunzea robusta*); cloud forest, with kahikatea (*Dacrycarpus dacrydioides*) and tōwai; and coastal, with rewarewa (*Knightia excelsa*) and taraire (*Beilschmiedia tarairi*). Marley collected five root samples from ramarama at each site, then examined them under the microscope and used molecular methods to identify fungal DNA. He found a surprisingly high level of species richness of arbuscular mycorrhizae at all sites. The family Archaesporaceae was particularly speciose. Many of these species are undescribed – the taxonomy of mycorrhizae is difficult and species concepts break down. While all sites had similar levels of diversity, there were notable differences in species composition between sites – the coastal site mycorrhizal community in particular could be distinguished from the other two. He found soil pH and nitrogen explained some of the difference between the fungal communities of the sites, a result consistent with findings from earlier research on mycorrhizae. In some species mycorrhizae have been suggested to enhance disease resistance of host plants. Part of Marley's intent was to establish a baseline of mycorrhizae present in the absence of myrtle rust, and for this reason chose sites that were free of this disease at the time of his sampling. Since then myrtle rust has been found at two of the sites, and he would like to return to see whether results differ post-infection. An interesting discussion followed, including the potential benefits of inoculating the soils of nurseries and restoration sites with mycorrhizae. Marley also had the opportunity to expand on his interest in lichenology.

April Field Trip Report

Stunning autumn weather and a diverse group of keen Bot Soc members made for a fun field trip to Waikākāriki/Horseshoe Lake Reserve on Saturday. Blackberry species identification, obscure weedy ferns, insect-plant interactions (e.g. getting 'rained on' by honeydew from giant willow aphids while eating lunch; and tiny caterpillars chewing holes inside *Juncus* culms), and taxonomy/systematics of Blechnaceae, *Hebe/Veronica*, and *Uncinia/Carex* were just a few of the stimulating topics discussed during the day.

May Meeting Report:

Lisa Danseur spoke on her MSc (Otago University) on the influence of the spatial distribution of microhabitat on invertebrate community composition in a New Zealand tussock grassland. She did her study in nine 1 hectare grassland plots on Mt Bengier in the Old Man Range. Three of which had been burnt in spring 2000 three others had been burnt in the summer of 2006 while the other three were controls. She looked at the spatial distribution of *Veronica odora* in the plots finding no difference in the plots. She also looked at invertebrate populations in the *V. odora* and in the grasslands of some plots. The community invertebrate composition between plots didn't change with treatment but was significantly different between grassland and the *Veronica* shrubs. This was a whole-systems approach synthesising botany, entomology and spatial analysis. The talk was on Zoom, in conjunction with Nelson and Wellington BOTSOC.

Coming up:

June 11 th	AGM (by Zoom)
July 9 th	Field trip to Riccarton Bush

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Whanganui Museum Botanical Group

Our meetings are held every two months on the second Tuesday, alternating with 'Nature Talks' (where the Whanganui Botanical Group has merged with Birding Whanganui and the Whanganui branch of Forest and Bird), which are held on the third Tuesday in even-numbered months. It is intended to continue with monthly botanical field trips to which members of the other two groups are invited.

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Wellington Botanical Society

President: Jon Terry

Secretary: Kate Jordan wellingtonbotsocsecretary@gmail.com <http://wellingtonbotsoc.org.nz/>

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Chair: Neill Simpson (03) 442 2035

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NOTES AND REPORTS

- **Mary Eleanor Gillham MBE (1921–2013), naturalist in New Zealand, Australia, and Macquarie Island**

Rhys Gardner, rhysogardner@hotmail.com

In Britain Mary Gillham is remembered with pride and affection but in New Zealand it seems that only our ornithologists know her name. This is not as it should be: Gillham's descriptions of the Southern Hemisphere's "spray-soaked islands" are of value to everyone interested in the biology and management of our coastal resources.

Her life and career are treated below in four parts. This material is mostly from the well-documented Wikipedia entry (accessed Jan 2022); see also Note 1.

Early life

London-born Mary Gillham worked as a Land Girl in England during WWII. She then took an agricultural degree at Aberystwyth in Wales, fell in love with that country's wild coastal places, and switched to botany. She obtained her Ph.D. with an investigation of the Pembrokeshire islands,

notably the nature sanctuary of Skokholm, where studies had been started by Ronald Lockley in the late 1920s. Thorough and indefatigable (she was a capable gymnast and swimmer) she thrived in this testing environment and collected from it a great amount of physical and biological data.

Her findings, which appeared in mid-'50s issues of the prestigious *Journal of Ecology*, were at their most original in showing how sites could be altered by the manuring, grazing and trampling activities of seabirds and rabbits (Note 2). These Skokholm observations often informed her later work—on Macquarie Island, for example, she reiterated the importance of the cosmopolitan green alga *Prasiola crispa* as a pioneer of nitrogen-drenched soil around bird colonies (Gillham 1967: 116).

New Zealand

Gillham taught at the University of Exeter for some time, then in December 1956 came to New Zealand to begin what would be four fieldwork-filled years in the Southern Hemisphere. During 1957 she was an exchange lecturer (and Mogenie House warden) at Massey University College, but she went to coastal places whenever possible, the offshore islands especially: Stewart I., Stephens I., Kapiti, Little Barrier I., the Mokohinau Is., Motiti and Mayor I. The 'parallel-ecology' habitat of the beach at Bluff's Ocean Bay freezing-works was visited too (Notes 3, 4).

From her fieldwork that year she produced five scientific articles, all but one (Gillham 1957) appearing in volume 88 of the *Transactions of the Royal Society of New Zealand*. Some years later she published a book *A Naturalist in New Zealand* (Gillham 1965), illustrated with her own effective sketches and photographs (Figs. 1–3). What she says about our coastal plants is of course not always original but her awareness of what birds and other animals might be doing in the scene is always interesting, e.g., she notes at one point the significance of Bob Brockie's work on the diet of the hedgehog.

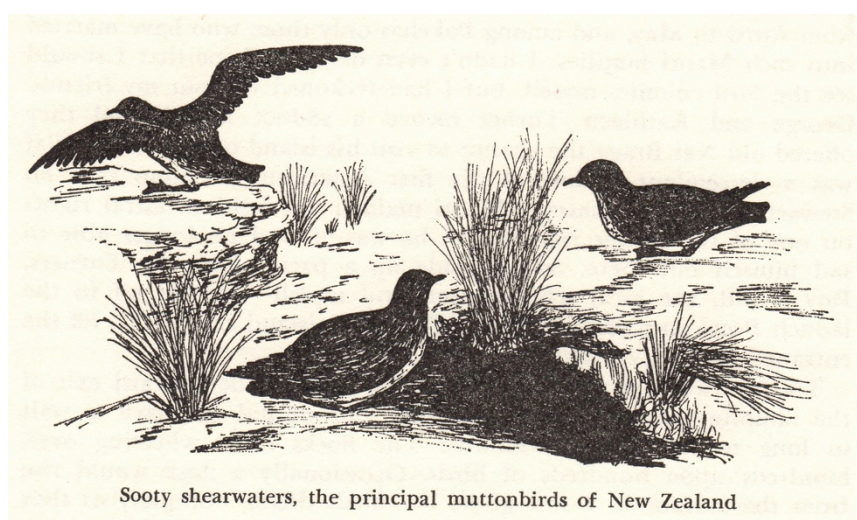
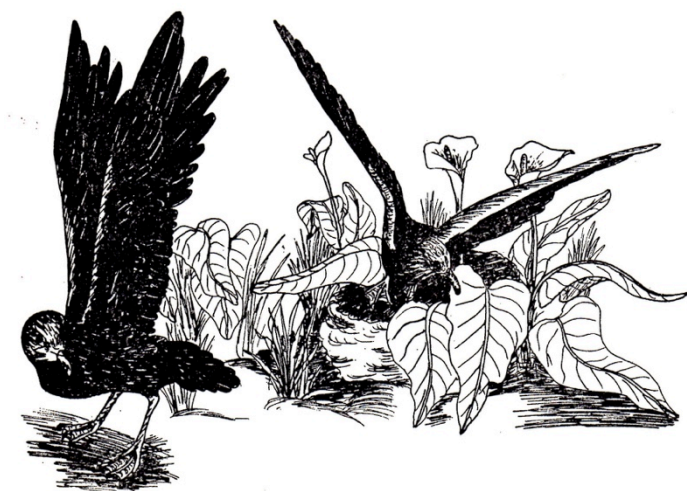


Fig. 1 Sooty shearwaters [probably Stewart I.], from Gillham (1965).



Grey-faced petrels

Popular and professional works on New Zealand plants, notably Cockayne (1967) and Wardle (1991), scarcely acknowledge her contribution. Esler (1967, 1978) made no mention of her, which is odd, since he himself was a Massey man and interested in the kind of things there that Gillham mentions (succession on Kapiti, pasture and dunes in the Manawatu).

Fig. 2 Grey-faced petrels and arum lilies, Mokohinau Is., from Gillham (1965).



Fig. 3 Māori woman and muttonbirds, Motiti I., from Gillham (1965).

not, it seems, New Zealand. In the 1970s she took part in the international effort to prevent Aldabra Island from becoming an airbase, in this way renewing a connection with G. Evelyn Hutchinson, who was also instrumental in what was to be a famous victory for conservation; see Gillham (1977) and Slack (2020).

Mary Gillham never married. She continued her teaching and local fieldwork late into life and was an inspiration to all who knew her. In 2008 she was awarded an MBE for services to nature conservation in South Wales. She died in Cardiff on 23rd March 2013, aged 91.

Bibliography

Gillham's scientific papers (c. 50, written between 1949 and 1983), and her books (more than 20, mostly on aspects of nature and landscape in Wales) are listed by the Mary Gillham Project online site at <http://www.marygillhamarchiveproject.com/written-work>.

Australia

In December 1957 Gillham left New Zealand for Australia, where she visited various parts of its coastline, in particular Flinders and King Islands in the Bass Strait. The next two years were spent in Australia, partly as an exchange lecturer at the University of Melbourne and partly on contract to CSIRO and Australian Wildlife, for whom she carried out fieldwork on the sustainability of the Tasmanian mutton-bird industry. She published ten scientific articles on various aspects of coastal Australia and later a substantial book (Gillham 2000).

Macquarie Island

At the end of 1959, Mary Gillham and Susan Ingham (British wildlife scientist and then biological secretary to the Australian Antarctic Division), and the Australian marine biologists Isobel Bennett and Hope Macpherson, became the first female scientists to join a Division Research Expedition to Macquarie Island. However, because the trip's purpose was to make the yearly changeover most of the time away was spent in travel and the four women had less than a week to carry out their fieldwork. But the notes Gillham was able to make allowed her to publish an article on habitat modification by birds and elephant seals and later a book on the island (Gillham 1961, 1967; Figs. 4–7; Note 5). The latter is dedicated to her former Ph.D. supervisor, Professor Lily Newton of the University of Wales (seaweeds, pollution studies).

Later life

Gillham left Australia in April 1960. She returned home via South Africa and several of its offshore islands (and wrote a *Journal of Ecology* article about these). In the years to come she travelled to numerous countries, including Tasmania but



Fig. 4 Gillham with sleeping sea elephant pup, from Gillham (1967).

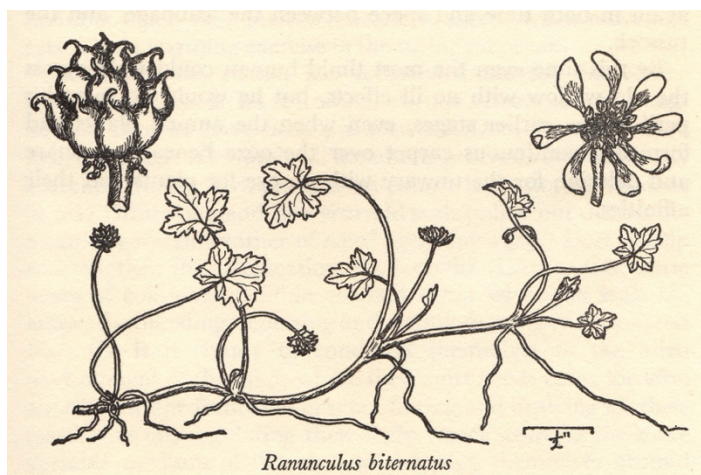


Fig. 5 *Ranunculus biternatus*, from Gillham (1967).

Eponymy

No plants seem to have been named after her.

Specimens

In the Allan Herbarium (CHR) there are 93 *Gillham* flowering plant specimens from New Zealand, mainly from offshore islands.

According to the Australian Virtual Herbarium site (accessed Jan 2022) there are slightly more than 100 *Gillham* specimens (including mosses and seaweeds) in Australian herbaria. Most are at the National Herbarium of Victoria (MEL).

At the National Museum of Wales (NMW) there are 171 *Gillham* fern specimens, from New Zealand and Australia.

No *Gillham* specimens from Macquarie Island have yet located. Appendix IV of Gillham (1967: 211) is a list of bryophytes identified by Mrs. E. A. Hodgson, but the relevant specimens seem not to be part of the Hodgson material at the Massey University herbarium (J. Tate, pers. comm. Jan 2022).

Gillham (1967: 16) says that in the preparation of her Macquarie book she used specimens, photographs and sketches that were made by Norman Laird and deposited at Kew. Some *Laird* specimens (HO) are cited by George et al. (1993); all are dated Jan 1949.

Notes

1 Gillham's vast trove of diaries, lists, and colour transparencies are now being digitized as the Mary Gillham Archive Project. The diaries themselves are held by Glamorgan Archives in Cardiff, Wales (A. Rowe, pers. comm.). The link to her 641 page-long Ph.D. thesis (accessed 24 Jan 2022) is https://issuu.com/sewbrec/docs/mary_scombinedthesis

2. Some of what Gillham saw in her Ph.D. studies must have already been appreciated by coastal folk and canny gardeners inland but as a science the field was a new one: Tansley's overview of British vegetation (1949) mentions only the article by Summerhayes & Elton (1928), while a *New Naturalist* book of the time, on coastal plants (Hepburn 1952), has no reference at all. (For nitrophilous Arctic lichens however see Lynge (1934); also, Gillham in her thesis gives several older references). The colonial scene was slightly more advanced, the connections being obvious in the subantarctic islands (Cockayne 1909: 232–35).

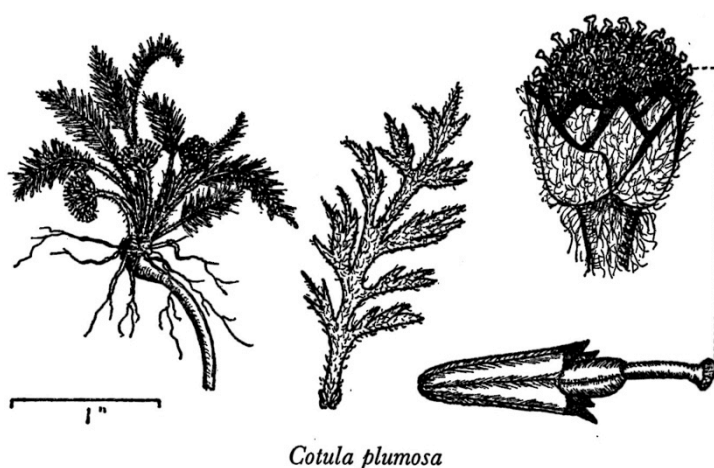


Fig. 6 *Cotula (Leptinella) plumosa*, from Gillham (1967).

At the same time as Gillham was doing her fieldwork one of the most influential ecologists of the era was completing his monumental synthesis of the biogeochemistry of the world's guano islands

(Hutchinson 1950). The study of nutrients in coastal ecosystems continues to be a productive one for southern botanists, e.g., Meurk & Foggo (1988), Norton et al. (1997), Erskine et al. (1998).

3. The dedication of *A Naturalist in New Zealand* is to “Mary Campbell of Massey”, a librarian at the university (see Campbell’s entry in the online New Zealand Biographical Dictionary). This is one of the few personal touches in the book; otherwise, there are just the briefest mention of some familiar names. An odd thing is the general lack of dates; these one would rather like to have for some of the observations.

In her year of fieldwork Gillham seems to have been passed from one interested party to the next. These included academics and museum people (Dick Barwick, Geoff Baylis, Robert Falla) but mostly knowledgeable locals, wildlife officers and foresters, fishermen and lighthouse keepers, and helpful Māori. It was a golden age for doing this kind of work, unencumbered by grant requirements, restrictive permits and time-wasting consultations.

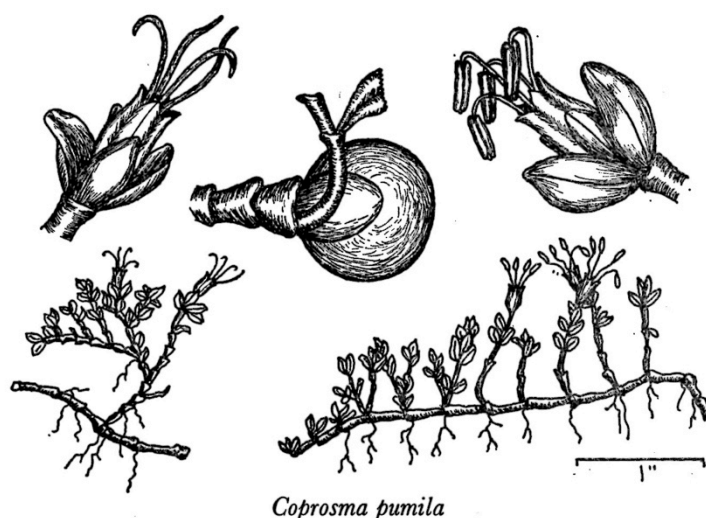


Fig. 7 *Coprosma perpusilla* subsp. *antarctica*, from Gillham (1967).

4 Gillham (1965: 55–56) wrote about the beach at the Ocean Bay freezing works:

First of all I made it my business to visit the vicinity of the freezing works to see what effect, if any, the hosts of carrion feeders were having on the plants. Not even the hordes of sandflies could deter me...The maritime turf was splattered with white, not all of it the white of guano. Among the pink and orange fruits of the mat plants bloomed myriads of starry white flowers: the split trumpets of *Selliera radicans* and *Pratia angulata*, purple-flecked eyebright, snowy bells of the native gentian, parsley, bedstraw, stonecrop, pearlwort, pennywort, and many others. Seldom have I seen such a wealth of tiny flowers

packed so closely before...That the [southern black-backed] gulls...managed to make a good living was evident in the number of crop pellets they had jettisoned along the coast. All those I pulled to pieces consisted of sheeps’ wool and bits of bone and skin and contained no plant remains or seeds. The waste from the freezing works seemed to supply all the gulls needed, and it was probably this conservative diet of animal matter that kept their roosting ground as free of weeds as any I have seen.

5 Selkirk et al. (1990) is a solid work on the environmental and biological aspects of Macquarie but makes no mention of Gillham. The *Flora of Australia* account of the island (George et al. 1993) is similarly lacking. Also, particularly in its specimen citations, this Flora skims over any botanizing on the island prior to the 1940s and ’50; there is no hint, for example, that Cheeseman (1909) and Cockayne (1919) are still very much worth reading.

With respect to popular books about the island, Gillham is mentioned by Terauds & Stewart (2008) just as one of the first four female scientists to go there, and they list her book without comment.

Acknowledgements

I am grateful to Ewen Cameron, Peter de Lange and Graeme Taylor for sharing their appreciation of Mary Gillham’s writings. My sincere thanks go to Adam Rowe (CEO, South-east Wales Biodiversity Centre) for information about archived material, and to Jennifer Tate (Massey University) and Sally Whyman (National Museum of Wales), who searched their herbaria for *Gillham* specimens.

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BIOGRAPHY / BIBLIOGRAPHY

■ Biographical Sketch – John Jolliffe (1822-1891)

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In the preface to his two-volume *Handbook of the New Zealand flora* (1864 and 1867) Joseph Dalton Hooker acknowledges Jolliffe's contribution of specimens for the earlier *Flora Novae-Zelandiae*. The

entire work mentions his name at least 34 times, pertaining to flowering plants, lichens and bryophytes.

John Jolliffe was born in 1822 on the Isle of Wight, England. His father William Jolliffe, an officer in the Royal Marines, had served abroad for several years before returning home on furlough to Languard Manor at Shanklin and dedicating himself to farming. In 1817 he married Mary, the second daughter of John Smith of Languard, and they subsequently had a family of five sons and three daughters. Their second son John was articled as a teenager to Mr Roach Smith at the London Hospital and College, where he was awarded an anatomy prize valued at over eighty guineas, and at the age of 21 obtained the Diploma of the Royal College of Surgeons. In



A reproduction of Hornbrook's painting of HMS Pandora.

1845, after passing his examinations and obtaining a commission as Acting Surgeon RN, he joined the Royal Navy hospital at Plymouth and sailed on HMS *Ringdove*, a second-class despatch and gun-vessel ship, to the East Indies. The next year he was on the *Agincourt* during the capture of Brunei, the main town of Borneo, and later the same year on the *Iris*, a 26-gun frigate, he was present at several engagements up-river and along the coasts. Then, in 1847 on the flagship *President* based at the Cape of Good Hope Station, he was engaged in attacking a slave establishment in Mozambique, for which he received the thanks of the Board of Admiralty – and promotion.

Jolliffe's five years (1851–1856) as surgeon on HMS *Pandora*, a two-masted brig under Captain Byron Drury, were mainly in New Zealand waters, exploring and surveying coasts, harbours, rivers and estuaries, extending the earlier work of the *Acheron*. The natural history collections (botany, zoology and conchology) under his direction and made mainly by him, prompted official thanks from the Admiralty, Sir William Hooker and others. A few of his collections of liverworts from Hokianga and Auckland are mentioned in J D Hooker's *Flora Novae-Zelandiae*, and several mosses from Banks Peninsula and North Island coastal localities are featured in the *Handbook*. Colenso suggests prolific collections on Jolliffe's expedition from the head of Pelorus River to the Wairau Plains. Jolliffe's diary for these years is held at Mitchell Library Sydney, and on microfiche at Alexander Turnbull Library, Wellington.

Jolliffe later served in North, Central and South American stations, as far south as the Falkland Islands and Cape Horn, but his career was cut short by malaria. Returning to England in 1862 he spent more than a year recuperating in the Haslar Royal Naval Hospital before retiring to his home "Thorncliff" at Niton on the Isle of Wight with (later) a good service pension. His last years were described as "doing deeds of kindness to all at Niton", where he died suddenly on 12 September 1891 aged 68, survived by his wife (née Blakeney?). Although distance and the suddenness of his death prevented many from attending his funeral, there were floral tributes aplenty, both from afar and the staff and gardens of "Thorncliff".

First described and named in Jolliffe's honour in 1859, *Sematophyllum jolliffii* was among many bryophytes from all over the world received by the Hookers at Kew and passed on to William Mitten for identification and description. Mt Jolliffe, near Drury Inlet in British Columbia, was also named after him.

Sematophyllum jolliffii

Sematophyllum (*semato* 'marked' and *phyllon* 'leaf', alluding to the distinctive cells) is a large moss genus of over 200 species of tropical and temperate regions worldwide, with five species recognised in New Zealand. *Sematophyllum jolliffii* is a lustrous and robust moss, forming mats of branching stems on rock or wood at shaded stream margins or on emergent streambed boulders within a range of forest types, from near sea level to 310 m. Widespread and common in northern regions of the North Island, the species has been observed in a few north-western South Island localities, and also occurs in the Australian states of Tasmania, Victoria and New South Wales.

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PUBLICATIONS

■ Publications Received

Nelson Botanical Society Newsletter Summer 2022 Trip reports for Windy Point, Nelson mineral belt, Mt Robert, Angler's Track and Howard Valley frost flats, spotlight on *Celmisia parva*, *Gratiola concinna* and *Pilularia novae-hollandiae*.

Wellington Botanical Society Newsletter April 2022 Upcoming meetings and trips, submission on stewardship land, grants and awards, QEII National Trust update, Percy Scenic Reserve news, Ōtari update, trip report for summer camp to Aongatete, Bay of Plenty.

The New Zealand Native Orchid Journal May 2022, No. 165 Second record of *Taeniophyllum northlandicum* in New Zealand, *Prasophyllum hectorii*, *Pterostylis cardiostigma* at Day's Bay, *Acianthus sinclarii* from the Wairarapa coast.