

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 Ruawaihiro 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 falcatum* 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. asplenoides*, 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 (*Melicactus 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.

### Acknowledgements

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### References

- Beever, J.; Malcolm, B.; Malcolm N. 2002: The moss genus *Fissidens* in New Zealand – an illustrated key. Micro-Optics Press, Nelson.  
Glenny, D.; Fife, A.J.; Brownsey, P.J.; Renner, M.A.M.; Braggins, J.E.; Beever, J.E.; Hitchmough, R. 2011: Threatened and uncommon bryophytes of New Zealand (2010 Revision). *New Zealand Journal of Botany* 49: 305-327.  
Wilcox, M.; Shanks, J.; de Lange, P. 2012: A Visit to Tuhua (Mayor Island). *Auckland Botanical Society Journal* 67: 17-33.

## 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

cobbles with interspersed coarse gravel or sand. There were large populations of kina (*Evechinus chloroticus*) and other species of sea urchin as well. The Auckland University Club studied the algae of Mayor Island in the 1950s (C.B. Trevarthen 1954, J. Trevarthen 1954), while Shears & Babcock (2004) contributed subtidal records from the northern end of the island.

### Green algae

#### *Caulerpa flexilis*

Common subtidally in Opo Bay, and washed up in Western Bay. *V.A.Hoggard*, Oct 1971, WELT A008156; *M.D.Wilcox*, Jan 2012, AK 330696-97.

#### *Caulerpa geminata*

Not seen by us. *R.P. Bell*, 1936, Opo Bay, AK 146120.

#### *Cladophora herpestica*

Opo Bay. *M.D.Wilcox*, Jan 2012, AK 330698.

#### *Codium convolutum*

Rather sparse in Opo Bay.

#### *Codium cranwelliae*

Not seen by us but recorded by Shears & Babcock (2004) from the northern coast, and also in drift by J. Trevarthen (1954). *A.N.Baker*, Oct 1969, WELT A002161.

#### *Microdictyon mutabile*

Opo Bay. *M.D.Wilcox*, Jan 2012, AK 330699.

#### *Microdictyon umbilicatum*

*R.P.Bell*, Dec 1936, AK 146171, AK 236533.

#### *Pedobesia clavaeformis*

Recorded by Shears & Babcock (1984) from the northern coast.

#### *Ulva pertusa*

Abundant in Opo Bay and Honeymoon Bay. Intertidal and subtidal. Frequently washed up on the beaches. *C.Duffy*, Mar 2001, WELT A027593; *M.D.Wilcox* & *P.B.Hutton*, Jan 2012, AK 330701; *M.D.Wilcox*, Jan 2012, AK 330700, AK 330702.

### Brown algae

#### *Carpomitra costata*

Commonly observed by Shears & Babcock (1984) subtidally on the north coast, but not found by us. *A.N.Baker*, Oct 1969, WELT A002954.

#### *Carpophyllum angustifolium*

Not seen by us but a dominant brown alga of the exposed headlands on the northern coast (Shears & Babcock 2004), and also Opo Bay (C.Trevarthen 1954).

#### *C. flexuosum*

In deeper water of Opo Bay (C.Trevarthen 1954) and northern coast (Shears & Babcock 2004). *R.P.Bell*, Dec 1936, AK 146869; *S.Miller*, Jan 1991, WELT A023788.

#### *C. maschalocarpum*

A dominant species all around the coast. *R.P.Bell*, Dec 1936, AK 146768; *S.Miller*, Jan 1991, WELT A023785; *M.D.Wilcox*, Jan 2012, AK 330729.

#### *C. plumosum*

One of the commonest seaweeds seen. *R.P.Bell*, Dec 1936, AK 146787, AK 146794-95, AK 146799; *A.N.Baker*, Jan 1979, WELT A010400.

#### *Colpomenia sinuosa*

Common on rock at Opo Bay in shallow water. *S.Miller*, Jan 1991, WELT A024976.

#### *Cystophora retroflexa*

Common at Opo Bay, shallow subtidal. *R.P.Bell*, Dec 1936, AK 146732; *V.A.Hoggard*, Oct 1971, WELT A008190; *M.D.Wilcox*, Jan 2012, AK 330706, AK 330727.

#### *C. torulosa*

At Opo Bay, low intertidal. Not recorded by Shears & Babcock (1984). *R.P.Bell*, Dec 1936, AK 146715; *M.D.Wilcox*, Jan 2012, AK 330725.

#### *Dictyota kunthii*

Common at Opo Bay, subtidal. *R.P.Bell*, Dec 1936, AK 146508-9; *M.D.Wilcox*, Jan 2012, AK 330713.

#### *Distromium skottsbergii*

Recorded commonly by Shears & Babcock (1984) from the northern coast in the understory of *Ecklonia* kelp forest. *A.N.Baker*, Oct 1969, WELT A002957.

#### *Durvillea antarctica*

An aged piece of bull kelp was found washed up on the beach at Honeymoon Bay. It is not known from the shores of Mayor Island.

#### *Ecklonia radiata*

Abundant all around the island, dominating down to 15 m depth. A big washup was seen by us on Western Bay. *R.P. Bell*, Dec 1936 (as *E. brevipes*), AK 146454; *S.Miller*, Jan 1991, WELT A023786.

#### *Halopteris paniculata*

Opo Bay, *R.P. Bell*, Dec 1936, AK 146462.

#### *Hormosira banksii*

Prominent on the reefs at Western Bay.

#### *Leathesia marina*

Not seen by us, but recorded by J. Trevarthen (1954).

*Perithalia capillaris*

We found this washed up on Opo Bay, and saw a few plants on shallow sub-tidal rocks. Not recorded by Shears & Babcock (1984). *A.N.Baker*, Jan 1979, WELT A010399; *M.D.Wilcox*, Jan 2012, AK 330728.

*Sargassum sinclairii*

Frequent in Opo Bay, and generally common (Shears & Babcock 1984). *R.P.Bell*, Dec 1936, AK 146851; *V.A.Hoggard*, Oct 1971, WELT A008160; *M.D.Wilcox*, Jan 2012, AK 330726.

*Scytothamnus australis*

Not noticed by us, but recorded from Opo Bay by J. Trevarthen (1954) and C. Trevarthen (1954).

*Splachnidium rugosum*

Some patches seen by us on intertidal rocks at Opo Bay. *R.P.Bell*, Dec 1936, AK 146274.

*Xiphophora chondrophylla*

A dominant species all around the coast, lower intertidal. *R.P.Bell*, Dec 1936, AK 146671; *M.D.Wilcox*, Jan 2012, AK 330730.

*Zonaria turneriana*

The most abundant of the smaller understorey brown algae. *R.P.Bell*, Dec 1936, AK 146587; *M.D.Wilcox*, Jan 2012, AK 330712.

**Red algae**

*Acrosorium ciliolatum*

*S.Miller*, Jan 1991, WELT A024585.

*Aphanocladia delicatula*

*A.N.Baker*, Oct 1969, WELT A002132.

*Apophlaea sinclairii*

Encrusting mid-intertidal rocks at Opo Bay.

*Asparagopsis armata*

*R.P.Bell*, Dec 1936, AK 147168-69; *A.N.Baker*, Oct 1969, WELT A002955.

*Bostrychia intricata*

Upper intertidal shaded rock crevices, Opo Bay. Mixed with *Capreolia implexa*. *M.D.Wilcox*, Jan 2012, AK 330719.

*Callophyllis decumbens*

*A.N.Baker*, Oct 1969, WELT A002952.

*Capreolia implexa*

Upper intertidal shaded rock crevices, Opo Bay. Mixed with *Bostrychia intricata*, Jan 2012, AK 330718.

*Catenellopsis oligartha*

Seen by us in Opo Bay forming patches on high to mid-intertidal rock faces, but dying off.

*Champia laingii*

Epiphytic on *Xiphophora chondrophylla*. *M.D.Wilcox*, Jan 2012, AK 330724.

*Chondria lanceolata*

*A.N.Baker*, Oct 1969, WELT A002576.

*Corallina officinalis*

Opo Bay. *R.P.Bell*, Dec 1936, AK 147347, AK 147415.

*Curdiea coriacea*

*V.A.Hoggard*, Oct 1971, WELT A008154.

*Delisea compressa*

Found in Opo Bay. Common on the northern coast (Shears & Babcock 1984). *M.D.Wilcox*, Jan 2012, AK 330722.

*Ectophora depressa*

*A.N.Baker*, Oct 1969, WELT A002956.

*Gigartina decipiens*

Common in Opo Bay, on boulders. *M.D.Wilcox*, Jan 2012, AK 330707, AK 330709-11.

*Gigartina* [undescribed sp.]

Common as a low turf on upper intertidal rocks in Opo Bay and Honeymoon Bay. This is an undescribed species, also found in clear waters of the Hauraki Gulf. *M.D.Wilcox*, Jan 2012, AK 330731-32.

*Hummbrella hydra*

*A.N.Baker*, Jan 1979, WELT A010401.

*Jania sagittata*

Western Bay, *R.P. Bell*, Dec 1936, AK 147363; *V.A.Hoggard*, Oct 1971, WELT A009751.

*Laurencia distichophylla*

Not seen by us, but recorded by J. Trevarthen (1954). *A.N.Baker*, Jan 1979, WELT A010382.

*Laurencia thyrsoifera*

Not seen by us, but recorded by J. Trevarthen (1954).

*Liagora harveyana*

Seen intertidally and subtidally in Opo Bay. *R.P.Bell*, Dec 1936, AK 147080.

*Melanthalia abscissa*

A common understorey species, shallow subtidal. *R.P.Bell*, Dec 1936; AK 147454; *M.D.Wilcox*, Jan 2012, AK 330729.

*Nesophila hoggardii*

Some fine examples of this offshore island "specialist" found in Opo Bay. *P.J.de Lange*, Jan 2012, AK 330723.

*Phacelocarpus labillardieri*

*V.A.Hoggard*, Oct 1971, WELT A008155.

*Plocamium cirrhosum*

Washed up on the beach at Western Bay. *S.Miller*, Jan 1991, WELT A024583.

*Pterocladia lucida*

Only a few patches seen in Opo Bay, but abundant on the northern coast (Shears & Babcock 1984). *R.P.Bell*, Dec 1936, AK 147246; *S.Miller*, Jan 1991, WELT A023787; *M.D.Wilcox & P.B.Hutton*, Jan 2012, AK 330715.

*Pterocladia capillacea*

Very common in all the bays, on boulders. *R.P.Bell*, Dec 1936, AK 147264; *S.Miller*, Jan 1991, WELT A023783; *M.D.Wilcox & P.B.Hutton*, Jan 2012, AK 330716; *M.D.Wilcox*, Jan 2012, AK 330714, AK 330717.

*Sarcodia montagneana*

*A.N.Baker*, Jan 1979, WELT A010402.

*Spyridia filamentosa*

Washed up on the beach, and found epiphytic on *Carpophyllum plumosum* at Western Bay. *M.D.Wilcox & P.B.Hutton*, Jan 2012, AK 330720; *M.D.Wilcox*, Jan 2012, AK 330721.

*Taylorophycus filiformis*

A fairly common turfing seaweed in Opo Bay. *M.D.Wilcox*, Jan 2012, AK 330694-95.

*Vidalia (Osmundaria) colensoi*

One of the commonest red algae, found subtidally all around the island. *S.Miller*, Jan 1991, WELT A023784; *M.D.Wilcox & P.J. de Lange*, Jan 2012, AK 330693; *M.D.Wilcox & P.B.Hutton*, Jan 2012, AK 330674.

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**References**

- Shears, N.T.; Babcock, R.C. 2004: Community composition and structure of shallow rocky subtidal habitats in northeastern New Zealand. *Science for Conservation* 245: 1-65. Department of Conservation, Wellington.
- Trevarthen, C.B. 1954: Features of the marine ecology of Little Barrier, Mayor, and Hen Islands. *Tane* 6: 34-60.
- Trevarthen, J. 1954: Algal species list for Mayor Island. *Tane* 6: 61-66.

## Birds noted on ABS Trip to Tuhua (Mayor Island) 27-30 January 2012

**Stella Rowe and Shelley Heiss-Dunlop**

### 1. Land and coastal birds

North Island brown kiwi, *Apteryx mantelli*. Eleven have been introduced in three transfers of seven adults (2006) and two lots of two chicks (2008, 2011). A possible call or two heard.

Mallard, *Anas platyrhynchos*. Two seen on Lake Te Paritu, six on Lake Aroarotamahine.

Brown teal, *Anas chlorotis*. Two releases in 2006 and 2008. Two seen in crater.

Little shag, *Phalacrocorax melanoleucos*. Fifteen seen roosting at L. Te Paritu with a few empty nests in pohutukawa above. Also one seen fishing round the coast.

Pied shag, *Phalacrocorax varius*. Three seen on a sandbank and roosting in pohutukawa at L. Te Paritu. More commonly seen around the coast.

Australasian bittern, *Botaurus poiciloptilus*. Not seen by us but three were recorded in the crater wetland in 1952 (Edwards 1955).

Swamp harrier, *Circus approximans*. One quartering low over the wetland in the crater.

New Zealand falcon, *Falco novaeseelandiae*. One seen and heard in the crater (P. de Lange, pers. comm.).

Banded rail, *Gallirallus philippensis*. One seen in crater (P. de Lange, pers. comm.).

Spotless crane, *Porzana tabuensis*. One seen in crater (P. de Lange, pers. comm.).

Southern black-backed gull, *Larus dominicanus*. Three seen at the crater lakes, and individuals on coast.

Red-billed gull, *Larus novaehollandiae*. A group of about 75 birds including newly-fledged young remained in Opo Bay during our stay.

White-fronted tern, *Sterna striata*. One seen at Omapu/Western Bay and one at Opo Bay on beach.

New Zealand pigeon, *Hemiphaga novaeseelandiae*. At least five seen, likely to be widely dispersed in moderate numbers.

Kaka, *Nestor meridionalis*. Widely seen and heard as they ranged over the island.

Orange-fronted parakeet, *Cyanoramphus malherbi*. Two releases, 71 birds in 2010, seven in 2011, from birds raised