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Flora and vegetation of Taitomo Island and Nun Rock, South Piha, West Auckland

E.K. Cameron, G.A. Taylor and J.E. Beever

Introduction

Taitomo Island (Camel) lies at the southern end of Piha Beach on Auckland's west coast (grid ref. NZMS Q11 406704) (Figure 1). It used to be known as Goat Island because of the goats which were present there up until a little after the turn of the century (P.J. Byers pers. comm.). Taitomo means 'tidal cave' which refers to the natural tunnel through it. The island, covering 2.6 ha, is vertically cliffed on the seaward side, and steep to vertically cliffed on the landward side except for more gentle slopes at the south-east end. The central ridge is a relatively easy gradient, reaching *c.*60 m a.s.l. at the north-east summit. At the southern end the island is separated from the mainland by a rocky channel, The Gap, but on its eastern side it is linked by a tidal sandy strip some 50 m wide. It is thus accessible by foot, except near high tide.

Taitomo Island is exposed to the full force of the Tasman Sea, and most of the steep topography is bare rock. At its most luxuriant the vegetation reaches 2 m tall and forms a low windswept cover on the south-facing landward slopes. Nun Rock (grid ref. Q11 405703) is a vertical pillar, mainly bare rock with overhangs, covering *c.*0.2 ha and reaching *c.*35 m a.s.l. It is situated on the exposed western side of Taitomo and is separated from it by less than 20 m (Figure 1).

Taitomo Island was awarded to the Kawerau Tribe, represented by four people, on 9 December 1942 (Kaipara Minute Book of the Maori Land Court, No. 23/178). Nun Rock appears to be uninvestigated Maori Customary Land. The adjacent mainland is part of Centennial Memorial Park managed by the Auckland Regional Council, and south of the parkland is private land owned by the Byers family. This article is based on two visits to the island by two of us (EKC and GAT on 29 December 1993 and 9 April 1994) and a single visit by one of us (JEB on 9 April 1994), plus a study of herbarium records. All specimens collected by us are lodged in the Auckland Museum Herbarium (AK) and are cited in this paper (see Appendix 1); only one previous collection was located (*Lindbergia maritima*).

Geology and History

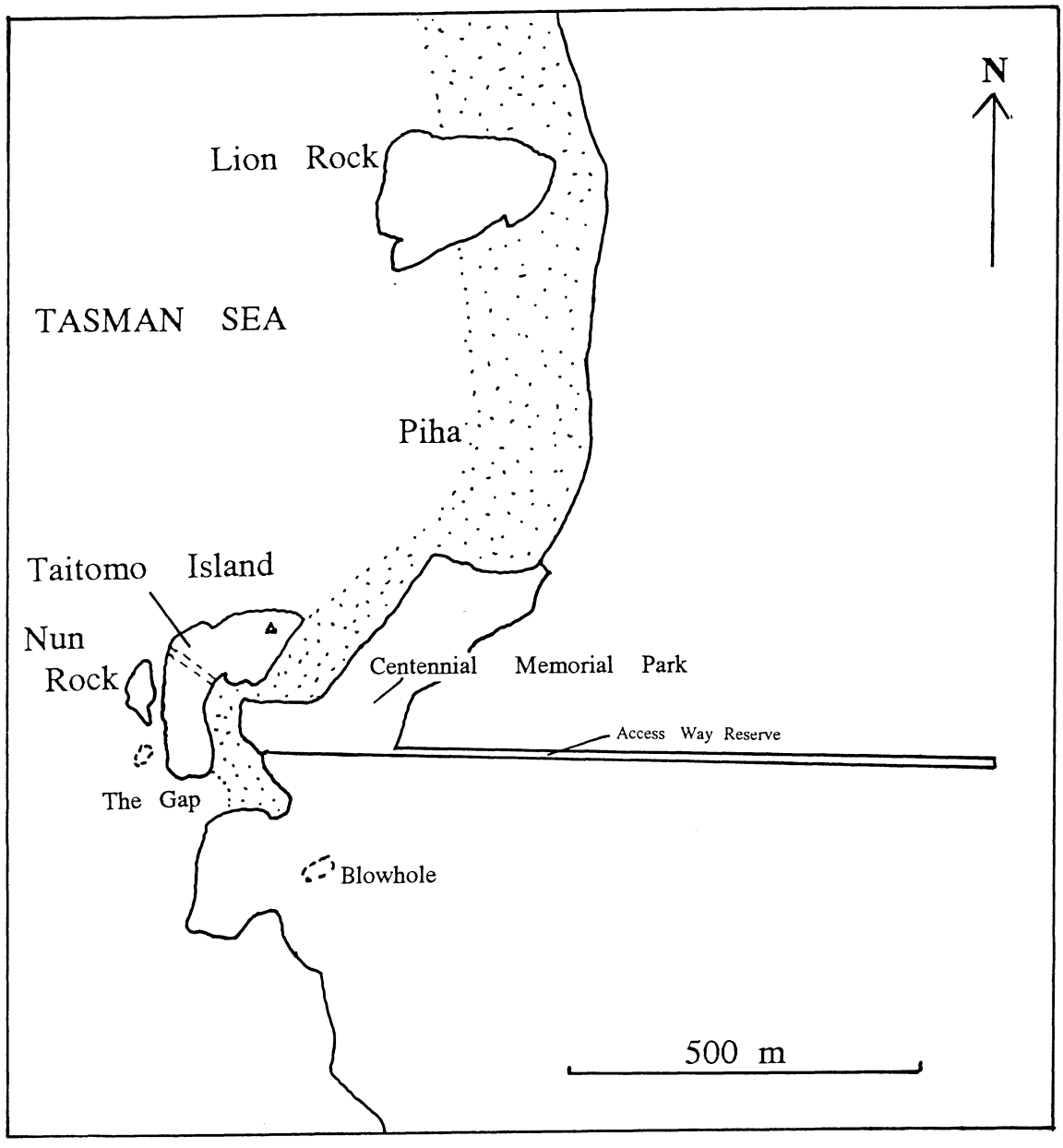
Both Taitomo Island and Nun Rock are comprised of volcanic conglomerate of early Miocene age (Waitakere Group) (B.W. Hayward pers. comm.). An andesite dyke runs through the middle of Taitomo, much of which has been blasted out by wave action, and forms the Key Hole, a wave-washed tunnel through which people gain access to favoured fishing sites on Taitomo's exposed storm platform.

The archaeological sites of south Piha, which include three pa, indicate that the area supported at times a large Maori population. Hayward and Diamond (1978) recorded on top of Taitomo Island a pa in two parts with platform, terraces and midden and below the top of the north face a rock shelter 12 x 2 m, dry floor beneath with a 3 m high roof.

Taitomo Island has suffered from a series of fires, the last of which in *c.*1957 burnt about one-third of the island's vegetation (P.J. Byers pers. comm.). In recent years the native bush on the adjacent

mainland has also suffered from fires. On 28 February 1994, some 7 ha of parkland bush were burnt (N.Z. Herald 1.3.1994, p.1).

Figure 1. Location of Taitomo Island and Nun Rock.



Flora

The flora of Taitomo Island and Nun Rock is listed in Appendix 1. The names for the mosses follow Beever, Allison & Child (1992). Nun Rock was surveyed with binoculars from Taitomo Island and no additions to the Taitomo flora were observed. The vascular flora totals 92 species of which 68% are native. Nineteen species of moss are recorded, all of which are native, including the rare endemic *Lindbergia maritima*. Native species dominate the vegetation. For such a small island there are several species present which are rather uncommon in the Waitakere Ecological District and some interesting 'endemics' to the Waitakere Ecological District:

Celmisia major (=*C. gracilenta* agg. of Druce 1993) - Allan (1961) separated Cheeseman's taxon into two varieties: var. *brevis* for Taranaki and var. *major* for Waitakere Ranges and Great Barrier Island. There have been no recent collections from Great Barrier (probably last collected January 1962,

Warren, AK 71534) and it is now thought to be extinct there. A taxonomic revision of the northern N.Z. celmisias (*C. adamsii, C. gracilenta, C. graminifolia, C. major*) is required to review the identity, distribution and synonomy of taxa in this group. See de Lange (1994) for a part discussion of this northern celmisia complex. In the Waitakere Ranges *C. major* is found from Raetahinga Point (AK 210562) (and presumably closer to Muriwai?) south to Manukau Heads and into the Manukau Harbour to Puponga Pt., Cornwallis (seen at this latter locality by V.A. May in *c.*1980 pers. comm.). On Taitomo this attractive daisy is locally common in a low sward on west-facing cliff tops and on top of large fallen rocky blocks at the north-east corner.

Elymus multiflorus blue wheat grass - this glaucous native coastal grass appears to be rather local along the Waitakere coast but is widespread around the North Island coast extending to Three Kings Islands and south to Nelson and Banks Peninsula (Connor 1994). On Taitomo it is occasional on the upper western cliff tops.

Hebe obtusata - Allan (1961) retained Cheeseman's Waitakere coastal distribution for this species: Manukau Heads to Muriwai. De Lange (1986) recorded this species from two localities in the eastern Kawhia Harbour. It is now known from four Kawhia localities but is locally extinct at two of these (P.J. de Lange pers. comm., 1995). On Taitomo, low sprawling/hanging shrubs of this species are locally common along the upper main ridge and rocky summit area.

Luzula banksiana s.str. reaches its northern geographical limit on Auckland's west coast, possibly at Taitomo Island. Only two Waitakere herbarium specimens were located: near Destruction Gully, *Gardner 3385* (AK 166051) and our Taitomo collection. On Taitomo it grows just back from the western cliffs near Nun Rock, in a low mixed grassy sward on sand.

Myosotis petiolata var. *pansa* (= *Myosotis* "pansa" of Druce 1993) was described by Lucy Moore (in Allan, 1961) as endemic to the Waitakere Ranges. We now know it also occurs in at least five scattered sites south of the Waitakere Ranges: Paparoa Point, South Kawhia, *de Lange 660* (AK 202070); Tapirimoko Point, near Moeatoa, *Clarkson* (WAIK, P.J. de Lange pers. comm.); Ngarupupu Point, Waikawau, *Druce* (CHR 208884-86); near Opito Point, south of Waikawau, *Ogle 485* (CHR 367212); and its southern-most locality near Waipingao Stream, White Cliffs, north Taranaki, *Druce* (CHR 323932-34) (also see Druce & Ogle, 1972). In the Waitakere Ranges it is known from coastal sites and river-gorges from Te Henga south to Destruction Gully area. On Taitomo it grows on the landward facing slopes amongst low vegetation, 5-40 m a.s.l.

Wahlenbergia "vernicosa" - this genus is currently being revised in New Zealand by Judith Petterson (1993) and the tall Taitomo plants with pale mauve flowers and glossy serrate leaves fit her concept of the widely distributed northern New Zealand *W.* "vernicosa". It grows amongst 0.5 m vegetation on main Taitomo ridge.

Zoysia minima - this appears to be the first confirmation of this species in the Waitakere Ranges. Gardner (1982) notes that Zotov's map might refer to the Waitakere Ranges (Zotov 1971) but that no specimen could be located. It grows above the main herbfield on the southern end of Taitomo and on the adjacent mainland where this grass forms a flat tight sward on sand.

Vegetation

Nun Rock

The island is predominantly bare rock with the vegetation limited to the ledges, the tallest being the occasional taupata (*Coprosma repens*) up to 30 cm tall. The rest of the vegetation is herbaceous.

Taitomo Island

Much of the island is bare rock which includes the lower coastal fringe and the exposed west and north facing cliffs. The main vegetation is a shrubland comprised of three abundant species: coastal toetoe (*Cortaderia splendens*), houpara (*Pseudopanax lessonii*) and flax (*Phormium tenax*). Commonly amongst this are shrubs of tauhinu or cottonwood (*Cassinia leptophylla*) and tangled stems of pohuehue or wire vine (*Muehlenbeckia complexa*). This dense vegetation 1-2 m tall exists

along most of the main ridge and extends down the landward slope of 30-45°. The tallest (2 m) and most diverse vegetation is on the steep south-facing slope, south-east of the summit. Here several species are represented by single or very few individuals: a trunkless ponga (*Cyathea dealbata*), karamu (*Coprosma robusta*), mahoe (*Melicytus ramiflorus*) and rangiora (*Brachyglottis repanda*). Fringing the coastal margin of the island's vegetation are swards of oioi (*Leptocarpus similis*), from high up on the western side to low down on the eastern side. Where the vegetation is low the oioi extends inland. Although pohutukawa (*Metrosideros excelsa*) trees are present on the adjacent mainland only 3 plants were observed on Taitomo: a seedling in a south-facing rock face and 2 plants *c.*70 cm high amongst taller shrubland near the centre of the island.

At the south end of the island, where the main ridge descends to sea level, an interesting salt herbfield exists on a moderate slope. This herbfield faces The Gap, where wave action and spray can be very impressive. (The large brown bull kelp (*Durvillaea antarctica*) is common here). The abundant plants of this low turf are: N.Z. ice plant (*Disphyma australe*), shore pimpernel (*Samolus repens*), glasswort (*Sarcocornia quinqueflora*) and lobelia (*Lobelia anceps*). Commonly present are two grasses (*Lachnagrostis* "littoralis", *Paspalum vaginatum*), remuremu (*Selliera radicans*), the small coastal sedge *Isolepis cernua* and shore groundsel (*Senecio lautus*); sow thistle (*Sonchus oleraceus*) and NZ spinach (*Tetragonia trigyna*) are present and oioi is common around the margin. *Zoysia minima* turf is present on the upper margin of this association. (A more extensive salt turf exists *c.*200 m to the south-east on the mainland by the Blowhole; the area is on private land and was not investigated).

Weeds

The island is remarkably free of weeds, exotic grasses being the most prominent. The three species that may spread and degrade the native vegetation are purple pampas grass (*Cortaderia jubata*), boxthorn (*Lycium ferrocissimum*) and gorse (*Ulex europaeus*). Only a few small pampas grass and boxthorn plants were seen on the main ridge high up. These were uprooted. Gorse was locally common along the high rocky outcrops near the highest point. Because of the existing dense vegetation on the more favourable sites gorse and boxthorn have few sites they can spread to, unless there is another fire.

Fauna

The most notable feature of the fauna of Taitomo Island is the presence of a small colony of grey-faced petrels (*Pterodroma macroptera gouldi*). About ten burrows were found under shrubs and flax on the main ridge, south of the middle peak. Four burrows were found on 29 December and none had evidence of recent activity. However, one of these burrows had an old grey-faced petrel feather and egg shell fragments by the entrance. Inside the chamber was a hatched eggshell indicating this species still breeds on this island. A further six burrows were found in the same area on 9 April. Several of these had fresh feathers by their entrance and a strong petrel odour was noted but no adult birds were caught.

P.J. Byers (pers. comm.) reported that muttonbirds (presumably grey-faced petrels) bred in large numbers on Taitomo as recently as 1936 and a few still bred on the adjacent mainland at that time. He considered that dogs had contributed to the decline of this colony. Fire would also have caused havoc in the colony if it occurred between April and December, the breeding season of this petrel species.

Other species of birds recorded during our visits included black-backed gulls (*Larus dominicanus*) and red-billed gulls (*L. novaehollandiae*). Several species of introduced passerines were also present (finches, blackbirds etc). The low shrubby vegetation is not yet suitable as a habitat for most native birds. Possibly tui (*Prosthemadera novaeseelandiae*) may visit seasonally to feed on the abundant flax flowers and houpara fruit, as they do on Kauwahaia Island (0.7 ha), near Te Henga.

No lizards were found during our visits. Copper skinks (*Cyclodina aenea*) occur on Kauwahaia Island and this species may be expected to occur on Taitomo Island.

Large rodent droppings were found near the summit and in several other locations on the island. The size of the droppings suggested that either ship rat (*Rattus rattus*) or Norway rat (*R. norvegicus*) were present. It would be unusual on an island this small for both species of rat to coexist. Ship rats are the more likely species as they have been found on other close inshore islands on the west coast, eg. Kauwahaia, Ihumoana (Te Henga) and Mataora (New Plymouth). Either species of rat is capable of taking eggs and chicks of grey-faced petrels and perhaps may have added to the decline of the petrel colony on Taitomo.

Possums (*Trichosurus vulpecula*) may be present on Taitomo Island as they occur on other islands on the Waitakere coastline, e.g. Lion Rock (Whakaari or Piha Island) and Ihumoana Island. We found no sign of possums during our visit. The sandy beach which connects Taitomo to the mainland at low tide would increase the chances of possums reaching the island if they are not already there.

Discussion

A prominent headland-island like Taitomo with a pa site would have been kept clear of vegetation during Maori use. The presence of goats around the turn of the last century would have maintained the low vegetation. Therefore, the most diverse and luxuriant vegetation on Taitomo this century, and possibly last century as well, probably existed prior to the fire in the late 1950's. Because it is such an exposed location the island's vegetation has recovered slowly since then.

Although small, Taitomo Island contains many of the unusual and interesting plants of the Waitakere Coast. The dense regeneration on the more gentle slopes is almost without weeds. If it remains free of fire this vegetation will develop into a short windswept forest. As the vegetation develops native pigeons may be enticed to visit the area bringing with them seeds of different coastal species, e.g. karaka (*Corynocarpus laevigatus*) and tawapou (*Pouteria costata*), both of which grow in the Piha area. Pohutukawa, with its tiny wind-blown seed, should increase in number and should develop into the largest trees on the island. It is an anomaly that there is no karo on the island. This may be related to rats eating the seed of the adjacent mainland karo. As the adjacent coastline and Kauwahaia Island indicate, Taitomo should be most suitable for karo.

Because of the close proximity of Taitomo to one of Auckland's most popular surf beaches the island is frequently visited. Most people cause no problems walking up the main ridge to enjoy the splendid views, or fishing off the exposed storm platform. The biggest threat to the vegetation is fire, and dogs are a threat to the remnant petrel population. Over recent years dogs have also decimated the blue penguin (*Eudyptula minor*) population nesting in this general area (P.J. Byers pers. comm.). Dogs should be banned from the island, ideally they should be banned south of the main Piha Beach. It is important to guard against fires and to be able to act quickly when they occur.

Another west coast 'high tide island' lacking legal protection is Kauwahaia Island. It is 8 km north of Taitomo at O'Neill Bay and makes an interesting comparison with it. The vegetation of both islands has been decimated in the past, but Kauwahaia's is older and taller being dominated by 6 m tall karo (Taylor and Cameron, 1990). The two islands have 55 vascular plant species in common of which 37 are native. Some 500 grey-faced petrels nest on Kauwahaia Island (GAT pers. obs.). What has saved Kauwahaia's biota is the fact that it is steeply cliffed around its base making it impossible for dogs, cats and most humans to climb, and since December 1989 the island has been regularly baited with Talon rat poison by one of us (GAT).

Taitomo Island with its nationally important flora, dense regenerating native shrubland, remnant petrel population, interesting geology, outstanding landform features, splendid views, and archaeological remains surely deserves to be protected? The recent agreement between the Kawerau a Maki Trust and the Parks Department, Auckland Regional Council to jointly manage islands and land on Auckland's west coast should give better protection to islands like Taitomo.

Acknowledgments

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Appendix 1. Vascular and moss flora of Taitomo Island and Nun Rock, south Piha

a = abundant
c = common
o = occasional
l = local
s = scarce (less than 5 seen)

x1 = single plant seen
* = adventive species

AK = Auckland Museum herbarium
AKU = Auckland University herbarium
MH = mainland headland facing Taitomo (Q11 406703), mosses excluded
NR = Nun Rock (apart from NR and MH all other abbreviations and comments refer to Taitomo Id)
H = Historical (c. 1957) P.J. Byers pers. comm.
[ ] = Observed on adjacent headland but not on Taitomo Id

Ferns (7)

Adiantum aethiopicum	l (AK 218559)
A. cunninghamii	l
Asplenium oblongifolium	c (AK 219691)
Cyathea dealbata	x1 (fronds c. 30 cm)
Phymatosorus pustulatus	o
Polystichum richardii	o
Pteridium esculentum	lc, MH

Dicots (51)

*Anagallis arvensis s.str.**	o
Apium prostratum s.str.	o
Brachyglottis repanda	s
Calystegia soldanella	o

Cassinia leptophylla	c, MH
Celmisia major	o-lc, NR
*Centaurium erythaea**	s, NR
[*Conyza albida**]	MH
[*Coprosma macrocarpa*]	MH
C. repens	l, NR, MH
C. robusta	s
*Crepis capillaris**	s
Dichondra repens	c, NR, MH
Disphyma australe	c, NR
Geniostoma rupestre	s
Gnaphalium audax	l (AK 218558)
Gonocarpus incanus	s
Hebe obtusata	lc (AK 218564 & 219692)
*Hypochoeris radicata**	o, MH
*Leontodon taraxacoides**	c, MH
Leucopogon fasciculatus	c
L. fraseri	lc
Lobelia anceps	c, NR, MH
*Lotus pedunculatus**	o, MH
*L. suaveolens**	c, NR, MH
*Lupinus arboreus**	o, MH
*Lycium ferrocissimum**	s
Macropiper excelsum	l
Melicytus ramiflorus	s
Metrosideros excelsa	s, MH
Muehlenbeckia complexa	c, NR, MH
Myosotis petiolata var. *pansa*	o (AK 218563)
Olearia furfuracea	s
Oxalis rubens	c (AK 218561), NR, MH (AK 218561)
Parsonsia sp.	s
Peperomia urvilleana	l
Pimelea urvilleana	o (AK 218565)
[*Pittosporum crassifolium*]	MH
*Polycarpa tetraphyllum**	o, MH
Pseudognaphalium luteoalbum agg.	o (AK 218566)
Pseudopanax crassifolius x *P. lessonii*	x1
P. lessonii	a (AK 221467), MH
*Sagina apetala**	o
*S. procumbens**	o, MH
Samolus repens	o, MH
Sarcocornia quinqueflora	o, NR, MH
Selliera radicans	lc, ?NR, MH
Senecio lautus	c, NR, MH
*Silene gallica**	o
*Sonchus oleraceus**	o, NR, MH
Spergularia media	o, MH
Tetragonia trigyna	o-lc, NR, MH
*Ulex europaeus**	lc
Wahlenbergia "vernicosa"	o (AK 218560)

Monocots (34)

Aira caryophyllea s.str.	o
Astelia banksii	o
*Briza maxima**	o, NR, MH
*Bromus diandrus**	o
*B. hordeaceus**	c, MH

*B. willdenowii**	o, NR, MH
Carex flagellifera	s
C. testacea	o
Cordyline australis	H (stunted)
*Cortaderia jubata**	s
C. splendens	a, NR, MH
Cyperus ustulatus	s
*Dactylus glomerata**	o-lc
Deyeuxia billardierei	c, NR, MH
Dichelachne crinita	o
Elymus multiflorus	o (AK 218562)
Gahnia lacera	x1
*Holcus lanatus**	c, MH
Isolepis cernua	lc
I. nodosa	c, NR, MH
Lachnagrostis "littoralis"	lc, NR, MH
*Lagus ovatus**	lc, MH
Leptocarpus similis	a, MH
Luzula banksiana var. *banksiana*	o (AK 218569)
*Paspalum dilatatum**	o, MH
*P. vaginatum**	lc
Phormium tenax	a, MH
Poa anceps	o-lc, NR
*P. pratensis**	l (AK 218598)
P. pusilla	o (AK 218567)
*Rytidosperma penicillatum**	o
*Sporobolus africanus**	o-lc, MH
*Vulpia bromoides**	lc
Zoysia minima	lc (AK 219693), MH (AK 218568)

Mosses (19)

Brachythecium sp.	s (AK 219807)
Bryum argenteum	l (AK 219804)
B. billardierei var. *platyloma*	l (AK 219812)
B. campylothecium	o (AK 218423)
B. dichotomum	l (AK 219806)
B. erythrocarpoides	l (AK 218425)
Campylopus introflexus	l (AK 219801)
Fissidens leptocladus	l (AK 219809)
? *Hymenostomum patulum*	l (AK 219800 & 219810)
Hypnum cupressiforme	l (AK 219803 & 219811)
Leptodontium interruptum	s (AK 219802)
Lindbergia maritima	l (AKU 66649)
Philonotis tenuis	l (AK 219808)
Ptychomnion aciculare	l (AK 219813)
Racopilum convolutaceum	l (AK 218426)
Sematophyllum amoenum	l (AK 219805)
S. homomallum	l (AK 219798)
Thuidium furfurosum	c (AK 218424)
Tortula papillosa	s (AK 219799)