THE VEGETATION OF RED MERCURY ISLAND

PART 1: THE PLANT COMMUNITIES AND A VASCULAR PLANT SPECIES LIST.

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SUMMARY

The main terrestrial plant communities of Red Mercury Island are briefly described and a vascular plant species list is presented.

INTRODUCTION

The vegetation of Red Mercury Island is distinguished from that of other off-shore islands visited by Field Club in being composed almost wholly of second-growth scrub following major fires. It is likely that during the period of Maori occupation at least some of the original vegetation was felled and burned, and Cochrane (1957) describes the vegetation of the north-western corner of Red Mercury as showing major cultural modification, while the remainder is described as partly modified. Milne (1969) reports that the island was burnt over as recently as 1934.

The introduced mammals which have modified the indigenous vegetation of other off-shore islands are absent from the small islands of the Mercury group. Bettesworth (1972) reports that the kiore, *Rattus exulans,* present on Red Mercury, feeds on leaves as a major portion of its diet, but no major damage to the vegetation is apparent.

This paper is based on studies made by the authors during the Auckland University Field Club Scientific Camp in August, 1971. In the time available it was possible to cover only the western half of the island in any detail and we are indebted to many fellow members of the party for the information they gave us about the vegetation in other areas.

THE PLANT COMMUNITIES

1. *Myrsine australis* scrub.

This community occupies the greater part of the area of the island. It consists of dense scrub of very uniform appearance and composition, generally about 3.0 metres in height, with a closed canopy, except along the streams, where the scrub becomes more open. *Myrsine australis* (mapou) is the dominant species, while *Geniostoma ligustrifolium* (hange hange) and *Coprosma* spp. are

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the major sub-dominants. On the seaward slopes *Brachyglottis repanda* (rangiora), *Cyathodes fasciculata* (mingi mingi) and *Leptospermum scoparium* (manuka) become important scrub species, while inland, *Olearia furfuracea* (akepiro) and *Carmichaelia cunninghamii* occur more frequently. Throughout, *Doodia media* is the most important ground cover species, with *Asplenium lucidum* also abundant.

Along the valley floors of the two permanent streams on the island the scrub becomes much more open and a great variety of ferns occur. In the valley of the western stream *Entelea arborescens* and *Sophora microphylla* (kowhai) are common, and there are isolated large trees of *Corynocarpus laevigatus, Dysoxylum spectabile,* and *Planchonella novo-zelandica. Doodia media* is again the most common fern with *Adiantum aethiopicum* also abundant. *Blechnum capense, B. filiforme, B. lanceolatum, Pteris comans, Polystichum richardii,* and *Thelypteris pennigera* were all recorded, while the two tree ferns *Cyathea dealbata* and *C. medullaris* occur along the edge of the stream. Along the eastern stream *Myrsine australis* is dominant and there is an understorey of small kowhais (D.Towns, pers. comm.).

2. Pohutukawa *(Metrosideros excelsa)* coastal forest.

Coastal forest of a somewhat modified nature occurs almost the whole way around the island, broken only where there are high steep cliffs or where mapou scrub extends straight back from a boulder beach as at Rolypoly Bay and Lunch Bay. The canopy consists of mature *Metrosideros excelsa* with a subcanopy of *Brachyglottis repanda, Melicytus ramiflorus, Geniostoma ligustrifolium,* and *Coprosma* spp. Scattered *Dysoxylum spectabile* and *Neopanax arboreum* occur, while the understorey is composed of the same species as occur in *Myrsine* scrub with the addition of *Macropiper excelsum, Pomaderris phylicifolia var ericifolia, Parsonsia heterophylla* and *Clematis paniculata.* There is a stand of *Pittosporum crassifolium* and *P. umbellatum* at the southern end of Rolypoly Bay and a large grove of *Hymenanthera novae-zelandiae* exists on the south-west shores of Lunch Bay. At the head of the valley of the western stream at Lunch Bay there is a grove of large pohutukawa amongst the scrub.

Asplenium lucidum is the most important constitutent of the ground cover, with *Doodia media* less abundant. Other frequently occurring ferns are *Adiantum aethiopicum, Polystichum richardii, Pyrrosia serpens,* and *Phymatodes diversifolium. Muehlenbeckia complexa* and *Phormium tenax* are important in the coastal fringe stands of pohutukawa. *Dichondra repens* and *Oplismenus undulatifolius* are common, while the three localities in which *Psilotum nudum* is found are all under pohutukawa.

At von Luckner's Cove *Leptospermum scoparium* is common and here also occurred the only stand of *Rhopalostylis sapida* seen on the island.

3. Other coastal communities.

The boulder beach at Rolypoly Bay is fringed by low sprawling trees of *Coprosma repens* interspersed with ngaio *(Myoporum laetum)* and flax *(Phormium tenax). Hymenanthera novae-zelandiae* also occurs here, as do many

of the herbaceous species found on the island, including *Haloragis erecta, H. procumbens, Solanum nigrum, Oxalis corniculatum, Senecio lautus, Phytolacca octandra* and *Sonchus oleraceus.* At Lunch Bay *Cyperus ustulatus* and *Baumea juncea* are found along the boulder beach and a short distance upstream.

The community found on cliff faces includes the common salt-tolerant species *Salicornia australis, Disphyma australe, Apium australe, Samolus repens, Tillaea sieberiana, Tetragonia trigyna, Rhagodia triandra, Calystegia soldanella,* and *Scleranthus biflorus.*

A small plateau on top of the southwestern cliff between Rolypoly Bay and Lunch Bay is occupied by a community containing some species not seen elsewhere. *Cassinia retorta, Pimelea prostrata, Coriaria arborea* and *Cortaderia toetoe* form a low open scrub in which the ground cover consists of *Scirpus nodosus, Carex inversa, Microlaena polynoda,* small *Cyathodes fraseri* and *Dichondra repens.*

DISCUSSION

The *Myrsine*-dominated scrub of Red Mercury Island is of considerable interest. The factors contributing to the dominance of *Myrsine australis,* rather than, the expected *Leptospermum scoparium,* are unknown. Atkinson (1964) states that manuka, tauhinu *(Cassinia retorta)* and bracken are species characteristic of secondary vegetation on some other islands in the Mercury group. None of these species is abundant on Red Mercury. Edgar (1962) notes that manuka is not common and suggests that it is being suppressed by the vigorous growth of other species. The present study shows that manuka is present in coastal areas of scrub but absent from the understorey of pohutukawa forest whereas mapou does occur in the understorey in both the subcanopy and shrub layers (Lynch and Ferguson, 1972). One possibility is that following the major fire of 1934, mapou trees present in the understorey of remnant pohutukawa forest provided a seed source which enabled rapid colonization of the burnt over areas, and prevented establishment of manuka. The dry, well-aerated soils under the former pohutukawa forest could well have favoured the establishment of mapou.

Other features of interest include the presence of the rare coastal species *Planchonella novo-zelandica* and *Sicyos angulata.* These two species are present on other islands of the group (Atkinson, 1962, 1964) and also on some of the Coromandel Islands off the west coast of the Coromandel Peninsula (Newhook et al, 1971).

The broad-leaved milk tree, *Paratrophis banksii,* was not seen, although it is recorded on Middle and Double Islands and on Old Man Rock (Atkinson 1962, 1964). Atkinson regards its absence from Green Island as "extremely puzzling". Milk trees are present on Goat Island, Bush Island, and Rat Island (Newhook et al, 1971). *Heimerliodendron brunonianum,* the third tree species both rare and mainly or wholly restricted to offshore islands (Atkinson 1968) is not present on any of the Mercury group for which species lists have been presented.

Only one specimen of *Vitex lucens* was seen on Red Mercury and it is recorded from Double Island elsewhere in the Mercury group. Puriri is also absent

from the Coromandel Islands with the exception of a single tree. Other species of which only one or a few specimens were seen are *Rhopalostylis sapida*, *Dodonea viscosa*, *Beilschmeidia tawa*, *Pseudopanax crassifolium*, *P. lessonii*, *Psilotum nudum* and the rare parsley fern, *Botrychium australe*. Of these, only *Dodonea* and *Pseudopanax lessonii* are recorded elsewhere in the group.

Hakea sericea is present in at least three localities and could spread.

Very few epiphytes are present. *Lycopodium billardieri* was always terrestrial and none were seen as epiphytes. *Astelia solandri* was also always terrestrial. Only one epiphyte was seen – *Earina mucronata* growing on *Cyathodes fasciculata* in scrub.

LIST OF VASCULAR PLANTS RECORDED ON RED MERCURY ISLAND IN AUGUST, 1971.

Nomenclature is as follows: Allan (1961) for psilopsids, lycopsids, ferns, and dicotyledons; Moore and Edgar (1970) for monocotyledons; Allan (1940) or Healey (1970) for adventive species.

Where knowledge of distribution and numbers is considered sufficient a note on the abundance and occurrence of a species is given. An appendix gives a list of those species recorded by Atkinson (1962, 1964) for other islands in the group. Adventives are marked*

Specimens of nearly all species are lodged in the herbarium of the Auckland Institute and Museum.

PSILOPSIDA

Psilotum nudum	three localities under pohutukawa

LYCOPSIDA

Lycopodium billardieri *L. volubile*	occasional in scrub

FILICOPSIDA

Ophioglossaceae	
Botrychium australe	three localities in scrub
Cyathaceae	
Cyathea dealbata *C. medullaris*	common along stream banks at Lunch Bay
Polypodiaceae	
Pyrrosia serpens	common throughout
Phymatodes diversifolium	common throughout
Thelypteridaceae	
Thelypteris pennigera	one plant seen
Pteridaceae	
Pteridium aquilinum var *esculentum*	common, local, throughout
Pteris comans	occasional, stream
Aspleniaceae	
Asplenium lucidum	abundant throughout
A. obtusatum	occasional, coastal
A. falcatum	one plant seen
A. flaccidum	occasional, throughout

Blechnaceae	
Doodia media	abundant throughout
Blechnum filforme	occasional, stream
B. capense	occasional, stream
B. lanceolatum	occasional, stream
Dryopteridaceae	
Polystichum richardii	occasional, stream or dry stream bed
Adiantaceae	
Adiantum aethiopicum	abundant, local, stream
A. hispidulum	common, local
A. cunninghamii	rare, stream

GYMNOSPERMAE

Pinaceae	
Pinus sp. *	one tree seen

ANGIOSPERMAE
DICOTYLEDONS

Lauraceae	
Beilschmiedia tawa	rare, one tree seen
Ranunculaecae	
Clematis paniculata	occasional, throughout
Piperaceae	
Macropiper excelsum	common, pohutukawa forest/stream
Violaceae	
Melicytus ramiflorus	common, throughout
Hymenanthera novae-zelandiae	occasional, Lunch Bay, coastal
Crassulaceae	
Tillaea sieberiana	rare, cliff
Droseraceae	
Drosera auriculata	occasional, pohutukawa forest
Aizoaceae	
Disphyma australe	common, coastal cliff
Tetragonia trigyna	rare, Lunch Bay stream
Caryophyllaceae	
Cerastium glomeratum *	rare
Stellaria media *	rare, scrub
Scleranthus biflorus	rare, coast
Phytolaccaceae	
Phytolacca octandra *	occasional, coastal
Polygonaceae	
Muehlenbeckia complexa	common, coastal
Chenopodiaceae	
Rhagodia triandra	rare, cliff
Salicornia australis	common, cliff
Geraniaceae	
Geranium dissectum *	rare, scrub
Pelargonium inodorum	rare
Oxalidaceae	
Oxalis corniculata	occasional, open coastal
Linaceae	
Linum mo[illegible]num	rare, coastal – Rolypoly Bay
Haloragaceae	
Haloragis erecta	occasional, coastal

H. procumbens	common throughout
Thymelaeaceae	
Pimelea prostrata	common, Lunch Bay headland, coastal
Proteaceae	
Hakea sericea *	occasional, local
Coriariaceae	
Coriaria arborea	occasional, coastal
Pittosporaceae	
Pittosporum crassifolium	common, local, coastal
P. umbellatum	common, local, coastal
Cucurbitaceae	
Sicyos angulata	rare coastal
Myrtaceae	
Leptospermum scoparium	common throughout
Metrosideros excelsa	common coastal
Tillaceae	
Entelea arborescens	occasional stream
Euphorbiaceae	
Euphorbia glauca	coastal
Papilionaceae	
Sophora microphylla	common, coastal, stream
Carmichaelia cunninghamii	common throughout
Lotus corniculata *	occasional to rare, coastal
Corynocarpaceae	
Corynocarpus laevigatus	occasional, forest, stream
Rhamnaceae	
Pomaderris phylicifolia var. *ericifolia*	common local, pohutukawa forest, stream
Meliaceae	
Dysoxylum spectabile	occasional, forest
Rutaceae	
Melicope ternata	rare, stream
Sapindaceae	
Dodonaea viscosa	rare, (one plant), central scrub
Araliaceae	
Neopanax arboreum	common throughout
Pseudopanax crassifolium	rare, one plant seen
P. lessonii	rare, one plant seen
Umbelliferae	
Apium australe	common coastal
Epacridaceae	
Cyathodes fraseri	rare, coastal
C. fasciculata	common throughout
Sapotaceae	
Planchonella novo-zelandica	common, local, grove at Lunch Bay
Myrsinaceae	
Myrsine australis	abundant, throughout
Loganiaceae	
Geniostoma ligustrifolium	abundant, throughout
Apocynaceae	
Parsonsia heterophylla	common, scrub
Rubiaceae	
Coprosma australis	common, scrub, forest

C. lucida x robusta	common, pohutukawa forest, scrub
C. australis x lucida	common, forest and scrub
C. repens	abundant, coastal
C. rhamnoides	occasional, scrub
Compositae	
Bidens pilosa	
Brachyglottis repanda	common throughout
Cassinia retorta	common coastal
Carduus sp. *	
Cirsium vulgare *	occasional, coastal
Cotula australis	occasional, coastal
Erechtites arguta	rare, coastal scrub
E. quadridentata	
E. scaberula	
Erigeron canadensis *	rare, coastal scrub
Gnaphalium collinum	occasional, coastal
G. luteo-album	occasional, coastal
G. spicatum *	occasional, coastal
Helichrysum glomeratum	rare (2), scrub
Hypochaeris radicata *	
Olearia furfuracea	common scrub
Senecio lautus	common coastal
Sonchus oleraceus *	common coastal
Gentianaceae	
Centurium erythaea *	
Plantaginaceae	
Plantago major *	rare, coastal
Primulaceae	
Samolus repens	occasional, coastal
Anagallis arvensis *	occasional, coastal
Lobeliaceae	
Lobelia anceps	rare to occasional, coastal
Solanaceae	
Solanum aviculare	rare, coastal
S. nigrum *	common, coastal
Convolvulaceae	
Calystegia soldanella	common, coastal
Dichondra repens	abundant, throughout
Scrophulariaceae	
Hebe stricta	common throughout
Orobanchaceae	
Orobanche minor *	
Myoporaceae	
Myoporum laetum	common, coastal
Verbenaceae	
Vitex lucens	rare, pohutukawa forest
MONOCOTYLEDONS	
Liliaceae	
Arthropodium cirratum	rare
Astelia solandri	common throughout
Dianella nigra	one seen
Agavaceae	
Phormium te.	common coastal
Cordyline australis	

Palmae	
Rhopalostylis sapida	rare
Cyperaceae	
Baumea juncea	rare, local
Carex inversa	occasional throughout
Cyperus ustulatus	occasional, local
Gahnia sp.	common throughout
Morelotia affinis	
Scirpus cernuus	occasional, coastal
S. nodosus	common, coastal
Tetraria capillaris	
Uncinia sp.	
Gramineae	
Cortaderia toetoe	occasional, local
Microlaena polynoda	
Oplismenus undulatifolius	common throughout
Orchidaceae	
Acianthus fornicatus var. *sinclairii*	common, local, throughout
A. reniformis	occasional, scrub
Earina mucronata	rare, one seen
Pterostylis banksii	occasional
P. graminea	
P. trullifolia	common, forest and scrub
Microtis unifolia	rare, scrub
Thelymitra longifolia	occasional, scrub

APPENDIX

List of Vascular Plant Species Recorded by Atkinson (1962, 1964) for Islands in the Mercury Group, apparently absent from Red Mercury Island.

Astelia banksii	OMR
Calystegia turguriorum	G
Cheilanthes sieberi	D
Chenopodium allanii	D,M,G,K
Corprosma macrocarpa	D,M,G,K
Danthonia sp.	K
Deyeuxia billardieri	OMR, D,M,G,K,
Euphorbia peplus *	K
Gahnia lacera	D
Hebe pubescens	D
Hydrocotyle moschata	K
Lepidium oleraceum	OMR
Leptospermum ericoides	K
Lycium ferocissimum *	OMR, G
Paratrophis banksii	OMR, D,M
Parietaria debilis	OMR, D,M,G,K
Pellaea rotundifolia	D
Peperomia urvilleana	OMR, D,G,K
Poa anceps	OMR, D,M,K
Pteris tremula	D,K
Ranunculus sessiliflorus *	K
Rhabdothamnus solandri	D
Solanum nodiflorum	M,G
Sonchus littoralis	OMR
Spergularia marginata	G
Sporobolus capensis *	D,K
Stellaria parviflora	M,G
Veronica plebeia *	K
Vulpia sp. *	D
Wahlenbergia gracilis	OMR, M,G

Key

OMR = Old Man Rock
D = Double Island
M = Middle Island
G = Green Island
K = Korapuki

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Fire will be a continuing hazard, especially to the scrubland and forest remnants. On 29 November 1982, subsequent to our visits, an area of about 45 ha, primarily of *Leptospermum* scrubland, but including some coastal forest remnants in sheltered gullies, was accidentally burned on Moturua Island (S. Anderson pers. comm.).

Table 1. Statistics of the wild vascular plant floras of 6 islands of the eastern Bay of Islands by plant group and island. (U = Urupukapuka, MR = Moturua, MA = Motuarohia, W = Waewaetorea, MK = Motukiekie, O = Okahu).

Group	U	MR	MA	W	MK	O	Overall Total
Native ferns and allies	20	21	21	20	17	17	80
Native gymnosperms	0	1	0	0	0	0	1
Adventive gymnosperms	1	0	1	0	1	0	1
Native dicotyledons	83	38	49	56	53	35	111
Adventive dicotyledons	88	42	50	69	41	53	122
Native monocotyledons	56	38	27	37	25	34	66
Adventive monocotyledons	45	29	23	35	15	28	54
Total natives							208
Total adventives							177
Grand total							385

Table 1 summarises the distribution of the flora by plant group and island. Floristically the islands are rich in adventive species which comprise 46% of the total. The grasses (Gramineae) with 59 species and the Compositae with 45 comprise the largest elements of a total flora of 385 taxa. A few relatively rare plants including the carmine rata (*Metrosideros carminea*), broad-leaved maire, *Pratia physaloides* and *Calystegia marginata* are present although in small numbers. Aggressive weeds present on at least some islands include apple of Sodom, blackberry, gorse and prickly hakea; control of these weeds will enhance the recreational value of the area.

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