

# FLORA OF RAROTONGA

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# Flora of Rarotonga

By GERRIT PARMILE WILDER

## INTRODUCTION

During three visits to the island of Rarotonga, I made a study of the plant life there. Collectively the time covered seven months, from March to August in 1925, 1927, and 1929. I would have preferred studying the flora through every month of the year, as many plants had neither flower nor fruit during my visits. However, I believe that this paper presents a fairly comprehensive survey of the wealth of the exceedingly interesting Rarotongan plant life, and I venture to express the hope that it may prove of some interest to students of botany, and particularly to those interested in the flora of the South Pacific Islands. Appearing, as it does, some 28 years after the publication of Cheeseman's valuable treatise on the same subject, this work may, for this reason, prove of interest as a comparative list of the plants growing then and now on the island of Rarotonga.

Rarotonga, the largest of the Cook Islands, lies in  $21^{\circ} 12'$  S. latitude,  $158^{\circ} 46'$  W. longitude. It is of volcanic origin. It is verdure-clad to the summits of its rugged mountains, except for the sheer faces of rocky cliffs which add grandeur to the aspect.

The highest mountain peak is Temanga, reaching an altitude of over 2000 feet. This, together with Tekou 1850 feet high, Maungaroa 1750 feet, Maungatea 1650 feet, Ikurangi 1620 feet, and other lesser peaks, forms the backbone of the island. These mountains are separated by deep, narrow valleys, in the beds of which flow streams, some of which are constant only during the rainy season. The largest of these streams runs through Avana Valley and empties into the sea at the District of Ngatangia.

Rarotonga is surrounded by a fringing coral reef, in which there are but few passes, and these, with two exceptions, are navigable only for small boats and canoes. The passes at Avarua and Avatiu, however, are large enough to admit schooners and boats of light tonnage, and the harbor of each affords safe moorings in good weather. At times, however, there occur terrific windstorms followed by heavy seas which lash the shores, doing much damage.

Avarua is the seaport. Here is a long wharf, from which passengers and freight are transported in scows and boats, towed by launches out to the big liners lying at anchor just outside the reef.

The native people of Rarotonga are Polynesian.

The rainy season is from November to April, and the annual rainfall is about 90 inches. There are often very severe rain storms, accompanied by thunder and lightning, and strong winds; at such times damage is done to the growing crops; but for the most part the climate is mild and agreeable.

The island, irregularly elliptical in shape, is about seven miles in length and 5 miles in breadth, and is partly bordered by white sand beaches, interrupted in some places by masses of volcanic rock, and in other places by stretches of broken coral rock.

The highway which runs around the island at sea level, is 20 miles long. From the comparatively narrow stretch of level land encircling the island at sea level, the rolling hills begin to rise gradually, ravines deepen, valleys narrow, vegetation becomes dense, and the ascent of the mountains becomes increasingly difficult. However, with perseverance the sharp narrow summits of all the mountains may be reached, and it is well worth the effort for each deep valley, each mountain peak, has its wealth of interesting plants.

Very few birds are met with in the woods, occasionally one hears the coo of the native wood pigeon, and high up on the rocky cliffs, the tropic bird builds its nest. One sees lizards, and ginks scurrying among the leaves, and frequently a centipede or a scorpion startles one.

Fortunately there are no venomous serpents; there are no frogs in the taro swamps. Mosquitoes are not very troublesome, but rats are one of the greatest annoyances.

#### HISTORICAL SKETCH

It is generally conceded that the Reverend John Williams of the London Missionary Society, was the European discoverer of Rarotonga: for the reason that he was the first to make known to the world the existence of this island, which he found in the year 1823.

On his first visit to Rarotonga, the Reverend Williams did not land on the island; he received permission, however, from the chief for two of his Tahitian teachers to land. These zealous missionaries were acceptable to the native people, who eagerly embraced Christianity. The Rarotongans today are faithful and constant churchgoers.

The redoubtable Captain James Cook discovered the other islands of the group, which have since been named the Cook Islands in his honor; however, he failed to find Rarotonga, the largest of them all.

An earlier visit of Europeans to Rarotonga, in the year 1789, is recorded.<sup>1</sup> The native people themselves described a great ship, the deck of which was

<sup>1</sup> Cheeseman, T. F., *The Flora of Rarotonga, Chief island of the Cook Group*: Linnean Soc., London, Trans., 2nd, ser. Botany, vol. 6, pp. 261-313, 1903.

like a garden, with many plants growing in it. This was without doubt the British ship *Bounty*, with its afterdeck filled with breadfruit trees growing in tubs. Captain Bligh had obtained them in Tahiti, and had started on his voyage to deliver them to the sugar planters of Jamaica in the British West Indies, who had petitioned His Majesty, King George III, to obtain breadfruit for them to augment the food supply of their plantation laborers. That voyage was brought to an abrupt end by the well known mutiny of the *Bounty*, when Captain Bligh and his loyal officers were set adrift in an open boat. The story of his great achievements in at last reaching England and appearing before his King is one of the great epics of the sea. It was without doubt on the return voyage to Tahiti that the mutineers visited Rarotonga; and there was every reason why they should not make this visit known to the world. There is also a local record (Cheeseman, Trans. Linnean Soc. London, 1903) of a visit in the year 1821 of a trading schooner, commanded by a man named Goodenough, who also had reasons of his own for not making his visit at Rarotonga known to the world.

The government of Rarotonga, as well as that of the other islands of the Cook Group, is administered from New Zealand, through a Commissioner, resident at Rarotonga. The resident Commissioner at the present time is Judge Hugh F. Ayson.

#### EXPORTS

These consist mainly of copra, oranges, bananas, and tomatoes in season, and are exported to the New Zealand markets.

During the time that has elapsed since Dr. Cheeseman compiled his list of Rarotongan plants, many changes in the flora of the island have taken place; new plants have been introduced, and a few have reached the island accidentally. Also changes in the naming of the genera and species of a number of plants have occurred.

This bulletin records 560 species of plants growing on Rarotonga and listed by me, 330 of this number were not recorded by Cheeseman. On the other hand he named 72 species of ferns; I was however, able to find but 15 of those listed by him. Of the 53 ferns collected by me, 36 are not recorded in the Cheeseman collection. Thus the deduction is apparent that the intervening years have caused many changes to take place. New plants have been introduced, and some destroyed by animals. Thus some species which grew on the island 28 years ago do not exist today.

With the exception of the *Fitchia speciosa*, in Rarotonga, there are no forests of gregarious native trees. The coconut is the only palm native to Rarotonga, and *Bambusa vulgaris* so represented by a few scattered small

clumps found in the deep recesses of moist valleys. It will be noted that one new genus, and seven new species are recorded in this bulletin.

Some difficulty was experienced in obtaining the correct Rarotongan names for trees and plants. Knowledge of them seemed to be possessed only by the older people, who were always interested and helpful.

#### ACKNOWLEDGEMENTS

I desire to express my profound gratitude for the assistance rendered me in my work by many friends at Rarotonga, both Polynesians and Europeans; to Makea Tinirau Ariki and his family whose hospitality and generosity was outstanding; to Judge Hugh F. Ayson, Resident Commissioner of the Cook Islands, for his unfailing helpfulness, and for facilities continuously placed at my disposal; to Mr. Reid, Superintendent of Public Works, for his timely assistance; to Mataiapo Charles T. Cowan of Ngatangia district, who, with a group of native helpers from his village accompanied me on several difficult tramps, into all but inaccessible mountain regions; to Dr. R. V. Hosking and his son William, both of whom rendered me valuable assistance in my work; to Mr. William McBirney, whose accurate drawings of rare plants appear in this work; to Capt. J. D. Campbell for interesting contributions to this collection; to Ngati Kao with whom I spent many long and interesting days collecting; to Alfred, my constant helper whose resourcefulness, great physical strength, and cheerfulness made the day's work easier. I have in mind many other friends at Rarotonga whose assistance and encouragement I should like to acknowledge here if space would permit.

Sincere appreciation is here expressed to Dr. Uglino Martelli of Italy, for describing a new species of *Freycinetia*; to Dr. Elmer D. Merrill of the New York Botanical Garden for identification of many species of plants, and for describing a new species of *Acalypha*; to Professor William A. Setchell of the University of California for describing new species of both *Cyrtandra* and *Balanophora*; to Dr. Edwin B. Copeland of the University of California for the determination of the collection of ferns; to Mr. Oakes Ames of Cambridge, Massachusetts, for determining and naming the orchids; to Dr. A. S. Hitchcock, United States Department of Agriculture, Washington, D. C., for determining the grasses; to Dr. Forest B. H. Brown for valuable help in identifying specimens; to Dr. Erling Christophersen, Botanist at Bernice P. Bishop Museum, for describing a new species of *Wikstroemia*; and to Dr. Harold St. John, Botanist at Bernice P. Bishop Museum, for describing a new species of *Pilea*.

## OPHIOGLOSSACEAE

**Ophioglossum pendulum** Linnaeus.

A plant of pendant habit growing on trees and logs. Blade long, narrow, entire, membranous, sickle-shaped.

Common in all the dark, deep valleys, altitude between 500 and 1500 feet.

## MARATTIACEAE

**Angiopteris longifolia** Greville and Hooker.

A tree fern of robust habit, the caudex stout and fleshy. Fronds sometimes as much as 15 feet long, bi-pinnate. The young, tender fronds are used in making wreaths, and when dry become fragrant.

Common in the dense woods, altitude ranging from 500 to 1500 feet. Especially abundant on the slopes of Mount Tukou. Native name: *nehe* or *anae*.

**Marrattia salicina** Smith.

A large fern with a stout base. Fronds ample, bi-pinnate. Pinnules alternate, lanceolate, acuminate, 1.5 to 6 inches long, finely-veined. Sori in two marginal rows, sessile, oblong, slit longitudinally.

Common in deep valleys in all districts; found even at an altitude of 1500 feet.

The root of this plant was used for human food during time of famine.

## SCHIZAEACEAE

**Schizaea dichotoma** (Linnaeus) Smith.

Stipes erect 5-10 inches in height, dark chestnut-colored, ending in dichotomously divided fronds. The sori arranged on short spikes at the tips of the segments of the fronds.

Common on the hilly, dry sides of the valleys and in the forests of higher elevations.

## GLEICHENIACEAE

**Gleichenia linearis** (Burmans) Clarke.

A trailing fern with slender naked stipes several feet long, repeatedly forking in the upper portion, ultimate, pinnae, 50-60 linear, rigid, entire, obtuse. Sori round, small, on either side of the midrib.

On all the dry hills. A great obstruction to travellers; known as the "staghorn fern"; *Gleichenia dichotoma* of Cheeseman's list. Native name: *tua nui*.

## CYATHEACEAE

**Cyathea decurrens** (Hooker) Copeland.

A large tree fern. Fronds 4-pinnate, upper surface dull-green, ultimate, pinnate, serrate.

Common in the high mountains. *Alsophila decurrens* of Cheeseman's list. Native name: *eki*.

**Cyathea species.**

A large tree fern common in the high mountains. As it was sterile its determination was not possible.

**Cyathea parksiae** Copeland.

A large tree fern with 3-pinnate fronds. Pinnules sessile, oblong, acute. Midrib dotted with numerous short spines.

Common in the damp woods, 100 feet elevation.

## HYMENOPHYLLACEAE

**Trichomanes bauerianum** Endlicher.

A fern 18-24 inches tall. Stipes tufted, stout, brown, hairy fronds 6-15 inches long, very dark-green, tri-pinnate, pinnules deeply lobed.

Common in the dark, damp woods of Rutaki Valley, Titikaveka, altitude 700 feet.

**Trichomanes dentatum** Linnaeus.

A tufted erect fern. Stipes numerous, the lower portion covered with brown hairs. Fronds bi-pinnate, small, ovate, harsh, rigid, dark-green. Pinnules dissected.

Maungatea, altitude 1000 feet. Common on trees and in moist places about rocks.

## POLYPODIACEAE

**Adiantum hispidum** Swartz.

A small fern with stiff, black, wiry stipes and delicate fronds. Sori on the upper edges and margins of the pinnules.

Maungatea, altitude between 700-1800 feet. Common in open pastures, deep ravines, on rocky slopes of the hills, about 300 feet elevation.

**Arthropteris obliterated** (R. Brown) J. Smith.

A climbing fern adhering to rocky cliffs, trees, and logs. Pinnae short, sessile, ends blunt.

Specimen sterile, taken from Maungatea, altitude 1000 feet. Common in the middle forest belt.

**Asplenium affine** Swartz.

A small tufted fern with slender stipes, and erect bi-pinnate dark green fronds.

Rutaki Valley, Arorangi District, altitude 700 feet. Common under logs and rocks.

**Asplenium gibberosum** (Forster) Mettenius.

A common fern having finely-dissected fronds, 1 to 3 feet in height.

Found along the ridges in many of the districts.

**Asplenium horridum** Kaulfuss.

A plant 2 to 3 feet in height with a short rhizome, and stout, dark-brown, shaggy stipes. Frond, pinnate, coriaceous, dark-green. Pinnae deeply divided into broad lobes, incised at the apex.

Ikurangi, altitude 1000 feet. Also in Tukuvaive Valley, base of Mount Tukou, altitude 600 feet.

**Asplenium nidus** Linnaeus.

Caudex thick, short, erect. Leaves or fronds narrow, 2 to 6 feet in length, 2.5 to 10.0 inches in width. Midrib coarse, stiff, brown, or black, the margins entire, wavy. Sori linear, generally on the veins of the upper half of the fronds.

Very plentiful in the woods from sea level to the highest mountains, in all the valleys of the island. Growing on trees, rocks, old logs, and along the sloping banks of the moist hillsides. Native name: *kotaa*.

**Blechnum orientale** Linnaeus.

A plant with a short trunk and stiff coarse stipes, the lower portion covered with cinnamon-colored hairs or scales. Pinnae linear, entire, sessile, acuminate. Sori on the upper part of the costa.

Ikurangi, altitude 1000 feet. Common on the foothills of all districts. Native name: *moumea*.

**Blechnum** species.

A spreading fern, 4 to 6 feet in height. Fronds 2 to 3 feet in length. Pinnae narrow, 6 to 10 inches in length, margins finely-crenate.

Common in the damp forests about 1500 feet elevation on Mount Tukou.

**Campium palustre** (Brackenridge) Copeland.

A small fern with pinnate fronds, 12 to 18 inches in length. Pinnae distant, lanceolate, acuminate, lobed, 3 to 5 inches in length.



Common in all districts, altitude about 600 feet; on rocks and grassy slopes.

**Cyclophorus angustatus** (Swartz) Desvaux.

A small fern with slender, creeping, wiry rhizomes. Fronds erect, spatulate, coriaceous, entire, 2.5 to 4 inches in length, the sterile fronds up to 0.75 inch in width. Sori copious, raised on margins of the fronds.

Common on trees, logs, rocks; all districts between altitudes of 200 and 1000 feet.

**Davallia solida** (Forster) Swartz.

A common fern with a creeping rhizome, covered with stiff, ferruginous scales. Stipes 6 to 12 inches in length, naked, light-brown, glossy. Fronds open tri-pinnate 12 inches or more in length. Pinnae broadly lanceolate, sori smooth in the upper portion of the pinnules.

Most common fern throughout the island from near sea level to the high mountains.

**Doodia media** R. Brown.

A small erect fern. Caudex short. Fronds dark-green, narrow, elliptical, 10 to 15 inches in length, 2 to 4 inches in width. Segments 30 to 80, spreading, margins finely-serrulate. Sori on both sides of the costa.

Common on the high mountains.

**Dryopteris decomposita** (R. Brown) O. Kuntze.

Rhizome stout, stipes erect, 18 to 30 inches in height, brown, smooth. Fronds tri-pinnate, 12 to 15 inches in length. Sori round, small.

Common along the river bed of Avana stream, altitude between 500 to 900 feet.

**Dryopteris dissecta** (Forster) O. Kuntze.

A fern with a short thick caudex. Scattered in the lower portion of the stipes are narrow, lanceolate, light-brownish scales. Fronds about 2 feet long, bi-pinnate. Pinnules pinnatifid or lobed. Sori round, between the margins and the costa.

Maungatea, altitude 750 feet.

**Dryopteris invisa** (Forster) A. Kuntze.

A large pinnate fern issuing from a stout rhizome. Fronds 2.5 feet long. Pinnae narrow, 2 to 6 inches in length, divided to the middle into acute lobes.

Connals Gulch, Titikaveka, and Ngatangia, Avana Stream, altitude 900 feet. Common along the banks of the streams and gulches, seen in all districts, altitudes of between 100 and 500 feet.

**Dryopteris leucolepis** (Presl) Maxon.

A large 4-pinnate erect-growing fern with a stout rhizome. Fronds 3 to 6 feet long. Pinnae 2 feet long. Midribs tomentose.

Mount Tukou, altitude 100 feet. Common on the high mountains.

**Dryopteris nymphalis** (Forster) Copeland.

A large, erect-growing fern having pinnate fronds about 2 feet long. Pinnae linear, finely tapering, divided into acute lobes.

Common along the dry lower forest zone from Connals Gulch, District of Titikaveka, altitude about 200 feet.

**Dryopteris obstructa** Copeland.

A large pinnate fern with bright-green fronds, 2 feet long. Pinnae linear, finely acuminate, up to 8 inches long, divided to the middle into acute falcate lobes.

Valley back of Avatiu. Common in the low lands of all districts.

**Dryopteris setigera** (Blume) O. Kuntze.

A large tri-pinnate fern with long fronds and slender naked stipes.

Not very common although specimens were collected in Arorangi, and the districts of Titikaveka in the dense, damp woods, and on the top of Mount Tukou.

**Dryopteris** species.

A common fern found on the high mountains, along the paths at an altitude of about 1500 feet, on Mount Tukou.

**Elaphaglossum** species.

An erect-growing plant 15 to 20 inches high. Fronds 10 to 12 inches long, 2.5 inches wide, simple, entire, acute at both ends; veins forked. Specimens sterile and undeterminable.

Very plentiful at the base of Mount Tukou, altitude 1000 feet.

**Histiopteris incisa** (Thunberg) J. Smith.

Large spreading fern with stiff elongated fronds. Stipes light-brown, naked, polished, 8 to 14 pairs of pinnae, ultimate lobes, acute, entire. Sori along the margins.

Connals Gulch, Titikaveka District, altitude 150 feet. Common along the banks of the streams in lower levels.

**Humata pectinata** Smith.

A small epiphytic fern clinging to trees, logs, or rocks. Rhizomes and stipes scaly. Fronds pinnate. Pinnae numerous, narrow, serrulate, the lowest pair of pinnae lobed. Sori round in two rows near the margins.

Common in the dense woods at altitudes of 200 to 1500 feet. *Davallia pectinata* of Cheeseman's list.

**Hymenolepis mucronata** Fèe.

An erect epiphytic fern with linear fronds 10 to 15 inches in length, 0.75 inch in width, acuminate at both ends. Sori arranged in spikes at the tips of the fronds.

Seen in Connals Gulch, on trees and logs, altitude 150 feet; also on Mount Tukou, altitude 1000 feet.

**Lindsaya decomposita** Willdenow.

A small tree fern at base of rocks or trees. Stipes slender, covered with a brown fur at the base, grooved, 4 inches in length. Fronds spreading, bi-pinnate, veins obscure. Sori marginal mostly at the tips of the pinnules.

Ikurangi, Maungatea, Maungaroa, altitude 1000 feet.

**Lindsaya macraeana** (Hooker and Arnott) Copeland.

A small terrestrial fern with creeping or ascending rhizomes. Fronds 10 to 20 inches in length. Pinnae short-stalked, glaucous, thin, dimidiate. Sori small on the upper margins of the pinnae.

Common on the damp hills above Avarua, and on Mount Tukou, 1000 feet elevation.

**Lomagramma wilkesiana** (Brackenridge) Copeland.

A climbing fern having two distinctly different forms of fronds on the same plant. Stipes naked, light-brown. Fronds 18 inches long, the sterile bi-pinnate, the fertile pinnate, with linear, serrulate pinnae.

A common plant seen on trees in the middle forest belt in all districts, between 500 and 1000 feet elevation.

**Microlepia speluncae** (Linnaeus) Moore.

A large fern with a stout rhizome, stipes brown, more or less covered with fine brown dots. Fronds 2.5 to 4 feet in length, tri-pinnate. Primary pinnae up to 15 inches in length. Ultimate pinnules oblong, lobed. Sori small at the base of the sinus.

Connals Gulch, altitude 150 feet.

**Nephrolepis biserrata** (Swartz) Schott.

A large fern with creeping rhizomes. Fronds pinnate, 3 to 4 feet long; midrib having rust-colored scales; pinnae linear, horizontal, as much as 6 inches in length; margins crenate; sori ovoid on a line, removed from the margins, the length of the pinnae.

Common in the damp valleys near the center of the island, altitude 1000 feet.

**Nephrolepis hirsutula** (Forster) Presl.

A fern 2 to 3 feet in length. Stipes straw-colored, slightly clothed with fine down-like hairs. Fronds pinnate. Pinnae close, horizontal, 40 to 50 on each side of midrib, linear, acute or obtuse. Serrated near the tips. Sori round, marginal.

Mount Tekou, altitude 100 feet. Common on the higher mountains.

**Polypodium scolopendria** Burmann.

A plant with a creeping rhizome. Stipes 12 to 15 inches in length, smooth. Fronds 12 to 15 inches in length. Segments entire, connected, lanceolate, acute or acuminate.

Common on trees and rocks. Native name: *maire*.

Fronds become fragrant soon after wilting, and are used in wreaths for personal adornment and decorating.

**Polypodium** species.

A small plant with crawling, slender rhizomes, covered with short, brown hairs. Blade 4 to 8 inches long, 0.5 inch wide. Sori round or oblong confined to upper portion of the frond.

Avana Stream, Ngatangiia District, altitude 900 feet. Common on trees or logs, and on rocky slopes.

**Polystichum aristatum** (Forster) Presl.

A small fern. Stipes 6 to 10 inches in length, covered in the lower portion with numerous brown hairs. Fronds tri-pinnate, 8 to 10 inches long. Sori in two rows on the pinnules.

Common in the high mountains above altitude of 900 feet.

**Pteris comans** Forster.

A very large fern, fronds 2 to 3 feet long, segments deeply cut, oblong, tapering, occasionally seen serrated at the tips. Sori minute on the margins except at the serrated apex.

Common along the banks of the main streams up to 500 feet elevation.

**Sphenomeris chusana** (Linnaeus) Copeland.

A fern with tri-pinnate fronds 12 to 16 inches long. Stipes naked, light-brown, smooth. Sori flat terminating the lobes of the pinnules.

Seen along the paths on Ikurangi, altitude about 800 feet.

**Tectaria decurrens** (Presl) Copeland.

A fern growing on the ground with a stout rhizome and large fronds 2 feet long, entire or divided into 2 to 10 segments which are thin, membranous, acuminate. Stipe and midrib winged.

Mount Tukou, altitude 1000 feet.

**Vittaria rigida** Kaulfuss.

An epiphytic fern seen on trees, logs, and rocks. Fronds linear, 6 to 12 inches long, acute, pendant, in clusters. Sori marginal.

Common in the upper woods and along the banks of the streams.

## LYCOPODIACEAE

**Lycopodium carinatum** Desvaux.

A small plant with erect, repeatedly forking stems. Leaves thin, small, scalelike.

Common on trees in Tereora district at an altitude of 700 feet. Not seen elsewhere.

**Lycopodium cernuum** Linnaeus.

A terrestrial plant with erect or prostrate, stiff stems, 1 to 2 feet high, with many, flexuous, forking branches. Fruiting bodies in terminal cylindrical spikes.

Common in the open, dry hills, generally growing with other ferns and grasses.

**Lycopodium phlegmaria** Linnaeus.

A epiphyte with an erect, stout, stiff stem. Pendulous when growing on trees. Three or four times forked, having ovate acute leaves, the fruiting portion in terminal spikes.

Common at an altitude of 900 feet. Hangs from trees along the Avana Stream, Ngatangia District. Native name: *rimu pina*.

**Lycopodium squarrosum** Forster.

A small erect-growing plant. Stems repeatedly forking. Leaves spreading, awn-shaped.

Mount Tukou, altitude 1800 feet. Common on trees, logs, and growing under rocks in all the valleys, above altitude of 1000 feet.

**Lycopodium** species.

An epiphyte. Leaves spreading, linear, acuminate.

Common on trees and rocks, found along the banks of Avana stream, Ngatangia District.

## PSILOTACEAE

**Psilotum nudum** Swartz.

An erect herb with a thick, short rhizome. Stems angular 12 to 18 inches high, branching. Leaves minute. Fruiting bodies globular, small.

Connals Gulch, Titikaveka District. Common on the ground under rocks, logs, and in the open, dry hilly country.

The fruiting bodies contain a yellow powder (spores) formerly used medicinally by the Rarotongans.

## PINACEAE

***Araucaria excelsa* R. Brown.**

Tall evergreen tree. Branches in whorls from 4 to 10, horizontal; covered with small, stiff, scalelike leaves, uniformly distributed.

Introduced from New Zealand. Several fine specimens are growing in the grounds of the London Missionary Society, at Avarua, and are very tall, towering above the coconut trees. Neither flowers nor fruit seen.

***Araucaria bidwilli* Hooker.**

A large tree with horizontal spreading branches, arranged in whorls about 2 feet distant. Leaves lanceolate, in rows, very sharp-pointed, firm, and thick.

A single specimen 80 feet in height is growing in the village of Avarua. A rare tree, introduced from Australia.

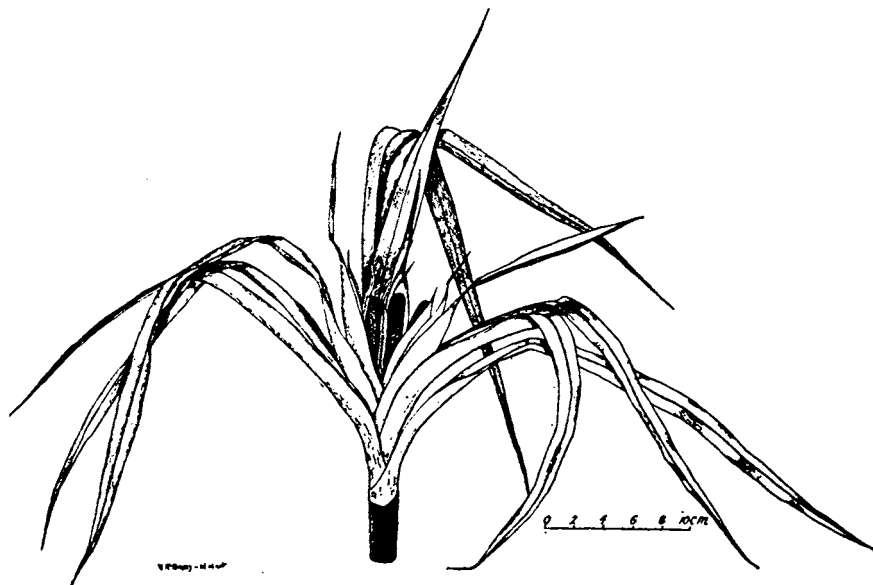


FIGURE 1.—*Freycinetia wilderi* Martelli [in litt.]; native name: *kiekie*. Endemic.

## PANDANACEAE

***Freycinetia wilderi* Martelli, in litt. (fig. 1).**

Endemic. Native name: *kiekie*.

**Pandanus tectorius** Solander.

Tree 10 to 25 feet in height having spreading branches, which send down aerial roots. Leaves crowded at the ends of the branches, linear, 2.5 to 5 feet in length, about 2 inches in width, having numerous prickles along the margins, and armed with stout thorns along the midrib. Staminate and pistillate flowers on separate trees. The staminate or male inflorescence pendulous, at the end of a branch, with several rows of large, white, ovate-lanceolate concave bracts 4 to 8 inches in length, each bract ending in a fine acuminate green tip.

A common tree along the strand. Native name: *ara*.

Several oblong conglomerate heads 2.5 inches long appear at the axils of the bracts, these heads having numerous stamens covered with fragrant pollen. The female flowers are also pendulous at first, appearing in a simple spadix surrounded by several fragrant white bracts, these turning later to a light green color. The syncarp or the fruit is made up of 40 to 60 drupes, 1.25 to 1.5 inches long, closely packed together, tapering towards the fleshy core, which is attached to a stout stem. The drupes or phalanges together form a large globose or oblong head. Each drupe is composed of 4 to 8 carpels covering small oblong ovules. The fleshy part (tips) of the drupes is orange-red, in some varieties yellow. The Rarotongans remove these, cut them into pointed shapes, and string them in wreaths for personal adornment. These wreaths when dry become very fragrant, and are popular.

**Pandanus** species.

A many-branched tree. Leaves small, narrow, 2 to 4 feet in length, the margins armed with numerous thorns, occasionally showing hard bony spines scattered along the midribs. Fruit consists of three separate sizes of syncarps attached to one stem. The individual fleshy drupes, 1 to 1.25 inches in length, vary in width.

Grows near the boundary stone wall at the Parsonage, Avarua. This species was not seen elsewhere. Native name: *ara*.

**Pandanus** species.

A plant 4 to 8 feet in height. Leaves or blades soft and flexible, without spines on the midrib, and only a few small thorns near the tips of the blades, which are 1.75 to 2 inches in width, varying in length.

Grows near dwellings in the native villages. Native name: *ara pae ore*. This plant is cultivated for the leaves, which are removed when mature, dried, and used for braiding into mats, baskets, and fancy articles. Does not flower nor produce fruit; propagated only by the offshoots.

## ALISMACEAE

**Sagittaria sagittifolia** Linnaeus.

An aquatic plant of erect habit. Leaves broad and sagittate. The scape erect with flowers in whorls; petals white.

An introduced plant common in the wet lowlands. English name: Arrowhead plant.

## GRAMINEAE

**Andropogon zizanioides** Nash.

A tall cultivated grass growing 6 to 8 feet in height with stiff, erect, stout stems, and long narrow blades. Flowers in a terminal spike 6 to 10 inches in length.

Common about native dwellings. Introduced. Native name: *mauku ahi*.

The roots when dry emit a fragrant odor, and are used to scent clothing and to preserve them from moths.

**Bambusa vulgaris** Schrader.

Tall-growing, unarmed plant, having hollow jointed stems 15 to 50 feet in height. Leaves glaucous, stipitate, alternate, oblong-lanceolate, sessile, acute, scabrous, and rounded at the base, terminating in a tight-clasping sheath. Flowers in long compound panicles issuing from the nodes.

Not very common, but seen in the valleys in a wild state; also cultivated by the Rarotongans near their dwellings. Native name: *koë*.

**Cenchrus calyculatus** Cavanilles.

A perennial, having stout, stiff, long stems, 2 to 4 inches apart, swollen at the joints. Blades flat, linear, longer than the internodes, scabrous on margins. Raceme 3 to 5 inches long; burs closely packed in a spike.

Seen only at base of Maungatea. A rare plant.

**Cenchrus echinatus** Linnaeus.

An annual, the culm much branched, decumbent at the base. Stems 1 to 2 feet in height, scabrous below the inflorescence. Sheath glabrous, blades long, narrow, flat, acute. Raceme 3 to 5 inches in length. The numerous small burs with hooked spines, are closely arranged one above the other on a stem 2.5 inches in length.

Introduced. Common everywhere in fields that were formerly cultivated. Native name: *piri piri*.

**Centotheca lappacea** Desvaux.

A stout-growing glabrous grass. Culms erect 12 to 15 inches in height. Nodes 1.5 inches apart. Sheaths clasping, extending beyond the nodes. Blades acute 4 to 6 inches in length, 0.5 to 0.75 in width. Margins wavy, scabrous. Panicle terminal, erect. Fruit acuminate.

Seen along the pathways in the deep valleys. Introduced from Tonga. Native name: *mauku Tonga*, or *mauku koekoe*.

**Coix lacryma-jobi** Linnaeus.

A tall-growing, erect, freely-branching perennial, 2 to 4 feet high. Leaf blades acuminate, cordate, 6 to 10 inches in length, 1.5 inches in width near the base, with a



prominent auricle, and then clasping the stem. Upper surface and edges of leaf covered with fine bristle-like hairs, the under side smooth. Flowers in axillary panicles. Fruit a hard, globular, hollow, bead-like seed, gray in color.

This pantropic plant is rapidly spreading along the waterways, and is becoming a noxious weed. Probably accidentally introduced.

The fruits are strung and used as ornaments.

**Cymbopogon citratus** (De Candolle) Stapf.

A cultivated oil-producing grass with long narrow blades, the margins armed with fine saw-like teeth. Neither flowers nor fruit seen.

Common about native dwellings, and known as Lemon grass. Introduced.

**Cynodon dactylon** (Linnaeus) Persoon.

A grass with creeping and rooting stems. The ascending branches produce the flowering digitate spikes, 1 to 1.5 inches in length. Blades linear, hairy around the base, flat; the keel ciliate.

Common in all the districts below an altitude of 100 feet. English name: Bermuda grass. Introduced.

**Dactyloctenium aegyptium** (Linnaeus) Richter.

A street weed. Culm ascending, blades narrow, flat, 2 to 5 inches in length. Spikes 2 to 5 inches long, rather thick, densely flowered.

Introduced.

**Digitaria microbachne** (Presl) Henrard.

A plant with culms ascending, 3 feet in height, from a spreading root base. Sheaths hispid, blades flat, narrow near the base. Margins scabrous. Racemes, several, 2.5 to 6 inches in length.

A common weed in pastures and in cultivated gardens. Introduced.

**Digitaria pruriens** (Trinius) Busse.

Culms 2 feet in height ascending from a decumbent base, glabrous. Sheaths densely pilose. Blades flat, lax, hispid, 2 to 3.5 inches in length, 0.125 to 0.25 inch in width. Racemes, several, hardly spreading.

Maungatea, altitude 1200 feet. Common on the slopes of the hills and the mountains.

**Digitaria timorensis** Balansa.

Culms erect, slender, 10 to 12 inches in height, sheaths glabrous; blades 2 to 4 inches in length, linear, acute, margins scabrous. Racemes 2 to 4 inches in length, linear, acute. Racemes 2 to 4.

Common in the lowlands.

**Echinochloa colonum** (Linnaeus) Link.

An annual, culms erect 10 to 18 inches in height, glabrous. Blades rather lax, 4 to 8 inches in length, less than 2.5 inches in width, scabrous on the margins.

Common in pastures of the lowlands.

**Eleusine indica** (Linnaeus) Gaertner.

A small erect tufted grass, 6 to 12 inches in height, having spreading, flat, narrow blades. Flower spikes 3 to 6, sessile, 1 to 3 inches in length.

Common in all the districts and well distributed. A troublesome weed about dwellings and cultivated ground.

**Eragrostis amabilis** (Linnaeus) Wright and Arnott.

Plant annual. Stems slender, erect 4 to 12 inches in height. Sheaths glabrous, striate, pilose at the throat. Blades flat, striate, narrow, thin, less than 4 inches in length. Panicle open, oblong, 2 to 6 inches in length, spikelets 4 to 6-flowered.

Common everywhere in open pastures. *Eragrostis plumosa* of Cheeseman's list.

**Holcus halepensis** Linnaeus.

Erect perennial plant; having stout creeping rhizomes. Blades 15 to 20 inches in length, 1 inch in width, rounded at the base, clasping the stem. Flowers form a large spreading panicle.

Common in fields and alongside the roadways. English name: Johnson grass. *Andropogon halepensis* of Cheeseman's list. Introduced.

**Isachne distichophylla** Munro.

A tall perennial grass, having stiff, erect, glabrous stems, 1 to 3 feet in height. Leaves alternate, lanceolate, acute, rounded at the base. Flowers in a slender terminal panicle.

Common in the woods up to an altitude of 300 feet.

**Miscanthus japonicus** Andersson.

A tall perennial grass, having terminal feather panicles. Leaves long and flat, the edges armed with minute sharp teeth.

The light stems or main axis, after flowering, are collected and from these a fine quality of material is prepared for braiding into hats. Native name: *kakao*.

**Oplismenus compositus** Beauvois.

A low-growing plant, creeping and rooting at the joints. The culms ascending, 10 to 24 inches in height. Blades pubescent, broadly lanceolate, acuminate, 1.5 to 2.5 inches in length. Margins scabrous. Panicle terminal, composed of 6 to 8 racemes, 0.25 to 0.5 inch in length; arranged, rather distant.

This species prefers shaded localities, and is very common at low elevations.

**Oplismenus undulatifolius** Beauvois.

A small, creeping, shade-loving annual, having slender stems, internodes less than 0.5 to 2 inches in length, finely acuminate; margins scabrous. Sheaths clasping, slightly hispid. Panicle 2 inches in length; terminal racemes 4 to 6, distant. Glumes awned.

Common in shaded places in the lower forest belt.

**Panicum ambiguum** Trinius.

A more or less creeping perennial grass, having stiff, wiry stems, short internodes. Blades narrow, 1 to 3 inches in length, acute, hairy on both surfaces, margins scabrous. Sheaths villous.

Common at Avarua by the sea, and damp places in other districts.

**Panicum distachyum** Linnaeus.

A tall-growing grass, having stems 3 to 5 feet in length. Nodes 1 to 6 inches apart. Blades linear 2 to 6 inches in length, acute. Margins scabrous. Panicle hairy. Spikes few, with solitary sub-sessile spikelets.

Common in pastures of wet land and hillsides, altitude up to 200 feet.

**Panicum maximum** Jacquin.

A tufted perennial, culms erect, glabrous, except at the nodes where are observed many fine hairs. Blades flat, acute, ascending, 9 to 20 inches in length, 0.25 to 1 inch in width. Scabrous on the margins. Panicle densely flowered.

Common in open ground along the roads. Cultivated for stock feed. English name: Guinea grass. Introduced.

**Paspalum conjugatum** Bergius.

A plant, having erect culms, 1 to 2 feet in height from a decumbent base. Blades flat, glabrous, very acute, and scabrous on the margins. Ligule ciliate. Racemes 2, sessile. Spikelets imbricate in 2 rows.

Seen in all districts. Common in the fields and waste places. Introduced.

**Paspalum dilatatum** Poir.

A tall perennial with stems erect. Sheaths glabrous. Blades flat, 8 to 15 inches in length. Racemes lax, generally 4 to 6, 1 to 1.5 inches in length.

Introduced as a forage plant. Not very common.

**Paspalum distichum** Linnaeus.

Plant with glabrous erect stems, 12 to 24 inches in height, issuing from a creeping, rooting base. Blades flat, 2 to 4 inches in length. Racemes 2, 1 to 1.5 inches in length, one sessile, the other having a short peduncle.

Common about Avatio; probably introduced.

This is a roadside weed, growing in shady places near the sea above high-water mark.

**Paspalum orbiculare** Forster.

A glabrous perennial, 3 feet in height, having narrow, flat blades. Racemes 4 to 8, spreading, distant, alternate, 1.5 inches in length. Spikelets brownish, glabrous, fruit brownish.

Introduced from Tahiti. Common in the lower forest belt.

**Phragmites communis** Trinius.

A tall perennial with jointed hollow stems, 6 to 12 feet in height, having a creeping stoloniferous root stock. Stems stout, covered with the leaf sheaths. Panicle compound, erect.

Not very common, seen only under cultivation, in several districts. Native name: *ofe papaa*.

**Rhaphis aciculata** (Retzius) Desvaux.

An annual robust creeper, common about the island in the open fields and dry hillsides. The small fruits become detached and work into one's clothing and become very troublesome. Of very early introduction. Native name: *piripiri*.

**Sporobolus indicus** R. Brown.

Plants of this species have perennial strong creeping rhizomes. Culms erect 8 to 14 inches in height, glabrous. Blades narrow, finely tapering, usually involute. Panicle spike-like, 4 to 8 inches in length, 0.25 inch thick. Spikelets small, numerous, oblong, reddish brown in color.

Not very common, seen only along the road from Avarua to Avatiu.

Probably of recent introduction.

**Saccharum officinarum** Linnaeus.

An erect, stout, solid-jointed plant, 6 to 15 feet in height. Leaves long, broad, 1 inch or more in width. Margins very scabrous. Sheaths clasping, hispid. Panicle compound, 1 to 3 feet in height, gray-colored, from the hairs surrounding the spikelets.

Of very early introduction. It was cultivated by the natives and used in the preparation of medicines before the arrival of the foreigners. Several varieties are recognized both in color of the stalks, and the quality of the juice, which is extracted by chewing.

**Stenotaphrum secundatum** (Walter) Kuntze.

A creeping stoloniferous grass with short, stiff, erect, leafy culms. Blades obtuse, smooth. The flowering racemes terminal, 4 to 6 inches in length.

Common along the seashore, in all districts. Said to have been introduced. *Stenotaphrum americanum* of Cheeseman's list. Native name: *mauku tai*.

**Thuarea involuta** (Forster) R. Brown.

A small creeping grass with stiff, wiry stems, rooting at the joints. Blades smooth, narrow. 0.75 to 1 inch in length. Racemes terminal, 1 inch in length.

Very common along the sandy stretches near the sea. *Thuarea sarmen-tosa* of Cheeseman's list,

## CYPERACEAE

**Carex graeffeana** Boeckeler.

An erect herb 2.5 to 3 feet in height, having stiff leaves longer than the stem. Spikes cylindrical, on small wiry peduncles.

Common in the damp woods up to an altitude of 700 feet.

**Cyperus flabelliformis** Rottboell.

A plant 2 to 4 feet in height, having horizontal, stout rhizomes. Stem 3-angled, spongy, having 15 to 25 narrow involucreal leaves 5 to 15 inches in length, prominently-nerved.

Introduced. Rare; seen only on borders of the stream near the Government Refrigerator at Avarua. English name: Umbrella plant.

**Cyperus rotundus** Linnaeus.

A plant with a creeping rhizome bearing small, nutlike tubers. Leaves or blades short, flat, scabrous near the apex. Stems trigonous. Umbel simple, 4 to 6 rays, bearing numerous spikelets.

Introduced. A common troublesome weed, found in all districts. English name: Nut grass.

**Eleocharis caribaea** (Roth) Blake.

A small densely-tufted erect plant, having slender threadlike stems, at the end of a single ovoid spikelet.

Avatiu Bay. Common in low, salty, wet areas near the sea.

**Fimbristylis annua** (Allioni) Roemer and Schultes.

A plant with tufted stems 1 to 2 feet in height. Leaves numerous, short, grass-like, thin, narrow. Spikelets ovoid-oblong, in short-stalked fascicles.

Connals Gulch at an altitude of 25 feet. Common in open pastures, and damp places.

**Kyllinga monocephala** Rottboell.

An erect plant with slender stems. Leaves grass-like, thin, flat, margins narrow, scabrous. Flowers and fruit in a single globular head, with three leafy bracts, 2 to 3 inches in length. Margins rough.

Said to be indigenous, or very early introduced. Common along the roadways, and everywhere in sandy soil and moist places.

**Mariscus cyperinus** Vahl.

An herb 2 to 4 feet in height, with narrow, linear, glabrous blades. The midrib scabrous. Stem short, umbel compact.

Common in Marairenga Valley, in shady places, growing at an altitude of 750 feet. Also collected in damp places near the seashore, Ngatangia.

**Mariscus cyperoides** Vahl.

An erect herb 2 feet in height, with slender linear blades. The margins scabrous.

Common on Ikurangi Mountain at an altitude of 1500 feet.

**Mariscus macrophyllus** Brongniart.

A plant 2 to 3 feet in height. Leaves or blades issue from a close, compact rhizome. Blades smooth, 0.5 inch wide at the base, finely acuminate, longer than the stalk, margins scabrous. Rays many, stout, of unequal length. Flowers in compact heads. Involucral leaves, 6 to 30 inches in length.

Common in all the valleys. Especially numerous in Tupapanui, Avarua, up to an altitude of 750 feet.

**Mariscus pennatus** (Lamarck) Merrill.

Stem stout, erect, 3 to 4 feet in height. Leaves long, narrow, stiff; upper and lower surfaces hispid. Margins scabrous. Umbel compact.

A common plant in all districts, growing along the roadsides and wet places. *Mariscus albescens* of Cheeseman's list.

The stems of the fruit stalks when bruised and shredded, form a matted fibre used to strain liquids, or to filter grated coconut meat.

**Mariscus sieberianus** Nees von Esenbeck.

A tall plant with single stalks, 3 to 4 feet in height. Blades narrow, 2 to 2.5 feet in length, glabrous, finely acuminate. Rays many, flowers in an elongated, compact spike.

Collected near Ngatangia Harbor, also up Avana stream at an altitude of 400 feet.

**Mariscus** species.

An erect-growing plant 12 to 20 inches in height. Blades long, linear. Margins scabrous. Flowers and fruit collected insufficient to be able to determine the species.

Common along the banks of Arote Stream, Avarua.

**Pycneus odoratus** Urban.

A small erect herb, 15 to 18 inches in height, bearing a few short blades and a closely arranged umbel or fruit cluster.

Grows in low damp places near the entrance to Avatiu harbor. Not seen elsewhere. A rare plant.

## PALMAE

**Cocos nucifera** Linnaeus.

A stately palm, often reaching at maturity a height of more than 100 feet. Caudex straight, or curved, bark light-gray in color, marked with ringlike leaf scars. Leaves terminal, 10 to 20 feet in length. Petiole 3 to 4 feet in length, partially clasping the trunk. Leaflets opposite, coriaceous, flaccid, arranged equidistant on a strong midrib. The inflorescence appears on a branching axillary spadix, at first enclosed in a cylindrical spathe, which, bursting longitudinally, exposes the ivory-colored flowers, the staminate aduandant, the pistillate which are attached to the small fruits are covered by overlapping sepals, which later become the floral envelopes.

After being fertilized by the adjacent staminate flowers, the hollow interior of the shell becomes filled with sweet water. The spherical fruits gradually increase to from 4 to 8 inches in diameter. The endosperm, at first an opaque, jellylike substance, forms in the inner walls of the shell, and gradually absorbs the water; it attains a firm thickness of from 0.25 to 0.5 inches. This is known as the "coconut meat" and forms an important article of diet for the Polynesian people. When dried it is known as copra, the chief article of export of the island. The nut is covered externally by a fibrous endocarp called the husk, which, on the young nuts, is a shiny-green color. The husk of mature nuts takes on a rusty-brown appearance. Germination begins at the inner end of the ovary, or embryo, which is found just below the largest of the three so-called eyes, and situated at the apex of the nut. The plumule forms then, forces its way up through the husk; external roots form on the side of the young plant, and gradually work their way down inside the husk, next to the shell, until they reach the ground. The plant receives its nourishment from the interior of the nut, through absorption of the spongy growth, termed the "apple."

The coconut is doubtless the most useful of all trees to the people of the South Sea islands, furnishing, as it does, not only nourishing food and drink, but wood for house-building, and leaves for thatching the roofs. The shells are utilized for domestic utensils, and the oil for medicinal and personal purposes. The leaflets of the long flexible leaves are dexterously plaited together by the native people and form durable waterproof covering for their houses. From the exceptionally thick husk of a certain variety of coconut (*palmyraensis*), a strong and durable rope called sennit or coir is made. The coconut tree thrives best in sandy soil about sea level, it will, however, grow and bear fruit at higher elevations.

The Rarotongans recognize several varieties of coconuts, distinguished by the shape and color of the fruit. A list of the following varieties of coconut (*nu*) was furnished me by an old resident of the island:

Native name	Color and texture of husk
Nu kura	yellowish-brown
Nu mangaro	green, thin, sweet, edible
Nu papua	golden yellow, tree, dwarfed variety
Nu rakata	reddish, fruit small, prolific
Nu tea	light yellow
Nu uri	bluish-green

***Elaeis guineensis* Jacquin.**

A slow-growing palm, with a stout thick trunk, 10 to 15 feet in height. Leaves numerous, pinnately divided. Spadix short and thick, both staminate and pistillate appear at different axils of the leaves. Fruit about the size of a pigeon egg, in large compact bunches.

Introduced. Not very common. English name: Oil palm.

***Livistona chinensis* R. Brown.**

A palm about 6 to 8 feet in height. Leaves numerous, reniform; segments linear-lanceolate; petiole lined with many stiff spines on both edges.

***Phoenix canariensis* Hortorum.**

A large spreading palm with a short trunk, and thick foliage. Fruit very abundant, seed unusually large, covered with a meager pulp.

Introduced. Not a very common tree.

***Pritchardia pacifica* Seemann and Wendland.**

A tall palm having a straight trunk; leaves large, fan-shaped, with numerous segments. Petioles twice the length of the blade. Fruit round, 0.5 inch in diameter, in large, closely-formed bunches.

Introduced. Not a common plant. A fine specimen is growing in front of the hotel at Avarua.

## CYCLANTHACEAE

***Cardulovica palmata* Ruiz and Pavon.**

A palm-like, herbaceous, stemless plant. Leaves flabellate on long, unarmed petioles. Blades 3 to 5-lobed, again cut into narrow segments, and parallel-veined. Flowers small on a short spadix.

A common, cultivated garden plant.

## ARACEAE

***Alocasia macrohiza* (Linnaeus) Schott.**

A caulescent herb. Leaves terminal, on long, thick petioles; blades sagittate, ovate, light green with wavy margins. One or more flower spathes rise from an axil; the individual spike made up of numerous pinkish-white florets protected by a sheath or hood.



Common in all the districts. Grows wild in the mountains. Native name: *kape*.

Some plants reach a height of 10 feet. The seeds do not mature; reproduction is brought about by planting sections of the stalk. The stalks are edible, but are only eaten in the time of food scarcity, and then only after thorough washing and cooking.

***Amorphophallus campanulatus* (Roxburgh) Blume.**

An herbaceous, giant, flowering annual, 2 to 4 feet in height. Leaves large, blade 3-parted, divisions pinnatifid, light-green, petiole thick, warty, and variously spotted with white and dark-green. Spathe large, reddish-purple, emitting a very pungent, disagreeable odor.

Common in the low dry sections. Native name: *teve*.

***Caladium bicolor* Ventenat.**

A perennial with rhizomes or tubers. Leaves long-petioled; blade ovate, sagittate, variegated on the upper surface, glaucous on the under side.

Introduced as an ornamental. Very common under cultivation.

***Colocasia esculenta* (Linnaeus) Schott.**

An herb with tuberous edible roots or corms. Leaves generally large, glaucous, cordate, peltate, light-green or dark-green, or even purplish-green; basal lobes not quite as long as the apical lobe, but varying in the different varieties. Native name: taro.

When the native population was larger than it is today, this plant furnished the principal article of diet. Since the introduction of rice, flour, and other starchy foods, it has not been planted so extensively, and many choice varieties have disappeared. In determining varieties, consideration is given to the formation of the leaf, its color and markings, its relation to the petiole, and its open or closed sinus. All the Rarotongan specimens that came under my observation had a closed sinus, and their leaves differed from those that I saw in other Pacific islands. These material differences lead me to believe that some of these varieties are endemic to Rarotonga. The following list of taros from Rarotonga, and their descriptions were furnished me by Mr. Charles Cowan, Mataiapo of Ngatangiia District:

*Apo*. Stem and leaves light-green; corm small, yellow, and hard when cooked.

*Amoa* (no. 1). Introduced from Samoa; stem black; leaves dark-green; corm attains a large size; when cooked becomes dark-gray and sticky; is made into poi, and *poke taro*.

*Amoa* (no. 2). Introduced from Samoa; a tall-growing variety, some plants as high as 7 feet; stems and leaves dark-green, tinged with black; corms very vigorous, large and with many attached off-shoots; when cooked flesh not very palatable; coarse and stringy.

*Keretata*. Stems reddish-brown, with brown and green stripes along the petiole; leaves dark-green; corm when cooked slate-colored.

Kiekie. Leaves dark-green with dark-reddish and pale-yellow stripes, along the petiole; corm small.

Koakoa. Leaves dark-green, stem dark-red; corm large, elongated, turns white when cooked. This plant yields many off-shoots or suckers by which it reproduces itself.

Mapuna. This variety matures in from 6 to 8 months, if left longer the corms rot. Grows best in running spring water. Leaves large, broad, dark-green; when young, used as spinach. Corm round, becomes white and soft when cooked; palatable and makes good poi.

Mapuna manava-anu. Resembles the variety *mapuna*, except that the stems are greenish-purple near the corm, and have slight red streaks higher up on the stem; corm becomes white when cooked, and is good to eat.

Mana-ura. Stem with dark-green background and pale-yellow and brown stripes; corm slate-colored when cooked, palatable.

Mapurakaka. Not a tall plant; stem and leaves small, pale-green; young leaves especially good for use as spinach; corm oblong, producing many off-shoots; becomes white, stringy, and fibrous when cooked.

Mapura-kuru. Stem pale-green; leaves large; corm very large, nearly round, white when cooked, is palatable and makes good poi.

Matarei. Stems light-green; leaves small, bearing a dark spot opposite the petiole; midrib dark-purple; corm white when cooked, very good to eat.

Nokanoka. Stem and leaves dark-green; has many off-shoots; reproduces by traveling and spreading. Not a popular variety: corm is small, of poor quality, and used as food only in time of scarcity; generally seen growing wild up in the valleys.

Numata. Leaves dark-green; stem dark-green becoming reddish-brown near the corm; corm white when cooked, soft, and of excellent quality, resembling a soft coconut (*numata*).

Poupou vare. Stem greenish-brown with light yellow stripes; leaves yellowish-green; corms said to be palatable.

Tiitii. Stem and leaves dark-green, with a dark spot in the center of the leaf; corm small, ash-colored when cooked, sticky, fine-flavored.

Tiitiimata-ara. Stem and leaves dark-green, a dark greenish-brown spot in the center of the leaf; corm large, becomes a light ash-color when cooked; palatable and of good quality.

Vai purau. Very rare. Stem and leaves dark-green; corm small, white and firm when cooked; suitable for making into poi.

Veo. Stem and leaves light-green; has twin petiole, the corm forming a double or twin at maturity; when cooked the corm is brownish-yellow, sticky, palatable, makes excellent poi.

### **Cyrtosperma chamissonis** (Schott) Merrill.

An herb with spiny stems. Leaves large, hastate. Flowers reddish-brown, in a spathe 8 to 10 inches in length. Tubers large, some several feet long, requires two years or longer to mature.

Not common, but found growing from sea level to an altitude of about 500 feet. Introduced and cultivated. Native name: *puraka*.

Edible when boiled or baked in a native oven.

### **Xanthosoma atrovirens** C. Koch and Bouché.

A tuberous herb. Leaves arrow-shaped large, glaucous, fleshy, light-green, surface wrinkled, veins prominent, sinus open. Flowers unisexual, in a large spathe, yellowish-green, fragrant.

Common in all the valleys, under cultivation. Also seen growing wild along the banks of the streams. Native name: *taru'a*.

Cultivated for its young edible tubers, which issue from the main corm. The young tender leaves are used as spinach.

***Epipremnum pinnatum* (Linnaeus) Engler.**

A robust climber. Leaves ovate, entire, 3 to 10 inches in length, 3 to 8 inches in width, glossy-green; petiole as long as the blade.

Common throughout the woods up to an altitude of 1000 feet. *Epipremnum mirabilis* of Cheeseman's list. Native name: *pirimoto*.

***Pothos aureus* Linden.**

A climbing perennial, having a stout thick stem. Leaves ovate, entire, acute, broad, deeply-cordate, and shiny; blades splashed with white.

Introduced. Common on trees and stone walls. Neither flowers nor fruit seen.

BROMELIACEAE

***Ananas comosus* (Linnaeus) Merrill.**

An erect herb. Leaves borne in a rosette, stiff, narrow, the margins armed with short thorns. Flowers aggregated, developing on an erect stem from center of rosette. Fruit a fleshy compact head.

Common about dwellings and much cultivated. A few plants were observed growing on the high mountains, escaped from cultivation, yet considered wild. The "Queen" was the only variety grown in Rarotonga. English name: Pineapple. Native name: *ara*. *Ananas sativa* of Cheeseman's list.

COMMELINACEAE

***Commelina nudiflora* Linnaeus.**

A creeping herb. Leaves alternate, oblong-lanceolate. Stems succulent. Flowers blue.

Common plant up to an altitude of 1000 feet. Native name: *maukupuaka toro* (grass for the cows).

***Rhoeo discolor* Hance.**

A short-stemmed, erect-growing plant. Leaves 8 to 12 inches in length, dark-purple on the under side, green on the upper surface. Flowers white, small, in a boat-shaped spathe arising from the axil of the leaf; nearly sessile.

Introduced. Growing at sea level in the districts of Arorangi and Titikaveka. Native name: *toetupou*.

**Zebrina pendula** Schnizlein.

A trailing, half-succulent herb. Leaves lanceolate-ovate, sessile; underside rich-purple, upper side green, streaked with white. Flowers red, contained in two boat-shaped bracts.

Introduced. Rather rare; seen only under cultivation.

## PONTEDERIACEAE

**Eichhornia crassipes** Solms.

A floating aquatic herb, rooting at the nodes. Leaves in tufts, constricted at the middle. Flower scape 6 to 10 inches long having several pale-violet flowers.

Introduced from Tahiti. Considered a noxious weed, spreading fast in patches of quiet water. Locally known as the "water hyacinth." Native name: *riri vai*.

## LILIACEAE

**Dianella intermedia** Endlicher.

A small herb. Rhizomes short. Leaves linear-lanceolate, stiff, parallel-veined. Flowers blue in a loose terminal panicle. Fruit a capsule with several seeds.

Common on the dry high hills above 1000 feet elevation. Native name: *pui*.

**Taetsia fruticosa** (Linnaeus) Merrill.

An erect shrub. Leaves broadly lanceolate; 12 to 24 inches in length, 3 to 6 inches in width; smooth, pale-green, base narrowing into a stout petiole. Nerves branching off the midrib at an acute angle. Flowers small, white.

Common from sea level to the tops of the mountains. *Cordyline terminalis* of Cheeseman's list. Native name: *lau ti*.

This plant produces a large fibrous tuber, which, when baked in a native oven, yields a sweet juice.

**Sansevieria zeylanica** Willdenow.

An herb with stiff, erect, narrow leaves, 1 to 3 feet in height. Flowers greenish-white in a long raceme. Fruits small, yellow, globose 0.25 inch in diameter, on a spike.

Introduced. English name: Bowstring hemp. A garden ornamental, not common.

A useful fibre can be made from the leaves.

## AMARYLLIDACEAE

**Crinum asiaticum** Linnaeus.

A giant lilylike plant, sometimes found along the strand. Leaves narrow, several feet in length. Flowers white, in an umbel at the end of a scape rising from the axils

of the leaves at or near the base of the bulb. This species bears large, fleshy, nearly round, green seeds.

Common under cultivation about native dwellings.

**Crinum** species.

Much like *Crinum asiaticum*. Stems red, flowers dark-red and very fragrant. Does not seed.

**Eucharis grandiflora** Planchon and Linden.

A bulbous herb, having broad, ovate, pale-green leaves, 12 inches in length and 6 inches in width. Scape 2 feet long, bearing an umbel of several pure-white, very fragrant, 6-petaled flowers.

Introduced.

Not very common; seen only under cultivation. English names: Amazon lily, or Star-of-Bethlehem lily.

**Fourcroya longaeva** Karwinsky and Zuccarini.

Slender, unbranched tree. Leaves lanceolate, acute, some 5 feet in length, 3 to 6 inches in width. Flowers greenish-white, on a long, erect spike 10 to 15 feet in height. Fruit an elongated capsule with many small seeds.

Seen only at Arorangi, at an altitude of 250 feet, where the remains of a few cultivated plants are still growing in a semiwild state. Introduced.

This plant bears fruit once and then dies. It does not produce suckers.

**Ismene calathina** Nichols.

An herb with a long-necked bulb. Leaves 6 to 8 inches in length; narrow. Flower stem 2-edged, 1 to 2 feet in height, having several white tubular flowers, with rounded, fringed lobes. Very fragrant.

Seen only in a private garden at Arorangi. Introduced. Rare. English name: Peruvian daffodil.

**Polianthes tuberosa** Linnaeus.

A tender flowering plant issuing from a bulb. Leaves long and narrow, on a stout spike 2.5 feet in length. Blossoms toward the end of the spike, pure-white, and very fragrant.

Introduced. Cultivated. Seen in private gardens. English name: Tuberose.

TACCACEAE

**Tacca pinnatifida** Forster.

An interesting herb with 3-parted, irregularly-pinnatifid leaves. Leaves radical, having long petioles striped with dark and lighter green. Flowers numerous, 10 to 40, fleshy at the end of a hollow scape 2 feet in height. Fruits, yellowish-green, the size of a small olive, on long peduncles, and containing many seeds.

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Common in the sandy soils of the lowlands, and very abundant when protected from animals. It is either cultivated or found growing wild. Not collected by Cheeseman. He may have mistaken *Amorphophallus campanulatus*, a similar plant, for *Tacca pinnatifida*. Native name: *pia*.

After the tubers mature the plant dies down, and these tubers are converted into starch by grating and macerating in water. After several washings, the starch is allowed to settle, and when dried, it becomes a white powder known as *pia*.

#### DIOSCOREACEAE

##### **Dioscorea alata** Linnaeus.

A cultivated plant of prostrate habits. Stems 4-sided, angular. Leaves opposite, 2.5 to 3 inches in length, 2.5 to 3.5 in width, ovate, entire, cuspidate, 7-nerved, outer pair united, having a deep basal sinus and petiole equal in length to the blade.

The rather coarse-textured, large, edible tubers, or roots, of this species form one of the staple foods of Rarotongans. Native name: *ui parai*.

##### **Dioscorea bulbifera** Linnaeus.

A tall, climbing, herbaceous vine. Leaves alternate, cuspidate, cordate, auriculate, 5-nerved, glabrous. Flowers not seen.

Common in the flat lowlands. Grows well, with no particular cultivation. Native name: *oi*, or *ui*.

This species of yam is conspicuous on account of the axillary tubers which it bears.

##### **Dioscorea pentaphylla** Linnaeus.

An herbaceous twining plant with angular stems producing edible tuberous rhizomes. Leaves alternate, having 3 to 5 palmately-lobed segments, lanceolate, cuspidate.

Common on the lowlands, growing semi-wild. Native name: *pirita*.

The tubers are used for food.

#### IRIDACEAE

##### **Belamcanda chinensis** De Candolle.

A garden plant, 2 to 3 feet in height, having a short root-stalk and several long, narrow leaves. Flowers yellow, lilylike.

A cultivated plant. Rare.

##### **Gladiolus** species.

Corm-bearing herbs with radical, long, narrow leaves. Flowers tubular, sessile, arranged alternately on a spike issuing from the center of the plant.

Introduced as an ornamental; several colors seen under cultivation. Not very common.

## MUSACEAE

**Musa paradisiaca** Linnaeus.

A much cultivated stoloniferous perennial herb. Leaves arranged in a terminal head, usually large, entire, oblong, pinnately parallel-veined. Petiole thick, stout, rounded beneath, grooved on the upper surface, ending in a sheath clasping the stem. Flower spike terminal, at first erect, then gradually drooping and pendulous; consists of several overlapping, red bracts covering the flowers. These fleshy bracts soon fall, and after the flowers are fertilized, the ovaries swell and form the fruits, arranged in alternate groups, one above the other, attached to the stem.

English name: Banana. Native name: *meiki*.

A large number of varieties were cultivated by the natives, but the ravages of live stock have materially reduced some of the endemic forms, and many of the bananas formerly grown in Rarotonga are now extinct. The following list was submitted by one who has cultivated the fruit for many years:

## ENDEMIC VARIETIES

Ai.	
Kaivao.	
Kirimangio.	
Koputea.	Introduced from Tahiti.
Maoa.	Produces very large fruits.
Moto.	Plant 10 to 12 feet in height. It was the custom of the natives to beat the trunk with a club to aid in ripening the fruit.
Pivaikura.	Bears short stubby fruits ( <i>kura</i> means red).
Raumaaru.	
Ravii.	Produces fruit in compact bunches.
Roviki (rokivi).	A plant 20 feet in height. Introduced from the island of Aitutake.
Taioura.	About 10 feet in height. Fruits were rolled and squeezed to make them soft and the skin easily removable.
Tarapuakanio.	A variety only 8 feet in height, having curved fruits which resembled a goat's horn ( <i>puaka nio</i> , goat's horn).
Tarapuakatoro.	This variety has stalks 8 to 9 feet in height. Large bunches, the fruit sometimes 9 inches in length.
Torota.	Fruits long.
Turita.	A choice variety, grown and reserved only for the chiefs.
Unauna.	Large fruiting variety.

## INTRODUCED VARIETIES

Mario.	From Tahiti; stem 20 feet in height, light-green; leaves green; midrib green. Fruit sharply-ridged; has coarse thick skin; calyx persistent. Quick-ripening variety, the flavor of the flesh rather tart when over-ripe.
Mario fiki.	This is a tall plant introduced from Fiji. Produces a large bunch, the hands well separated on the fruit stem; fruits 7 to 9 inches in length, slightly curved, having a smooth skin. A good shipping sort.

- Mario muramura. Introduced from India; plant 20 feet in height. Leaves long; stalk, midrib, and fruits red; flesh yellow, very sweet.
- Mario tiki. Tall plant; stalk dark-purple; bears large bunches of small, closely-packed fruits 2.5 inches in length; thin-skinned; flesh of fine quality. Introduced from Jamaica by Mr. Dick Donaldson, whose Rarotongan name was "Tiki."
- Puroini teatea. A plant 15 to 18 feet in height. Leaves and stems light-green. Name signifies that the fruit has the appearance of having been dusted with flour.
- Puroini taru a. This plant is tall, sometimes 20 feet in height. Bears large bunches of fruit, well separated on the stem. Fruits conspicuously angled, 7 to 8 inches in length, 1.75 inches to 2.5 inches thick, point tapering. Skin tough, fibrous. Immature fruit bluish-green, when ripe a creamy-yellow. Fruit is preferably cooked.

### **Musa cavendishii** Lambert.

A plant with a short stalk. Leaves glaucous, 6 to 8 in a dense head, spreading 3 to 5 feet in length, 12 inches broad, rounded at the base; petiole stout, deeply grooved on the upper surface. Flower spike dense, short, drooping; fruits numerous, as many as 200 in a bunch, oblong-angled, slightly curved, 4 to 5 inches in length, 1.5 inches or more in diameter. Seedless; skin rather thick; flesh delicately fragrant.

The Duke of Devonshire, whose name was "Cavendish," introduced a number of banana plants from Apia, Samoa, of this variety, also known as the "Chinese banana." From these plants several varieties have resulted which are the ones chiefly grown, and the fruits exported to the markets of New Zealand.

- Kauari. This variety is planted for the numerous suckers or off-shoots it produces. The plant is about 15 feet in height.
- Kauari enua tikai. A tall-growing plant with a slender stalk which has to be propped up when bearing its bunch of fruit.
- Kauari rau petetue. A tall-growing plant. Leaves thick, set close together in a whorl at the top of the stalk. Leaves and stalk dark-green. Neither flowers nor fruit seen.
- Taunga. The best of the *cavendishii* type; reaches 12 feet in height. Leaves loosely set; stalk dark-green. A sport from Kauari.

### **Musa fehi** Vieillard.

A stout stoloniferous herb, 15 to 20 feet in height, having thick, large, black stems, shading to dark-green near the top. Leaves large, shiny, dark-green; stout prominent veins, petiole thick and fibrous; when cut a violet-colored juice, used as a dye, exudes.

This species differs from other bananas, for the flower spike issues from the top of the plant and remains in an upright position. After being fertilized fruits form, some 15 to 20 in the bunch. These are oblong, angled, 4 to 6 inches long, 1.5 to 2 inches thick, having a thin skin, yellow when ripe. The flesh is golden yellowish-green, edible only when cooked. Native name: *uatu*.



- Uatu pi vai. From the habit of this plant it may be a distinct species, for although the flower spike at first stands erect and resembles *uatu* in its foliage and fruit, as soon as the fruit matures and begins to ripen, the remaining unfertilized flower spike becomes pendulous, unlike other *fehi*.
- Pou tu. The tallest of the banana species growing in Rarotonga. Plant 2 feet thick at the base, 20 to 30 feet in height. Leaves and stems light-green, dusted with a fine glaucous bloom, unlike the black stems of other *fehi* forms. Individual fruits large, thick, light-green, and rounded at the ends. The flowers and fruit stalk remain erect until the bunch begins to ripen, then it hangs downward like the species of *Musa paradisiaca*. This type of *fehi* is not very common, and is found growing only in the deep recesses of the valleys. By a concerted agreement among the natives, the fruit is gathered only on certain days of the month, that all may share equally in the ripe fruit.

### **Ravenala madagascariensis** Gmelin.

A plant about 20 feet in height. Leaves large, crowded in two ranks, giving the appearance of a huge fan. Petioles 5 to 10 feet in length, alternately clasping the stalk. Flowers white, in a large boat-shaped spathe. Fruit a 3-valved capsule.

A rare tree, seen only in the Government Experimental Garden, Avarua.

The petioles, which alternately clasp the stalk, form concave bases which gather rain water, and, when punctured, give forth a refreshing drink.

## ZINGIBERACEAE

### **Alpinia nutans** (Wendland) K. Schumann.

A tall herb whose long slender shoots spring from gingerlike rhizomes. Leaves lanceolate, long-veined, glabrous. Flowers in terminal, drooping, racemes resembling orchids; color pink and yellow, fragrant.

Common under cultivation and also growing semiwild in the moist valleys. Very ornamental and decorative. English name: Shell flower.

### **Alpinia purpurata** Schumann.

An erect many-stemmed plant with ginger-like roots. Stalks 6 to 10 feet in height. Leaves alternate, lanceolate, acute, 6 to 24 inches in length, 2 to 5 inches in width, glabrous, finely feather-veined; petiole short, decurrent, clasping the stem. Flowers few, rarely seen, small, white, 1 inch long at axils of the scarlet sepals which are alternately formed on a tapering, terminal, pendent, showy raceme.

Introduced from Fiji. Not very common; seen only in cultivation.

At the axils of the scarlet sepals appear adventitious leaf buds, turning into small plantlets with descending roots. As the stalk ages and withers these plantlets are borne to the ground and take root; thus reproduction takes place.

**Curcuma longa** Linnaeus.

An erect ginger-like herb. Leaves few, elliptic—oblong, acuminate, membranous. Flowers in an elongated compound spike, with many concave bracts. Rootstocks perennial. Stems annual.

A common plant growing in the lower forest belt, and much esteemed by the Rarotongans. From the grated mature rhizomes is expressed a yellow juice which is used in the preparation of food. This substance is the turmeric of commerce. The native name of this plant is *rea*, on account of the yellow coloring matter.

**Hedychium coronarium** Koenig.

An herb 4 to 6 feet in height. Leaves long, narrow, pointed, smooth on the upper surface, hairy beneath. Flowers in a terminal spike, white, very fragrant. This variety will produce seed.

Common in all the moist valleys, and has become wild. Used for decorating and for stringing into wreaths for personal adornment. Cheeseman recorded it under *Scitamineae*. English names: "garland flower," "white ginger flower," or "butterfly flower." Native name: *kopi*.

**Hedychium flavum** Roxburgh.

An herb 3 to 6 feet in height. Leaves sessile, oblong, glabrous above, hairy beneath. Flowers in a dense terminal spike, pale-yellow, fragrant.

Common in all the valleys and generally cultivated near dwellings for the flowers which are made into garlands and wreaths. Of very early introduction. Native name: *kopi*.

**Zingiber officinalis** Roscoe.

A small reed-like perennial herb, 2 feet high, producing tuberous, aromatic rhizomes. Leaves linear, sessile 6 to 8 inches in length, narrow and clasping the stem. Corolla yellowish-green. Bracts ovate, pale-green. The flower spike or head and the leaves appear on separate stems.

Introduced. A rare plant seen only under cultivation. Commercially known as Ginger. Native name: *kopekai*.

**Zingiber zerumbet** Roscoe.

A stout, erect herb, 10 to 15 inches in height, sprouting from a tuberous, horizontal rhizome. Leaves alternate, lanceolate, entire, acuminate, 1 to 8 inches in length, 0.75 to 1.25 inches in width, thin, both surfaces glabrous or slightly pilose on the under surface; midrib prominent; petiole short. Flowers white, in an oblong foliose head, surrounded by spathe-like dull-green bracts which become dull-red when mature.

Found only at the base of Mount Tukou and Tukuvaive Valley, altitude 1100 feet. Native name: *kopi enua*.

## CANNACEAE

***Canna indica* Linnaeus.**

A plant having a slender, erect stem 2 to 6 feet in height. Leaves oblong, acute, 1 to 1.5 feet in length. Flowers small, red, in a terminal raceme. Capsule glabrous, contains several round, black, hard seeds.

Common weed in the lowlands and along the banks of streams. Cultivated species introduced from New Zealand were also seen, showing several different colors. Native name: *nuaenga*.

## MARANTACEAE

***Maranta arundinacea* Linnaeus.**

An erect perennial herb, 2 to 6 feet in height. Leaves alternate, ovate-oblong, pointed. Inflorescence loose, spreading. Flowers small; corolla white.

Not a common plant. Native name: *tiare aru ra*.

The tuberous rhizomes produce an edible starch known as Bermuda arrowroot.

***Maranta zebrina* Sims.**

Similar to *Maranta arundinacea* Linnaeus, except that the leaves are streaked with white. Flowers white.

Not a common plant. Introduced as an ornamental. The rhizomes also produce an edible starch.

## ORCHIDACEAE

***Cirrhopetalum thouarsii* Lindley.**

A pseudobulbous epiphyte of a rambling habit found growing on trees and old logs. Leaves 3 to 5 inches in length, narrow. Umbels from 3 to 6. Flowers closely arranged on a slender stem about 6 inches in length. Fruit 1 inch long, creamy-yellow, contains numerous minute seeds.

Common on all the mountains above altitudes of 1000 feet.

***Dendrobium dactyloides* Reichenbach f.**

A common grasslike orchid having stiff, wiry stems about 1 foot in length. Leaves alternate, acuminate, about 12 inches in length, parallel-veined, light grass-green in color. Flowers axillary, small, yellow.

Ikurangi, altitude 1500 feet; also on all the other high mountains of the island.

***Habenaria amplifolia* Cheeseman.**

An erect, terrestrial, leafy herb, 8 to 24 inches in height, having acuminate, lanceolate, thin, membranous leaves, 3 to 10 inches in length and 1.5 to 2.5 inches in width. Flower spike erect, sometimes 1 foot in length, with a dozen or more greenish-colored blossoms.

Very common in the dense dark woods, and along the banks of the streams.

**Melaxis resupinata** O. Kuntze.

A terrestrial orchid. Leaves large, ovate, forming a rosette from which there rises, annually, a spike or raceme of green flowers, followed by oblong seed pods.

Common along the dry river bottom in the dense woods.

**Phajus grandifolius** Loureiro.

An erect annual herb, 2 to 4 feet in height at flowering season (June, July). Leaves long and narrow with parallel veins. Issuing from the rhizome is a tall spike of flowers 2 to 4 feet in length, on which appear handsome, alternating, chocolate-colored blossoms.

Common in the woods above 200 feet elevation, and along the banks of the streams in moist valleys. Native name: *nutupa*.

This plant dies down after flowering.

**Saccolabium guamense** Ames.

A small orchid on logs and trees, with distichous, lanceolate leaves and a short flower spike.

Connals Gulch at an altitude of 250 feet, in the district of Titikaveka. Also seen in other valleys. Not common.

**Taeniophyllum asperulum** Reichenbach.

A small orchid. Flowers minute, yellowish-green, on slender peduncles.

Very common in all the valleys above an altitude of 250 feet. Found attached to the moist bark of the native forest trees.

**Vanilla planifolia** Andrews.

A climbing orchid with stout stems. Leaves alternate, thick, fleshy, acuminate, oblong, lanceolate; petiole short. Flowers greenish-yellow.

Not a common plant. To produce the pod or bean, the flowers must be artificially pollinated. The fruit takes several months to mature and is cured by sweating and drying. This constitutes the raw material for commercial vanilla.

**Phajus amboinensis** Blume.

A terrestrial orchid having a slender creeping rhizome. Stem 1 to 2 feet in height. Leaves light-green, elliptic-lanceolate, 10 to 18 inches in length, 2.5 inches in breadth, having 8 to 10 longitudinal threadlike veins, and the petiole 3 to 5 inches in length, clasping the stem. Flowers 4 to 7, on a stout spike issuing from the axil of a leaf; sepals and petals white; throat of the labellum light-yellow in color.

Common at 900 feet elevation near the head of Avana Stream, Ngatangia District; not seen elsewhere. Native name: *nu roa*.

## CASUARINACEAE

**Casuarina equisetifolia** Linnaeus.

A large leafless tree with drooping branches. The pale-green, simple, jointed internodes comprise the foliage. Flowers small ripening into a cone or head.

Common near the seacoast and even high up on the hills.

The hard, tough wood is valuable, and used for many purposes.

## PIPERACEAE

**Peperomia** species.

A small succulent herb of trailing habit, branching at the internodes. Leaves opposite, nearly round, 0.125 to 0.5 inch in length; petiole short. Flowers and fruit not seen.

Common in moist places under rocks, logs, and moss; especially abundant in Connals Gulch, District of Titikaveka, between altitudes of 25 to 250 feet.

**Peperomia** species.

An erect succulent herb, 4 to 8 inches in height. Leaves oblong, entire, obtuse, 0.5 to 1 inch in length; petiole short. Flower spikes slender, terminal, 2 to 4 inches in length.

Common on Maungatea and on the high mountains at an altitude of 1000 feet.

**Peperomia** species.

An herb 2 to 4 inches in height. Leaves small, opposite. Flowers minute on long spikes.

A rare plant seen only on Maungaroa under rocks and logs at an altitude of 1100 feet.

**Peperomia** species.

A strong-growing erect herb. Leaves elliptical, alternate, sometimes opposite, acuminate, 1 to 2 inches in length, 0.5 to 1 inch in width; petiole short; veins prominent. Flower spikes short, generally in pairs at axils of leaves.

Slopes of Maungatea. Not very common.

**Piper latifolia** Forster.

A common shrub with the same habits as *piper methysticum*. Leaves smaller, internodes or joints shorter.

This plant is very abundant in the dense woods, and forms much of the forest cover above an altitude of 500 feet. Native name: *kavakava atua*.

It is not used in making a beverage.

**Piper methysticum** Forster.

A dioecious shrub, 4 to 6 feet in height. Leaves alternate, entire, cordate-ovate, generally glabrous, acuminate at the apex, cordate at the base. Flowers minute, in a drooping axillary catkin.

Native name: *kava*.

From the macerated tuberous roots, a drink (kava) may be concocted.

## CHLORANTHACEAE

**Ascarina lanceolata** Hooker f.

A small, spreading tree. Leaves opposite, lanceolate, serrate, acuminate at both ends, finely-nerved, 2 to 5 inches in length, 0.5 to 1.5 inches in width. Flowers small, greenish-yellow, in a terminal spike.

Common on Ikurangi, Maungaroa, Temanga, and Tekou. Native name: *kaiatea*.

This hardwood tree is found between altitudes of 250 and 1800 feet.

## SALICACEAE

**Salix babylonica** Linnaeus.

A tree of weeping habit, 20 to 30 feet in height, having long slender branches. Leaves alternate, simple, pointed, serrulate, 2 to 6 inches in length. Flowers in loose catkins.

Introduced. English name: Weeping willow.

Cultivated as an ornamental or shade tree; not very common.

## MYRICACEAE

**Myrica** species.

A large spreading tree with alternate, scattered, acute, oblanceolate leaves, 1.5 to 2.5 inches in length. Leaves entire, marginal; serrations irregularly spaced; petiole short.

Government Experimental Garden at Avarua. Only one specimen was seen. Introduced. Rare.

## ULMACEAE

**Celtis paniculata** Planchon.

A small tree about 15 feet in height. Leaves alternate.

A common plant seen in the valley above Ngatangia, and also on the slopes of Maungatea at an altitude of 1000 feet.

When the foliage is bruised it emits a fragrant odor, and is used in the making of wreaths for personal adornment.

## MORACEAE

**Artocarpus incisa** Linnaeus.

A tree 25 to 40 feet in height. Leaves alternate, large, broadly-lobed, or digitate, in some varieties nearly entire. Pistillate flowers compose the large globular head. After fertilization this head increases to about 6 to 10 inches in length, 4 to 8 inches in diameter, and becomes the fruit. Staminate inflorescence composed of a long catkin, generally appears at the same time on the same branchlet as the pistillate.

This tree grows readily in the mountain valleys, and is universally cultivated around the villages of the natives, providing an important article of food. Among the esteemed varieties were: *kuru atu*, *kuru patea*, *kuru tartara*, *kuru maori*, and *kuru peka*. The last-named variety is an interesting one said to have been introduced from the Marquesas; bearing small fruits about 3 inches in diameter, appearing on short peduncles at the axils of the leaves. English name: Breadfruit. Native name: *kuru*.

**Artocarpus integra** (Thunberg) Merrill.

A tall tree with obovate leaves, sometimes oblong and entire. The young leaves seen were 2 or 3-lobed. Fruit is borne on the main stem and the smaller branches, and is composed of an aggregate of pistillate flowers forming an oblong head covered with protuberances; when mature, the size of a large melon.

The pulp is not much used for food, but the oblong or ovate seeds, 1 to 1.5 inches in diameter, are edible when roasted. English names: Jac, Jaca, or Jack fruit.

**Broussonetia papyrifera** Ventenat.

A small tree. Leaves ovate, dentate, entire, acuminate, blade 4 to 8 inches in length; hispid on upper surface; tomentose on the underside; petiole 1 to 2 inches in length. Flowers and fruit not seen.

A rare plant. Native name: *aute*.

This tree is cultivated for its tough bark or fiber which was formerly used in the manufacture of a coarse native cloth.

**Castilloa elastica** Cervantes.

A large tree. Leaves alternate, short-petioled, entire.

Introduced.

This tree produces rubber, but is not grown commercially.

**Cecropia palmata** Willdenow.

A large tree with alternate peltate leaves; blade somewhat rounded in outline, segments or leaflets 7 to 11. Flowers very small. Fruit a collection of fleshy spikes resembling the hand.

Not a common tree. Introduced.

**Ficus elastica** Roxburgh.

A gigantic tree, perfectly glabrous, sending down roots from the branches; trunk supported by high buttresses. Leaves shiny, elliptical; blade 5 to 10 inches in length, nerves parallel. Petiole 0.5 to 2.5 inches in length. Fruit small, in pairs, sessile in the axils of the leaves; when ripe turns a yellowish-brown.

Introduced. Not a common tree. The rubber plant of florists.

**Ficus prolixa** Forster.

A large tree, considered sacred by the natives, and generally cultivated by them near their dwellings. Specimens were seen covering half an acre, and the aerial roots supporting the huge branches presented a very imposing sight. A coarse fibre and a variety of cloth were formerly made from the bark. Native name: *aoa*.

**Ficus rarotongensis** Summerhayes, new species (in litt.).

A large tree, having small, thick, smooth leaves. No flowers or fruit.

The only specimen on the island grew near the road between Avarua and Avatiu.

**Ficus tinctoria** Forster.

A large tree. Leaves alternate, entire, about 6 inches in length, 2.5 to 3.5 inches broad, having a short petiole. Fruit 0.5 inch in diameter at axils of leaves.

Common plant in all districts, and also seen on the highest hills and mountains. Cultivated by the natives about their dwellings. A coarse cloth was formerly made from the tough bark. Native name: *mati*.

**Morus alba** Linnaeus.

A small, unarmed tree. Leaves alternate, large, smooth, acuminate, light-green, edges jagged. Flowers small, monoecious, hanging in axillary catkins. The staminate flowers fall and an aggregate fruit is formed. Pale-purplish in color.

Not a common tree; seen only in private gardens. Introduced. English name: Mulberry.

**Morus** species.

A shrub 6 to 8 feet in height. Branches spreading. Leaves large, cordate, ovate, alternate, acute, crenate, thick, triple-nerved, glaucous on the upper surface, hispid on the underside, 6 to 12 inches in length, 4 to 10 inches in width; sinus oblique at the base; petiole slightly decurrent, 1 to 2 inches in length.

A rare plant growing at the Government Experimental Garden, Avarua. Introduced. Neither flowers nor fruit seen.



## URTICACEAE

**Cypholophus macrocephalus** Weddell.

A shrub 6 to 8 feet in height. Leaves opposite, ovate, serrate, acuminate, 2.5 to 5 inches in length, 1 to 2.5 inches in width. Petiole, stem, and leaves tomentose.

Not a common plant. Seen only in Arorangi District on Mount Maunaroa, at an altitude of between 1500 to 1800 feet.

**Fleurya interrupta** (Linnaeus) Gaudichaud.

An annual nettlelike herb. Leaves alternate, ovate, serrate, deep-green, 3-veined at the base, long-petioled. Flowers in clusters, small, green, on slender peduncles.

A common weed seen in cultivated and waste places.

**Missiessya corymbulosa** Weddell.

A small shrublike tree 6 to 10 feet in height. Leaves opposite, lanceolate, acuminate, upper surface hispid, underside silvery, tomentose. Flowers not seen. Fruit at axils of leaves.

Common on the slopes of the mountains and deep ravines, up to an altitude of 600 feet. *Leucosyke corymbulosa* of Cheeseman's list. Native name: *rautaui*.

**Paratrophis anthophagorum** Bentham and Hooker.

A medium-sized tree. Leaves alternate, shiny, dark-green, 2.5 to 7 inches in length, 1.25 to 3 inches in width; veins prominent; petiole slender.

Not a common plant. This tree grows preferably in damp places, in dense woods at an altitude of about 1500 feet.

The bark was formerly made into a coarse rope. When cut, both stems and bark emit a milky substance.

**Pilea bisepala** St. John, species nova (Pl. III; fig. 2).

Herba erecta succulenta 30-100 cm. alta ramosa, foliis oppositis, laminis pallidiviridibus, ellipticis vel suborbicularibus obtusis vel interdum retusis basim rotundatis vel nonnunquam subcordatis 10-32 mm. longis, 6-21 mm. latis, venis pinnatis, floribus terminalibus capitatis subinvolutis, floribus masculis campanulatis 1-6 longe pedicellatis in centro receptaculo, sepalis 4 ellipticis, antheris 4 sagittatis, floribus femineis multis breve pedicellatis, sepalis 2 lanceolatis fimbriatis ad basim saccatis glandulosis, stylis minutis vel nullis, achaeniis lanceolatis lenticularibus 0.7 mm. longis.

An erect herb, succulent, glabrous, glaucous, 30 to 100 cm. tall. Stem smooth, pale-green, transparent, very succulent, weak, at base when fresh about 25 mm. in diameter, when dried 10 mm. in diameter, the branchlets 0.5 to 1 mm. in diameter. Branches numerous, ascending, arising from one or both axils of the node; leaf-bearing only on the upper third or less. Leaves opposite, usually exceeding the internodes; petioles divergent, 5 to 21 mm. long; blades pale-green, thick, fleshy, oval, at times, oblong-elliptic or suborbicular, obtuse or sometimes retuse, rounded at base or sometimes subcordate, 10 to 32 mm. long, 6 to 21 mm. wide, the clear translucent margin thickened, the venation pinnate, the midrib prominent for half or three-quarters of the distance from

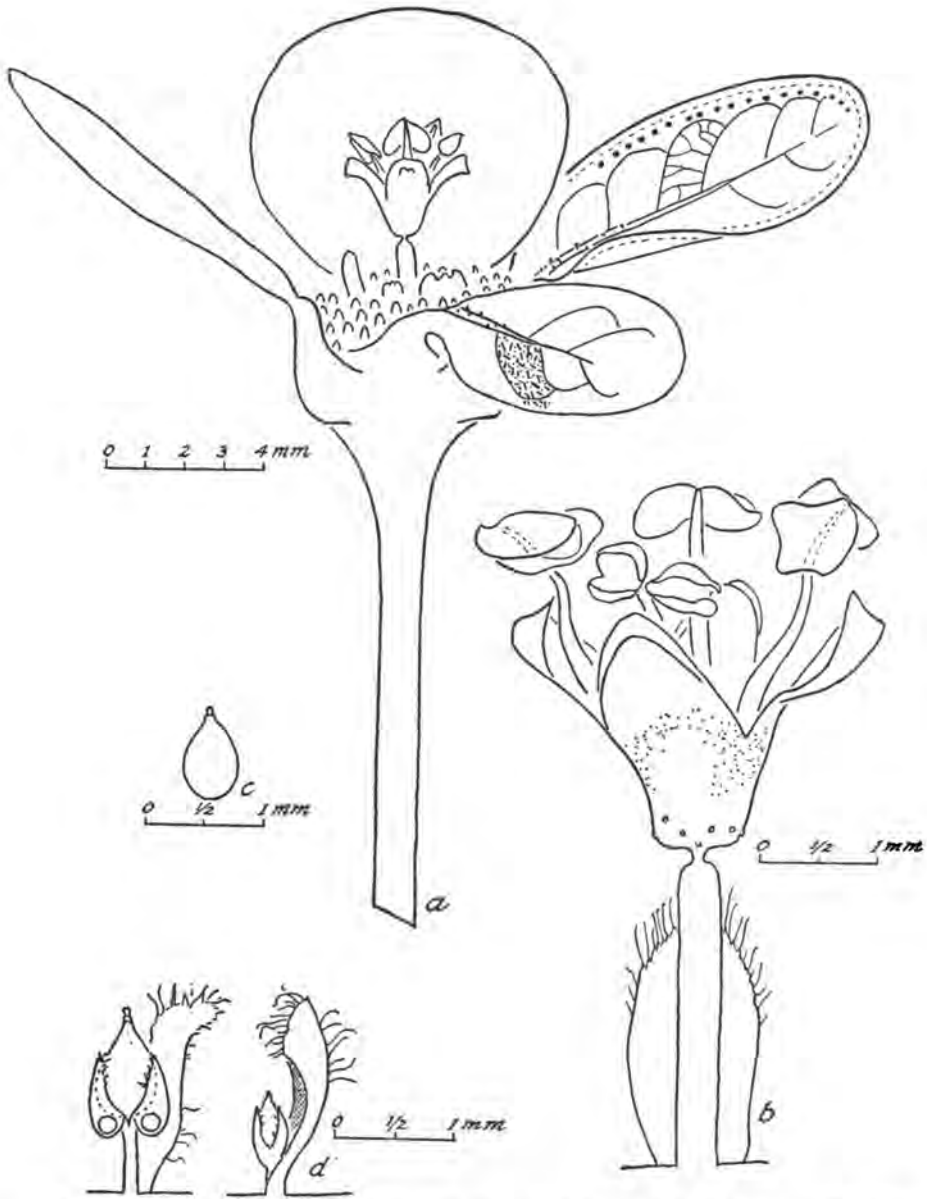


FIGURE 2.—*Pilea bisejala* St. John, new species: *a*, terminal bud showing subtending leaves; *b*, staminate flower; *c*, achene; *d*, old and young pistillate flowers.

the base, the divergent lateral veins nearly invisible, the midrib with scattered, short, dark glands near the base, the entire upper surface white-ridged with short linear or forking cystoliths, the green mesophyll containing near the leaf margin an irregular row of rounded yellowish glands which apparently communicate to the lower surface at depressed spots several cells wide. Inflorescence terminal on the branches, closely subtended by a pseudo-involucre of two pairs of subsessile or sessile, decussately opposite leaves. Flower heads monoecious. Flowers all subtended by pale-brownish, fimbriate, oblong-spatulate scales. The 1 to 6-staminate flowers central, on stout, cylindrical pedicels 2 mm. long; calyx campanulate, 4-parted, black-stalked, glandular at base, yellowish, glandular, dotted at distal end of tube and around the base of each sinus, the sepal-lobes broadly elliptic, strongly cucullate, the 4 stamens opposite the sepal-lobes, all attached at the center, filaments stout, dark except at the base; anthers sagittate, basifixed; anther sacs dehiscing along the sides for the full length. After the shedding of the pollen, the sacs are conspicuously light and membranous, with numerous black dots. Pistillate flowers numerous; about 75 to 150, surrounding the central staminate flowers and forming a flat or slightly convex disk; pedicel slender, becoming 0.5 mm. long; perianth parts 2, distinct, broadly lanceolate, fimbriate, concave, at base strongly saccate and semicordate, enclosing a large, rounded, yellowish gland. Pistil lanceoloid, slightly compressed, firm, smooth, shining, pale-brownish, 0.7 mm. long; style minute or none. Stigma small and tufted. Fruit an achene, lanceoloid, about 0.7 mm. long, lenticular in cross section.

Rarotonga, on rocky cliffs, base of Maungatea, altitude 600 feet. G. P. Wilder. Type, B. P. Bishop Mus. no. 788.

This plant is obviously a member of the Urticaceae, but in order to find its precise systematic position, I had to make not only a careful microscopic study of its floral morphology, but also a comparison and evaluation of the generic characters of a group of related genera. *Lecanthus* has, as divergent characters, a 3-parted perianth in the pistillate flowers, the ovate or ovate-lanceolate leaves opposite and unlike, 3-nerved, and toothed. On the whole, this genus seems but feebly distinct from *Pilea*. In habit, as well as in technical morphological characters, the plant from Rarotonga is closest to the genus *Pilea*. This genus is characterized by a 2-parted pistillate perianth with scale-like staminodia, the staminate perianth fleshy, white, or rose, the pistil rudiment barrel-shaped, and, in most species, the leaves 3-nerved, unlike, and upon unequal petioles. The plant from Rarotonga differs in all these particulars, but when they are evaluated most of them do not seem of major importance. The degree of development of staminodia in the pistillate flowers and of the pistil rudiment in the staminate flowers, varies from species to species, hence, is not of generic value. Nor do the texture and color of perianth or the unequal size of leaf blade or stalk appear of any more importance. Commonly the species of *Pilea* have their leaves 3-nerved from the base. This is true for so many species that it would seem to be of importance. Yet, *Pilea microphylla* (Linnaeus) Liebmann, and a few related species, have definitely pinnately-veined leaves, so the type of venation lacks value as a generic character. Finally, only one important character remains to differentiate *Pilea* from the plant Rarotonga—the 3-parted perianth of the pistillate flowers. The

number of perianth parts is considered of major importance and is used as a key character to separate *Pilea* from *Achudemia* and *Lecanthus*. In order to make a consistent classification, it seems necessary at first to describe a new genus to receive the Rarotongan plant. Not wishing to found a genus upon a single character, I investigated all the available related species. I found that even *P. microphylla* has in the pistillate flowers 3 unequal perianth segments, and *P. peploides* (Gaudichaud) Hooker and Arnott, has 2 unequal segments. The new plant had 2 equal perianth segments in the pistillate flowers. Variability is allowed in *Pilea* in the number of perianth parts of the staminate flowers, from 2 to 4, usually 4. My studies have established that there is a similar variation in the number of perianth parts of the pistillate flowers. Instead of erecting a weak genus that will later be knocked down, it seems logical to extend the limits of the existing genus. Hence, I propose that the generic characters of *Pilea* be amended to read: "perianth parts of the pistillate flowers 2 to 3, equal or unequal."

When once established as a member of the genus *Pilea*, it is proper to contrast the new species with its closest relative. *Pilea microphylla* (Linnaeus) Liebmann has the leaves unequal, 1.5 to 5 mm. long, the base often cuneate attenuate, the cystoliths forming long transverse ridges, the petioles 1 to 5 mm. long, the stems weak and slender, and the cymes several, occurring in almost all of the axils. On the other hand, *Pilea bisejala* St. John has the leaves equal, 10 to 32 mm. long, the base rounded or sometimes subcordate, the cystoliths forming short linear or forking ridges, the petioles 5 to 21 mm. long, the stems stout and fleshy, and the cymes only terminal.

An unpublished species is also a close relative. It was collected on the island of Rapa by Stokes, numbered 245, and will soon be published as a new species by Dr. F. B. H. Brown. It has the stem up to 40 cm. in height; the petioles about 10 mm. in length; the blades acute or obtuse, cuneate at the base, entire to obscurely crenate, up to 25 mm. in length, 16 mm. in width; the flowers dioecious (?) in the upper axils or terminal, short pedicellate to sessile; and the staminate perianth 2 mm. in height, the lobes each with a 2-lobed protuberance. In contrast, *P. bisejala* has the stem 30-100 cm. in height; the petioles 5-21 mm. in length; the blades obtuse or retuse, rounded or subcordate at base, entire, 10-32 mm. in length, 6-21 mm. in width; the flowers monoecious, in terminal sessile heads; and the staminate perianth 3 mm. in height, the lobes cucullate.

### **Pipturus velutinus** Weddell.

A shrub or small spreading tree, 5 to 10 feet in height, the young branches gray-tomentose. Leaves alternate, ovate, crenate, acute, upper surface smooth, underside silvery-tomentose. Flowers sessile in close heads.

Common all around the island at the lower elevations. Native name: *orongo*.

The bark of this plant is used to make a native twine.

**Procris pedunculata** (Forster) Weddell.

A small succulent herb, 1 to 2 feet high. Leaves long, narrow, alternate, acuminate, entire, the margins wavy; petiole short. Male flowers white, small, in a corymbose head. Fruit 0.25 inch in diameter, at the axils of the leaves; red when ripe; resembles a strawberry.

Common on all the mountains at the base of trees and on rocks at an altitude of 500 feet.

PROTEACEAE

**Leucadendron argenteum** R. Brown.

An ornamental shrub. Branches densely clothed with narrow, entire, acute, sessile, lanceolate leaves, 2.5 to 4 inches in length, 0.5 to 0.75 inches in width. The upper and lower surfaces covered with a silvery tomentum, the leaves ending with a hardened apex.

Found only in the garden of the Governor at Ngatipa, Avarua. Very rare.

Introduced from New Zealand. English name: Silver tree.

**Grevillea robusta** Cunningham.

A tall tree with erect-growing branches. Leaves alternate, twice-pinnatifid, narrow, and pointed, pubescent. Flowers in a raceme, golden-yellow. Fruit broad, 0.5 inch long, containing 1 or 2 winged seeds.

Not very common. Introduced. Seen in several of the villages.

LORANTHACEAE

**Loranthus insularum** A. Gray.

A parasitical shrub. Leaves opposite, rather thick, entire, acute at both ends. Flower golden-red, with several stamens. Fruit a berry about 0.5 inch long.

Observed on *Fitchia speciosa* on the slopes of Mount Tukou. Rare specimens were also taken from the branches of *Evodia* species, at the head of Avana stream. Native name: *pauma*.

This parasitical shrub attaches itself to native species of forest trees.

**Viscum articulatum** Burmann.

A leafless, branching parasite. Joints thick and fleshy, broader at the top than at the base. Flowers green or yellowish.

Avana Stream, Ngatangiiia, at an altitude of 900 feet.

This parasite attaches itself to several of the native species, especially *Fitchia speciosa*.

## BALANOPHORACEAE

**Balanophora (Polyplethia) wilderi** Setchell, new species (Pl. IV).

Rhizome slender at emergence from the root of the host, soon increasing in size; cuneate applanate, becoming also dilated and branching dichotomously, occasionally cristate, forming a flattened mass, 4 to 5 cm. high and 5 to 6 cm. broad, the ultimate branches 1 to 1.5 cm. thick and 1 to 2 cm. long, superficially pustulate, with occasional stellate clusters of pustules regularly spaced; fertile stems emerging from the branches of the ultimate branches of the rhizomes, 5 to 7 cm. high, 0.5 cm. thick, cylindrical below, swollen above into a spadix about 1 cm. in diameter, monoecious, with pistillate flowers below and staminate flowers above; pistillate flowers archegonium-like, with swollen but short-pedicelled, basal portion and slender neck of 4 twisted series of cells, either free or attached laterally to the spadicels. Spadicels orbicular, broadly pedicellate, with the outer walls of the cells of the upper surface smooth, staminate flowers occupying half (or more) of the spadix, crowded among the papilliform, swollen solid bracts of equal height and diameter with the staminate flower buds; perianth 3 to 5 divided, with thick, ovate-cucullate lobes, internally sculptured through pressure of the synandria. Synandria single in each flower, horizontally compressed, short-stalked, convex above, and bearing 10 to 13 pauciseriate, polygonal thecae.

A slender monoecious species with the staminate flowers above differing in this character from all others of the genus. It is much more slender than *Balanophora (Polyplethia) pallens* Solandar, Setchell, of Tahiti. It is parasitic on the roots of *Ficus*.

## POLYGONACEAE

**Antigonon leptopus** (Hooker and Arnott) Stuntz.

A tuberous-rooted, slender tendril climber. Leaves alternate, entire, glabrous, cordate, acuminate, 3 to 5 inches in length. Flowers rose-pink, in racemes with terminal tendrils.

Cultivated in all districts. Common vine along fences, arbors, and stone walls.

**Coccoloba uvifera** Linnaeus.

A small tree with spreading branches. Leaves alternate, entire, glossy, leathery, glabrous, heart-shaped, with margins slightly revolute, 3 to 5 inches in length, 5 to 7 inches in width. Flowers in a raceme, erect, fragrant. Fruit, a small berry, hangs in large bunches, edible, having an acid-sweetish flavor.

Not a common tree. Introduced. English name: Sea grape.

**Muehlenbeckia platyclados** Meissner.

A small erect plant with alternate, broad, ribbonlike, glossy, flat leaves, which thicken and become the branches. Flowers in clusters along the sides of the flat stems. Fruit not seen.

Rare. Cultivated as an ornamental. Introduced.

## AMARANTACEAE

**Achyranthes aspera** Linnaeus.

An erect herb. Leaves opposite, elliptic-oblong, slightly pubescent on the under surface, acuminate at both ends. Stems quadrangular. Flowers green, in a terminal spike. Seeds awnlike.

Common along the sandy stretches near the seashore. Native name: *piripiri*.

**Alternanthera bettzichiana** Regel.

A small, erect, glabrous border plant. Leaves narrow, spatulate; apex somewhat mucronate. Flowers sessile, conspicuous.

An introduced common plant found in private gardens.

**Amarantus viridis** Linnaeus.

A small erect herb. Leaves alternate, entire, having fleshy stems. Flowers green, sessile, arranged on a terminal spike.

A troublesome weed found everywhere in cultivated areas.

**Celosia cristata** Linnaeus.

An annual. Leaves alternate, entire, acute, glabrous, ovate, 2 to 3 inches in length, about 1 inch in width. The inflorescence a bright-red, crested spike. Seeds small, black, shiny.

An introduced garden plant. Not very common. Seen only under cultivation.

**Cyathula prostrata** (Linnaeus) Blume.

A small erect herb. Leaves opposite. Stems 4-sided, wiry. Flowers, a terminal spike; followed by small, burlike seeds.

Common on sandy stretches near the seashore in all districts.

**Gomphrena globosa** Linnaeus.

A small, branching, pubescent annual. Leaves opposite. Flowers in a dense globular head; seen in three colors: crimson, rose and white.

Common about dwellings and cultivated gardens, also as an escape by the roadsides. English name: Bachelor's-button.

## NYCTAGINACEAE

**Boerhaavia diffusa** Linnaeus.

A troublesome weed with many branches. Leaves linear, ovate, or rounded, acute, the base cordate. Flowers small, jointed on the pedicle, perianth tubular. Fruit 5-ribbed, covered with a sticky substance.

Maungatea, at an altitude of 1500 feet. Also on the summit of Mount Tukou. Not a very common plant. Native name: *rima*.

**Bougainvillea glabra** Choisy.

An introduced glabrous shrub. Leaves alternate, entire, ovate, acuminate, bright-green. Flowers small, enclosed in 3-leafed, rose-red bracts, which constitute the decorative part of this plant.

Introduced. Common under cultivation in many gardens.

**Ceodes umbraculifera** Forster.

A very large tree with huge spreading branches and large buttresses. Leaves opposite, oblong, glaucous, pale-green, in whorls at ends of branches, 3 to 6 inches in length, 2 to 4 inches in width, pointed at the tip. Flowers dioecious, in a terminal cluster, small, white. Fruit not seen.

Common along the strand, and in the low places near the sea. Native name: *hukatea*.

**Mirabilis jalapa** Linnaeus.

A quick-growing herb. Leaves ovate-lanceolate, acuminate, entire, having a short petiole. Flowers funnel-shaped, very fragrant, opening in the late afternoon. Several colors seen. Fruit a hard black-ribbed seed.

Common everywhere. Known as the Four o'clock flower.

**Pisonia inermis** Forster.

A small soft-wood tree. Leaves obovate, acuminate, entire, 4 to 8 inches in length, 2 to 3.5 inches in width; petiole 0.5 inch long. Flowers in a loose panicle. Fruit 5-ribbed, covered with a sticky substance.

Common on all of the mountains above an altitude of 400 feet.

AIZOACEAE

**Sesuvium portulacastrum** Linnaeus.

A prostrate, succulent herb. Leaves opposite, linear or oblong, somewhat fleshy. Flowers axillary, solitary, rose-colored. Capsule oblong, 3- to 5-celled.

Ngatangiia Harbor and on the beach near Black Point. Rare, confining itself to salt marshes. English name: Sea purslane.

PORTULACACEAE

**Portulaca lutea** Forster.

A low, prostrate, perennial herb, with fleshy obovate leaves. Flowers yellow.

Common in open pastures, in lowlands, and near the sea. Native name: *pokea*.



**Portulaca oleracea** Linnaeus.

A common weed in sandy locations and along the roadsides. Leaves spatulate, opposite, thick, dull-green or reddish in color. Flowers small, yellow, open only during the day.

The Pigweed of gardens and cultivated fields. Native name: *pokea*.

## BASSELLACEAE

**Boussingaultia basseloides** von Humboldt, Bonpland, and Kunth.

A strong-growing vine with thick, succulent stems. Leaves alternate, entire, wavy-margined. Flowers small, in a long axillary, terminal raceme.

Common on stone walls and fences. English name Madeira vine.

## MAGNOLIACEAE

**Magnolia grandiflora** Linnaeus.

A tall evergreen tree, 15 to 25 feet in height. Leaves thick, oblong, 4 to 8 inches in length, glossy on the upper surface, rusty-brown on the underside. Flowers with large milky-white petals, very fragrant.

Introduced. Rare. Seen only under cultivation.

## ANNONACEAE

**Annona muricata** Linnaeus.

A small, evergreen tree. Leaves alternate, obovate, oblong, acute, leathery in texture, smooth, glossy-green. Flowers large; exterior petals green, thick, and fleshy; inner petals smaller, whitish-green. Fruit large, fleshy, ovate, dark-green; skin bearing soft fleshy spines; pulp white, cottonlike, juicy, slightly acid, imbedded with numerous brown seeds 0.5 inch long.

An introduced plant cultivated in gardens; never growing wild. English name: Soursop.

Both leaves and flowers, when bruised, emit an unpleasant odor.

**Annona reticulata** Linnaeus.

A small deciduous bushy tree. Leaves alternate, entire, acute, oblong-lanceolate, dark-green, with short petiole. Flowers in axillary clusters, having 3 green, oblong, linear petals. Fruit 2.5 to 4 inches in diameter; surface divided into many hexagonal areoles.

Of early introduction. Extensively grown by the Rarotongans. Is seen in every garden and occasionally growing wild, as an escape, in the woods. English names: Sweetsop, or Sugar-apple. Native name: *taputapu*.

***Annona squamosa*.**

A small tree with spreading branches. Leaves alternate, acute, lanceolate, entire, pale-green, 3 to 7 inches in length, 1 to 1.25 inches in width. Flowers pale greenish-yellow in axils of the leaves, in clusters, only one flower becoming fertilized and forming a fruit. Fruit 3 to 6 inches in length, heart-shaped; skin yellowish-red when ripe, covered with a glaucous bloom; pulp yellowish-white, very sweet, with a fine flavor, containing many seeds.

Introduced. Not so common as *Annona reticulata*. English names: Custard apple, or Bullock's heart. Native name: *taputapu*.

***Canangium odoratum* (Lamarck) Baillon.**

Very large tall tree, 30 to 60 feet in height. Leaves opposite, acute, entire, narrow, bright-green; petiole short. Flowers greenish-yellow, with 6 linear petals, very fragrant. Fruit about the size of a small olive, clustered, maturing in June.

Common everywhere under cultivation in native gardens. Also seen growing wild, escaped from cultivation. English name: Ilang ilang. Native name: *moto oi*.

The flowers are used in scenting coconut oil, and are also strung into garlands for personal adornment.

## LAURACEAE

***Cassytha filiformis* Linnaeus.**

A twining parasitical herb, adhering to host plants. Stem and leaves bright-yellow, the latter reduced to minute scales. Flowers small, axillary. Fruit about 0.25 inch in diameter.

Found in many places near the seacoast; especially abundant near the wireless station, where it has become a noxious weed.

***Cinnamomum camphora* Nees von Esenbeck.**

Large tree. Foliage compact; leaves alternate, acuminate, ovate-elliptical. Pinkish in young growth. Flowers small in axillary panicles. Fruit a drupe the size of a pea.

A rare tree, seen only in private gardens.

***Cinnamomum zeylanicum* Nees von Esenbeck.**

An evergreen tree. All parts aromatic. Leaves opposite, thick, coriaceous, glabrous, 3 to 5 inches in length; upper surface shiny, underside dull-green; young, tender leaves pinkish. Flowers in a small terminal panicle. Fruit dark-purple, ellipsoid, 0.5 inch in length.

***Persea americana* Miller.**

A large tree growing in the deep valleys, with peculiar red stems and leaves with red veins. Flowers red, fruit said to be of poor quality.

A seedling Avocado introduced from Tahiti. Native name: *apoka*.

## HERNANDIACEAE

**Hernandia moerenhoutiana** Guillemain.

A tall, stately, forest tree. Leaves thick, alternate, entire, triple-nerved, midrib prominent. Flowers in panicles. Fruit a single seed covered with a loose balloonlike, fleshy involucre.

Common tree in the low forest belt. English name: Jack-in-the-box.  
Native name: *turina*.

**Hernandia peltata** Meissner.

A large tree with acuminate, ovate, peltate leaves on long petioles. Nerves prominent, feather-veined. Flowers unisexual in panicles clustered on the ends of the branches. Fruit a single black seed covered with a loose balloonlike, white, fleshy sac; often tinted with red, and open at its lower end.

A common tree in all the districts from sea level to an altitude of 500 feet.  
Native name: *puka*.

The wood is very light, and of little value.

## CRUCIFERAE

**Cardamine sarmentosa** Forster.

A glabrous annual 6 to 12 inches in height. Some leaves pinnate on long petioles. Flowers small, white. Seed pod linear, erect.

A common weed of the gardens. Used medicinally by the Rarotongans.  
Native name: *toatoa*.

**Senebiera pinnatifida** De Candolle.

A low-growing herb branching from the base. Flowers white, small, the pod shorter than the pedicel.

Common in all the districts. It is known as Pepper-grass and is found growing in wet places along the mountain streams and by cultivated taro patches.

**Lepidium piscidium** Forster.

A small hollow-stemmed glabrous herb. Leaves alternate, entire, elliptical, 1 to 1.5 inches in length, 0.5 to 0.75 inches in width, acute at both ends, tapering into a short petiole. Flowers small, white, arranged along a terminal spike, flat, 2-celled, on a slender peduncle.

Common near the sea.

## CAPPARIDACEAE

**Capparis sandwichiana** De Condolle.

A sprawling shrub. Leaves entire, oblong, rounded at both ends. Flowers axillary, white, with many stamens. Berry oblong, 1 to 2 inches in length, 0.75 inch in width, containing many seeds.

A rare plant, found only on the small island of Motu Tapu, at the entrance to Ngatangia Harbor.

This plant is sometimes seen climbing over rocks. It has a very strong pungent odor.

**Lonicera japonica** Thunberg.

A climbing herb. Leaves opposite, ovate, oblong, entire, pubescent, acuminate; petiole short. Flowers short-pedicelled, fragrant, white, changing to yellow.

Cultivated as an ornamental. Not common.

**Polanisia icosandra** (Linnaeus) Wight and Arnott.

An erect herb, leaves digitate, stems and petioles prickly; leaflets covered with a sticky pubescence. Flowers in terminal racemes.

A common rapidly-spreading weed, about Avarua near the sea. Also seen in other districts. *Cleome viscosa* of Cheeseman's list.

CRASSULACEAE

**Bryophyllum pinnatum** (Lamarck) Kurz.

A glabrous, erect, succulent herb, 2 to 3 feet in height. Leaves opposite, fleshy, ovate, deeply crenate. Flowers in loose panicles, green, tinged with reddish-yellow.

Common along the roadway and in rocky places; especially abundant in the Avatiu District, but also seen elsewhere. *Bryophyllum calycinum* of Cheeseman's list. Native name: *ngangaere toka*.

PITOSPORACEAE

**Pittosporum rarotongensis** (Cheeseman).

A tree, 25 feet high. Leaves alternate, lanceolate, 3 to 6 inches long, glabrous and strongly aromatic. Flowers small, petals yellow, in terminal cymes. Fruit about 1 inch in diameter, round, contains some 30 to 50 orange-colored seeds.

Collected at Tereora, between 300 to 700 feet elevation. Common on the dry hills, in the interior of the islands. Native name: *kava kava*.

CUNONIACEAE

**Weinmannia rarotongensis** Cheeseman.

A medium-sized tree with spreading branches. Leaves opposite, lanceolate, crenate, bright shiny-green; petiole short. Flowers in a terminal panicle, white, fragrant. Fruit not seen.

Common forest tree growing at an altitude of 1000 feet. Native name: *kaiatea*.

## ROSACEAE

**Eriobotrya japonica** Lindley.

A small evergreen tree 6 to 10 feet in height. Leaves alternate, thick, oblong, remotely-toothed, crowded at ends of the branches; upper surface shiny, underside rusty-tomentose. Flowers white. Fruit appears in clusters, pear-shaped, yellow, 1 to 1.5 inches long with 1 or 2 large seeds.

Under cultivation in a few localities. Not very common. English name: Loquat.

The acid pulp has an agreeable flavor.

**Osteomeles anthyllidifolia** Lindley.

A small, stiffly-branching shrub. Leaves impari-pinnate, 2 inches long, with 10 pairs of leaflets covered with a grayish tomentum. Flowers white, in panicles. Fruit white, globose, with a persistent, extended calyx.

Common on the dry hills up to an altitude of 600 feet.

**Pyrus bretschneideri** Rehder.

Medium-sized tree. Leaves alternate, ovate, acuminate, margins serrate. Flowers have 5 petals, white. Fruit globose-ovoid, 1 inch long; peduncle long; yellow when ripe, and dotted with numerous pale dots; flesh firm, sweet, edible. Seeds few.

A rare tree growing in a private garden at Arorangi. Introduced.

## LEGUMINOSAE

**Abrus precatorius** Linnaeus.

A tropical climber. Leaflets oblong, in numerous pairs, blunt. Flowers white, small, in dense racemes. Corolla pea-shaped. Fruit a bean which contains many bright-red round seeds with a black spot.

Common under cultivation, as well as escaped to the woods. Native name: *piti piti mata*.

The seeds are strung into necklaces for personal adornment.

**Acacia farnesiana** Willdenow.

A branching shrub 6 to 10 feet high, generally glabrous. Stems armed with stout spines. Leaves with 4 to 6 pinnae. Leaflets about 0.5 inch long. Flowers fragrant, yellow, in a globular head. Pods thick, containing a sticky substance in which are embedded small, hard, brown seeds.

Growing at Avarua and Avatiu. Native name: *titima*.

**Adenanthera pavonina** Linnaeus.

A large tree with bi-pinnate leaves. Leaflets generally 13, ovate, obtuse, glabrous on both sides. Flowers small, in axillary racemes, white and yellow-colored in the same cluster. Fruit numerous, consisting of twisted pods containing red, hard, lens-shaped seeds.

Not a very common tree; occasionally seen about dwellings. Introduced.

The seeds are strung for necklaces and used in other ways for ornaments.

**Bauhinia monandra** Kurz.

A small deciduous tree with slender spreading branches. Leaves binnate, broad, two-lobed, 3 to 4 inches across, 8 to 10-nerved. Flowers in simple, terminal, or axillary racemes; petals 5, rose-colored, variegated with red and yellow. The fruit or pod is 6 to 8 inches long and contains several flat seeds.

Branches of this tree were used as stakes on which to train the vanilla vine. The young tender leaves are employed medicinally by the Rarotongans. Native name: *pini*.

**Albizzia lebbek** (Linnaeus) Bentham.

A medium-sized, unarmed, deciduous tree with alternate leaves, 4 to 8 pinnae, with 10 to 18 bi-pinnate sessile leaflets 1 to 1.5 inches in length. Flowers greenish-yellow in short, axillary, globular heads. Fruit a large, flat, yellow pod without pulp, contains several seeds.

Common under cultivation about dwellings and planted as a shade tree. A fine specimen grows near the Royal Theater.

When mature and dry the fruit rattles in the wind with a peculiar rustling sound.

**Caesalpinia crista** Linnaeus.

A shrub having climbing branches, armed with sharp prickles along the stems and leaves. Leaves abruptly bi-pinnate, pinnae in 4 to 6 pairs. Flowers yellow. Pods flat, broadly ovate-oblong, in clusters, 2.5 inches in length; covered with prickles. Seeds generally 2, hard, of a gray color, nearly round.

Seen only in Tupapanui Valley in the dry section. Not a common plant. Native name: *tartara moa*.

**Caesalpinia pulcherrima** (Linnaeus) Swartz.

Shrub 6 to 8 feet in height with spreading branches armed with numerous stout prickles. Leaves glabrous, delicate evergreen, having 12 to 18 pinnae, 18 to 24 oblong leaflets. Flowers gaudy-red or orange-colored, in a terminal raceme at the end of the young growth. Pods 2 to 4 inches long, flat, ovate, containing several seeds.

English name: Pride of Barbados.

**Cajanus indicus** Sprengel.

An erect shrub. Leaves tri-foliolate, branches slender. Leaflets entire, oblong-lanceolate, upper and lower surfaces covered with a silky down. Flowers yellow, veined with red, forming a terminal panicle. Pod 2 to 3 inches in length, 0.75 inch wide, containing several edible seeds.

Cultivated on the lowlands about dwellings. Introduced. Known as Pigeon peas.

**Canavalia galeata** Gaudichaud.

A strong twining herb. Leaves pinnately tri-foliolate; leaflets ovate, acuminate, entire, glabrous. Flowers purplish or pink. Pod coriaceous, oblong, 3 to 4 inches long, tricarinate, containing 3 to 5 chestnut-colored, ovoid, subcompressed seeds.

Common on the lowlands and along the seashore. It is to be found climbing trees and rocks. *Canavalia ensiformis* of Cheeseman's list.

**Canavalia sericea** A. Gray.

A trailing prostrate strand herb. Leaves tri-parted; leaflets ovate, both upper and lower surfaces covered with an ashy-gray tomentum. Flowers brilliant scarlet. Pod 3 to 5 inches long, light-brown in color; contains several chestnut-colored seeds.

Common along the strand. Native name: *pohue tai*.

**Cassia alata** Linnaeus.

A shrub 4 to 6 feet high. Branches thick, brittle. Leaves glabrous, subsessile, abruptly pinnate; leaflets minutely mucronate. Flowers yellow; venation prominent. Pod membranous with a broad wing down the middle of each valve, 3 to 5 inches long, contains 50 or more small oblong seeds.

Not a common plant. Seen only in private gardens.

**Cassia glauca** Lamarck.

An erect shrub 4 to 10 feet tall. Leaves glabrous, pinnate; leaflets arranged in pairs, ovate, entire. Yellow flowers in axillary racemes. Fruit not seen.

Introduced as an ornamental.

**Cassia occidentalis** Linnaeus.

A glabrous ill-smelling weed 2 to 4 feet high with abruptly pinnate leaves, a prominent gland at the base of the petiole. Leaflets 4 to 6 pairs, ovate-lanceolate, acute. Flowers yellow, pedicelled at axils of leaves. Pod linear, slightly curved, flat, contains many small seeds.

Common weed found everywhere in pastures on the lowlands. Native name: *parenga*.

The leaves are used medicinally. The bark from the roots is said to be a cure for certain forms of skin affections.

**Ceratonia siliqua** Linnaeus.

An evergreen tree. Leaves pinnate; leaflets in 2 or 3 pairs, oval, obtuse, entire, dark-green. Neither flowers nor fruit seen.

Rare, seen only in Government Experimental Garden. Known as St. John's bread, on account of its large edible pod.

**Clitoria ternatea** Linnaeus.

A hardy vine, having herbaceous stems. Leaves with 2 to 5 pairs of ovate blunt leaflets. Flowers solitary, blue or white in color, peduncles short. Pod linear, pubescent, flat; seeds small.

Introduced as an ornamental.

**Crotolaria angulosa** Lamarck.

An erect annual shrub having four-sided branches and stems. Leaves simple, entire, of various shapes, pale-green; glabrous. Flowers white in a raceme, pods 1.5 inches long, glabrate and containing many small seeds.

Introduced. Not a common plant.

**Delonix regia** (Bojer) Rafinesque-Schmaltz.

A medium-sized tree; having spreading branches. Leaves bi-pinnate, 1 to 2 feet long, 10 to 20 pairs of pinnae, each pinna with many small oval leaflets. Flowers bright-scarlet, in large racemes, 5 petals, the upper petal striped with yellow. Pod flat, strap-like, 8 to 20 inches long. Seeds oblong, brown with gray markings.

Ngatipa, Avarua. Introduced very early. Fine specimens are seen along the roadways, and at the residence of the Governor. Formerly known as *Poinciana regia*.

**Derris elliptica** (Roxburgh) Bentham.

A strong climber having 1 to 3 pairs of pinnate leaves, ending in an odd leaflet; leaflets 2 to 4 inches long, 1.5 to 2.5 inches wide, smooth, acuminate, petiole short. Flowers are small on a spike at axils of leaves.

Introduced from New Guinea. Grows near the beach; sometimes cultivated in the valleys and near dwellings.

This plant is cultivated for its roots from which is extracted, after macerating, a milky fluid, used to stupefy fish. Native name: *vai rakou papua*.

**Desmodium gangeticum** De Candolle.

A sub-erect weed, 1 to 2 feet high. Leaves lanceolate, entire, acute; venation prominent; petiole 0.5 inch long. Flowers in a terminal spike. The fruit pod consists of several sections joined together and covered with sticky hairs, which cause the pod to adhere to whatever it touches.

Not a very common plant; seen only at Avarua.

**Desmodium heterocarpum** De Candolle.

An erect herb sometimes climbing. Leaves opposite, with three leaflets broadly ovate. Flowers small, pink, or sometimes white, clustered on a terminal raceme. Seed pod sessile, covered with a sticky adhesive substance.

Common everywhere, all districts of the island. *Desmodium polycarpium* of Cheeseman's list. Native name: *piri piri*.



**Dolichos lablab** Linnaeus.

A strong twining vine. Leaves glabrous, 3-divided, or pinnately-trifoliate; leaflets triangular-ovate 2.5 to 3.5 inches long, entire, acute. Flowers white on a short pedicle. Fruit a small pod 2 to 3 inches long, flat, usually smooth. Seeds about 4.

Valley of Avana, Ngatangiia; not a common plant.

The beans are edible either raw or cooked. English name: Bonavist.

**Entada phaseoloides** (Linnaeus) Merrill.

A spineless, woody climber. Leaves bi-pinnate with 2 or 3 pairs of pinnae, 3 to 4 pairs of leaflets, obovate-oblong, acute at the base. Flowers yellow, very small, sessile, crowded on long pedunculate axillary spikes. Pod straight, flat, compressed, jointed, 3 to 8 feet long; seeds 2 inches in diameter, mahogany-colored, smooth, and shiny.

Common in all the districts throughout the island. Covers the trees of the middle forest with its snakelike branches. Potable water flows from the large stems after they are cut. Native name: *kaka vai*.

**Erythrina crista-galli** Linnaeus.

A shrub or small tree with spiny stem and trunk. Leaves alternate; leaflets ovate-oblong, entire. Flowers large, brilliant red. Fruit a pod containing hard, smooth, red, ovoid seeds.

Introduced. Not a common plant, seen only under cultivation. Known as the Coral tree.

**Erythrina indica** Lamarck.

A moderate-sized tree, usually armed with prickles when young. Leaves pinnately trifoliate, glabrous; leaflets ovate, obtuse, entire. Flowers scarlet, in dense racemes. Fruit a twisted pod, linear, contracted at intervals, contains several hard brown seeds.

Seen about native dwellings, sometimes grows wild. Grows near the sea-coast and dry localities. Native name: *ngatae*.

The wood is very soft, light, and is used as float material for fish nets.

**Hymeaea courabaril** Linnaeus.

A large tree. Leaves alternate, with 1 pair of oblong, coriaceous, acuminate, glabrous leaflets, about 3 inches long, petiole short. Flowers in corymbose panicles, yellow with purplish stripes. Pod oblong, thick, woody, 2.5 to 4 inches long; contains few seeds.

A rare tree, seen only under cultivation.

**Indigofera suffruticosa** Miller.

Low-growing shrub. Leaves alternate, impari-pinnate; leaflets in 3 to 7 pairs, spatulate-oblong. Flowers small in a dense axillary raceme or spike. Pods closely packed, slightly incurved, torulose, slightly thickened along the line of dehiscence. Each pod contains from 3 to 7 seeds.

Common weed seen everywhere, especially in abandoned pastures and along roadways. *Indigofera anil* of Cheeseman's list.

**Inga edulis** Martius.

A large spreading tree. Leaves alternate, abruptly pinnate; having 2 to 5 pairs of opposite leaflets, nearly sessile, with a gland between each pair, acute or acuminate, lanceolate, glaucous on the upper surface, the under side light-green; midrib and veins very prominent. Flowers in axillary racemes pale-green in color, with many stamens. Fruit a thick pod 6 to 15 inches long having large seeds covered with a sweet, white, spongy, edible pulp.

Seen in Avatiu; not a common tree. Said to have been introduced from Tahiti. Native name: *koka* or *pakai*.

**Inocarpus edulis** Forster.

A stately tree. Leaves oblong, leathery, bright-green, with a short petiole. Flowers small, yellow, fragrant, 5-petaled. Pod short-stemmed, obovate, curved, having a hard fibrous covering, and contains a single fleshy, firm seed.

Common on the lowlands and cultivated about native dwellings for the fruit which constitutes one of the staple articles of Rarotongan diet. The seed, boiled or baked, tastes much like a chestnut. The natives roast them in the *umu* (oven), string them on midribs of coconut leaflets, and offer them for sale. Tree picturesque; when young the trunk is smooth and straight; as the tree grows older the roots form buttresses adhering to the sides of the trunk. Native name: *mape* or *ii*.

**Leucaena glauca** Benth.

A small unarmed tree. Leaves alternate, bi-pinnate, glands on the petioles. Pinnae 4 to 6 pairs, bearing 10 to 20 pairs of acute, oblong-linear leaflets, glaucous beneath. Peduncles solitary or 2 or 3 together in the upper axils of the leaves. Flowers small, whitish-yellow in a globose head about 1.25 inches in diameter. Fruit a straight coriaceous, strap-shaped dehiscent pod with 15 to 20 seeds.

Introduced. Common on the lowlands. In 30 years, this plant has spread over the island, and has become a pest. Horses lose the hair from mane and tail if the foliage and seeds are eaten as a steady diet. English name: Lead tree. Native name: *mara inu*.

**Leucaena forsteri** Benth.

A medium-sized unarmed strand tree, growing erect. Alternate, twice-pinnate leaves, having 6 to 18 pairs of opposite leaflets and numerous fine pinnae. Flowers on a single peduncle composed of numerous stamens forming a globular head. Pod flat, short-stalked, 3 to 4 inches in length, contains 10 to 20 seeds. Wood is yellow and emits a very unpleasant odor when green.

Common on the lowlands near the sea. Native name, *toromiro*.

**Mimosa pudica** Linnaeus.

A spreading perennial herb; leaves alternate on hairy petioles 1.5 inches in length, with 2 pairs of pinnae, each pinnae with 15 to 20 pairs of oblong linear leaflets. Flower

heads ovoid, composed of numerous pink stamens. Pod oblong, armed with prickers and containing several seeds.

Common in many of the districts of the island; was introduced and has become a troublesome weed. When this plant is disturbed, it folds back its foliage and wilts, temporarily. English name: Sensitive plant. Native name: *rakau pikika*.

**Mucuna gigantea** (Willdenow) De Candolle.

A glabrous climber having alternate tri-foliolate leaves on long petioles; leaflets subcoriaceous, glabrous, the terminal one oblong-cuspidate, the lateral ones uneven-sided, the lower side bulging. Flowers pale greenish-yellow on long peduncles. Pod oblong, flat, commonly contains 2 seeds, orbicular, 1 inch in diameter, dark-brown.

Common along the seacoast in sandy and coral formation. Native name: *kakatea*.

**Samanea saman** (Jacquin) Merrill.

A large-spreading, leguminous tree, from 30 to 60 feet in height. Branchlets pubescent. Leaves 2 to 4 pinnate; leaflets 2 to 8 pinnate, ovate, oblong, shiny on the upper surface, pubescent on the under surface. Flowers axillary in globose heads consisting of many pink stamens. The pod is flat, 4 to 6 inches in length, 0.75 inch in width, generally straight, fleshy, contains several seeds embedded in a sticky brown pulp.

An introduced ornamental shade tree found in all villages.

**Sophora tomentosa** Linnaeus.

A medium-sized shrub having gray, velvety branches. Leaves odd-pinnate, with 7 to 8 pairs of broadly ovate leaflets obtuse at both ends. Large yellow flowers in a raceme, arranged on a stout stalk. Pod covered with a velvety down, seeds pale-brown or yellowish.

Common along the shores of all districts. Native name: *pohutu kava*.

**Tamarindus indica** Linnaeus.

A large evergreen tree with alternate leaves abruptly pinnate; leaflets 20 to 40, opposite, entire, obtuse, 0.5 to 0.75 inch in length, soft pale-green. Flowers few in a raceme, pale-yellow veined with red. Fruit a plump thin-shelled pod, containing several hard brown flat seeds covered with a sticky, firm, acid pulp.

A cultivated tree about native dwellings.

**Tephrosia piscatoria** Persoon.

A small shrub having erect stems, leaves alternate, leaflets entire, 4 to 6 pairs, odd-pinnate. Flowers in a terminal raceme, white, pod flat slightly curved, 2 inches long, seeds oblong, speckled with brown.

Ngatangia. Common on the dry hills of Tereora, and in Avana Valley. Foliage and fruit used to stupefy fish. *Tephrosia purpurea* of Cheeseman's list.

**Vigna marina** (Burmam) Merrill.

A trailing perennial. Leaves alternate, trifoliate, on long petioles having entire, glabrous, obovate, tri-nerved leaflets, rather fleshy, the two lateral ones nearly sessile, the terminal one having a longer petiole. Flowers yellow on a raceme, long peduncled. Pods short, linear, oblong, few seeds.

Common in all districts. Generally along the seacoast; seen also at an altitude of 300 feet. *Vigna retusa* of Cheeseman's list. Native name: *pohue tai*.

**Wistaria frutescens** Poir.

A stout climber. Leaves alternate, odd-pinnate. Flowers and fruit not seen.

Arorangi, recently introduced. A rare plant, growing at the home of Dr. R. V. Hosking.

## OXALIDACEAE

**Averrhoa carambola** Linnaeus.

A cultivated tree. Leaves alternate, odd-pinnate; leaflets alternate, entire, ovate, acuminate. Flowers borne in clusters on the branches, small pink-colored, fragrant. Fruit in bunches, ovate, 5-angled, thin-skinned, juicy; pulp watery, sub-acid, with a few seeds.

Introduced. A rare tree seen only under cultivation.

**Oxalis repens** Thunberg.

A prostrate herb, having runners about 1 foot long. Leaves alternate, 3 or more foliate, entire. Flowers small, yellow.

A common weed in gardens, in damp places. Used medicinally by the native Rarotongans. Native name: *koki*.

## RUTACEAE

**Casimiroa edulis** La Llave.

A large evergreen tree. Leaves alternate, digitate, 3 to 5 foliate; leaflets entire, acuminate, upper and lower surfaces smooth dark-green; petiole long. Flowers greenish-yellow, small, 5 petals. Fruit a depressed drupe, 1.5 to 2 inches in diameter; skin thick; pulp palatable, contains several large oblong seeds.

Avarua. Introduced. A rare tree in the Government Experimental Garden.

**Citrus aurantium** var. **sinensis** Linnaeus.

A medium-sized tree. Leaves glabrous, acute; petiole often winged, especially in the young growth. Branches have axillary thorns. Flowers white, sweet-scented. Fruit globose, pulp sweet, contains many seeds.

Grows more or less wild in the valleys and woods. Large quantities are

shipped to the New Zealand markets in the fruiting season. English name: Orange. Native name: *arani*.

**Citrus limetta** Auctorum.

A low bushy species, branching from the base, and very thorny. Leaves small, alternate, entire, margins wavy, petiole slightly winged. Flowers white, small, very fragrant. Fruit round to oblong, smooth, color light-yellow, with a prominent apical papilla; seeds few.

A cultivated plant, also seen growing in a wild state. Known as the West Indian or Mexican lime.

**Citrus limonia** Osbeck.

A small armed tree with irregular branches. Leaves large, alternate; pale-green, ovate, acute, smooth, with slightly scalloped edges; petiole short. Flowers white, fragrant, in small clusters at axils of leaves. Fruit generally oval; skin thick, rough; pulp very acid, contains many seeds.

Common on the lowlands about dwellings, also seen growing wild, probably escaped from cultivation.

**Citrus maxima** (Burmam) Merrill.

A large tree. Leaves alternate; leaflets large, ovate-oblong, sometimes emarginate. Young shoots pubescent. Petioles broadly-winged. Flowers large yellowish-white, fragrant. Fruit 6 to 8 inches in diameter, either globose or pyriform; rind thick, pale-yellow when mature; pulp pale-yellow, contains many large seeds.

Introduced. Not a common tree.

**Citrus mitis** Blanco.

A small erect-growing tree. Leaves broadly oval, alternate, entire, 1.5 inches in length, 1 inch in width, smooth, glossy-green; petiole narrowly-winged. Flowers small, white, at ends of branches. Fruit globose, somewhat depressed, with a loose, bright orange-colored skin; pulp very acid, seeds few.

Introduced; a rare plant.

**Citrus nobilis** Loureiro.

A small, upright, thornless tree, with slender branches. Leaves small, pointed, entire, glossy-green, with narrowly-winged petioles. Flowers small, white. Fruit globose, depressed, 2 to 3 inches in diameter; skin greenish-yellow, loose, easily removed; segments 10 to 12; pulp sweet, juicy; seeds numerous.

Common under cultivation, in all districts. English name: Mandarin orange.

The fruit is shipped to the markets of New Zealand.

**Evodia** species.

A tree 15 feet in height. Leaves alternate, entire, thin, membranous, 2.25 to 9 inches in length, 1.5 to 4.5 inches in width; margins wavy, apex acute, sometimes

slightly retuse; petiole stout, 1.5 inches in length. Flowers small in a panicle, axillary, near the ends of the branches. Fruit solitary, in dehiscent capsules or pods, arranged singly, in pairs, or threes.

A rare tree, seen only on the slopes of Mount Tukou.

**Fortunella japonica** (Thunberg) Swingle.

A small tree, having nearly thornless stems and branches. Leaves alternate, small, smooth, entire, acuminate; petiole short; midrib prominent; veins hardly visible. Flowers small, white, very fragrant. Fruit oblong, 1 inch long; skin orange-yellow, thick, oily; pulp acid; seeds many.

Introduced; rare.

**Murraya paniculata** (Linnaeus) Jackson.

A small bushy tree. Leaves alternate, having 6 to 10 alternate, glabrous entire leaflets, acute at both ends, dark glossy-green, slightly revolute; petiole short, terminating in a single leaflet having a long petiole. Flowers in a terminal corymb, white very fragrant. Fruit oblong, 0.25 inch in length, red when ripe.

Introduced. Seen only under cultivation about dwellings. Not common.

**Skimmia japonica** Thunberg.

A shrub 3 to 5 feet in height. Leaves alternate, entire, 3 to 5 inches in length, crowded at the ends of the branches, short petioled. Bright yellowish-green above and below. Flowers not seen. Fruit depressed, globose, scarlet.

Introduced. A rare plant seen in private gardens in Arorangi.

SIMARUBACEAE

**Suriana maritima** Linnaeus.

A shrub or small bushy tree. Leaves opposite, entire, thick, fleshy, oblong, crowded, sessile; upper and lower surfaces covered with a gray pubescence. Flowers axillary, solitary; petals yellow. Fruit a compact cluster of small, nearly round seeds.

Rare; seen only on the islet of Motu Tapu at the entrance to Ngatangia Harbor. Grows near salt water and coral rock. Native name: *ngagie*.

In olden days, spears were made from the hard wood of this tree. Today, the tough angular branches are used in the making of clumsy wooden hooks, used for catching a certain species of fish.

BURSERACEAE

**Canarium** species.

A large cultivated tree at the Government Experimental Farm. It bears a small edible nut.

## MELIACEAE

**Melia azedarach** Linnaeus.

Leaves 2- or 3-pinnate; leaflets ovate or lanceolate, serrate, acute; veins prominent. Flowers purplish in open panicles. Fruit a single-seeded, 5-celled drupe, smooth, yellow when ripe, 0.5 to 0.75 inch in diameter.

A common tree in the lowlands; generally cultivated. English name: Pride of India, or Persian lilac. Native name: *tiri*.

## MALPIGHIACEAE

**Malpighia glabra** Linnaeus.

A small shrub. Leaves opposite, glabrous, entire, acute, ovate. Flowers few, 5-petaled in an umbel, rose-pink, ends fringed. Fruit a scarlet drupe, 0.5 inch in diameter, with a thin skin containing several 4-angled seeds embedded in a soft, tart, edible pulp.

Rare; cultivated in private gardens only. Introduced.

## EUPHORBIACEAE

**Acalypha boehmerioides** Miquel.

Small erect shrub. Leaves alternate, 1 to 2 inches in length, 0.5 to 1 inch in width, ovate, acuminate, crenate; petiole slender, same length as the blade. Flowers and fruit at axils of leaves.

Common in dry low places.

**Acalypha hispida** Burmann.

A garden shrub. Leaves alternate, 4 to 6 inches in length, 3 to 4.5 inches in width, acuminate, serrate; petiole slender, 2 to 3 inches in length. Flowers numerous on spikes 6 inches to 2 feet in length at axils of leaves.

Introduced. Common about habitations.

**Acalypha hispida** Burmann. var. *alba*.

An erect shrub. Leaves alternate, narrow, acuminate at both ends, irregularly crenate; petiole, long, slender. Flowers on a catkin or spike 6 to 15 inches in length, at axils of leaves; greenish-white or pale-rose.

Not very common.

**Acalypha wilderi** Merrill, new species (Pl. V).

Frutex dioicous, erectus, haud ramosus, partibus junioribus inflorescentiisque plus minusve hirsutus; foliis ovatis ad ovato ellipticis, membranaceis, utrinque glabris, breviter acuminatis basi cordatis, longe (7 ad 18 cm.) petiolatis, penninerviis, 12 ad 23 cm. longis, 6 ad 17 cm. latis, nervis primariis utrinque circiter 12, perspicuis; inflorescentiis ♂ gracilibus, dense multifloris pendulis, usque ad 60 cm. longis, circiter 4 mm. diametro, floribus minutis bracteis numerosissimis, linearis, ciliatis, circiter 0.5 mm. longis, ♀ solitariis, erectis, pedunculatis, circiter 25 mm. longis multifloris, bracteis orbiculari-ovatis, paucidentatis, nervosis, superioribus circiter 3 mm. longis, inferioribus usque ad 1 cm. longis; capsulis circiter 3 mm. diametro, verruculosus, leviter hirsutis.

An erect, normally-unbranched shrub rarely exceeding 2 m. in height, the trunk up to 2.5 cm. in diameter, usually dioecious, the younger parts and the inflorescence more or less hirsute, tips off the stems 5 to 6 mm. in diameter, the growing parts greenish when dry, sparingly pubescent. Leaves membranaceous, green when dry, penninerved, ovate to ovate-elliptic, 12 to 23 cm. long, 6 to 17 cm. wide, glabrous, shining, entire to distantly and rather obscurely-toothed, base rather distinctly cordate, apex shortly acuminate; lateral nerves about 12 on each side of the midrib, prominent, scarcely anastomosing, or joining very close to the margin; petioles slender, green, glabrous, 7 to 18 cm. long; stipules linear, sparingly ciliate-hirsute, up to 1 cm. in length. Staminate spikes pendulous, solitary, cylindric, densely many-flowered, up to at least 60 to 80 cm. long, about 4 mm. in diameter, shortly peduncled, occasionally with a pistillate flower at the base, the rachis densely ciliate; bracts very numerous, linear, sparingly ciliate, about 0.5 mm. long; staminate flowers minute, the sepals 0.5 mm. long, slightly pubescent outside. Pistillate spikes erect, peduncled, up to 25 cm. long, the rachis densely ciliate-hirsute, the lower bracts more or less scattered, the upper ones close, all green, reticulate-veined, nerves pubescent on the back, sparingly-toothed, the upper ones about 3 mm. long, orbicular, cordate, gradually larger below, the lowermost ones up to 1 cm. in length. Pistillate flowers solitary, the capsules (cocci) about 3 mm. long, verruculose, sparingly hirsute.

Rarotonga, in forests in semi-dry valleys, back of the village of Avarua, altitude 200 to 300 m., 1929, Gerrit P. Wilder (staminate and pistillate specimens). Type in the herbarium, New York Botanical Gardens.

The same species is undoubtedly represented by the specimens collected near Arorangi by Cheeseman, which he records (Trans. Linn. Soc. Bot. 6: 295, 1903) as follows: "*Acalypha* sp. nov. Shaded woods near Arorangi, not common. I had referred this, with doubt, to *A. insulana* Mueller-Aargau, but the Kew authorities report it as undescribed."

This is a striking species, distinguishable by its habit—being erect and unbranched—its large leaves and long petioles, as well as by its greatly elongated and pendulous staminate spikes. It is unquestionably in the alliance with *Acalypha insulana* Mueller-Aargau, but from the descriptions, and such material as is available to me for the purpose of comparison, it is abundantly distinct from *A. insulana*, and from other recognized varieties.

#### ***Acalypha wilkesiana* Mueller-Aargau.**

An ornamental herb. Leaves ovate, acuminate, serrate, mottled, bronzy-green and red. Flowers small, in a spike at axils of leaves.

Very common in all districts; used as a hedge plant. *Acalypha tri-color* of Cheeseman's list.

#### ***Aleurites moluccana* Willdenow.**

A spreading soft-wood tree, 20 to 30 feet high. Leaves variable, ovate or rhombolanceolate, entire, acute, cordate at the base, glossy light-green in color, the under surface tomentose. Flowers small, white, appearing in clusters. Fruit a hard commonly one-seeded nut.

Native name: *tuitui*.

A useful oil is extracted from the nut.



**Breynia nivosa** (Bulliard) J. K. Smith.

A small erect-growing shrub. Leaves alternate, 0.5 to 1 inch in length, ovate-elliptical, obtuse or entire, dull-green, irregularly mottled with red, white, and pink; petiole short. Flowers axillary, small, white.

Introduced. A common cultivated hedge plant.

**Cicca acida** (Linnaeus) Merrill.

A small spreading tree cultivated for its fruit. Leaves alternate, ovate, acute, 1 to 2 inches in length, entire, usually 2-ranked, resembling pinnate leaves. Flowers axillary, green. Fruit 0.75 inch in diameter, fleshy, ribbed, pale greenish-white when ripe; flavor subacid.

Not a common tree. Introduced from Tahiti. Native name: *kavakava*.

Fruit is either eaten raw or made into preserves.

**Codiaeum variegatum** (Linnaeus) Blume.

A tropical glabrous shrub. Leaves alternate, pinnately-veined, entire, stems contain a bitter milky juice. Flowers small, yellowish-white, arranged on a long spike.

A common plant cultivated for hedges. Introduced. Several varieties seen; known as crotons.

**Euphorbia chamissonis** Boissier.

An erect herb. Leaves opposite, obovate, entire, emarginate, 0.5 to 1.25 inches in length, 0.25 to 0.75 inches in width. Flowers green in a terminal cyme.

Common weed along the seashore and also on the dry hills. Native name: *akoko*.

**Euphorbia heterophylla** Linnaeus.

A glabrous annual 1 to 3 feet high. Leaves ovate, sinuate-toothed, bright-green, the base of the terminal leaves red.

A common weed along the roadsides in the lowlands.

**Euphorbia hirta** Linnaeus.

An annual. Leaves ovate, opposite, acute, serrate, lanceolate. Stems hairy and when bruised emit a sticky juice. Flowers numerous, minute, greenish, crowded into a head at the axils of the leaves.

Common weed in the lowlands. *Euphorbia pilulifera* of Cheeseman's list.

**Euphorbia pulcherrima** Willdenow.

A shrub 2 to 6 feet in height. Leaves lanceolate to ovate-elliptical, entire, 3 to 6 inches in length, somewhat pubescent, the upper leaves smaller and of a brighter red.

Not very common; seen in a few gardens. Introduced. English name: Poinsettia.

This plant is cultivated as an ornamental on account of its brilliant scarlet foliage.

**Euphorbia splendens** Bojer.

A cultivated pot plant, sometimes seen growing in the open. Stems 2 to 4 feet in length, covered with stiff spines. Leaves few, bright-green, generally on the young growth. Near the ends of these stems are 2 bright-red bracts.

Not a common plant. Introduced.

**Glochidion ramiflorum** Forster.

A spreading hardwood tree 15 to 20 feet in height. Leaves alternate, elliptical, 2.5 to 5 inches in length, 1.5 to 1.75 inches in width, acute, entire; petiole short. Flower axillary. Fruit contains several small seeds.

Found in the deep valleys. Not common. Native name: *maame*.

**Homalanthus pedicellatus** Bentham.

A small tree. Leaves alternate, simple, entire, triangular, ovate, glabrous; petiole slender, longer than the blade; venation prominent. Flowers small, green, on slender racemes. Fruit small, quadrangular.

This tree is found growing on the slopes of the highest mountains.

**Jatropha curcas** Linnaeus.

A small spreading tree. Leaves alternate, cordate, entire; petiole long; stems and branches glabrous. Flowers small, greenish-yellow at axils of leaves, 5 petals. Fruit ovoid, about 1 inch long, 3-celled.

Common on the lowlands and cultivated about dwellings. Wood used for living fence posts. When bruised both stems and leaves emit a milky fluid. Fruit said to be poisonous. Fruit and leaves used medicinally by the natives.

**Macaranga harveyana** Mueller-Aargau.

A medium-sized tree. Leaves large, alternate, peltate, entire, palmately-nerved; petioles long. Flowers small in a long raceme. Wood soft and pithy. Flowers green, small. No fruit seen.

Common plant in the lowlands. Native name: *enua*.

**Manihot dulcis** Pax.

A spreading cultivated shrub. Leaves alternate, deeply 3 or more-parted; lobes lanceolate; petioles long. Flowers green, paniculate. Fruit capsule contains 3 seeds.

A common plant from the roots of which a fine starch is produced. English name: Sweet cassava. Native name: *maniota aipi*.

**Manihot utilissima** Pohl.

A much-cultivated glabrous shrub. Leaves 3- to 5-parted. Lobes 2 to 6 inches in length; petiole long. Flowers and fruit not seen.

Common about native dwellings. English name: Bitter cassava. Native name: *maniota*.

At maturity the large tubers are grated and macerated in water, and the sediment, after many washings, precipitates a starch which is edible when cooked.

**Pedilanthus tithymaloides** Porteau.

A tender, cactuslike shrub. Stems thick and fleshy. Leaves alternate, ovate, or oblong, acute. Involucres bright-red, in dense terminal cymes.

Cultivated as an ornamental. Not a common plant.

When bruised or broken the stems emit a milky juice.

**Phyllanthus niruri** Linnaeus.

A small glabrous monoecious annual, 1 foot in height. Stems angular. Leaves variable in size, oblong, pale-green in color, glaucous on the under surface; tips either rounded or acute; petioles short and slender. Flowers whitish, numerous. Stipules linear-lanceolate. Seed pod spherical, depressed, smooth.

Grows in open pastures and along the roadways. Native name: *kavakava*.

This plant when bruised emits a milky juice said to be efficacious as a remedy for skin affections.

**Ricinus communis** Linnaeus.

An erect plant 5 to 15 feet in height. Leaves alternate, large, peltate, palmately divided, with generally 7 broadly-lanceolate, serrate lobes. Flowers in a terminal panicle or raceme, 3 to 8 inches in length. Fruit a capsule, echinate, containing 3 seeds.

Seen only in Tukuvaive Valley. Not a very common plant. Native name: *tuitui pakarangi*.

## ANACARDIACEAE

**Anacardium occidentale** Linnaeus.

A large, spreading tree. Leaves alternate, obovate, entire, emarginate, wavy. Flowers in a terminal cluster, rosy-tinted, and very fragrant. The fruit consists of a nut which is attached to the outside of a fleshy receptacle.

Not very common.

The nut is edible only when roasted.

**Mangifera indica** Linnaeus.

A large tree. Leaves alternate, glabrous, entire, oblong, lanceolate, acute, shiny, bright-green, of different lengths and widths. Flowers in a terminal panicle.

Common in all districts. English name: Mango. Native names: *vi-mango*, *vi-papaa*.

A number of introduced grafted varieties are under cultivation as well as many seedlings.

**Pleiogynum solandri** Engler.

A large tree 30 feet in height. Leaves odd-pinnate; leaflets 7 to 9, obliquely ovate, entire, obtuse, 2 to 3 inches in length. Fruit and flowers not seen.

Rare. Introduced from Australia.

**Schinus molle** Linnaeus.

An evergreen tree, 25 feet in height, with graceful, pendulous, brittle branches. Leaves alternate, pinnate; leaflets sessile, linear-lanceolate, 1.5 to 2 inches in length. Flowers in panicles, yellowish-white. Fruit in large bunches, scarlet when ripe.

Introduced. Not very common. Planted as a shade tree.

**Spondias dulcis** Forster f.

A large widely-branching tree, 30 to 50 feet high. Leaves alternate, imparipinnate. Flowers whitish. Fruit obovoid or oval, 2 to 3 inches long, golden-yellow when ripe, with a tough skin which is easily removed, containing a single, oval echinate seed, covered with edible pulp.

Common under cultivation only. English name: Vi apple. Native name: *vi*.

## CELASTRACEAE

**Gymnosporia vitiensis** Seemann.

A spreading shrub or vine. Leaves alternate, ovoid, serrate, emarginate, some obtuse, bright-green, with short petiole. Stems bright-red. Flowers white, small, in a raceme. Fruit not seen.

A common plant in dry sections. Found on Maungaroa, Ikurangi, and Maungatea, at an altitude between 300 and 400 feet.

## SAPINDACEAE

**Allophylus vitiensis** Radlkofer.

A large tree 15 to 25 feet in height. Leaves alternate, tri-foliolate on long petioles. The terminal leaflet oval, serrate, acuminate at both ends, and has a slender petiole. The lateral leaflets nearly sessile, uneven-sided, the lower half bulging, midrib prominent; veinlets inconspicuous, having at their junction with the midrib, a collection

of fine hairs. Flowers small, white, in a dense panicle. Fruit a drupe appearing in pairs, 0.25 inch in diameter.

Common in all the valleys and on the dry hillsides in the lower elevations. Recorded by Cheeseman as *Bischofia javanica* under Euphorbiaceae. Native name: *koka*.

**Cardiospermum halicacabum** Linnaeus.

A tendril climbing herb with alternate, bi-ternate leaves; leaflets dentate, acute, the lateral leaflets nearly sessile. Flowers axillary, white, in racemes, with a pale-yellow center. Fruit an inflated, broadly pear-shaped, hollow capsule, 1 inch thick, resembles a balloon and contains a single, round, black seed with a white spot on one side.

A cultivated ornamental. Not very common. Seen only in Avarua. English name: Balloon vine, or Heart pea.

**Dodonea viscosa** (Linnaeus) Jacquin.

A shrub, sometimes seen as a small tree. Branches many, the bark longitudinally cracked. Leaves simple, nearly sessile, 1 to 2 inches in length, linear-lanceolate, entire, the margins often revolute, glabrous, more or less viscid, with a shiny resinous exudation. Flowers small, yellowish, on slender axillary pedicles. Fruit a flat, winged capsule, orange-brown in color; in large bunches; seeds small, black.

Common on the dry hills between an altitude of 300 to 500 feet. Native name: *ake*.

**Melicocca bijuga** Linnaeus.

A large evergreen tree. Leaves abruptly pinnate; leaflets in 2 pairs, elliptical, entire, glabrous, bright shiny-green. Flowers small, white, fragrant, in large terminal racemes. Fruit 1 inch long, like a small plum, greenish-yellow; skin leathery, thick; one large seed to which adheres juicy pulp of a grape-like flavor.

Not a common tree. Introduced from Tahiti. Native name: *kerenete*. English name: Genip tree.

RHAMNACEAE

**Alphitonia zizyphoides** A. Gray.

A very large, tall tree. Trunk straight, 25 feet in height before branching. Leaves entire, alternate, lanceolate, about 4 inches long, 0.75 to 1 inch in width, pinnately-lobed, loosely crenate, bright-green on the upper surface, covered with a white tomentum on the under side. Flowers numerous in axillary and terminal bunches. Fruit 0.25 inch in diameter, brownish-purple when mature; contains several seeds.

Indigenous. Seen only in the district of Ngatangiia, Avana Stream, at an altitude of 600 feet. Native name: *toi*.

The hard wood of this tree is used for clubs, spears, tool handles. The flowers appear in April.

**Colubrina asiatica** Brongniart.

A large, spreading, deciduous shrub, entirely glabrous. Leaves alternate, acuminate, cordate, membranous and glossy; blade 1.5 to 2.5 inches in length, 1 to 1.5 inches in breadth; petioles 0.25 to 1 inch long. Flowers greenish, in an axillary cyme; peduncles short. Fruit 0.25 inch in diameter, 3-grooved, pale-brown; seeds black, small.

Common plant along the seashore in all the villages. English name: Hoop withe.

**Zizyphus jujuba** Lamarck.

A cultivated tree about 20 feet in height, armed with thorns. Leaves alternate, broadly-ovate, entire, dark-green, glabrous above, white-tomentose beneath, 1 to 3 inches in length, triple-nerved. Flowers small in axillary cymes. Fruit sub-globose 0.75 inch in diameter, orange-red when ripe, containing one large seed. Fruit ripe in January.

Not very common. Introduced from India.

## TILIACEAE

**Elaeocarpus rarotongensis** (Cheeseman) Hemsley.

A forest tree 20 to 30 feet in height. Leaves alternate, acute or acuminate, crowded at the ends of the branches, 2 to 3 inches in length, 1.5 to 2.5 inches in width; margins wavy; petiole long; midrib and veins very prominent. Flowers small, white. Fruit a single globose berry, 0.25 inch in diameter, in large bunches, blue when ripe; contains a single seed, deeply furrowed.

Indigenous, although rarely seen. Grows in dry sections at an altitude of about 300 feet. Native name: *karaka*.

**Grewia crenata** (Forster) Setchell.

A small tree. Leaves alternate, acuminate, crenate, 2.5 to 4 inches in length, 1.25 to 2.5 inches in width. Flowers white, 5 petals in axillary terminal panicles. Fruit a small drupe, singly or in pairs on stout stems; seed single, covered with a loose testa.

Grows commonly at an altitude of about 500 feet. Seen on Mount Ikurangi, also above Titikaveka, and near the head of Avana Stream, Ngatangiia District. Native name: *auere*.

**Triumfetta procumbens** Forster.

A creeping herb having long, trailing, pubescent stems. Leaves alternate, 3-cleft, crenate, tomentose; young leaves sometimes oval. Flowers yellow, singly or in pairs at the axils of the leaves. Fruit a small bur, 0.25 inch in diameter, covered with many, small, soft, spine-like bristles.

Common along the seashore. English name: Bur weed. Native name: *kupili*.

The fiber obtained from this plant was formerly used in making twine for fish nets.

**Triumfetta semitriloba** Jacquin.

A shrub 3 to 5 feet in height. Leaves alternate, 3- to 5-lobed, pubescent, serrate, acuminate; petiole one-half the length of the blade. Flowers small, 5-petaled, yellow, pendulous, at the axils of the leaves. Fruit a small, spiny, burlike capsule.

A common plant along the pathways away from habitation. English name: Burbark.

## MALVACEAE

**Gossypium barbadense** Linnaeus.

A tall bush. Leaves large, alternate, more or less lobed, sometimes seen entire. Flowers white, turning to purple. Fruit an ovoid capsule, 3-valved, each cell having several seeds covered with a short fibre.

This plant was formerly cultivated for its fiber or lint, but is now seldom seen under cultivation.

**Hibiscus abelmoschus** Linnaeus.

An annual 2 to 4 feet in length. Leaves 5 to 7 palmately lobed, spreading, lanceolate, coarsely-toothed. Flowers pale-yellow, about 4 inches in diameter, with a dark-maroon center. Fruit an elongated pod covered with hairs, contains numerous small gray seeds.

Found growing in the wet recesses of Tukuvaie, altitude 250 feet.

Not a common plant. Formerly a fine quality of twine was made from the bark. Native name: *tauriau*.

**Hibiscus esculentus** Linnaeus.

An annual. Leaves cordate in outline, 3- to 5-lobed, or divided, the lobes pointed, coarsely-notched. Flowers solitary, axillary, having peduncles 1 inch in length; blossoms yellow with dark centers. Fruit a long, ribbed pod containing many seeds.

Seen only under cultivation.

This annual is chiefly grown for its young, edible pods.

**Hibiscus mutabilis** Linnaeus.

A small tree with cordate, 5-angled, downy leaves, 3 inches in diameter; petiole 2 inches long. Flowers axillary, 2 to 3 inches broad, white in the morning, turning pink in the afternoon; capsule globose, hairy, contains many small reniform seeds.

Not a very common plant. Both single and double flowering species may be seen in gardens under cultivation.

**Hibiscus rosa-sinensis** Linnaeus.

An ornamental shrub. Leaves ovate, acuminate, entire at the base, coarsely-toothed at the apex. Flowers solitary, scarlet, 5-petaled, occurring in the upper axils of the new growth.

Many hybrid varieties have been introduced. Native name: *kaute*.

**Hibiscus schizopetalus** (Masters) Hooker.

A tall ornamental glabrous shrub having many slender drooping branches. Leaves ovate-elliptical. Flowers coral-red on long peduncles; petals 5, deeply cut and curved backwards; pistil long, pendant, supple.

Common everywhere in gardens; never seen wild. Introduced.

This hibiscus does not seed but hybridizes readily with other species.

**Hibiscus siriacus** Linnaeus.

A cultivated shrub 3 to 6 in height, having many glabrous branches. Leaves alternate, ovate, commonly 3-lobed, teeth rounded. Flowers solitary, both single and double were seen, having colors ranging from blue-purple, to pale-lavender, or white.

An introduced species, known as *althea*. English name: Rose of Sharon.

**Hibiscus tiliaceus** Linnaeus.

A spreading tree 15 to 30 feet in height. Leaves entire, round-cordate, short-acuminate, slightly crenate, 3 to 12 inches in diameter, glabrous above, tomentose on the underside, palmately 7- to 9-nerved, the 3 middle nerves having nectar glands near the blade. Flowers axillary, one or more at the ends of the branches, pale-yellow with dark centers; when faded turns to a brick-color. Fruit a capsule having 5 cells each containing several small seeds.

Common everywhere from sea level to the highlands. Native name: *au*.

The bark of this plant is very strong and furnishes temporary cordage. The large leaves are used as a covering for the native ovens. The wood is very light, and makes suitable outriggers for the native canoes.

**Malvastrum coromandelianum** (Linnaeus) Garcke.

An erect herb 18 to 24 inches in height. Numerous hairs on stems and branches. Leaves ovate, to lanceolate, 1 to 1.5 inches in length; petioles 0.5 to 1 inch in length; margins serrated. Flowers few, small, yellow, at the ends of the branches. Fruit consists of several seeds in a depressed capsule.

Common weed on the lowlands.

**Malvaviscus arboreus** Cavanilles.

A cultivated shrub 3 feet in height. Leaves alternate, slightly 3-lobed, acuminate, hispid. Flowers scarlet, never well-opened, pistil extends beyond the petals of the flower.

A rare plant. Introduced as an ornamental in Arorangi District.

**Malvaviscus mollis** De Condolle.

A cultivated shrub; leaves alternate, cordate, acuminate, tomentose, soft. Flowers scarlet.

Rather rare. Introduced.

**Sida acuta** Burmann.

An erect shrub. Leaves alternate, lanceolate, serrate; petiole short. Flowers small, 5-petaled, yellow.

An abundant weed, seen everywhere.



**Sida rhombifolia** Linnaeus.

A low shrub 2 to 4 feet in height. Leaves rhomboidal, tomentose, acute, light-green on the upper surface, hairy beneath; petiole short. Flowers axillary, pale-yellow.

Very common in the lowlands. Native name: *pulumi*.

This plant yields a good stout fiber and the stiff branches are made into bundles and used as brooms.

**Thespesia populnea** (Linnaeus) Solander.

A spreading tree, 25 feet in height. Leaves usually entire, sometimes lobed, roundish, cordate, acuminate, glabrous. Stems as long as the blade. Flowers yellow, changing to a purplish-pink on withering. Fruit a globose, compressed capsule containing numerous seeds.

Common on the lowlands. Native name: *miro*.

**Urena lobata** Linnaeus.

A small spreading herbaceous plant. Leaves rounded, hairy, cordate, 5- to 7-lobed. Flowers pink. Fruit a small bur covered with hooked bristles.

Common in the lowlands everywhere. Native name: *piripiri*.

## BOMBACACEAE

**Ceiba casearia** Medicus.

A large tree with spreading branches and spiny trunk. Leaves digitate, on long, slender petioles; leaflets 5 to 7, lanceolate, acuminate, smooth. Flowers white, petals hairy outside. Fruit a long, narrow capsule, 5-valved; many seeds to which is attached a white cottony fiber.

A common plant cultivated in the lowlands. English name: Kapok. The cottony fiber is used for stuffing mattresses and pillows, and, because of its non-absorbent qualities, it is used in life preservers.

**Durio zibethinus** Murray.

An introduced single specimen of this rare tree was seen growing at the Governmental Experiment Farm, Avarua. It was young and had neither flowers nor fruit.

**Pachira aquatica** Aublet.

Tree of medium size. Leaves digitate, on a long stiff petiole; leaflets 5 to 7, entire, sessile. Flowers large, 4 to 6 inches in length; petals lacinate or linear, whitish-green outside, yellowish-white inside, gracefully recurved when open, showing numerous stamens and pistils. Fruit an oblong capsule, dividing into 5 sections, when ripe bursting open and revealing 8 to 15 round seeds covered with a tough parchment.

An introduced, rare tree; only one specimen was seen growing in a private garden.

When boiled, the contents of the seeds are edible, and resemble chestnuts in flavor.

## STERULIACEAE

**Brachychiton acerifolium** F. von Mueller.

A medium-sized tree. Leaves deeply-lobed, with long petioles. Flowers and fruit not seen.

A rare tree; seen in a private garden. Introduced from Australia.

**Heritiera littoralis** Dryander.

A medium-sized tree. Leaves alternate, entire, acute at both ends; midrib and veins prominent; petiole short. Under surface of leaves silvery-white and shiny. Fruit carpels sessile, ovoid, 1.25 to 2.5 inches in length, thick, and almost woody, with a slight, projecting, inner edge and a strong-winged single seed.

Not common; seen in cultivation only. English name: Looking-glass tree.

The wood of this tree is very durable.

**Theobroma cacao** Linnaeus.

An evergreen tree 10 to 15 feet in height. Leaves large, alternate, leathery, oblong, entire, acuminate. Flowers borne on twigs and branches. Fruit an oblong pod, containing many seeds.

A few trees grow on the island. English name: "cocoa."

The fruit is not utilized.

## GUTTIFERAE

**Calophyllum inophyllum** Linnaeus.

A spreading tree 25 to 50 feet in height, glabrous. Leaves coriaceous, shiny, oblong, 4 to 8 inches in length, 3 to 4 inches in width, emarginate, parallel-veined, having short petioles. Flowers fragrant, white; petals 4, in axillary racemes with many yellow stamens. Fruit globose, about 1.25 inches in diameter, contains a fleshy kernel which is the seed.

Common throughout the island and especially near the seacoast and about native dwellings. Native name: *tamanu*.

The wood of this tree is very durable and is used for making household utensils. It was formerly one of the trees from which canoes were made.

**Garcinia mangostana** Linnaeus.

A small tree. Leaves thick, leathery, acuminate, oblong-elliptical, with numerous horizontal nerves, culminating at a marginal line one-sixteenth of an inch from the edge of the leaf, continuing completely around and ending at the petiole. Without flowers or fruit.

Very rare. A few young plants were seen at the Government Experimental Garden at Avarua.

**Mammea americana** Linnaeus.

A tall erect tree. Leaves large, oblong, rigid, glossy, dark-green, entire; petiole short, thick. Flowers greenish, solitary; petals thick, yellowish-white, fragrant. Fruit globose, 3 to 5 inches in diameter, russet-colored; pulp yellow, firm, adhering to the large seeds.

A rare, introduced tree. English name: Mammea apple.

The pulp of the fruit can be stewed and made into a conserve.

## BIXACEAE

**Bixa orellana** Linnaeus.

A small tree. Leaves alternate, 3 to 6 inches in length, 2 to 4.5 inches in breadth, glabrous, entire, cordate or ovate; veins prominent. Flowers borne in terminal panicles, pink; petals 5; stamens numerous; capsule 2-valved, contains numerous seeds covered with a brick-red pigment.

Commonly cultivated about native dwellings. Introduced. Native name: *ueva*.

A dye is extracted from the seed coverings.

**Xylosma gracile** Hemsley.

A tree, 15 to 20 feet in height. Leaves alternate, coriaceous, lanceolate, 0.75 to 2 inches in length, 0.5 to 1 inch in width, crenate, crowded on the ends of the branches; petioles short. Flowers numerous at axils of the leaves. Fruit not seen.

Common on all the mountains above an altitude of 1000 feet. Native name: *akeake*.

## FLACOURTIACEAE

**Aberia gardneri** Clos.

A small branching tree. Leaves opposite, lanceolate, acute at both ends, upper surface smooth, underside tomentose. Flowers axillary, greenish; peduncle short. Fruit 0.75 inch in diameter, round, pale-purple; skin thin, covered with soft downlike hairs; seeds 6 to 8.

Not common. A cultivated plant.

**Flacourtia ramontchi** L'Heritier.

A small cultivated tree of spreading habit. Leaves alternate, acuminate, simple, crenate; petiole short; midrib prominent. Trunk and branches armed with stout spines. Flowers in short racemes, the fertile ones solitary. Fruit 1 inch in diameter, dark-red when mature, with a tough skin, bearing on top the remains of the persistent stigma. In the pulp are buried from 6 to 10 flat seeds.

Introduced. A rare tree. English name: Governor's plum.

The fruit, which resembles a cherry, is eaten raw or cooked.

**Homalium acuminatum** Cheeseman.

A large tree. Leaves opposite, elliptical, 2 to 5 inches in length, 1.75 to 2.5 inches in width, acute at both ends, crenate; margins wavy; veins prominent; petiole short. Flowers small, in large panicles.

A common, useful forest tree growing at an altitude of 250 feet. Native name: *moto*.

The wood of this tree is hard and durable.

## PASSIFLORACEAE

**Passiflora edulis** Sims.

A strong-growing vine with 3-lobed, alternate, serrate leaves. The petioles bear a pair of glands. Flowers white, tinted with purple. Fruit globular, having a hard rind; pulp agreeable, acid; seeds many.

Rather rare. A single specimen of this vine was seen growing at Government House, Ngatipa, Avarua.

This plant does not fruit at sea level.

**Passiflora maliformis** Linnaeus.

A very hardy vine with stout stems. Leaves alternate, entire, glossy light-green; petioles bear 4 glands in pairs. Lavender flowers, solitary, at axils of leaves; sepals dotted with purple. Fruit about 1.5 inches in length, with a very hard shell.

Commonly cultivated. Native name: *parapotini iti*.

This vine grows wild in the lower forest belt and fruits abundantly. The fruit is tart and of very fine flavor.

**Passiflora quadrangularis** Linnaeus.

A strong glabrous climber often cultivated. Leaves alternate, entire, mucronate, cordate at the base. Flowers large, purple, 3 to 5 inches broad, fragrant. Fruit oblong, 5 to 10 inches in length; rind fleshy, 1 inch thick, yellowish-green in color, the center hollow, contains numerous flat seeds around which is an edible juicy pulp.

Very common in the woods. It is found growing wild in all districts below an altitude of 200 feet. English name: Granadilla. Native name: *parapotini maata*.

## CARICACEAE

**Carica papaya** Linnaeus.

A plant having a straight hollow trunk, 6 to 15 feet in height. Leaves palmately 7-lobed. Flowers axillary. Fruit 4 to 6 inches in length, varying from round to oblong; flesh yellow and fine-flavored; hollow cavity contains many seeds.

This is one of the most numerous plants on the island. It has now become wild and is found in all the districts, even far up into the hills and mountains. Native name: *ninita*.

**Opuntia** species.

A low-branched succulent, having ovate joints, 3 to 5 inches in length, and areoles with gray wool and spines. Neither flowers nor fruit seen.

Very rare; only one specimen seen on the beach between Avarua and Avatiu. As this is a noxious weed, it is destroyed wherever it appears.

**Zygocactus truncatus** (S. Haworth) K. Schumann.

A many-branched fleshy-leaved herb. Leaves obovate, flat-jointed. Stems 1 to 1.5 inches in length, 0.75 to 1 inch in width; margins serrate, having a few acute teeth on the sides of the leaves. Flowers scarlet, growing from the ends of the young joints.

A rare plant; seen only under cultivation where it was grafted on other species of cactus. English name: Crab cactus.

## THYMELAEACEAE

**Wikstroemia sericea** Christophersen, species nova (Pl. VI).

Frutex patulus circiter 1 m. altus. Rami dichotomi tereti, juniores dense sericeo-pubescentes dein subglabri. Folia opposita vel subopposita subcoriacea breve petiolata ovalia vel obovata acuta, basi obtusa vel rotundata, margine integerrimo leviter undulato; laminae 30-65 mm. longae 14-29 mm. latae, petiolis 1-2 mm. longis; folia juniora subtus in nervis pilosa dein glabra. Capitula breve pedunculata 5-7-flora, pedunculis sericeis. Flores virideo-flavi tetrameri. Pedicelli puberuli 2-3 mm. longi. Tubus subcylindricus extus puberulus intus glabrus 4 mm. longus. Laciniae calicis quam tubus 3-plo breviores extus puberulae intus glabrae. Stamina 8 biseriata. Stylus brevis, stigmati globoso. Ovarius ovoideus superne pilosus. Squamae 2 ligulatae 0.7 mm. longae.

Maungatea, altitude 600-1100 feet, found in flower, April 23, 1929. Type, B. P. Bishop Mus. no. 764.

This species is most closely related to the Tongan *W. rotundifolia* Decaisne, but is distinct in its longer and acute leaves, which are not subcordate at the base, in its longer-pedicelled, more hairy flowers, its pilose ovary, and smaller scales. From *W. viridiflora* Meisner it is distinguished by its sericeous-pubescent young branches, its longer and broader leaves, longer pedicelled flowers, and fewer scales. From *W. foetida* (Linnaeus f.) A. Gray it is also readily distinguished by its sericeous-pubescent young branches.

## LYTHRACEAE

**Cuphea ignea** De Candolle.

A small ornamental. Leaves opposite, entire, ovate, lanceolate, acuminate. Branches angled. Flowers red, solitary, at axils of leaves, attached to a pedicle issuing from the side of the corolla.

Rare. Introduced. Only seen in the Muri district. Cultivated for the blossoms. English name: Cigarette plant.

**Lagerstroemia indica** Linnaeus.

A small glabrous shrub. Leaves opposite, entire, sessile, mostly acute. Flowers pinkish, in axillary and terminal spikes.

This plant is cultivated for its beautiful rose-colored flowers. English name: Crape myrtle.

**Lagerstroemia speciosa** Persoon.

A large spreading tree. Leaves glabrous, alternate, elliptical, acuminate, 4 to 8 inches in length, 1.5 to 2.5 inches in width; margins wavy; petiole short. Flowers pinkish-white, in a terminal panicle, the edges of the petals wavy. Fruit a spherical capsule opening into 4 sections, contains several winged seeds.

A rare tree; seen only under cultivation at the Government Experimental Garden, Avarua. Introduced.

**Punica granatum** Linnaeus.

A large shrub. Leaves opposite, obtuse, entire, shiny. Flowers orange-red. Fruit large, contains many seeds around which is a firm pulp rather tart.

Not common, although seen about dwellings under cultivation. Introduced.

## LECYTHIDACEAE

**Couroupita guianensis** Aublet.

A tall soft-wooded tree. Leaves alternate, oblong-ovate, entire, flowers and fruit not seen.

Rare. Introduced lately. Seen only at the Government Experimental Garden at Avarua.

**Barringtonia butonica** Forster.

A handsome, glabrous tree. Leaves entire, oblong, obtuse, coriaceous. Flowers large, white, 4 petals, many stamens, resembling a brush. Fruit a 4-sided pyramid, 3 inches in diameter, enclosed in a tough parchment-like covering, containing one large seed.

Common along the strand in all districts. Native name: *utu*.

The seed of this tree is used in poisoning fish.

**Barringtonia edulis** Seemann.

A small tree. Leaves entire, narrow, crowded at the ends of the branches. Flowers on a long pendant raceme, white with many stamens. Fruit oblong 4-angled, with very prominent persistent calyx.

Rare. Introduced. Seen only at Ngatipa, the residence of the Governor.

## COMBRETACEAE

**Terminalia catappa** Linnaeus.

A large deciduous shade tree. Branches in horizontal whorls. Leaves large, alternate, entire, obovate, clustered at the ends of the branchlets, glaucous when adult; base caudate; petiole short. Flowers small, axillary, spicate. Fruit an ellipsoid, 1.25 inches in length, slightly compressed, encircled by a ridge keel; endocarp hard, enclosing an oblong-elliptical edible seed having the flavor of a walnut.

A common tree along the roadways where it is planted. Native name: *kauarika*.

The wood of this tree is hard and tough, of a reddish color, and used for shaping into useful domestic utensils.

**Terminalia** species.

A tall tree. Leaves alternate, acute, cuspidate, spatulate, crowded at the ends of the branchlets, 4 to 8 inches in length, 2 to 4 inches in breadth; petioles short. Flowers greenish, small. Fruit 1.5 inches long, 1 inch broad; exocarp smooth, shiny when dry; endocarp corky, fibrous.

Common on the high mountains; seen on Maungatea at an altitude of 1500 feet. Native name: *kauarika*.

**Terminalia** species.

A small tree. Leaves alternate, ovate, 2.5 to 6 inches in length, 1.25 to 4.25 inches in width; venation prominent; petiole 1.5 to 2 inches in length.

An introduced plant; only one specimen seen, growing at the Government Experimental Farm at Avarua.

## MYRTACEAE

**Eucalyptus longifolia** Link and Otto.

A medium-sized tree having rough, wrinkled bark. Leaves elongated, lanceolate. Flowers long-stalked, stamens short. Fruit turbinate.

Only one seen growing at the Government Experimental Gardens, Avarua. Introduced. English name: Wollybutt.

**Eucalyptus microcorys** F. von Mueller.

A tall tree. Bark wrinkled. Leaves alternate, broadly-lanceolate, thin, dotted with minute oil glands. Flowers small, pedicelled, with many white stamens, the buds club-shaped. Fruit small.

Introduced. English name: Tallow-wood tree.

**Eucalyptus robusta** Smith.

A tree with very rough dark-brown bark. Leaves oval-lanceolate, large, acuminate, coriaceous; veins prominent. Flowers white; stamens many. Fruit, goblet-shaped.

Not a common tree. Introduced. English name: Swamp mahogany.

**Eucalyptus** species.

A tree having smooth bark. Leaves alternate, acuminate, ovate; petiole 1 inch in length. Flowers and fruit not seen.

Introduced.

**Eugenia jambolana** Lamarck.

A tall tree. Leaves opposite, entire, broadly-oblong, thick, shiny, 2.5 to 5.5 inches in length, 1 to 3 inches in width. Flowers white with numerous stamens. Fruit a drupe, having a thin skin; pulp edible, rather tart, surrounding a single large seed. Several large trees were seen growing along the roadways.

Common on the lowlands, and spreading into the hills. English name: Java plum. Native name: *kahika papaa*.

**Eugenia jambos** Linnaeus.

An evergreen tree 20 to 30 feet in height. Leaves opposite, acuminate, lanceolate, thick, shiny, 5 to 8 inches in length, 1 to 2 inches in width. Flowers have many greenish-white stamens. Fruit pyriform, 1.5 to 2 inches in diameter, hollow, containing one large, brown, unattached seed, 0.75 inch in diameter. The crisp edible flesh is 0.25 inch thick, creamy-pink; flavor agreeable.

Not a common tree; seen only under cultivation near dwellings. English name: "rose-apple." Native name: *kahika papaa*.

**Eugenia malaccensis** Linnaeus.

A large, pantropic, forest tree. Leaves opposite, ovate, elliptic, entire, glossy, attenuate at both ends; petiole short. Flowers in dense axillary cymes, with numerous scarlet stamens. Fruit nearly round, crowned by the scar of the calyx lobes; pulp edible, sweet, watery; seeds large—usually only one.

Common in the valleys. Also observed near dwellings. Probably indigenous. Native name: *kahika papaa*.

In its natural habitat this tree often reaches a height of 40 feet. It is cultivated for its much-prized fruit.

**Eugenia uniflora** Linnaeus.

A small bush or shrub, 3 to 5 feet in height. Leaves opposite, entire, ovate-lanceolate, glossy, 1 to 2 inches in length, 0.5 to 0.75 inch in width; petiole short. Flowers axillary, in a cyme, white, fragrant, having many yellowish-green stamens. Fruit a



berry, 0.75 inch in diameter, thin-skinned, and ribbed longitudinally, scarlet in color to even dark-red when ripe; pulp surrounding single seed, edible.

Not a common plant. Introduced. Seen only under cultivation. English name: Surinam cherry.

The fruit has a tart acid flavor and makes an excellent conserve.

**Metrosideros collina** (Forster) A. Gray, subspecies *polymorpha* (Gaudichaud) Rock.

A small bushlike tree. Leaves opposite, entire, elliptical or oval, acute at both ends, 0.75 to 1.50 inches in length, 0.5 to 0.75 inch in width, feather-veined; nodes 0.5 to 0.75 inch distant; midrib prominent. A fine marginal line extends completely around the blade. Flowers orange-red.

Seen on the slopes of Maungatea, altitude 1000 feet. *Metrosideros villosa* of Cheeseman's list. Native name: *raia*.

The following varietal forms of *Metrosideros* were also collected by me:

1. Shrub 2 to 3 feet in height. Leaves opposite, coriaceous, entire, obtuse, faintly feather-veined, 1.5 to 2 inches in length, 1 to 1.5 inches in width; petiole short. Flowers red.

Maungatea, altitude 900 feet.

2. A large bushy tree, 6 to 8 inches in height. Leaves opposite, entire, elliptical, glabrous, both ends acute, 1.25 to 2.5 inches in length, 0.75 to 1.25 inches in width; sometimes the tips are obtuse; midrib prominent, feather-veined. Flowers in a terminal cyme; peduncles tomentose. Stems and branches bright-red.

Ikurangi, altitude 1660 feet. Common on the high mountains.

3. A tree 6 to 10 feet in height. Leaves large, fleshy, lanceolate, entire, acute or acuminate; 1.25 to 2 inches in length, 1 to 1.5 inches in width; stems and petioles bright-red; internodes spaced, 0.75 to 1.5 inches apart; petiole 0.25 inch in length; midrib and marginal veins prominent.

Common on the high ridges up to an altitude of 1800 feet.

4. A shrub having opposite pale-green leaves, 1 to 1.25 inches in length; 0.75 to 1 inch in width. Stems and branches rough; bark split and streaked with white. Leaf scars prominent; immature and young leaves tomentose; cymes few-flowered, terminal, orange-red in color.

Maungatea, altitude 1500 feet.

5. A spreading shrub. Leaves opposite, 2 to 2.25 inches in length, 1 to 1.5 inches in width, entire, thick, shiny, elliptical, feather-veined; prominently acuminate at petiole end; both acute and truncate leaves on the same plant; midrib prominent; petiole short. Flowers terminal, orange-yellow.

Seen only on the dry slopes of Ikurangi, altitude about 800 feet. Rare.

**Pimenta officinalis** Berger.

A medium-sized tree. Leaves opposite, entire, thick, leathery, 3.5 to 6 inches in length, 2 to 2.5 inches in width. Flowers and fruit not seen.

A rare tree. Introduced. English name: Allspice.

The bark of this tree is aromatic and the leaves are used in flavoring food.

**Psidium cattleianum** Sabine.

A small spreading tree. Bark smooth. Leaves opposite, obovate-elliptical, coriaceous, glabrous, acute at apex, tapering to acuminate at the base, 2 to 3 inches in length, 1 to 1.25 inches in width, with a short petiole. Flowers white; petals 5; stamens numerous and very fragrant. Fruit obovate, 1.5 inches in diameter; skin thin, purplish-red when ripe, contains a rather tart aromatic pulp with numerous hard round seeds.

Common in all the districts and grown under cultivation. Introduced. English name: Strawberry guava.

These trees are cultivated principally for their fruit.

**Psidium guayava** Linnaeus.

A shrub, sometimes growing into a good-sized tree. Leaves opposite, elliptical, oblong, sometimes oval, 3 to 6 inches in length, 1.5 to 2.5 inches in width, light-green; veins prominent. Flowers axillary, white; petals 5; stamens numerous, fragrant. Fruit globose, or pyriform, about 1.5 inches in diameter. Flesh red, sweet. Contains many seeds.

Common everywhere and considered a troublesome weed about agricultural lands. English name: Guava. Native name: *kuava*.

**Syncarpia glomulifera** Niedenzu.

A large tree with opposite, elliptico-oblong or ovate leaves.

Rare; seen only in the Government Experimental Garden, Avarua. English name: Turpentine tree. Introduced.

This tree is a native of Australia.

## MELASTOMATACEAE

**Melastoma denticulatum** Labillardiere.

A small shrub. Leaves opposite, ovate, or oblong-ovate, acuminate or acute. Stems and leaves hairy. Flowers white, several together at the ends of the branches. Fruit resembles a strawberry, said to be edible.

Seen on Ikurangi, altitude between 200 and 600 feet, on dry hills. Common in all districts. Native name: *kotaa*.

## ONAGRACEAE

**Jussiaea repens** Linnaeus.

A small low-growing, spreading aquatic plant. Leaves alternate, acute, lanceolate; petiole as long as blade. Flowers solitary, axillary, yellow.

Common in all districts, particularly in marshy places. English name: Clove strip.

This plant is a troublesome weed in taro patches.

**Jussiaea suffruticosa** Linnaeus.

An erect aquatic herb, 2 to 3 feet in height. Leaves narrow, 1.5 to 3 inches in length. Flowers solitary, sessile, yellow.

A common weed in all wet districts of the lowlands. It is usually found in taro patches. Native name: *tiemu*.

**Jasminum sambac** Solander.

A sprawling shrub. Leaves opposite, entire, shiny, ovate-elliptical, sometimes acute, or rounded on the end; veins prominent. Flowers white; petals 5, fragrant.

Common about native dwellings, under cultivation. English name: Arabian jasmine. Native name: *pitate*.

**Olea sativa** Hoffmannsegg and Link.

A tree. Leaves narrow, shiny, opposite, having a prominent midrib; petiole short. Neither flowers nor fruit seen.

Rare. Introduced. Cultivated. The olive of commerce.

## ARALIACEAE

**Meryta pauciflora** (Cheeseman) Hemsley.

A small, erect tree, 10 to 15 feet in height. Leaves alternate, large, coriaceous, glossy-green, 10 to 16 inches in length, 2.5 to 3 inches broad; blade acute, narrowing towards the short stiff petiole. Staminate inflorescence sessile in a terminal panicle; the pistillate flowers growing on a separate tree consist of a terminal spike. Fruits numerous, about 0.75 inch in diameter, each containing several seeds.

Common at altitudes from 150 to 1000 feet. Seen in Connals Gulch, Titikaveka, and on Maungatea. Native name: *kaka vatua*.

**Polyscias filicifolia** Bailey.

An erect, glabrous shrub. Leaves alternate, large, lanceolate serrate, bright-green spotted with white, pinnately 3-compound; petiole clasping at the base. Flowers and fruit very rare.

Imported from Tahiti for the purpose of growing stakes upon which to train vanilla. It is also planted for hedges. When not pruned or cut back, this shrub reaches a height of 25 feet.

**Polyscias guilfoylei** Bailey.

An erect-growing shrub. Leaves regularly pinnate; petiole expanded and clasping at the base; leaflets bright-green, bordered with white, margined with acuminate teeth, ovate or ovate-elliptic, on short, stout petiolules. Flowers very rare, in a terminal raceme. Fruit a small berry, blue when ripe.

Introduced from Tahiti. Common in all the districts. Flowers and fruit collected from a plant growing in the village of Avarua. Local English name: False coffee.

This shrub is used for hedges.

UMBELLIFERAE

**Centella asiatica** (Linnaeus) Urban.

A creeping prostrate, sometimes semi-aquatic herb. Leaves reniform, crenate, on long petioles; internodes 3 to 5 inches apart, rooting at every joint. Flowers axillary, small, white, 3 or 4 in a single head. Fruit orbicular, 0.25 inch in diameter.

This plant is common in the wet low sections of all the valleys. *Hydrocotyle asiatica* of Cheeseman's list. Native name: *kapukapu*.

**Apium leptophyllum** F. von Mueller.

A strong-smelling glabrous weed. Stems erect, 1 to 2 feet in height. Leaves opposite; leaflets linear in pairs, 2 to 3 with one terminal leaflet. Flowers very small, white. Fruit small, ovate, compressed laterally.

Common in waste places about native dwellings, and by roadsides.

CORNACEAE

**Aucuba japonica** Thunberg.

A small cultivated plant. Leaves ovate, opposite, coarsely-dentate, acuminate, shiny. Flowers small. Fruit a bunch of red berries.

Rare, cultivated as an ornamental. Introduced.

ERICACEAE

**Vaccinium reticulatum** Smith.

A small erect shrub, 1 to 2 feet in height. Branches angular, stiff. Leaves alternate, coriaceous, oblong; edges dentate, minutely pubescent when young; petiole short. Flowers axillary, small, white. Fruit a globose berry, reddish-yellow, covered with a waxy bloom.

Common on the high mountains above 1000 feet altitude. *Vaccinium cereum* of Cheeseman's list. Native name: *poroporo*.

## MYRSINACEAE

***Ardisia humilis* Vahl.**

A large shrub. Leaves glabrous, entire, obovate-oblong, 4 to 8 inches long, narrowed into a short petiole. Flowers pink in an axillary cyme, with a 5-parted, rotate corolla. Fruit 1-seeded, shiny-black, about the size of a pea.

Generally cultivated, but recently has become wild and is found in the valleys and the woods.

***Rapanea cheesemani* Hemsley.**

A small spreading tree. Leaves alternate, acute, entire, smooth; midrib very prominent. Flowers minute in dense clusters on the branches. Fruit small, round. Wood fiber hard, reddish in color.

Common on Maungatea, altitude between 900 to 1100 feet. Also seen on Maungaroa, and up, at an altitude of 1800 feet, on Tukou Mountain. *Myrsine cheesemani* of Cheeseman's list. Native name: *taraire*.

## PLUMBAGINACEAE

***Plumbago capensis* Thunberg.**

A semi-climbing shrub. Leaves glaucous, scattered, oblong, ovate, acuminate, narrowed into a very short petiole. Flowers small, pale-blue, in a terminal raceme, the calyx covered with hairs and a sticky substance.

Seen only under cultivation. Rare. Introduced.

***Plumbago zeylanica* Linnaeus.**

A straggling, branching herb. Leaves glabrous, oblong, acute, the base of the short-winged petiole clasping the stem. Flowers in a terminal corymb, white; calyx hairy and covered with a viscid substance.

Not common; seen only in private gardens under cultivation.

## SAPOTACEAE

***Achras sapota* Linnaeus.**

An evergreen tree 25 feet high. Leaves entire, glabrous, ovate-elliptical, 2 to 5 inches in length on a short petiole. Flowers small, axillary near the ends of the branches. Fruit spherical, 1 to 1.5 inches in diameter; skin rusty-brown; pulp yellowish-brown when fully ripe, embedded with several flat brown seeds.

A rare tree; seen in the Government Experimental Garden at Avarua, and also at Arorangi Village. Introduced. English name: Naseberry.

The fruit is soft and melting to the taste.

***Chrysophyllum cainito* Linnaeus.**

An evergreen tree, 15 to 25 feet in height. Leaves oval or oblong, alternate, entire, stiff, the upper surface shiny, the underside a beautiful bronze-brown. Flowers axillary,

small, purplish-white. Fruit globular, smooth, fleshy, soft, purple when ripe; contains several large flat seeds. Cross section discloses the star-shaped core.

Not very common. Introduced.

#### **Sideroxylon** species.

A large tree. Leaves simple, entire, thick, dark-green. Flowers not seen. Fruit a berry with two seeds. Wood hard, durable.

Seen on Maungatea and on Tereora about 600 feet elevation. Not a common tree. *Bassia* species of Cheeseman's list.

When bruised, the leaves and branches emit a white gummy substance.

### EBENACEAE

#### **Diospyros ebenaster** Retzius.

A tall tree when full-grown. Leaves elliptic, obtuse, entire, 3 to 12 inches in length, glossy-green. Neither flowers nor fruit seen.

Lately introduced from Hawaii; seen in Arorangi. English name: Brown persimmon.

#### **Diospyros kaki** Linnaeus.

Small shrub or tree. Branches slender. Leaves alternate, ovate-elliptical, entire, glabrous, acuminate, 2.5 inches in length, 2 inches in width, shiny on the upper side, slightly pubescent beneath. Flowers yellowish-white. Fruit a globose, juicy berry, 2.5 inches in length, bearing an enlarged calyx at the base. Several large, flat, brown seeds.

A single specimen was seen growing at the residence of Mrs. Morrell, Arorangi. An introduced plant.

### OLEACEAE

#### **Jasminum didymum** Forster.

A strong climbing vine with opposite tri-sected leaves, on stiff stems. Flowers white in axillary terminal racemes, petals 4 to 6. Fruit a small berry single or in pairs, black when ripe.

Common from sea level to the hills. Native name: *aketa*.

The stems are used for tying thatch on native houses.

#### **Jasminum grandiflorum** Linnaeus.

An erect often spreading herb. Leaves opposite; leaflets entire, 5 to 7 elliptical; the terminal leaflet acuminate, cuspidate. Flowers white, 5 petals, very fragrant.

Common about dwellings. Seen under cultivation only. Native name: *pitate*.

## LOGANIACEAE

**Fagraea berteriana** A. Gray.

A large tree. Leave opposite, entire, stiff, glossy-green, 5 to 8 inches in length, 3 to 4.5 inches in width. Petiole 0.75 inch long. Flowers large, tubular, white, changing to yellow, fragrant. Fruit a yellow berry containing quantities of small seeds.

This tree has a durable fine-grained wood. Native name: *pua*.

## APOCYNACEAE

**Allamanda hendersonii** Bulliard.

A strong-growing vine. Leaves opposite, entire, thick, large, leathery, ovate-elliptical, appearing in threes and fours at the internodes. Flowers large, yellow.

Not very common; seen in private gardens. Introduced.

**Allamanda neriifolia** Hooker.

A dwarf bush or semi-climber, having woody stems. Leaves petiolate, 2 to 5 in a whorl, elliptical or ovate, acuminate, entire; petiole very short. Flowers yellow. Fruit a spiny, globular pod, 1 inch in diameter, having numerous small, round seeds.

Introduced. Rare; seen only in the district of Muri, under cultivation.

**Alstonia costata** R. Brown.

A small tree, showing a milky juice when bruised. Leaves opposite, acuminate, thick, leathery, undulate, glossy-green. Midrib and veins very prominent. Flowers small, yellow, in a terminal cyme. Fruit a slender pod 6 to 10 inches in length.

Common on all hills and mountains above an altitude of 250 feet.

**Alyxia elliptica** Cheeseman.

An evergreen shrub or small tree. Branches sometimes twining. Leaves opposite, entire, glossy, acuminate at both ends, 1 to 0.75 inch in length, 0.5 to 0.75 inch in width, coriaceous, slightly rugose. Flowers axillary, small, yellow. Fruit generally a single, fleshy, elliptic-oblong, black drupe, some lomentaceous, some paired.

The young twigs and leaves when partially dried become fragrant and are used by the natives for personal adornment. The stems emit a milky juice when bruised or broken. Native name: *maire rakau*.

## Var. 1.

Leaves small, narrow, entire, emarginate, glossy, 0.75 to 2 inches in length, 0.25 to 0.75 inch in width.

On the hills above Nikao, at an altitude of 700 feet.

## Var. 2.

Leaves 3 inches long, 1 inch wide, some dentate.

A few large-leaved plants were seen above Tereora at an elevation of 750 feet, without flowers or fruit.

**Cerbera manghas** Linnaeus.

A small tree. Leaves entire, alternate, narrow-lanceolate, crowded at ends of branches; veins horizontal, issuing from a prominent midrib. Flowers in a terminal cyme, single, large, 5-petaled. Fruit an ovoid drupe, about 3 inches long, having 1 large seed.

Introduced. Not a common plant, but seen about dwellings. Native name: *reva*, or *ava*. *Cerbera odollam* of Cheeseman's list.

Planted by the natives, who use the fruit and flowers medicinally; said to be poisonous if taken internally. Flowers and hollow stems emit a sticky white fluid when bruised.

**Nerium indicum** Miller.

An evergreen glabrous shrub. Leaves in whorls, narrow, lanceolate, leathery, transversely feather-veined. Flowers 5-lobed, in a terminal cyme.

A cultivated ornamental plant, esteemed for its varicolored flowers. Common about gardens.

**Plumeria alba** Linnaeus.

A small, many-branched, spreading tree. Leaves alternate, commonly 2 feet long, 2.5 to 3 inches wide, acuminate, tomentose on the underside. Flowers white, fragrant.

Common about dwellings and is mostly planted in cemeteries. English name: Frangipani. Native name: *tipani*.

Occasionally a perfect flower sets fruit, which consists of a 2-winged pod 4 to 8 inches in length, containing numerous flat seeds.

**Tabernaemontana divaricata** (Linnaeus) R. Brown.

A shrub 4-8 feet high. Leaves glossy-green, opposite, thin, oblong; some acuminate, entire, oblanceolate. Flowers white, 5-lobed, corolla salvershaped, 1 to 2 inches broad; petals crimped on the edges.

A common plant, in cultivation about dwellings of the natives. Native name: *tiare moorea*.

**Thevetia peruviana** (Persoon) Merrill.

A small, spreading, glabrous tree, 6 to 10 feet in height. Leaves alternate, linear, feather-veined, shiny, 3 to 5 inches in length. Flowers 2 to 3 inches long, yellow, somewhat fragrant. Fruit 1 to 1.5 inches in diameter, broader than long, 2-celled.

Introduced. Common in all districts on lowlands. Found only under cultivation.

The fruit of this tree is mildly poisonous when eaten.

**Vinca rosea** Linnaeus.

An erect, tender shrub, about 2 feet high. Leaves opposite, shiny, entire, oblong. Flowers axillary, 5-petaled.

Common in gardens and often seen escaped from cultivation.



## ASCLEPIADACEAE

**Asclepias curassavica** Linnaeus.

An erect herb, about 2.5 feet high. Leaves opposite, lanceolate, acute, glabrous 3-4 inches long; petiole short. Flowers in an umbel, orange-red. Fruit commonly a single carpel, about 2 inches long, sometimes found in pairs, acute at both ends, containing many flat, brown, tufted seeds.

An early introduced species. Common; seen on waysides in all districts. English name: Blood flower.

**Cryptostegia grandiflora** R. Brown.

A climbing woody shrub. Leaves opposite, oblong, entire, 3 inches long, 1.5 inches broad. Flowers in a cyme, purple. Fruit a 3-sided, tapering folicle, generally in pairs, containing numerous flat, winged seeds.

Introduced. Rare; seen only as a cultivated ornamental.

**Stephanotis floribunda** Brongnairt.

A climbing vine. Leaves opposite, elliptic, coriaceous, entire, thick, shiny. Flowers white, fragrant; calyx 5-parted, corolla salverform. Fruit an ellipsoid, 3 inches long, 2 inches thick, containing numerous flat-winged seeds.

Common as an ornamental in gardens. Introduced.

## CONVOLVULACEAE

**Calonyction album** (Linnaeus) House.

A strong-growing vine. Leaves cordate, acute, alternate, 2 to 3.5 inches in length, 2 to 4.5 inches in width; veins radiating; auricles rounded. Flowers axillary, 3 inches in diameter, white. Fruit a capsule containing several seeds.

**Ipomoea batatas** Poir.

Leaves deltoid, 3-parted, acuminate. Tubers dark-purple. Flesh white when cooked.

Much cultivated. Foliage very thick; a strong grower. English name: Sweet potato. Native name for all varieties: *kumara*; for this variety: *kumara muramura*.

## VARIETIES

- |                 |  |
|-----------------|--|
| Kumara oi.      | Leaves finely cut, skin of tuber red, smooth. Flesh when cooked light-purple.  |
| Kumara raupipi. | This plant has small finely cut leaves. Tuber pale yellow when cooked. A poor variety, not very popular, seldom cultivated.  |
| Kumara rea.     | Leaves pale-green, skin white, flesh yellow when cooked. This variety is rare, the rats seem to attack this more than other Kumaras, and seldom can perfect tubers be found. |

- Kumara rengarenga.** The common sweet potato generally cultivated by the Rarotongans. Leaves finely cut, petiole twice as long as the blade, stems purple. Tuber yellow when cooked.
- Kumara ti.** This variety has small leaves, skin of the tuber white, flesh white when cooked, and becomes firm and hard.
- Kumara vanu.** Leaves dark-green, skin or tuber pale-pink, flesh, when cooked, light-yellow. A potato of fine quality, said to have been introduced from Hawaii.
- Kumara vavai**  
(cut into pieces). A strong-growing vine with large tubers, skin red, flesh yellow when boiled, should be cut into pieces to ensure being thoroughly cooked.
- Kumara wehi.** A strong-growing, prolific plant, stems hairy. Leaves 5-lobed, petiole long, slender. Tuber purple-colored; flesh white when cooked. Introduced from Hawaii.

***Ipomoea denticulata* Choisy.**

A small-stemmed creeper, sometimes climbing. Leaves heart-shaped, 0.75 to 1.75 inches long, 0.75 to 1.75 inches wide, petiole twice the length of the blade. Flowers axillary, pale rose-color.

Seen on Maungatea; also common on other ridges and mountains. Native name: *pipa*.

***Ipomoea gracilis* R. Brown.**

A glabrous vine with small, slender stems. Leaf deltoid, or cordate, acute or acuminate, sometimes seen rounded; petiole slender, the same length as the blade. Flowers in pairs, axillary.

***Ipomoea pes-caprae* Vahl.**

A glabrous creeping vine with long, fleshy, smooth, non-rooting stems. Leaves long-petioled, rounded, deeply 2-lobed. Flower large, corolla funnel-shaped, rose-purple. Capsule 2-celled, 2-seeded, seeds covered with a dark-brown hairy pubescence.

A common plant along the seashore. *Ipomoea biloba* of Cheeseman's list.

***Merremia nymphaeifolia* Hallier.**

A strong-growing vine, climbing trees and eventually breaking them down with its great weight. Leaves large, peltate. Stems strong. White flowers borne in large bunches.

Very common in lowland woods. Native name: *pohue*.

A very troublesome plant about cultivated areas.

***Rivea nervosa* Hallier.**

A strong climber. Leaves cordate-ovate, entire, membranous, 4 to 8 inches long, glabrous on the upper surfaces, stems and underside of leaves coated with silky white tomentum. Flowers purple in axillary corymbs, with long peduncles. Fruits brown, containing several seeds which are covered with minute hairs.

Rare plant. Introduced.

## BORAGINACEAE

**Cordia subcordata** Lamarck.

A large spreading tree, 20 to 30 feet in height. Leaves alternate, entire, spatulate. Flowers orange-red, in a short terminal cyme. Fruit an ovoid drupe 1 to 1.25 inches in diameter, white when mature; contains a single large seed.

A cultivated tree common in all the districts near sea level. Native name: *tou*.

The wood of this tree is valuable and was formerly used for domestic utensils.

**Heliotropium anomalum** Hooker and Arnott.

A decumbent herb, 4 to 6 inches in height. Leaves small, thick, spatulate, entire, covered with soft silky hairs. Flowers small, in a terminal spike; corolla funnel-shaped, fragrant, pale-blue.

Common along sandy beaches near the sea.

**Heliotropium peruvianum** Linnaeus.

A shrub. Leaves alternate, oblong-lanceolate; veins very prominent; petiole short. Flowers small, in a compact cyme, pale bluish-purple, and sweet-scented.

A cultivated ornamental garden plant.

**Tournefortia argentea** Linnaeus.

A small tree of spreading habit, 6 to 10 feet in height. Leaves alternate, obovate-oval, tapering at the base, rounded at the apex, simple, pubescent, crowded at the ends of the branches. Flowers white, sessile, with numerous globose buds. Fruit the size of a small pea.

Common along the seashore.

The wood of this tree is of little value.

## VERBENACEAE

**Clerodendron fallax** Lindley.

An erect ornamental shrub 2 to 4 feet in height. Stems 4-sided. Leaves opposite, large, entire, hairy, cordate-ovate; petiole stout. Scarlet flowers, numerous, in large terminal cymes.

Introduced as a garden plant and now spread to many parts of the island. It is becoming a troublesome weed.

**Clerodendron fragrans** Ventenat.

A hardy shrub 3 to 5 feet in height. Leaves opposite, ovate, acuminate, cordate at the base, margins coarsely-toothed, hispid on the upper surface, pubescent beneath. Flowers generally double, in a terminal subsessile cyme; calyx 5-cleft, pale-roseate in color.

Common in the lowlands in moist places away from the sea. Native name: *pitate mama*.

**Clerodendron thomsonae** Balfour.

A shrubby glabrous vine. Leaves opposite, oblong-ovate, entire, acute, often acuminate, short-petioled. Flowers axillary; calyx 5-angled, white or green-tinged; corolla red.

Not a common plant, seen only in private gardens under cultivation. Introduced.

**Duranta repens** Linnaeus.

A woody, glabrous shrub or small tree, branches 4-angled, sometimes having small axillary spines. Leaves opposite, in whorls, acute, elliptical, entire, sometimes ovate, on a short petiole. Flowers in paniced racemes, corolla pale-blue. Fruit a yellow drupe, in large pendent bunches.

Introduced.

**Lantana camara** Linnaeus.

A small shrub. Leaves opposite, thick, rough, crenate-dentate, ovate, acuminate. Stems and branches armed with short prickles. Flowers small in a dense head, yellow, pink, and orange-red in color.

As this plant is considered a noxious weed it is seldom seen. Introduced.

**Premna tahitensis** Schauer.

A spreading shrub, sometimes climbing when it finds support. Leaves opposite, entire, broadly-ovate, short, acuminate at both ends, 1 to 2.5 inches in length, 1 to 2 inches in width; petiole 1 inch long. Flowers small, greenish-white, terminal in spreading panicles.

A common cultivated plant about native dwellings. Flowers made into garlands for personal adornment.

**Stachytarpheta jamaicensis** Vahl.

An herb 1 to 2 feet in height, stems quadrangular. Leaves acuminate, crenate-serrate, petiole short. Both leaves and branches pubescent. Flowers small; petals 5, deep-blue in color, the flower tube sunk into a thick spike or stem, containing the oblong, linear seeds or fruit.

A common weed everywhere along the roads and in pastures, and on the hills.

**Vitex negundo** Linnaeus var. **bicolor** H. J. Lam.

A small spreading tree. Leaves opposite, palmately compound, branchlets 4-cornered, finely pubescent; petioles slender 1 to 1.5 inches in length; leaflets 3 or 5, the two lower pair sessile, the others long-petioled, acute, linear-lanceolate, the upper surface glabrous, the underside covered with a dense white pubescence. Flowers axillary or in a peduncular cyme, numerous, small, lilac-blue in color. Leaves aromatic when bruised. Fruit a small, globose drupe appearing in bunches, black when ripe.

Common in low wet sections, and swampy land. *Vitex trifolia* of Cheeseman's list. Native name: *rara*.

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**Vitex trifolia** Linnaeus var. **unifoliata** (Linnaeus) De Candolle.

An evergreen shrub with spreading loose branches. Leaves opposite, leaflets usually 3, obvate-oblong, obtuse, entire, under side of leaves and inflorescence white. Flowers blue in terminal panicles, fragrant. Fruit a globose drupe appearing in bunches.

Common in the lowlands near the sea.

## LABIATAE

**Coleus blumei** Benth.

A small herb of upright growth. Leaves opposite, ovate, narrowed or broad, dentate or serrate; margins sometimes wavy.

Cultivated as an ornamental for its vari-colored foliage. Introduced. Growing in all the villages.

**Leonurus sibiricus** Linnaeus.

An erect roadside weed about 2 feet high, having numerous purple or white flowers arranged in whorls. Leaves on a long petiole.

Cheeseman recorded this plant as rather rare, but after a period of 28 years it has spread to all the districts of the island.

**Leucas decemdentata** Smith.

A small erect herb with opposite leaves, acuminate at both ends. Flowers small in whorls at axils of leaves. Fruit a small open capsule containing numerous minute seeds.

Ikurangi, altitude 1600 feet. Rare. Native name: *tutae kolea*.

**Mentha viridis** Linnaeus.

A small ornamental shrub, 1 to 2 feet in height. Leaves lanceolate, serrate, 2.5 inches in length. Flowers in whorls on a spike.

Common about dwellings. Introduced. Cultivated for the aromatic leaves and stems. English name: Spearmint.

**Ocimum basilicum** Linnaeus.

A branching, annual shrub, 1 to 2 feet in height; leaves opposite, ovate, glabrous, slightly-toothed. Flowers in dense racemes; varieties have both white and purple blossoms.

Cultivated by the natives about their homes for the fragrant leaves and flower spikes, both of which are made into wreaths for personal adornment, as well as for flavoring food. Native name: *miri*.

**Ocimum gratissimum** Linnaeus.

A strong-growing erect herb, 2 to 4 feet high. Leaves opposite, lanceolate, acute, crenate, pubescent, wavy, tomentose, 1.5 to 5 inches long, 0.75 to 1.5 inches wide. Flowers white, small, on a terminal spike.

A troublesome weed along the roadsides, and in the uncultivated bottom lands of all districts. Native name: *miri papaa*.

**Salvia coccinea** Jussieu.

A shrubby annual 1 to 2 feet high. Leaves long ovate, acute, crenate, pubescent on the upper side, hoary-tomentose underneath. Flowers in a simple raceme, corolla scarlet.

Seen by the roadside at the eastern end of the island. Not very common. Sometimes cultivated as an ornamental about native dwellings.

**Salvia occidentalis** Swartz.

A spreading weed. Leaves broadly ovate, 1 to 1.5 inches long, acute, serrate. Flowers small, in a raceme; corolla blue.

Common along the roadsides.

**Satureia hortensis** Linnaeus.

A small annual pubescent herb. Leaves entire, oblong-linear, acute; petiole short. Flowers in a dense spike.

Common in private gardens. Cultivated. English name: Summer Savory.

The leaves of this herb are used in flavoring food.

## SOLANACEAE

**Brunfelsia calycina** Benth.

A small plant of erect habit. Leaves entire, acute, glabrous, very shiny on the upper surface; petiole short. Flowers rich, dark, purplish-blue, very fragrant, in terminal or axillary cymes, in clusters or solitary; limb salver-shaped; margins of the petals wavy.

Seen under cultivation, in gardens. Not very common.

**Capsicum frutescens** Linnaeus.

A shrubby perennial, 3 to 6 feet high. Leaves broadly ovate, acuminate.

This small red, edible pepper which was originally cultivated by the natives, is now found growing wild in all parts of the island below an altitude of 1000 feet. Native name. *oporo*.

**Cestrum diurnum** Linnaeus.

A small shrub. Leaves oblong, opposite, ovate, shiny on the upper surface. Flowers white at axils of the leaves, fragrant. Fruit a globular berry, black when ripe.

Common plant about dwellings. Introduced. Cultivated for its fragrant flowers.

**Datura arborea** Linnaeus.

A small tree. Leaves entire, pubescent, ovate-lanceolate. Flowers white, large, tubular, with a peculiar, pungent odor. Fruit not seen.

A cultivated plant; rather common. English name: Angel's trumpet.

**Datura fastuosa** Linnaeus.

An herbaceous annual, 2 to 3 feet in height. Leaves ovate-lanceolate, acuminate, sometimes having wavy margins. Glabrous on both sides. Flowers solitary, purple-white inside the throat. Fruit a spiny, globose capsule, 1.25 inches in diameter, contains many seeds.

A common plant growing wild in pastures and open places.

**Lycopersicum esculentum** Miller.

Several fine varieties of edible tomatoes are grown throughout the island and exported to the markets of New Zealand. They constitute an important source of revenue for Rarotonga.

**Nicotiana tabacum** Linnaeus.

A few plants seen under cultivation about the homes and villages. Also seen growing wild having escaped from cultivation. Not common. Specimens collected from Avarua, Arorangi, and Ngatangia. Native name: *avaava*.

**Physalis lanceifolia** Nees von Esenbeck.

A perennial, strong-growing, pubescent plant having angled stems. Leaves ovate, cordate, acute, irregularly toothed, 1.5 to 3.5 inches long, 1.25 to 3 inches wide. Flowers open, bell-shaped, yellow, purple spots on the throat. Fruit, a many-seeded ovoid berry, 0.75 inch in diameter, yellow when ripe, enclosed in a parchment-like covering or husk.

Common under cultivation, and also seen in the lowlands, growing wild. English name: Cape gooseberry.

This fruit is particularly palatable when made into a conserve.

**Solanum nigrum** Linnaeus.

A low unarmed annual, 1 to 2 feet high. Leaves alternate, simple, ovate, narrow, with sinuate teeth along the edges. Flowers small, whitish. Berry or fruit small, round, 0.25 inch in diameter, black when mature.

Common in pastures and waste places in the lowlands. Native name: *poro*.

The berries are edible and are also used medicinally by the natives.

**Solanum anthropogorum** Seemann.

A shrub 2 to 4 feet high. Leaves elliptical, alternate, entire, acute at both ends, dark glossy-green 3 to 5 inches long, 1.5 to 2.5 inches wide; petiole long and slender. Flowers whitish-yellow. Fruit an oblong berry 1 to 1.5 inches long, having a tough, thick, red skin, which is removed in strips and braided together with fragrant flowers into wreaths for personal adornment.

Common everywhere under cultivation. Both red and yellow-colored varieties of this fruit are grown by the natives about their dwellings. *Solanum uporo* of Cheeseman's list. Native name: *poroiti*.

**Solanum auriculatum** Aiton.

A small spreading tree or bush. Leaves alternate, ovate, acute, large, thick, all parts of the stems and leaves covered with a greenish-yellow tomentum. On either side

at the base of the petiole are 2 large stipules clasping the stem. Flowers pale-blue, in axillary corymbs. Fruit in bunches containing many small flat seeds.

This plant was probably an accidental introduction, and in 28 years has spread to the middle forest in every section of the island, and has become troublesome.

## SCROPHULARIACEAE

**Angelonia salicariaefolia** Von Humboldt and Bonpland.

A perennial shrub, 1 to 2 feet in height, branches 4-sided. Leaves opposite, lanceolate, serrate, sessile, slightly pubescent. Flowers blue. Fruit a small pod with numerous minute seeds.

Common in gardens, cultivated. Introduced from Tahiti.

**Lindernia crustacea** (Linnaeus) F. von Mueller.

A small herb with opposite leaves.

Found growing high up on the open ridges. *Vandellia crustacea* of Cheeseman's list. Native name: *toatoa fenua*.

This plant is used as a native medicine.

**Russelia juncea** Zuccarini.

A cultivated shrub with slender branches. Leaves opposite, small, verticillate. Flowers in a lax cyme, red, calyx deeply 5-cleft.

Common in gardens of all districts.

## BIGNONIACEAE

**Crescentia cujete** Linnaeus.

A spreading glabrous tree. Leaves alternate, clustered at the nodes, lanceolate, 4 to 6 inches in length, dark glossy-green. Flowers solitary, yellowish-green. Fruit ovoid or oblong, 6 to 10 inches in diameter, hard-shelled.

Introduced. Common about native dwellings. Native name: *kumete*.

The fruit is used for all kinds of domestic utensils.

**Spathodea campanulata** Beauvois.

A tall tree. Leaves opposite, odd-pinnate; leaflets entire, lanceolate, acuminate, upper surface glabrous, beneath slightly pubescent when young. Flowers large, orange-red, in panicles. Fruit an oblong boat-shaped capsule, seeds flat, winged.

A few specimens lately introduced, some of which are growing at the Government Experimental Farm at Avarua.

**Parmentiera cereifera** Seemann.

A small tree. Leaves alternate, 3-foliolate. Flowers tubular, greenish-white, on long peduncles. Fruit an elongated cylindrical smooth pod, containing many winged seeds.

Only one specimen seen growing at the Government Experimental Farm, Avarua.



**Stenolobium stans** (Linnaeus) D. Don.

A medium-sized tree or bush. Leaves odd-pinnate; leaflets 5 to 7, lanceolate, acuminate, glabrous, margins serrate. Flowers yellow, fragrant, in a terminal panicle. Capsule linear, containing many small flat winged seeds.

This plant is often used for stakes upon which to train the vanilla vine. Common everywhere and spreading rapidly. Formerly known as *Tecoma stans*. Native name: *piti*. Introduced.

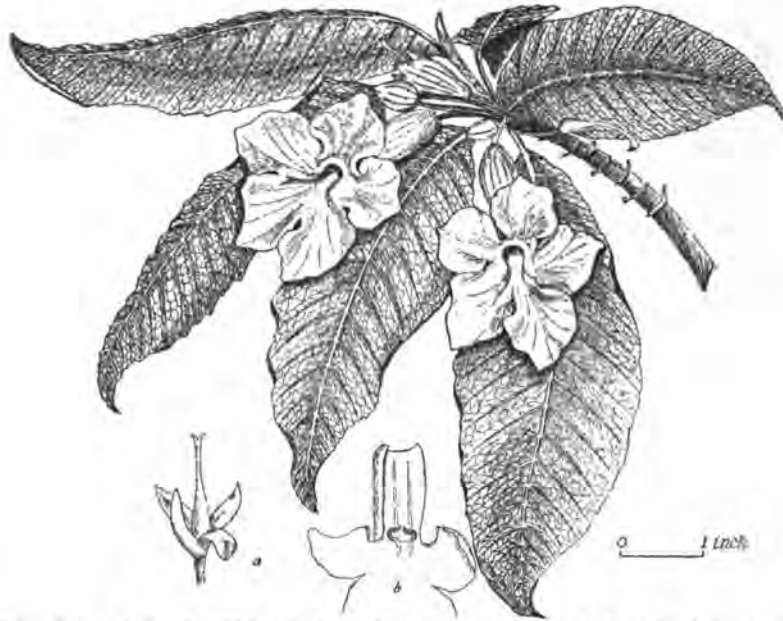


FIGURE 3.—*Cyrtandra lillianae* Setchell, new species: a, pistil and calyx; b, stamens.

## GESNERIACEAE

***Cyrtandra lillianae*** Setchell, species nova (Plate VII, fig. 3).

Frutex 60 cm. altus, ramosus, trunco lignoso, 0.6 -cm. diam.; caulibus vestustioribus cylindricis, ramis superis ultimis quadrangularibus, juvenilibus dense rubro-rufoso tomentosis, demum inferis glabris, superis rubrorufoso tomento indutis; foliis oppositis, subaequalibus, 15-17 cm. longis, 5-6 cm. latis, petiolis 2-3 cm. longis, 1.5-2 mm. diam., rubro-rufoso tomentosis; laminis obovato-lanceolatis, nunc falcato-curvatis, basi attenuatis apice longe acuminatis, supero glabris, atro-viridibus, sicco rufescente-viridibus, subtus granuloso albido-rufescentibus, glabris, nervis subtiliter rufo-tomentosis, utrinque latere 9-10, marginibus grosse et distanter dentatis; floribus in axillis foliorum superiorum singulis aut rare binis, pedunculis usque ad 5 cm. longis, 1 mm. diam., bracteis in paribus, duobus, quibusque foliis juvenilibus ramorum simillimis sed parvioribus, in pedunculorum partes inferas sitis invicem moderate distanter, non aut tarde deciduis (?); calycibus amplis, late campanulatis, externe inferoque hispidulis 2.5 cm. altis latisque, bilabiatis, duo-tertio, nunc ad basim, longitudinaliter spissis (demum caducis?); corollis magnitudine maximis, tubus 3.5-4 cm. longis, 1 cm. latis, late cylindricis, basi parve

tumidis, rectis aut lente curvatis, sub limbo infero tumidis, externe subtiliter hispidulis, longitudinaliter nervatis, faucibus abrupte dilatatis, limbis 5-5.5 cm, latis, interne externeque glabris, bilabiatis, labiis superis late 2-divisis, inferis late 3-divisis, lobis late orbiculari-cuneatis, subtiliter laxe reticulato-venatis, albis; staminibus perfectis 2, inclusis, rudimentariis 2, parvis; antheris sagittatis, loculis inferne lente divergentibus longitudinaliter dehiscentibus; stigmatibus bilobis; disco annulari, 1.5-2 mm. alto. margine libero lente undulato, ochraceo; bacca colore carnosio oblonga, 15 mm. longa, 7-8 mm. lata.

*Cyrtandra lillianae* is in striking contrast to the only other species of the genus thus far known to Rarotonga, *C. rarotongensis* Cheeseman in the single large apical flower of the cyme, two lateral flower rudiments being, at least so far as the specimens seen, almost always both abortive. The calyx seems to be long persistent, but is probably circum-sessile at the base and caducous, at least after flowering, as are those of the section *Polynesieae* of C. B. Clarke. No fruits are to be seen on the specimens examined and, consequently, this point is still uncertain. From all the *Polynesieae* of the eastern Pacific islands, it is to be distinguished by the length of peduncle, corolla tube, and the diameter of the limb in connection with the 1 (very rarely 2-) flowered cyme. The bracts also seem persistent, but nothing is shown of this in the specimens. From the description, it seems possibly near to *Cyrtandra graef-feri* Clarke, of Upolu, Samoa, but that species is described as having terete ramuli, elliptical, somewhat falcate leaves, copiously sprinkled with multicellular hairs, the younger fulvous silky, and with 7 to 8 lateral veins. It also seems in some specimens with leaves falcately curved to be near to *C. falcifolis* Clarke, of Savaii, Samoa, but the leaves of that species are described as 3 dm. long and 12 cm. wide, apparently a much larger-leaved plant than *C. lillianae*. The cymes also are lax and few-flowered, and the whole plant seems more villose than this Rarotongan species.

#### ***Cyrtandra rarotongensis* Cheeseman.**

A shrub 2 to 4 feet in height with stout quadrangular branches. Leaves large, fleshy, opposite, crenate, ovate-elliptical. Flowers white, fragrant; 0.5 inch in diameter in axillary cymes. Fruit 0.75 of an inch long, 0.5 inch wide, pink-colored when mature; contains many minute seeds.

Ikurangi, altitude 1500 feet; also on Mount Tukou, altitude 1800 feet, and in Connals Gulch, Titikaveka. Not a common plant.

### ACANTHACEAE

#### ***Eranthemum atropurpureum* Hortorum.**

A shrub. Leaves opposite, acuminate, entire. Flowers very showy, orange-colored, in whorls on a terminal spike.

Seen only at the home of King Makea Tinirau. Cultivated.

**Graptophyllum hortense** Nees von Esenbeck.

A small shrub, 6 feet tall. Leaves elliptical, acuminate, entire, irregularly marked with yellow along the midrib. Flowers crimson, in axillary whorls.

An introduced ornamental, not very common, seen only under cultivation in private gardens.

**Justicia carnea** Hooker.

A shrub. Leaves large, lanceolate, acuminate at both ends. Flowers dull-red, in a dense terminal spike.

An ornamental plant. Not very common, seen in one or two gardens.

**Thunbergia natalensis** Hooker.

An erect plant about 2 feet high. Stems quadrangular, glaucous. Leaves crowded, opposite, ovate, acute, sinuate-dentate, glabrous on the upper surface, midrib and veins hairy. Flowers 1.5 inches in length, solitary, tubular, pale-blue, yellow in the throat. Fruit a 4-seeded capsule, resembles the beak of a bird.

Rather rare. Grown as a decorative plant.

## MYOPORACEAE

**Myoporum sandwicense** A. Gray.

A small bushy tree. Leaves alternate, elliptic-lanceolate, glabrous, fleshy, acute at both ends, and crowded at the tips of the branches. Flowers white, axillary in clusters, 5 to 8; corolla funnel-shaped with 5 nearly equal lobes. Fruit a globose drupe, 0.5 inch in diameter, 5 to 10-celled, ribbed when dry, with several pendulous seeds.

This plant is very rare; only one specimen having been seen on the small islet, Motu Tapu, at the entrance to Ngatangia Harbor. English name: False sandalwood tree. Native name; *ngaio*.

The fragrant flowers of this tree are used to scent coconut oil for personal use.

## PLANTAGINACEAE

**Plantago major** Linnaeus.

A small, erect, stemless herb, with triple-nerved, succulent leaves. Sends up a slender spike 6 to 10 inches long, small flowers appearing on the upper half.

A common weed on the lowlands.

## RUBIACEAE

**Canthium barbatum** Seemann.

Tall, glabrous, unarmed shrub, or small tree. Leaves opposite, acuminate, entire, 2.5 inches long, 1.75 inches wide; petiole short. Flowers axillary, small, yellow, fragrant. Fruit a fleshy drupe with 1 or 2 seeds.

Common from seashore to the highest mountains. *Plectonia barbata* of Cheeseman's list. Native name: *matira*.

The wood of this tree is hard and durable.

**Coffea arabica** Linnaeus.

A plant. Leaves glabrous, glossy, opposite, ovate-oblong, acute, 3 to 6 inches long; flowers small, fragrant, clustered in the axils of the leaves; petals 5, creamy-white. Fruit an ovoid, deep-crimson berry, usually 2-seeded and covered with thick skin.

Introduced. Generally cultivated about dwellings, or in the edge of the woods. It has now become wild in the hills and mountains.

These berries constitute the coffee of commerce.

**Coprosma laevigata** Cheeseman.

A small tree 5 to 20 feet in height. Leaves opposite, acute, oblong, entire, the upper and lower surface smooth; midrib prominent. At the base of each veinlet is a small sac filled with minute hairs. Flowers numerous at axils of leaves. Fruit not seen.

Ikurangi, altitude 1200 feet; on Nikau, altitude 700 feet; also in other districts at an altitude of 1000 feet.

When bruised, the leaves are fragrant and are used as garlands for personal adornment.

**Gardenia taitensis** De Candolle.

A shrub or small spreading tree. Leaves opposite, acute, lanceolate, entire, 3 to 6 inches in length. Flowers white, salver-shaped, 5-petaled.

Very common under cultivation. Native name: *tiare tahiti*.

The tree is cultivated for its fragrant flowers.

**Geophila herbaceae** (Jacquin) O. Kuntze.

A small prostrate herb. Leaves opposite, cordate, entire, with long slender petiole. Flowers small, white. Fruit a berry, yellow when ripe.

Common; seen growing along the streams. *Geophila reniformis* of Cheeseman's list. Native name: *kapukapu*.

This herb is used medicinally by the Rarotongans.

**Guettarda speciosa** Linnaeus.

An evergreen tree. Leaves broad, obtuse, oval, 5 to 10 inches long, pubescent on the under side. Flowers white, fragrant, polygamous, small, on long stems, at axils of leaves. Fruit white, nearly round, contains one large seed.

Common along the sea coast. Native name: *anō*.

The flowers are strung into garlands for personal adornment. The wood is very hard, and has many domestic uses.

**Hamelia erecta** Jacquin.

A garden plant, 4 to 6 feet in height, with spreading branches. Leaves acute, entire, opposite, 2 to 3 inches in length, 1 to 1.25 inches in width; petiole short. Flowers orange-red, in terminal racemes.

A rare plant. Introduced.

***Ixora odorata* Hooker.**

A cultivated shrub. Leaves large, thick, obovate-lanceolate, acute, 6 to 10 inches in length. Flowers in an open panicle, much divided; corolla 3 to 5 inches in length, fragrant, white in color, changing to a yellowish-brown; stamens protruding.

A rare plant. Introduced.

***Ixora bracteata* Cheeseman.**

A small erect shrub or tree. Leaves thick, glabrous, opposite, acute, entire, 2 to 5 inches in length, 1.5 to 3 inches in width; petiole short. Flowers axillary, white, fragrant. Fruit 0.5 inch long, generally in pairs.

A common hardwood tree found above an altitude of 400 feet, in all the valleys. Native name: *itoo*.

***Morinda citrifolia* Linnaeus.**

A small tree with 4-angled branches. Leaves opposite, broadly elliptical, acute, shiny, 6 to 10 inches in length. Flowers at the axils of the leaves; corolla 5-lobed. Fruit ovoid, fleshy, yellow when ripe.

Common about dwellings. Native name: *nono*.

This tree is cultivated for its fruit, which, when properly cooked, is edible. The root yields a yellow dye; the bark a red dye. Certain parts of the fruit and leaves are used medicinally by the Rarotongans.

***Mussaenda frondosa* Linnaeus.**

A low erect shrub or bush. Leaves opposite, oblong, or ovate, acuminate. Flowers yellow; corolla pubescent; calyx with an orbicular, white, leafy lobe. Fruit an ovoid berry.

Common on all the open hillsides above an altitude of 150 feet. Native name: *kotuku* (indicating its resemblance to the white plumes of the heron, *Ardea sacra*).

***Oldenlandia foetida* Forster.**

A small erect herb with 4-sided stems and branches. Leaves opposite, linear, entire, acute, 1 to 2 inches in length; midrib prominent. Flowers small in a terminal corymb. Fruit small, with a projecting, 4-pointed calyx.

Common on the high mountains, altitude 1100 feet. Native name: *toroura*.

***Vangueria madagascariensis* Gmelin.**

A glabrous shrub. Leaves opposite, large, oblong, acute, membranous, light-green; petiole short. Flowers small, greenish-white, in axillary clusters. Fruit nearly round, 1 to 1.5 inches in diameter; skin tough, thick, contains a sticky, tart pulp with several stony seeds.

A rare cultivated plant. Introduced. Known locally as the "Indian tamarind." Native name: *vi papaa*.

## CUCURBITACEAE

**Citrullus vulgaris** Schrader.

An annual tendril-bearing plant.

Common at certain seasons of the year. Cultivated by the natives. English name: Watermelon.

**Cucumis melo** Linnaeus.

A cultivated vine with large, hairy, heart-shaped leaves. Flowers yellow. Fruit ribbed; size variable.

English name: Musk melon.

**Cucumis sativus** Linnaeus

This is the well known, edible cucumber.

**Cucurbita pepo** Linnaeus.

An annual tendril plant, bearing 3 to 5-lobed, dull-green leaves. Stems and leaves rough and scabrous. Flowers monoecious, large, yellow, solitary at axils of leaves. Staminate inflorescence having long peduncles, while those of the pistillate, on which the fruit forms, are short.

Cultivated for its food value. English name: Pumpkin.

**Luffa cylindrica** (Linnaeus) M. Roemer var. **insularum** Cogniaux.

A hardy, tendril-climbing herb, attaching itself to trees. Leaves rounded in outline, 5-lobed, coarsely-toothed. Yellowish flowers, 5-petaled, solitary-axillary. Fruit round, gourdlike, thick-shelled, with fibrous interior and numerous, flat, black seeds.

Common on all the hills, altitude about 200 feet. Native name: *motini*.

**Momordica balsamina** Linnaeus.

A glabrous, climbing, herbaceous vine, with bright-green foliage. Leaves cordate-orbicular, 5-lobed. Flowers solitary, yellow. Fruit orange-yellow, 2 inches long, ovoid, surface tuberculate, interior a scarlet pulp containing numerous flat seeds.

Common everywhere on the lowlands.

**Sechium edule** Swartz.

An herbaceous climbing annual. Leaves 3-lobed, 4 to 6 inches in length, cordate at the base, the surface somewhat rough. Flowers axillary, greenish. Fruit 3 to 5 inches in length, pear-shaped, surface grooved or corrugated; one seed, large, flat.

Introduced. Common in gardens where it is grown as a vegetable. Known as the "Christophene," or "Chayote."

## CAMPANULACEAE

**Sclerotheca viridiflora** Cheeseman.

An erect, hollow-stemmed, glabrous shrub, 4 to 6 feet in height. Leaves opposite,

lanceolate, serrate, acute, 5 to 8 inches long, 2 to 2.5 inches in width; midrib and veins very prominent. Flowers green, solitary, at axils of leaves. Fruit not seen.

Rare. Found only at the base of Mount Tukou, altitude 1100 feet.

#### GOODENIACEAE

##### **Scaevola frutescens** (Miller) Krause.

A low shrub found only along the seashore. Leaves alternate, spatulate, entire, bright-green. Flowers axillary, white. Drupe or fruit white, round, 2-celled.

Common in all districts. *Scaevola koenigii* of Cheeseman's list. Native name: *ngagnaw*.

The native name *kaka hina* has been also given, on account of the brittle stems and branches which make a decided noise when broken.

#### COMPOSITAE

##### **Ageratum conyzoides** Linnaeus.

A small, erect annual. Leaves opposite, ovate, obtuse, crenate, 2.5 to 3 inches in length, 2 to 2.5 inches in width. Flowers in a dense terminal cyme; florets numerous, pale-blue or white.

Common in the lowlands and open places in old fields. A very troublesome weed.

##### **Bidens pilosa** Linnaeus.

An annual, about 2 feet in height. Leaves opposite, thin, ovate, acuminate, sharply serrate, 1 to 2 inches long; petiole about 0.5 inch long. Flowers yellow, in a radiating head. Seeds 4-angled, with sharp, strong barbs, which attach to all objects coming in contact with them.

Common in pastures and on roadsides, in every part of the island, visited by me, up to an altitude of 600 feet.

##### **Calendula officinalis** Linnaeus.

A small flower-garden herb with entire, thick, oblong, alternate leaves. Flower heads single, on stout stalks. Rays flat, spreading, orange-colored.

Cultivated as an ornamental. Introduced.

##### **Coreopsis lanceolata** Linnaeus.

A low perennial herb, 1 to 3 feet in height, slightly glabrous. Leaves entire, oblong to linear, barely acute. Flower heads radiating, 1.5 to 2 inches broad; petals yellow.

Introduced. Common in private gardens, open pastures, and on lowlands. Grown as an ornamental.

**Dahlia juarezii** Hortorum.

A plant having stout rhizomes, hollow stems or stalks, 4 to 10 feet in height. Leaves finely-cut. Flowers single, on long peduncles; petals of a pale-purplish tinge.

Introduced. Not very common.

**Eclipta alba** (Linnaeus) Hasskarl.

An erect annual, sometimes seen in the form of a creeping plant. Leaves opposite, ovate to oblong-lanceolate, or almost linear, 1 to 2 inches long, coarsely-toothed, or nearly entire. Ray florets small, white.

Common weed in wet places and near taro swamps. Recorded by Cheeseman as *Eclipta erecta*.

**Elephantopus scaber** Linnaeus.

A noxious weed, 2 to 4 feet high, with alternate, crenate, acute leaves. Stems hairy. No flowers seen.

Introduced. Common in Aorangi District, and spreading rapidly. Native name: *vavae elepana*.

**Emilia sonchifolia** (Linnaeus) De Candolle.

A small weed 6 inches to 1 foot in height. Leaves alternate, slightly hairy. Flowers having numerous stamens on long terminal stems.

**Erigeron albidus** (Willdenow) A. Gray.

An erect herb, 2 to 4 feet in height, with opposite, linear, glabrous triple-nerved leaves.

Common weed in all districts from sea level to an altitude of 500 feet.

**Fitchia speciosa** Cheeseman (Pl. VIII).

A small tree, 6 to 25 feet in height. Leaves large, opposite, acuminate, oblong-lanceolate to ovate, glabrous; color bright-green and shiny; margins wavy; venation prominent; blades varying in size from 5.5 inches in length, 3.5 inches in breadth, to 10 inches in length, 7 inches in breadth; petiole the length of the blade. Flower heads large, solitary, composed of many orange-red stamens and pistils, surrounded at their base by stiff overlapping bracts, together forming a concave receptacle which is attached to a stout, fibrous, nodding peduncle.

This gregarious species is endemic, and is found growing along the banks of the streams, also on the open ridges, and often becomes established in the thick growth of the staghorn fern, forming a conspicuous part of the forest above 150 feet elevation. It even reaches to the highest mountain tops. Native name: *pua neinei*.

The flower resembles a huge paintbrush, and secretes a copious supply of nectar. The wood is hard; the center of the young stems is pithy. Aerial roots descending from the main trunk, 2 or 3 feet from the ground, support the tree and give it a very odd appearance.



**Helichrysum bracteatum** Andrews.

An ornamental annual with an erect stem, 1 to 3 feet in height. Leaves alternate, lanceolate, entire, sessile. Flower heads terminal, solitary, yellow with pink shading to reddish-yellow; involucre dry, composed of numerous, short, obtuse, overlapping, glabrous scales.

Introduced. Seen only in Ngatangiia. English name: Sword lily.  
This plant is cultivated for the flowers.

**Siegesbeckia orientalis** Linnaeus.

An annual herb, 1 to 2 feet in height. Leaves opposite, ovate, triangular, pubescent. Flowers small, yellow, in a loose panicle.

Common weed in all the districts below an altitude of 300 feet.

**Solidago canadensis** Linnaeus.

A many-branched herb with stout stems, 2 to 4 feet in height. Leaves lanceolate, acute, serrate. Flowers yellow, in terminal panicles.

Introduced. A rare shrub cultivated for its flowers. English name: Golden rod.

**Sonchus oleraceus** Linnaeus.

An erect glabrous annual, 1 to 3 feet in height, having hollow stems. Leaves alternate, thin, and bordered with prickly teeth. Florets pale-yellow.

A common plant on the lowlands.

**Synedrella nodiflora** Gaertner.

A weed. Leaves opposite, ovate, acute. Flowers and fruit at the axils of the leaves.

Introduced. Common in all districts. Found growing at sea level.

**Tagetes erecta** Linnaeus.

An erect, hardy ornamental, about 2 feet high, with opposite leaves, pinnately divided. Flowers in a solitary head, golden-yellow. Stems and leaves very strongly scented.

Common about the gardens of the natives, and cultivated for the flowers which are strung into garlands. English name: Marigold. Native name: *nuengatai*.

**Tanacetum vulgare** Linnaeus.

A cultivated plant with alternate, finely-pinnate leaves. Flowers yellow in a terminal cyme.

Not common.

Used in making wreaths for personal adornment.

**Tithonia diversifolia** A. Gray.

An annual weed, 6 to 10 feet in height, with stout branches. Leaves alternate, 3-lobed, membranous, acuminate, crenate; petiole slender. Flower heads yellow, on a long thick peduncle. Seeds 0.25 inch long, 4-angled, pilose.

Very common. Introduced.

**Vernonia cinerea** (Linnaeus) Lessing.

A small erect herb. Leaves alternate. Flower-heads terminal in the upper axils of the leaves.

Seen in the village of Arorangi.

Common plant along the roadsides.

**Wedelia biflora** De Candolle.

A glabrous shrub. Leaves opposite, ovate, serrate, acuminate, 2 to 4 inches in length, 1 to 2 inches in width. Flower-heads terminal; petals yellow.

Common on the lowlands near the seashore. *Wedelia aristata* of Cheeseman's list.

**Xanthium strumarium** Linnaeus.

An herb. Leaves alternate, stiff, acute, dentate, palmately 3-lobed, upper and lower surfaces rough; petiole 2 to 4 inches in length. Fruit an oblong bur, 0.75 inch long with many spines terminating in a hook.

Not very common; probably introduced accidentally from Australia. An annual herb growing near the sea coast, open pastures, and abandoned fields.



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<i>Flacourtia ramontchi</i> .....	W 76	<i>Alyxia elliptica</i> (var. A, B) .....	W 88
<i>Homalium acuminatum</i> .....	C W 77	<i>Cerbera manghas</i> .....	C W 89
<i>Passiflora edulis</i> .....	W 77	<i>Nerium indicum</i> .....	C W 89
<i>Passiflora maliformis</i> .....	W 77	<i>Plumeria alba</i> .....	C W 89
<i>Passiflora quadrangularis</i> .....	C W 77	<i>Tabernaemontana divaricata</i> .....	W 89
<i>Carica papaya</i> .....	C W 77	<i>Thevetia peruviana</i> .....	C W 89
<i>Opuntia species</i> .....	W 78	<i>Vinca rosea</i> .....	C W 89
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<i>Wikstroemia sericea</i> .....	W 78	<i>Cryptostegia grandiflora</i> .....	W 90
<i>Cuphea ignea</i> .....	W 78	<i>Stephanotis floribunda</i> .....	W 90

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Kumara ti .....	W	91	Justicia carnea .....	W	100
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VIEW OF THE HIGHROAD ENCIRCLING RAROTONGA.

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A



B



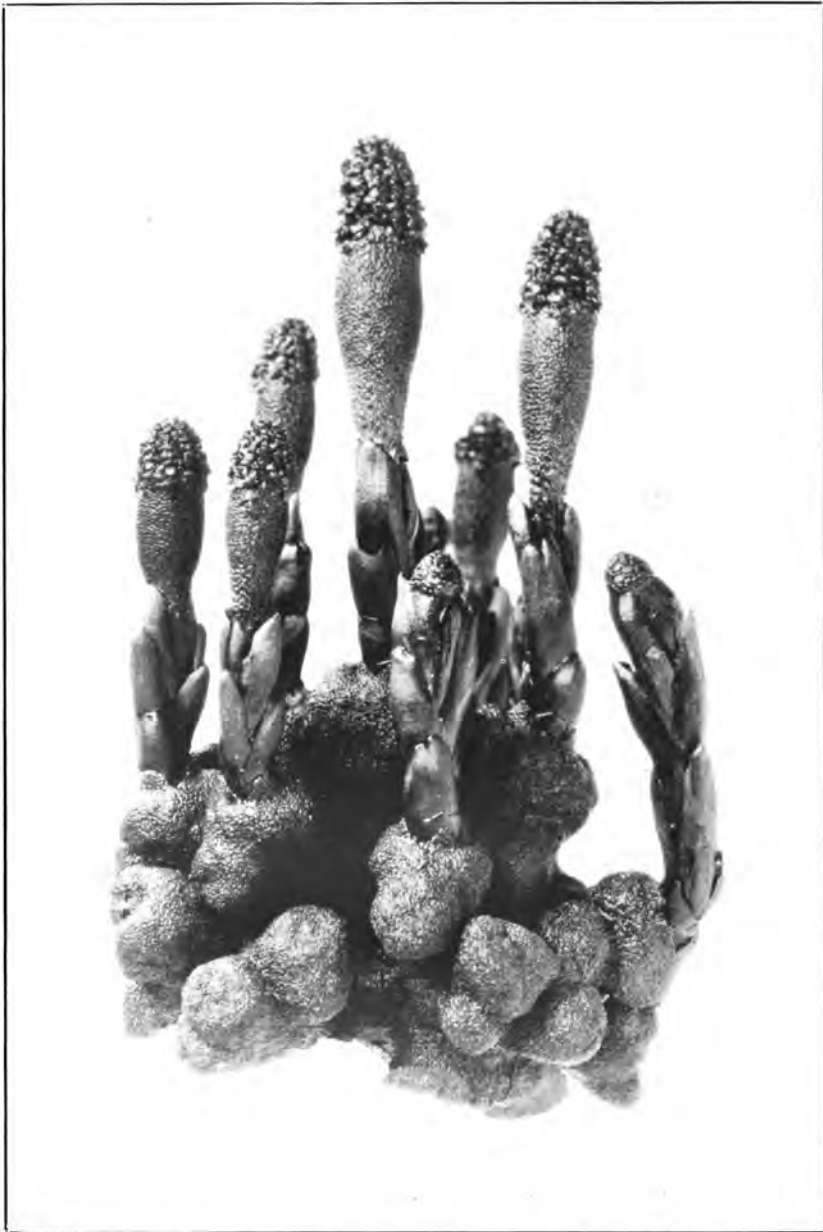
C

MOUNTAINS OF RAROTONGA: A, MAUNGAROA, ALTITUDE 1850 FEET; B, FAMOUS ROCK, KNOWN AS "TIPI A TOI"; C, SUMMIT OF MOUNT IKURANGI, ALTITUDE 1650 FEET; ROAD IN FOREGROUND LEADS TO NGATIPA, RESIDENCE OF THE GOVERNOR.



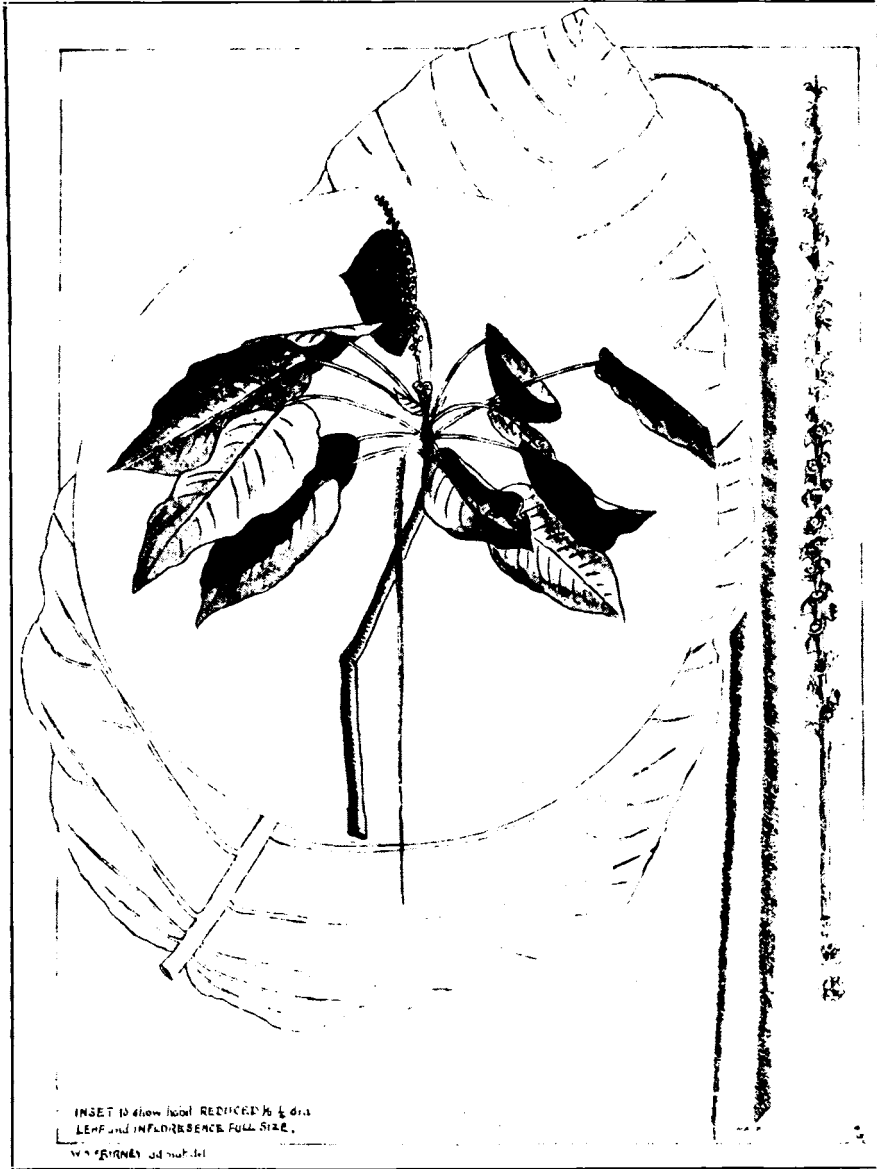
PILEA BISEPALA ST. JOHN, NEW SPECIES. (ABOUT ONE-THIRD NATURAL SIZE.)

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BALANOPHORA WILDERI SETCHELL, NEW SPECIES: A PARASITE FOUND GROWING ON ROOTS OF FICUS. (NATURAL SIZE.)

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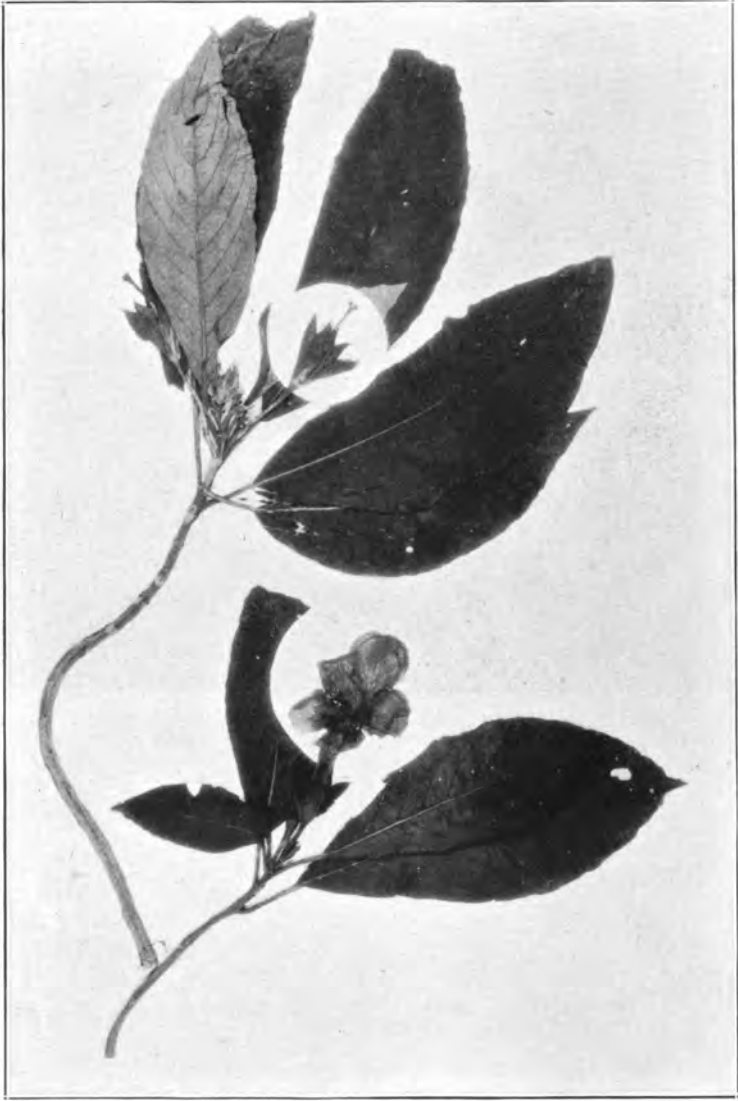


ACALYPHA WILDERI MERRILL, NEW SPECIES. (SINGLE LEAF AND FLOWERS APPROXIMATELY ONE-HALF NATURAL SIZE.) INSET SHOWS STEM BEARING LEAVES AND FLOWERS. (APPROXIMATELY ONE-EIGHTH NATURAL SIZE.)



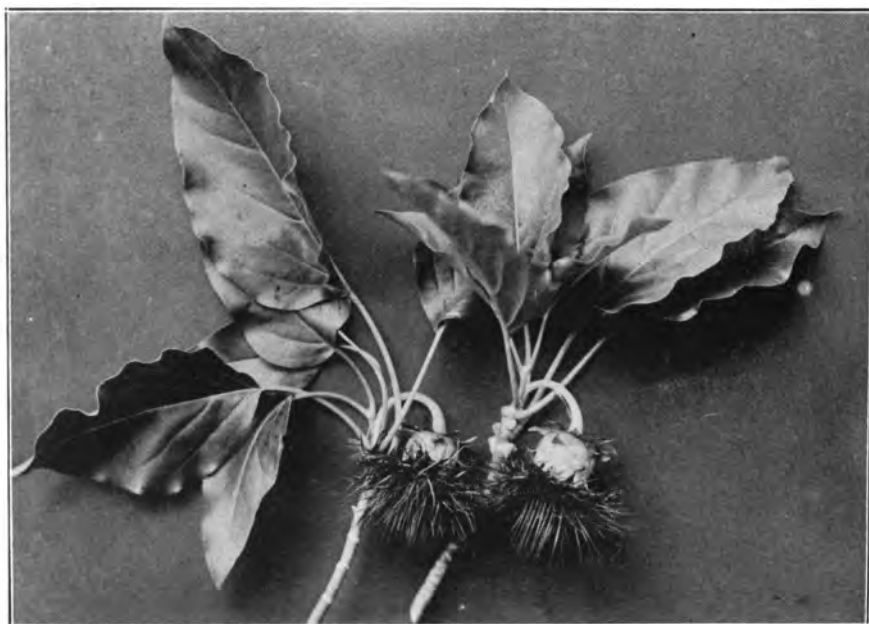
WIKSTROEMIA SERICEA CHRISTOPHERSEN, NEW SPECIES.

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CYRTANDRA LILLIANAE SETCHELL, NEW SPECIES.





FITCHIA SPECIOSA CHEESEMAN. AN ENDEMIC HONEY PLANT WITH BRILLIANT ORANGE-RED FLOWERS. (ABOUT ONE-FOURTH NATURAL SIZE.)

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