A preliminary account of the bryophytes of Tuhua (Mayor Island)

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Introduction

This short note is intended to provide an interim assessment of the bryophyte flora of Tuhua (Mayor Island). It would seem that, from an admittedly purely electronic survey of the three main New Zealand Herbaria (the Auckland War Memorial Museum Herbarium (AK), Allan Herbarium (CHR) and Museum of New Zealand Te Papa Tongarewa (WELT)) that bryophytes had scarcely been collected from the island before we participated in the Auckland Botanical Society Anniversary Weekend 2012 Tuhua (Mayor Island) field trip (see Wilcox et al. 2012). Prior to our visit it seems that only mosses had been collected from the island, and the bulk of those were gatherings made by the Auckland University Field Club in 1936 and by T.C. Chambers on another Auckland University Field Club visit in 1952.

During our visit to the island, we collected 282 packets of bryophytes and since then one of us (PdL) has been steadily working on the identity of these gatherings. In addition, specimens of the more difficult genera have been passed to moss specialists J.E. Beever (Fissidentaceae, Pottiaceace) and A.J. Fife (Amblystegiaceae) and the hornworts and liverworts to J.E. Braggins and M.A.M. Renner. A consignment of the complex genus *Frullania* prepared as duplicates from specimens lodged in the AK will eventually be sent to M. von Konrat (Field Herbarium (F), Chicago) for identification.

Results

At this stage (March 2012) we have identified c.127 moss taxa from Tuhua (Mayor Island) and one hornwort (*Dendroceros granulatus*) and c.61 liverworts. A large number of liverwort packets still remain to be determined.

The bryophyte flora of Tuhua (Mayor Island) is dominated by a very few species, all of them typical of northern New Zealand pohutukawa (*Metrosideros excelsa*) -dominated offshore islands. The most common "macro" mosses are *Fissidens asplenioides*, *Racopilum cuspidigerum* var. *convolutaceum* and *Thuidium sparsum*, which were found throughout those parts of the island we investigated. Other mosses such as *Bryum billardierei* var. *platyloma*, *Campylopus clavatus*, *C. introflexus*, *Dicranoloma billardierei*, *Leucobryum javense*, *Ptychomnion aciculare*, *Thuidium furfurosum* and *Triquetrella papillata* were locally common but not nearly as abundant as they are in similar habitats on the adjacent mainland. Liverworts were far less conspicuous, probably the most obvious, abundant "macro" liverworts being the corticolous species *Archilejeunea olivacea* and *Thysananthus anguiformis*. However, undoubtedly the most common liverworts were those scarcely-observed, relatively non-descript, minute members of the Lejeuneaceae, belonging to such genera as *Cololejeunea*, *Harpalejeunea*, *Lejeunea* and *Metalejeunea*. Also on the exposed pohutukawa trunks and branches and on rocks, at least one of the *Frullania rostrata* agg. (Frullaniaceae) was very commonly seen. On the track side banks, and on slip scars and rubble slopes *Chiloscyphus semiteres* var. *semiteres* was locally common, while the shaded cliff tops of Te Panui Pa, overlooking Opo Bay sported dense cushions of *Kurzia hippuroides* and *Lepidozia pumila*.

Around Opo Bay, especially within the camp ground and ruins of the former Deep Sea Fishing Club buildings, was the only place where we found *Bryum argenteum*, *Tortula muralis* and the exotics *B. radiculosum*, *Eurhynchium praelongum*, *Fissidens bryoides*, *F. taxifolius*, *Lunularia cruciata* and *Pseudoscleropodium purum* – the latter, ironically only seen outside the Quarantine Building. We assume that these bryophytes have all come in on building materials and via human traffic to the island over the years.

Exposed cliff faces, dry overhangs and rubble slopes, the domain of the Pottiaceae moss family, supported

Table 1: Threatened and Uncommon Bryophytes of Tuhua (Mayor Island). Threat listings follow Glenny et al. (2011).

'Threatened / Nationally Critical'
Erpodium glaucum
Hampeella pallens
'Threatened / Nationally Endangered'
Ricciocarpos natans
'At Risk / Naturally Uncommon'
Cratoneuron filicinum
Fissidens hylogenes
Fissidens hyophilus
Ischryodon lepturus
Harpalejeunea filicuspis
Heteroscyphus argutus
Plagiochila bazzanioides
Pyrrhobryum paramattense
Syrrhopodon armatus
Tortella cirrhata
'Data Deficient'
Plagiochila banksiana var. *echinophora*

masses of *Weissia controversa* and we assume *Trichostomum*. Less commonly seen in these habitats were *Didymodon australasiae* and, from another family altogether, *Bryum*. On the rubble slopes below the Devil's Staircase dropping into Takitimi Bay, the beautiful *Ischryodon lepturus* was locally common.

Several places on the island were notable for their diversity of bryophytes, in particular the ridgeline leading to Tutaretare Trig across to Ruawaipiro Pass and up toward Opuahau, and the long defile that leads down from Opuahau to the Opuhi Spring. In these areas, a range of moisture-loving liverworts and mosses not seen elsewhere around the island were present, e.g., *Alleniella hymenodonta*, *Plagiochila banksiana* var. *echinophora*, *P. bazzanioides*, *Porella elegantula*, *Pyrrhobryum mnioides*, *P. paramattense*, *Thamnobryum pandum* and *Trachyloma diversinerve*. The shoreline of Aroarotamahine (Green Lake) provided another interesting, though in this case hardly diverse bryophyte habitat; here we found *Clasmastocolea vermicularis*, *Fissidens waiensis*, *Leptodicyton riparium*, and on a partially submerged concrete block below the abandoned picnic area grew *Cratoneuron filicinum*. In the swamps near Te Paritu (Black Lake) a small amount of *Sphagnum falcatulum* was seen, and in pools of shallow water floating amongst *Landoltia punctata*, *Lemna minor* and *Wolffia australiana* grew the beautiful, threatened, floating liverwort *Ricciocarpos natans*.

The boulder falls along the base of the caldera wall and between it and Te Paritu (Black Lake) were heavily colonised by *Fissidens hyophilus*, *Lepidolaena taylorii*, *Leptostomum macrocarpon*, *Leucobryum javense* and *Plagiochila arbuscula* var. *arbuscula*.

Fissidens hyophilus, very much a moss of northern New Zealand offshore islands but with a strange disjunction to Wellington, the Kaikoura coast and Rekohu (Chatham Island) (Beever et al. 2002; P.J. de Lange unpubl. notes), was next to *F. asplenioides*, the most abundant "conspicuous" member of this genus on the island. Great carpets of it were frequently seen festooning the exposed root plates and associated soil as well as the lower trunks of mahoe (*Melicytus ramiflorus*), mangeao (*Litsea calicaris*), puriri (*Vitex lucens*) and tawapou (*Planchonella costata*).

Conclusions

Although we were only able to spend two full days in the field, and our coverage was limited to the better-tracked areas of the island, our gatherings and observations suggest that Tuhua (Mayor Island) would repay further critical attention from a bryologist. At least one distinct habitat, which we were unable to visit due to time constraints, the series of wetlands bordering Te Paritu (Black Lake), would be worth investigating.

Our survey also located populations of two "Threatened / Nationally Critical" mosses (*Erpodium glaucum* and *Hampeella pallens*), one "Threatened / Nationally Endangered" liverwort (*Ricciocarpos natans*) and ten 'At Risk / Naturally Uncommon' and one 'Data Deficient' species (Table 1).

A full paper describing the bryophyte flora of Tuhua (Mayor Island) is currently being prepared by PdL.

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References

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Seaweeds of Tuhua (Mayor Island)

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The Bot Soc Anniversary Weekend camp at Mayor Island, 27-30 January 2012, provided an opportunity to record the seaweeds to be found there. Observations were confined to South East (Opo) Bay, Western (Omapu) Bay, Honeymoon (Otiora Bay) Bay and North West (Oira) Bay. Some observing and collecting was possible on intertidal rocks, and some beach drift was examined, but most of the records obtained were from samples gathered in water down to 4 m deep by snorkelling in the very clear water. The substrates were either solid reefs of stony rhyolite and obsidian or sub-tidal boulders and