

Ferns and Flowering-plants of Mayor Island, N.Z.

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[Read before the Philosophical Institute of Canterbury, 1st October, 1924; received by Editor, 24th October, 1924; issued separately, 6th March, 1926.]

Plate 5.

MAYOR ISLAND (Tahua of the Maori) lies in the Bay of Plenty, north-north-east of Tauranga, about 32 km. (20 miles) from the mainland and beyond the 180 m. (100 fath.) depth line. The island, of volcanic origin, is somewhat square, of 1,277 ha. (3,154 ac.) extent, with a high ridge running east and west across the south end, and north and south on the western side, rising to about 396 m. (1,300 ft.) at the north end. The centre of the island is occupied by a great crater, some 8 km. (5 miles) in circumference, in which are two lakes—one of 2.5 ha. (6 ac.), dark blood-red from a distance; the other 8 ha. (20 ac.), of a deep blue-black. The colour is apparently due to the abundance of algal growth. There is a small opening, Opo Bay, on the south-east corner, the usual landing-place. Seaward there are rough water-worn cliffs streaked with veins of obsidian and surmounted by ash-beds sloping into the crater.

Dr. L. Cockayne, F.R.S., has kindly forwarded us the notes taken by him on a very brief visit to the island in February, 1905, and the following account of the vegetation is based on these and upon the notes and specimens taken by one of us (K. W. D.) during a fortnight's stay in March, 1924. We have to thank Dr. Cockayne for critically examining certain of the specimens collected.

The list of species shows that Mayor Island belongs to the Thames Subdistrict of the South Auckland Botanical District of Cockayne.*

The dominant tree is the pohutukawa (*Metrosideros tomentosa*), many specimens of which are of great size, the largest noted measuring 9 m. in circumference, with a trunk clear of branches for 3 m., and surmounted by a magnificent spreading head. The pohutukawa forms great groves in the lower flats all over the island.

The slopes of the main ridges are a continuous succession of small, deep, dry gullies, the spurs of which are clothed in thickets of manuka (both *Leptospermum scoparium* and *L. ericoides*), amongst which *Knightia excelsa*, about 3.5 m. tall, is dotted about. The gully-bottoms have a dense growth of whau (*Entelea arborescens*), and the side-slopes contain large makomako (*Aristolochia serrata*) up to c. 0.7 m. in diameter, *Litsaea calicaris*, *Dysoxylum spectabile*, *Suttonia australis*, *Brachyglottis repanda*, *Melicactus ramiflorus*, and odd tree-ferns. The liane *Rhipogonum scandens* is frequent, and the undergrowth is mainly *Coriaria sarmentosa*, *Rhabdothermus Solandri*, and a few ferns. The undergrowth is, however, much altered and depleted owing to the presence of pigs, while the unstable surface militates against regrowth. The high ridges contain a dense scrub in which manuka, *Cyathodes acerosa* vars., *Leucopogon fasciculatus*, *Coprosma* spp., *Gaultheria oppositifolia* are prominent.

* See COCKAYNE, L., 1921. *Die Vegetation der Erde*, xiv: The Vegetation of New Zealand, p. 300 et seq. Leipzig: Wilhelm Engelmann.

There are small areas of swamp by the lakes, but otherwise the crater-basin is covered with pohutukawa and manuka. Much of the manuka shrubland is an indigenous-induced association on ground formerly cultivated by the Maori. In one place exists a clump of *Pinus Pinaster*, and this aggressive species threatens to extend its area rapidly. One old cultivation-ground is covered in *Hibiscus trionum*.

A small grassy flat at Opo Bay, containing scattered pohutukawa, has as its main constituents *Sporobolus indicus*, *Holcus lanatus*, *Dactylis glomerata*, *Poa pratensis*, *Lolium perenne*, *Trifolium repens*, and is thus an exotic-induced association.

There are a number of other exotic species established, especially on the old Maori clearings. Some of them are *Ricinus* sp., *Rosa eglanteria*, *Phytolacca octandra*, *Oenothera odorata*, *Rumex obtusifolius*, *Solanum nigrum*, *Anagallis arvensis*, *Erigeron canadense*.

LIST OF SPECIES OF PTERIDOPHYTA AND ANGIOSPERMAE.

The list includes 98 species or distinct varieties, distributed among 78 genera and 50 families. The abbreviations "fl." and "fr." indicate that the species were observed to be in flower or in fruit in March, 1924.

Lycopodiaceae: *Lycopodium volubile* Forst. f.

Psilotaceae: *Psilotum triquetrum* Swartz.

Marattiaceae: *Marattia fraxinea* Smith.

Cyatheaceae: *Cyathea dealbata* Swartz; *Cyathea medullaris* Swartz; *Cyathea Cunninghamii* Hook. f.

Polypodiaceae: *Adiantum hispidulum* Swartz; *Cheilanthes Sieberi* Kunze; *Pteris comans* Forst. f.; *Pteridium esculentum* (Forst. f.) Cockayne; *Blechnum capense* (L.) Schlecht.; *Asplenium flaccidum* Forst. f.

Typhaceae: *Typha angustifolia* L. var.

Gramineae: *Paspalum scrobiculatum* L. (ft.); *Oplismenus undulatifolius* Beauv. (ft.); *Spinifex hirsutus* Labill.; *Dichelachne crinita* (Forst. f.) Hook. f.; *Dichelachne scurea* Hook. f.; *Agrostis Billardieri* R. Br.

Cyperaceae: *Mariscus ustulatus* (A. Rich.) C. B. Clarke (ft.); *Eleocharis sphacelata* R. Br. (ft.); *Scirpus nodosus* Rottb.; *Gahnia gahniaeformis* (Gaud.) Heller; *Uncinia* sp.

Liliaceae: *Rhipogonum scandens* Forst. (ft.); *Cordyline australis* Hook. f.; *Astelia Banksii* A. Cunn. (ft.); *Astelia* sp. (epiphytic); *Dranella intermedia* Endl.; *Phormium tenax* Forst. (ft.); *Phormium Colensoi* Hook. f.

Piperaceae: *Macropiper excelsum* (Forst. f.) Miq. var. *major* Cheesem.; *Peperomia Endlicheri* Miq. (fl.).

Proteaceae: *Knightsia excelsa* R. Br.

Polygonaceae: *Muehlenbeckia complexa* (A. Cunn.) Meissn.

Chenopodiaceae: *Salicornia australis* Sol.; *Salsola Kali* L.

Aizoaceae: *Mesembryanthemum australe* Sol. (fl.).

Ranunculaceae: *Ranunculus hirtus* Banks et Sol. (ft.).

Monimaceae: *Hedycarya arborea* Forst. (ft.).

Lauraceae: *Litsaea calicaris* (Sol.) Benth. et Hook. f. (ft.).

Cruciferae: *Lepidium oleraceum* Forst. f. var.

Pittosporaceae: *Pittosporum Colensoi* Hook. f.; *Pittosporum crassifolium* A. Cunn.; *Pittosporum* sp. (probably *P. umbellatum*).

- Rosaceae: *Acaena Sanguisorbae* Vahl. var. (ft.).
 Oxalidaceae: *Oxalis corniculata* L. var. (fl.).
 Meliaceae: *Dysoxylum spectabile* (Forst. f.) Hook. f. (ft.).
 Euphorbiaceae: *Euphorbia glauca* Forst. f.
 Coriariaceae: *Coriaria sarmentosa* Forst. f. (ft.).
 Corynocarpaceae: *Corynocarpus laevigata* Forst.
 Sapindaceae: *Dodonaea viscosa* Jacq.
 Rhamnaceae: *Pomaderris phyllocaefolia* Lodd.
 Elaeocarpaceae: *Aristotelia serrata* (Forst.) W. R. B. Oliver.
 Tiliaceae: *Entelea arborescens* R. Br. (ft.).
 Malvaceae: *Hibiscus trionum* L. (fl. and ft.).
 Violaceae: *Meliclytus ramiflorus* Forst.; *Hymenanthera novae-zelandiae*
 (A. Cunn.) Hemsl. (ft.).
 Thymelaeaceae: *Pimelea virgata* Vahl.; *Pimelea prostrata* (Forst. f.)
 Willd. var. (fl.); *Pimelea* sp. (= *P. Urvilleana* Cheesem. non A. Rich.).
 Myrtaceae: *Leptospermum scoparium* Forst. (ft.); *Leptospermum ericoides* A. Rich. (ft.)
 [there also occurs a form with narrow-linear leaves and small fruits
 that is possibly *L. ericoides* × *lineatum*]; *Metrosideros tomentosa*
 A. Rich. (ft.).
 Onagraceae: *Epilobium cinereum* A. Rich.
 Halorrhagidaceae: *Halorrhagis erecta* (Murr.) Schindl. (fl.); *Halorrhagis*
procumbens (Sol.) Cheesem.
 Umbelliferae: *Apium prostratum* (DC.) Labill. (fl.).
 Araliaceae: *Nothopanax Sinclairii* (Hook. f.) Seem.; *Nothopanax*
arborescens (Forst. f.) Seem. (ft.); *Nothopanax* sp.? [the specimens
 gathered include a single remarkable leaf of what may prove to be
 an undescribed species—there are seven sessile leaflets, the larger
 ones broadly obovate with tapering cuneate bases and rather distant
 blunt teeth: see Plate 5]; *Pseudopanax Lessonii* (A. Rich.) C. Koch.
 Ericaceae: *Gaultheria antipoda* Forst. f. var.; *Gaultheria oppositifolia*
 Hook. f. (ft.).
 Epacridaceae: *Cyathodes acerosa* R. Br. [there are distinct forms pre-
 sent, one of which is probably var. *orycedrus* (R. Br.)]; *Leucopogon*
fasciculatus (Forst. f.) A. Rich. (ft.); *Leucopogon Fraseri* A. Cunn.;
Dracophyllum Sinclairii Cheesem.
 Myrsinaceae: *Suttonia australis* A. Rich. (ft.).
 Loganiaceae: *Geniostoma ligustrifolium* A. Cunn. (ft.).
 Convolvulaceae: *Calystegia Soldanella* (L.) R. Br. (fl. and ft.); *Dichondra*
repens Forst.
 Verbenaceae: *Vatex lucens* T. Kirk (ft.).
 Solanaceae: *Solanum aviculare* Forst. f. (fl. and ft.).
 Scrophulariaceae: *Hebe salicifolia* (Forst. f.) Pennell var. (fl.).
 Gesneriaceae: *Rhabdothamnus Solandri* A. Cunn. (fl.).
 Myoporaceae: *Myoporum laetum* Forst. f. (ft.).
 Rubiaceae: *Coprosma grandifolia* Hook. f. (ft.); *Coprosma lucida*
 Forst. f. (ft.); *Coprosma lucida* Forst. f. var. (ft.); *Coprosma robusta*
 Raoul (ft.); *Coprosma robusta* Raoul var. *angustata* Kirk? [this is
 a very narrow-leaved form, and may be a hybrid; it does not belong
 to the × *C. Cunninghamii* group.] (ft.); *Coprosma retusa* Hook. f.
 Campanulaceae: *Lobelia anceps* L. (ft.).
 Compositae: *Brachyglottis repanda* Forst.; *Senecio Banksii* Hook. f.



A leaf of *Nothopanax* sp. Mayor Island.