Seaweeds of Great Barrier Island

Mike Wilcox

Great Barrier Island is situated at the entrance to the Hauraki Gulf, 80 kilometres north-east of Auckland city. The coastline is rugged and intricately indented by numerous bays and inlets particularly on the western side. At many places small islands also lie close inshore. The subtropical East Auckland Current reaches the north-eastern coast of Great Barrier Island at times, and appears to influence the coastal biota. The base rock of Great Barrier Island is composed of hard shales and greywackes from the Jurassic-Permian period. It is overlain to a considerable depth on most of the island by roughly stratified Tertiary andesitic breccias, tuffs and agglomerates. An overall downward movement of the land on the western side during recent geological times allowed the sea to invade the deep narrow valleys of the earlier land mass, forming a coastline characterised by a series of bays and inlets with a number of islets lying offshore.

Fig. 1. *Capreolia implexa*, Karaka Bay, Great Barrier Island, 7 Feb 2009. Photo: M.D. Wilcox.

Several studies have been made on the marine algae of Great Barrier Island. Dellow (1955) included sites at Whangaparapara and Port Fitzroy on the inside (western) coast, and Needles Point and Oruawharo Bay on the outside (eastern) coast in her study of the Hauraki Gulf. Francis & Grace (1986) published a valuable account of the algae from the northeastern coast – including subtidal communities – centred on Rangiwhakaea Bay, while Kelly & Haggitt (2002) and Haggitt & Mead (2008) reported on benthic reef surveys on the northeastern coast. Wilcox (2007) described the intertidal seaweed flora on neighbouring Kaikoura Island.

The Auckland Botanical Society's visit in February 2009 presented an opportunity to record seaweeds on the margins of Whangapoua Estuary, at Tapuwai Point (near the 'S.S.Wairarapa' graves) at the northern end of Whangapoua Beach, at Rangiwhakaea Bay on the northeastern coast, and in Port Abercrombie on the western coast.

Whangapoua Estuary

Mangroves grow at the back of the estuary at Okiwi, and the pneumatophores support abundant growth of the red alga *Catenella nipae*. Behind the mangroves there are dense beds of sea rush (*Juncus kraussii*), entangled around the bases of which can be found the red alga *Bostrychia moritziana*, intermingled with *Bostrychia simpliuscula* and *Caloglossa vieillardii*. A stream enters the sea at the southern end of the estuary, and *Hormosira banksii* grows on stones in the stream bed and on the bank, with much epiphytic *Ectocarpus siliculosus*. The hard, volcanic rock boulders on the margin have the high-tidal red algae *Apophlaea sinclairii* and *Capreolia implexa*.

Fig. 2. *Ahnfeltia torulosa*, Rangiwhakaea Bay, Great Barrier Island, 7 Feb 2009. Photo: M.D. Wilcox.

Tapuwai Point

This greywacke rock promontory at the northern end of Whangapoua Beach is fully exposed to the ocean and has seaweed assemblages typical of high energy shores of eastern Northland (Morton 1993). The high-tide crevice and cave mouth community comprises the red algae *Bostrychia gracilis* and *Bostrychia intricata*, with *Caloglossa vielliardii*. Open rock surfaces in the upper intertidal zone have scattered *Porphyra coleana* and much *Capreolia implexa* and *Apophlaea sinclairii*. The brown alga *Scytothamnus australis* is dominant in the mid intertidal, especially on sand-washed rocks beside the beach, the worm-like thalli of *Nemalion helminthoides* hang from rock faces, while *Hormosira banksii*, *Leathesia difformis* and *Corallina officinalis* are common on the more protected platforms.

The bushy greenish-coloured red alga *Gigartina alveata* grows very prominently on the mid-tidal rocks, and below it occurs a band of *Pachymenia lusoria*, with *Gigartina macrocarpa*, *Splachnidium rugosum*,

Endarachne binghamiae, *Caulacanthus ustulatus*, *Gelidium caulacantheum*, *Codium convolutum*, *Cladophora herpestica* and *Ulva pertusa* interspersed.

Deep channels and pools have *Haliptilon roseum*, *Jania micrarthrodia*, *Pterocladiella capillacea*, *Melanthalia abscissa*, *Chondria macrocarpa*, *Laurencia thyrsifera*, *Champia laingii*, *Lophurella caespitosa*, *Carpophyllum plumosum*, *Glossophora kunthii* and *Zonaria turneriana*. At the sublittoral fringe is a band of *Xiphophora chondrophylla*, and below it *Carpophyllum angustifolium* and *Carpophyllum maschalocarpum*., and the large red alga *Sarcothalia circumcincta*. The attractive red alga *Placentophora colensoi* was found cast ashore on the beach.

Fig. 3.*Rhodochorton purpureum*, Rangiwhakaea Bay, Great Barrier Island, 7 Feb 2009. Photo: M.D. Wilcox.

Rangiwhakaea Bay

At the southern end of Burrills Bay within Rangiwhakaea Bay there is an intertidal assemblage in distinct zones on the andesitic reefs: *Gigartina alveata* above, *Pachymenia lusoria* below it, and *Ahnfeltia torulosa* and *Nemalion helminthoides* on the sand-washed rocks. The rocks at the northern end of the Burrills Bay had a very prominent colony of sea lettuce (*Ulva pertusa*), both in the rosette form and in the form with long, twisted ribbons. *Centroceras clavulatum* was common in high-tidal rock pools, *Catenellopsis oligarthra*, *Splachnidium rugosum* and *Nothogenia pulvinata* occurred on open rocks, and *Cystophora torulosa* and *Cystophora retroflexa* grew in the lower intertidal. *Porphyra coleana* was found on the upper intertidal rocks, and *Rhodochorton purpureum* grew as a very short turf on sand-washed rocks.

Francis & Grace (1986) recorded algae at Rangiwhakaea Bay from both intertidal and subtidal sites. They noted the dominance of *Carpophyllum angustifolium* at the start of the subtidal communities ("shallow mixed weed zone"), with *Pterocladia lucida*, *Xiphophora chondrophylla*, *Osmundaria colensoi*, *Carpophyllum maschalocarpum*, *Carpophyllum plumosum*, *Sargassum sinclairii*, *Gigartina macrocarpa* and *Cladhymenia oblongifolia* as regular associates. They also observed the large laminarian, *Lessonia variegata*, on top of rocks subject to severe wave surge, and a kelp forest of *Ecklonia radiata*, at depths of 4-20 m, with *Caulerpa flexilis*, *Caulerpa geminata*, *Curdiea coriacea*, *Zonaria turneriana*, *Plocamium cirrhosum*, *Carpomitra costata* and *Perithalia capillaris*.

Fig. 4.*Ulva pertusa*, Rangiwhakaea Bay, Great Barrier Island, 7 Feb 2009. Photo: M.D. Wilcox.

A community comprising the red algae *Hummbrella hydra*, *Delisea compressa*, *Acrosymphyton firmum*, *Ptilonia mooreana*, *Scinaia firma* and *Caulerpa flexilis* was observed by Francis & Grace (1986) at depths of 15-25 m on the sand/rock interface below the kelp beds, and the subtidal green alga *Codium cranwelliae* has been reported from the bay. At depths >60 m there are no seaweeds at all, but rich assemblages of sponges, black corals and fish. The deepwater green alga *Pedobesia clavaeformis* (Hawkes 1983) has also been recorded from Rangiwhakaea Bay (Irving & Jeffs 1993), and John Ogden has found it too, washed ashore at Awana Bay.

Fig. 5.*Rivularia*, Karaka Bay, Great Barrier Island, 9 Feb 2009. Photo: M.D. Wilcox.

Port Abercrombie

Observations were made of seaweeds on the comparatively sheltered shores of Karaka Bay, including Wood Island. Two blue-green algae (Cyanobacteria) were prominent in the upper

intertidal zone. *Placoma vesiculosum* occurred in extensive colonies of brownish, vesicular thalli, typically intermingled with *Apophlaea sinclairii*, while the bright green thalli of *Rivularia* sp. were abundant amongst *Capreolia implexa* on high tidal shaded rock platforms near the Orama Community jetty in Karaka Bay. A third blue-green alga, the hair-like filamentous *Lyngbya majuscula*, was recorded at Nimaru Bay in Katherine Bay.

Green algae were represented by *Microdictyon umbilicatum* and *Cladophora herpestica* at Wood Island, abundant *Microdictyon mutabile* along the lower intertidal shoreline of Karaka Bay, the introduced *Codium fragile* subsp. *tomentosoides* at Nimaru Bay and Karaka Bay, and *Ulva procera* in association with *Capreolia implexa*. During the winter of 2008 John Ogden observed a massive wash-up of *Microdictyon mutabile* on the shore of Tryphena on the south-western coast of Great Barrier Island (Ogden 2008).

The dominant large brown algae in Karaka Bay were *Ecklonia radiata* and *Carpophyllum flexuosum* forming extensive subtidal beds; *Carpophyllum maschalocarpum*, *Carpophyllum plumosum*, *Xiphophora chondrophylla*, *Cystophora torulosa* and *Cystophora retroflexa* in the lower intertidal zone and sublittoral fringe; and *Scytothamnus australis*, *Splachnidium rugosum* and *Hormosira banksii* in the mid-low intertidal zone.

Red algae of the upper shore were the very abundant *Capreolia implexa* growing in dense tangled, turfs, *Bostrychia intricata*, *Bostrychia gracilis* and *Caloglossa vieillardii* on shaded rock faces, *Corallina officinalis* on mid-tidal platforms, and *Polysiphonia sertularioides* in rock pools. *Liagora harveyana* was found at Nimaru Bay.

Occurrence of bull kelp

Bull kelp (*Durvillaea antarctica*) occurs at the Needles in the far north of Great Barrier Island (Dellow 1955; Irving & Jeffs 1993). Apart from sightings at the Mokohinau Islands (P. de Lange pers. comm.) the Needles is the only occurrence of this large brown alga from the Hauraki Gulf, and indeed it is not otherwise known from the east coast of the North Island north of East Cape and south of the Three Kings Islands.

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Species List: Seaweeds of Great Barrier Island and adjoining islands

List based on specimens in the AK and WELT herbaria, and other collections made by M.D.Wilcox and J.Ogden.

Red algae

Abroteia suborbiculare
Acrosorium ciliolatum
Acrosorium decumbens
Acrosymphyton firmum
Ahnfeltia torulosa
Ahnfeltiopsis humilis
Apophlaea sinclairii
Arthrocardia corymbosa
Asparagopsis armata
Bostrychia gracilis
Bostrychia intricata
Bostrychia moritziana
Bostrychia simpliuscula
Callophyllis sp.
Caloglossa vieillardii
Capreolia implexa
Catenella nipae
Catenellopsis oligarthra
Caulacanthus ustulatus
Ceramium sp.
Champia laingii
Champia novae-zelandiae
Cheilosporum sagittatum
Chondracanthus chapmanii
Chondria macrocarpa
Cladhymenia coronata
Cladhymenia lyallii
Cladhymenia oblongifolia
Corallina officinalis
Curdiea codioides
Curdiea coriacea
Dasyclonium incisum
Delisea compressa
Dipterosiphonia dendritica
Gelidium caulacantheum

Gigartina alveata
Gigartina atropurpurea
Gigartina laingii
Gigartina macrocarpa
Glaphrymenia pustulosa
Grateloupia intestinalis
Grateloupia urvilleana
Griffithsia traversii
Haliptilon roseum
Halymenia latifolia
Helminthocladia australis
Hildenbrandia sp.
Hummbrella hydra
Hymenena variolosa
Jania micrarthrodia
Jania novae-zelandiae
Laurencia distichophylla
Laurencia gracilis
Laurencia thyrsifera
Liagora harveyana
Lithophyllum carpophyllii
Lithothamnion calcareum
Lomentaria umbellata
Lophurella caespitosa
Melanthalia abscissa
Metamorphe colensoi
Nemalion helminthoides
Nesophila hoggardii
Nothogenia pulvinata
Osmundaria colensoi
Pachymenia lusoria
Peyssonnelia rugosa
Placentophora colensoi
Plocamium cartilagineum
Plocamium cirrhosum
Polysiphonia sertularioides
Porphyra coleana
Pseudoscinaia sp.
Pterocladia lucida
Pterocladiella capillacea
Pterosiphonia pennata
Ptilonia mooreana
Rhizopogonia asperata
Rhodochorton purpureum
Rhodophyllis membranacea
Rhodymenia sonderi
Sarcothalia circumcincta
Sarcothalia marginifera
Schizymenia novae-zelandiae
Scinaia firma
Tsengia feredayae

Brown algae

Bachelotia antillarum
Carpomitra costata
Carpophyllum angustifolium
Carpophyllum flexuosum
Carpophyllum maschalocarpum
Carpophyllum plumosum
Colpomenia sinuosa
Cystophora retroflexa
Cystophora torulosa
Dictyota dichotoma
Durvillaea antarctica
Ecklonia radiata
Ectocarpus siliculosus
Endarachne (*Petalonia*) *binghamiae*
Dictyota dichotoma
Glossophora kunthii
Halopteris virgata
Hormosira banksii
Landsburgia quercifolia
Leathesia difformis
Lessonia variegata
Myriogloea intestinalis
Notheia anomala
Perithalia capillaris
Portphillipia australis
Ralfsia verrucosa
Sargassum sinclairii
Scytosiphon lomentaria
Scytothamnus australis
Splachnidium rugosum
Tinocladia novaezelandiae
Undaria pinnatifida
Xiphophora chondrophylla
Zonaria turneriana

Green algae

Caulerpa flexilis
Caulerpa geminata
Chaetomorpha ligustica
Cladophora herpestica
Codium convolutum
Codium cranwelliae
Codium fragile subsp. *tomentosoides*
Derbesia novae-zelandiae (incl. *Halicystis phase*)
Microdictyon mutabile
Microdictyon umbilicatum
Pedobesia clavaeformis
Ulva procera
Ulva pertusa
Wittrockiella salina

Blue-green algae (Cyanobacteria)

Lyngbya majuscula
Placoma vesiculosum (*Entophysalis deusta*)
Rivularia sp.

Webb Creek, Kauaeranga Valley, Coromandel Forest Park

John Smith-Dodsworth

On the 18 April 2009 a good turnout of 30 members met at the last car park, altitude 160 m, in the upper Kauaeranga Valley inland from Thames, in ideal conditions, cool and overcast with little wind. The group was: Tricia Aspin, Romily Atkinson, Peter Atkinson, Tom Atkinson, Colleen Brewer, Matthew Brewer, Warren Brewer, Jan Butcher, Colleen Crampton, Gael Donaghy, Marcel Horvath, Peter Hutton, Graeme Jane, Helen Lyons, Christine Major, Elaine Marshall, Barrie McLeay, Gretta McLeay, Carol McSweeney, Garry McSweeney, Helen Preston-Jones, Juliet Richmond, Chevelle Sands, Trinia Smith, John Smith-Dodsworth (leader), Harold Waite, Alison Wesley, Mike Wilcox, Tony Williams, Maureen Young.

Starting off at 10 am we went along the main track up the valley over the first crossing of the river. The numerous trees of *Pittosporum eugenioides* at first, between the carparks, had been planted. The first tree to attract interest were the numbers of very large northern rata trees (*Metrosideros robusta*) with the upper branches covered in epiphytes and one with two large shining broadleaf trees (*Griselinia lucida*) as epiphytes in the upper branches.Also near the river crossing was the first clump of *Loxsoma cunninghamii* to be seen and some *Pseudopanax laetus*, both of which were of great interest to many. Branching off the main track, up the Webb Creek Track, we climbed