

### Rushes

<i>Juncus articulatus</i>	jointed rush
<i>Juncus tenuis</i> var. <i>tenuis</i>	track rush

### Composite herbs

<i>Cirsium vulgare</i>	Scotch thistle
<i>Crepis capillaris</i>	hawksbeard
<i>Erigeron sumatrensis</i>	broad-leaved fleabane
<i>Gamochaeta coarctata</i>	purple cudweed
<i>Hypochaeris radicata</i>	catsear
<i>Jacobaea vulgaris</i>	ragwort
<i>Leontodon taraxacoides</i>	hawkbit
<i>Mycelis muralis</i>	wall lettuce
<i>Sonchus oleraceus</i>	puha, sow thistle
<i>Taraxacum officinale</i>	dandelion

### Dicot. herbs (other than composites)

<i>Digitalis purpurea</i>	foxglove
<i>Lotus pedunculatus</i>	lotus
<i>Plantago lanceolata</i>	narrow-leaved plantain
<i>Prunella vulgaris</i>	selfheal
<i>Ranunculus repens</i>	creeping buttercup
<i>Rumex acetosella</i>	sheep's sorrel

## **Bryophytes of Handcock property, Paeroa Range, Part 1**

Matthew A.M. Renner

Following the interesting suite of species gathered at Highlands Station in August, the Rotorua Botanical Society trip to the Handcock property on 25th September 2022, presented another opportunity for good collecting in an under-explored area of high habitat diversity on one of the higher elevation landforms of the Taupo Volcanic Zone. Indeed, the early detection of *Herzogianthus vaginatus* (At Risk-Naturally Uncommon) on a south-facing ignimbrite bluff alongside the road as we walked up to the hut heralded a good day.

The Australasian Virtual Herbarium has vouchers from 12 other populations in the North Island which, along with records on iNaturalist from Mangorewa Gorge just north of Rotorua, and one possible recent collection by Leon Perrie in the Nelson Region, make the Paeroa Range the 15th, or thereabouts, population of this species known. *Herzogianthus* is the sole genus in the Herzogianthaceae, perhaps New Zealand's only endemic family of plant. *Herzogianthus* is a very unusual liverwort, having two of the four growth patterns known in leafy liverworts both of which are

found in no other species. This suggests that when its relationships are finally and fully resolved using data from next generation sequencing technologies, Herzogianthaceae may warrant placement into its own order or suborder. *Herzogianthus vaginatus* grew in a fairly diverse bryophyte community on the bluff and other exposed ignimbrite, including what may be a new species of *Heteroscyphus* (*Heteroscyphus* sp. 1), and *Leptoscyphus beckettianus*, for which the Hancock property represents the third known station in the North Island, and a new northern limit by a couple of hundred metres. The other known locations are the Whareorino Forest at the same latitude, and the Wairarapa Plains.

I am often asked how long it takes to identify bryophytes and the general rule is for every hour you collect in the field, you spend ten hours at the microscope. Sometimes, though, you spend more than that and the *Leptoscyphus beckettianus* provides a good illustration of how this can come about. The first gathering made was male, and as the male branches were 'Chiloscyphoid' I naturally assumed I had a *Chiloscyphus*. In fact, so similar to *Chiloscyphus semiteres* did the plant appear that I was tempted to simply determine it as that species without further critical examination, a temptation I found hard to resist. Nevertheless, I progressed the sample through the key to *Chiloscyphus* species in Volume 2 of the Liverwort and Hornwort Flora of New Zealand, and kept coming to *Chiloscyphus novae-zelandiae* var. *grandistipulus*, which the plant clearly was not. The reason it kept keying there were the concave underleaves. None of the other *Chiloscyphus* with unlobed leaves were similar to the plant. Next I tried *Heteroscyphus*, again without success, and finally *Leptoscyphus*, without a really satisfactory outcome, though the plants did key to *L. beckettianus*, they were not a good match for the underleaf morphology of the South Island specimen of that species illustrated in the Flora, so I thought. Finally, I resorted to comparing illustrations and recognition sections for all the species in *Leptoscyphus*, and *L. beckettianus* did, in the end seem a reasonable fit. That was four hours dedicated to cracking one sample. Then I found a fertile female specimen, and the identity was easily settled.

Though I have not kept a record, I would estimate that the list below has taken close to 40 hours to compile. That is an average of 20 minutes per determination, which is a reasonable rate at which to prepare specimens for examination, including sectioning, and progress them through various keys, and then corroborate identity against descriptions, illustrations, and recognition sections.

But so far, we've only covered the road up to the hut, not the rest of the day. As at Highlands Station, my impressions of the forested habitat at our field site were that

it appeared to be not particularly diverse. Further, because we were moving at the relatively rapid pace of vascular plant botanists, I did not really anticipate having much time to locate anything of particular interest. Once again, my impressions were completely wrong, in regards to both the terrestrial and epiphyte floras. The list below comprises 125 species and is not a comprehensive account of the bryoflora of the Handcock property, which is, again, an interesting one. A few of the more interesting occurrences from the Handcock property are described in the notes below.

- *Herzogianthus vaginatus*. Approximately the 15th location known for the At Risk species, as noted above.
- *Fissidens curvatus* var. *inclinabilis* and *Fissidens tenellus* var. *australiensis*. The most recent collections for these two tiny but distinctive *Fissidens* species from the country between Taupo and Rotorua were made in 1932 and 1931, respectively.
- *Paracromastigum* aff. *furcifolium*. An undescribed entity known from a few of the higher hills and ranges within the Waikato Region, where it does not appear uncommon on exposed pumaceous soils. Stella Fish, current Masters student at Otago University is formally describing this species with David Glenny.
- *Heteroscyphus* sp. 1. This plant keys to *Heteroscyphus lyallii*, but has a finely asperulate leaf surface and 5-8 oil-bodies per leaf lobe cell. The plant shares some similarities with *H. fissistipulus*, but differs on the basis of features described in Volume 2 of the Liverwort and Hornwort flora (Engel and Glenny 2018). Though it is possible that the plant is, in fact, a member of the *H. fissistipulus* complex, given the leaf cell surface ornamentation and oil-body number, it is not *H. fissistipulus* in the strict sense.
- *Heteroscyphus* sp. 2. The familial attribution of this plant was not immediately obvious, due to its possession of a singular feature without precedent across the whole of the Lophocoleinae, insofar as I am aware. At first glance this plant, which was female, appears furnished with conspicuous curved shoot calyptra, arising from the abbreviated lateral-intercalary gynoecial branches, whose apices reach greater heights than the leaf apices of the shoots from which they arise. On that basis they should, perhaps, belong to the Acrobolbaceae, an impression only enhanced by their brownish oil-bodies. However, the leaf cell surfaces are smooth, and the rhizoids are in fascicles, even though they occur in association with underleaves almost identical to those of *Saccogynidium australe*. The apparent juxtaposition of incompatible character states in this perplexing plant was finally resolved when the specimen dried, and the hyaline, reduced perianth separated from the collapsed *calyptra*. Such spectacularly elaborated calyptra that are more than twice the length of the perianth that 'houses' them are

unknown within Lophocoleaceae, though the calyptra of what is probably a related species, *H. lingulatus*, extends to ‘near the mouth of the perianth’ (Engel and Glenny 2018 p. 479). This plant keys to *Heteroscyphus planiusculus*, but differs in leaf shape, which are more oblong and lack the dilated base, and the under leaves which resemble *S. australe* as noted above. Fertile female material of many of the other *Heteroscyphus* with unlobed leaves is not known, so it remains to be seen whether the striking development of calyptra in this plant is genuinely unique. At any rate, there is sufficient evidence from the form of the vegetative gametophyte to be confident that this plant is undescribed.

### Division Marchantiophyta

*Acrobolbus knightii*  
*Acromastigum colensoanum*  
*Asterella tenera*  
*Balantiopsis diplophylla* var. *hockenii*  
*Bazzania hochstetteri*  
*Bazzania nitida*  
*Bazzania tayloriana*  
*Cephaloziella* sp. *indet.*  
*Chiloscyphus erosus*  
*Chiloscyphus lentus*  
*Chiloscyphus muricatus*  
*Chiloscyphus subporosus*  
*Cololejeunea laevigata*  
*Cryptolophocolea helmsiana*  
*Cryptolophocolea mittenianus*  
*Cryptoplagiochila radiculosa*  
*Cuspidatula monodon*  
*Frullania aterrima*  
*Frullania fauciloba*  
*Frullania monocera*  
*Frullania nicholsiana*  
*Frullania pycnantha*  
*Frullania rostrata*  
*Frullania spinifera*  
*Herzogianthus vaginatus*  
*Heteroscyphus fissistipus* var. *repandus*  
*Heteroscyphus oblongifolius*  
*Heteroscyphus* sp. 1  
*Heteroscyphus* sp. 2  
*Isotachis montana*  
*Kurzia hippuroides* var. *hippuroides*  
*Lamellocolea granditexta*  
*Lejeunea flava*

*Lejeunea tumida*  
*Lepidozia laevifolia* var. *laevifolia*  
*Leptoscyphus beckettianus*  
*Lopholejeunea* sp. *indet.*  
*Marchantia foliacea*  
*Metalejeunea cucullata*  
*Metzgeria* sp. *indet.* 1  
*Metzgeria* sp. *indet.* 2  
*Metzgeria* sp. *indet.* 3  
*Microlejeunea latitans*  
*Microlejeunea* sp.  
*Pallavicinnia tenuinervis*  
*Pallavicinnia xiphoides*  
*Paracromastigum* aff. *furcifolium*  
*Paracromastigum drucei*  
*Plagiochila subfasciculata*  
*Porella amoena*  
*Radula demissa*  
*Radula grandis*  
*Radula strangulata*  
*Riccardia aequicellularis*  
*Riccardia cochleata*  
*Riccardia colensoi*  
*Riccardia crassa*  
*Riccardia nitida*  
*Solenostoma inundata*  
*Solenostoma rufiflorum*  
*Symphyogyna undulata*  
*Telaranea herzogii*  
*Thysananthus anguiformis*  
*Treubia lacunosa*  
*Trichocolea mollissima*  
*Tricholepidozia lindenbergi* var. *lindenbergi*  
*Zoopsis argentea* var. *argentea*

**Division Bryophyta**

*Achrophyllum dentatum*  
*Atrichum androgynum*  
*Barbula unguiculata*  
*Breutelia pendula*  
*Calomnion complanatum*  
*Calyptrochaete cristata*  
*Campylopus clavatus*  
*Catagonium nitens*  
*Catharomnion ciliatum*  
*Cladomnion ericoides*  
*Cyathophorum bulbosum*  
*Cyrtopus setosus*  
*Dicnemon calycinum*  
*Dicranoloma billardierei*  
*Dicranoloma menziesii*  
*Didymodon* (?)  
*Distichophyllum pulchellum*  
*Ditrichum difficile*  
*Echinodium hispidum*  
*Fissidens asplenioides*  
*Fissidens curvatus* var. *inclinabilis*  
*Fissidens tenellus* var. *australiensis*  
*Hypnodendron arcuatum*  
*Hypnum chyrogaster*  
*Hypnum cupressiforme*  
*Leptotheca gaudichaudii*  
*Leucobryum javense*  
*Lopidium concinuum*  
*Macrocoma tenue* subsp. *tenue*

*Macromitrium gracilie*  
*Macromitrium ligulare*  
*Macromitrium longipes*  
*Macromitrium microstomum*  
*Neckera pennata*  
*Papillaria crocea*  
*Papillaria flavo-limbata*  
*Pendulothecium auriculatum*  
*Philonotis* sp. indet.  
*Pogonatum subulatum*  
*Polytrichadelphus magellanicus*  
*Ptychomnion aciculare*  
*Racopilum cuspidigerum*  
*Rhaphidorrhynchium amoenum*  
*Rhizogonium distichum*  
*Rhynchostegium praelongum*  
*Rhynchostegium tenuifolium*  
*Rosulabryum billardierei*  
*Rosulabryum* sp. indet.  
*Thuidium furfurosum*  
*Thuidium laeviusculum*  
*Trachyloma planifolium*  
*Weymouthia cochlearifolia*  
*Weymouthia mollis*  
*Wijkia extenuata*  
**Division Anthocerophyta**  
*Anthocerotae* Gen. et sp. indet.  
*Megaceros flagellaris*  
*Megaceros pellucidus*