Mosses of Motuketekete, Hauraki Gulf

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The visit of the Auckland Botanical Society to Motuketekete on 23 November 2014 provided an opportunity to study the mosses of the island (Fig. 1). For a general introduction to the island, its vascular flora and vegetation, and the Botanical Society visit see Cameron (2015).

The pine plantation which covers most of the island was particularly depauperate in mosses, with only five taxa seen, very occasionally, and usually in small amounts, on rotting pine logs or stumps (Fig. 2): *Campylopus introflexus*, *C. pyriformis*, *Dicranoloma billardierei*, *Ptychomnion aciculare* and *Rhaphidorrhynchium amoenum*. No epiphytic mosses were seen, nor any ground mosses due to the inimical carpet of pine needles.

In the remnant of native forest on the SE side of the island several species were found: two epiphytic mosses, *Macromitrium gracile* and *Camptochaete arbuscula* var. *arbuscula*, grew on trunks of large karo (*Pittosporum crassifolium*), and three soil-dwelling taxa, *Distichophyllum crispulum*, *Fissidens tenellus* var. *tenellus* and *Trichostomum sciophilum*, were found on the forest floor. This last species is not well documented. Its type locality is the Selwyn Gorge in north Canterbury, but it has been recorded on a number of the northern islands, e.g., on Rotoroa I. and Rangitoto I. (Beever 2007 a & b respectively, both as *Trichostomum brachydontium*), on Hauturu/Little Barrier I. (Beever 2012), on Raoul I. in the Kermadec Is. (de Lange & Beever 2015), as well as on the mainland.

Exposed coastal sites had few mosses: *Bryum dichotomum* (a very common species of *Bryum* with a wide range of habitat preferences) grew on a greywacke ledge above the beach, in what was probably an intermittent water course, and *Philonotis tenuis*, at the edge of a seep. *Sematophyllum homomallum*, a characteristic species of northern New Zealand coasts, was seen on an exposed root of pōhutukawa, c. 2 m above high tide level. On the northern coast, near the limestone outcrop, was a sward of a pottiaceous moss, extending over several square metres on steeply sloping soil. This had short, broad leaves, stiffly curved (not crisped) when dry, with the costa shortly excurrent from the leaf apex as a stout apiculus. It has been tentatively identified as *Weissia* "North Cape". Similar specimens have been found on serpentinite at North Cape (hence the tag name) and on the Kermadec Islands (de Lange & Beever 2015).

The moss genus with the most species recorded on the island was *Fissidens*. *F. linearis* var. *linearis* grew abundantly on damp soil in a shaded valley bottom, under a dense canopy of māhoe (*Melicytus ramiflorus*). This moss has been seen in similar dense swards on the Poor Knights Is (Beever 2014a) and the Kermadec Is. (de Lange & Beever 2015). Two other micro-*Fissidens*, *F. curvatus* var. *curvatus* and *F. tenellus* var. *tenellus*, were seen only in small amounts, also on shaded soil.

The genus *Bryum*, together with the segregate genus *Rosulabryum*, had three species recorded: *Bryum argenteum*, *B. dichotomum* and *Rosulabryum* sp. The specimen of *Rosulabryum* proved equivocal. It was from a cleft in coastal greywacke (leg. E.K. Cameron AK 358481) and had perigonia (male sex organs), but no capsules. Fife (2015), in his recent account of the family Bryaceae in New Zealand, noted that "not all sterile [or male] material of *R. campylothecium* and *R. capillare* can be confidently distinguished ..... particularly in coastal

Fig. 1. The author examining bryophytes on a *Cyathea medullaris* trunk, south-east coast. Photo: Cheryl Taylor, 23 Nov 2014.

Fig. 2. *Rhaphidorrhynchium amoenum* with capsules on a pine stump. Photo: Philip Moll, 23 Nov 2014.

situations." Typically, *Rosulabryum capillare* has the leaves strongly spiralled round the stem when dry. This was not the case in the Motuketekete specimen, in which the dry leaves were erect. The leaves had, however, the excurrent costa flexuose, and laminal cells thin-walled and non-porose, features characteristic of *R. capillare* (Fife 2015).

Comparison with moss records from Te Haupa I. (Tennyson & Taylor 1999, Beever 2014b) is interesting: Te Haupa I. is a much smaller inner Hauraki Gulf island, and lies some 7 km to the SW of Motuketekete. The vegetation of both islands has been highly modified: Te Haupa I. is regenerating from having been burnt some 70 years ago, and retains a coastal fringe of large pōhutukawa (Tennyson & Taylor 1999, Cameron 2014); Motuketekete, on the other hand, has been planted in pines, but retains limited native forest on the upper SE coast of the island. On both islands 22 taxa of mosses have been recorded, but only four were found to be in common (or possibly 5, if sterile *Weissia*/*Trichostomum* is included). The species in common were: *Ptychomnion aciculare* and *Rhaphidorrhynchium amoenum* (on rotten wood), *Tortella flavovirens* (on coastal rocks or sand) and *Rhynchostegium tenuifolium* (on Motuketekete on an unusual substrate: slag from the copper smelter, whereas on Te Haupa I. the moss was seen on a more typical substrate, i.e., on soil of the forest floor).

The observation that two small islands, located only 7 km apart, support such different moss floras was striking. It no doubt reflects the high sensitivity of these small plants to their micro-environment, a product of both geology and surrounding vegetation.

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Appendix. Moss list for Motuketekete.

Moss names follow updated versions of the Mosses of New Zealand (Fife 1995). These may be obtained on request from Allan Fife at Manaaki Whenua Landcare Research (FifeA@landcareresearch.co.nz). In addition, the eFlora of New Zealand Mosses is being progressively published on line, family by family, and pdfs may be found at: http://www.nzflora.info/publications.html

[1] moss families available on eFlora website at time of going to press; [2] taxa also recorded on Te Haupa (Beever 2014 b)

Taxon	Family	AK Voucher
Bryum argenteum	Bryaceae [1]	358465
Bryum dichotomum	Bryaceae [1]	358466
Camptochaete arbuscula var. *arbuscula*	Lembophyllaceae	358467
Campylopus introflexus	Dicranaceae	358468
Campylopus pyriformis	Dicranaceae	358469
Dicranoloma billardierei	Dicranaceae	358470
Distichophyllum crispulum	Daltoniaceae	358471

Fissidens curvatus var. *curvatus*	Fissidentaceae [1]	358472
Fissidens linearis var. *linearis*	Fissidentaceae [1]	358473
Fissidens tenellus var. *tenellus*	Fissidentaceae [1]	358474
Macromitrium gracile	Orthotrichaceae	358475
Philonotis tenuis	Bartramiaceae	358476
Ptychomnion aciculare [2]	Ptychomniaceae	358477
Rhaphidorrhynchium amoenum [2]	Sematophyllaceae	358478
Rhynchostegium ?*laxatum*	Brachytheciaceae	358479
Rhynchostegium tenuifolium [2]	Brachytheciaceae	358480
Rosulabryum ?*capillare*	Bryaceae [1]	358481
Sematophyllum homomallum	Sematophyllaceae	358482
Tortella flavovirens [2]	Pottiaceae	358483
Tortula muralis	Pottiaceae	358484
Trichostomum sciophilum	Pottiaceae	358485
Weissia "N Cape"	Pottiaceae	358486

Algae of Motuketekete, Hauraki Gulf

Mike Wilcox

The shoreline of Motuketekete covers a distance of around 2.7 km. There is a short sandy beach at the northern end and cobble or gravel beaches on the western side; the rest of the shore has hard greywacke in the northwest and south west, while an unusual flaggy limestone is the dominant rock type in the north and east (Fig. 1). The seawater was very clear during a visit by the Auckland Botanical Society (ABS) made on 23 November 2014. Intertidal seaweeds were noticeably sparse or absent over long stretches of the shore. For a general introduction to the island and the ABS visit see Cameron (2015).

The sheltered western shore has subtidal beds of the brown algae *Colpomenia sinuosa* and *Hydroclathrus clathratus*, both of which wash up as drift on the gravelly beaches. Lower intertidal algae prominent during the visit were *Microdictyon mutabile* and *Leathesia marina* (a spring-summer annual) (Fig. 2), and below these, *Cystophora torulosa*. There were also patches of *Hormosira banksii*, best seen in shallow rock pools in the northwest, crusts of *Ralfsia verrucosa*, and occasional *Codium fragile* subsp. *fragile* (Fig. 3). *Cystophora torulosa* also occurred subtidally on the

Fig. 1. Limestone formation, northern coast, Motuketekete. Photo: Mike Wilcox, 23 Nov 2014.

Fig. 2. *Leathesia marina* and *Microdictyon mutabile* association, with *Cystophora torulosa*, Motuketekete. Photo: Mike Wilcox, 23 Nov 2014.