

The native vascular plants of Niue, SW Pacific

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Introduction

The Polynesian island of Niue, the world's second-largest raised coral atoll (after Lifou in the Loyalty Is.) lies isolated in the central, tropical expanse of the Pacific Ocean, nineteen degrees south of the equator. Approximately 500 km to the west and northwest are the island groups of Tonga and Samoa, while the scattered islands of the Cook Islands Group are mostly situated twice that distance and more to the east (Note 1).

The inland parts of Niue were once forested by *Calophyllum*, *Dysoxylum*, *Planchonella*, *Pometia*, *Rhus*, *Syzygium* and *Terminalia* species. Such forest now covers only about a fifth of the island, having been reduced by a thousand years of Polynesian occupation and the agricultural and logging clearances of the twentieth century (Wright & van Westerndorp 1965; Walter & Anderson 1995; Butler 2001; Pointer 2015). The natural vegetation around the island's rugged coastline, of herbfield, scrub and low forest, is somewhat less depleted

and perhaps covers about a tenth of the island (Butler 2001: 14).

Scope and format

This list (see Appendix) of 198 species (none of them endemic to Niue) updates the nomenclature of Sykes (1970) and includes five new discoveries for the island (see below), two of which are illustrated here (Figs. 1, 2). Included too are several species that might not be native in the strict sense — they are food-plants or weeds that perhaps were introduced by humans to Niue, accidentally or deliberately, in the pre-European era. Their names are followed by an asterisk. More about the naturalised species of Niue can be found in Gardner (2021; Note 2).

To facilitate reference to Sykes' (1970) compilation, changes in nomenclature have been kept to a minimum. Note in particular that *Ipomoea violacea* replaces *I. macrantha*, *Planchonella tahitensis* replaces *P. grayana*, and *Sida parvifolia* replaces *S. samoensis*.

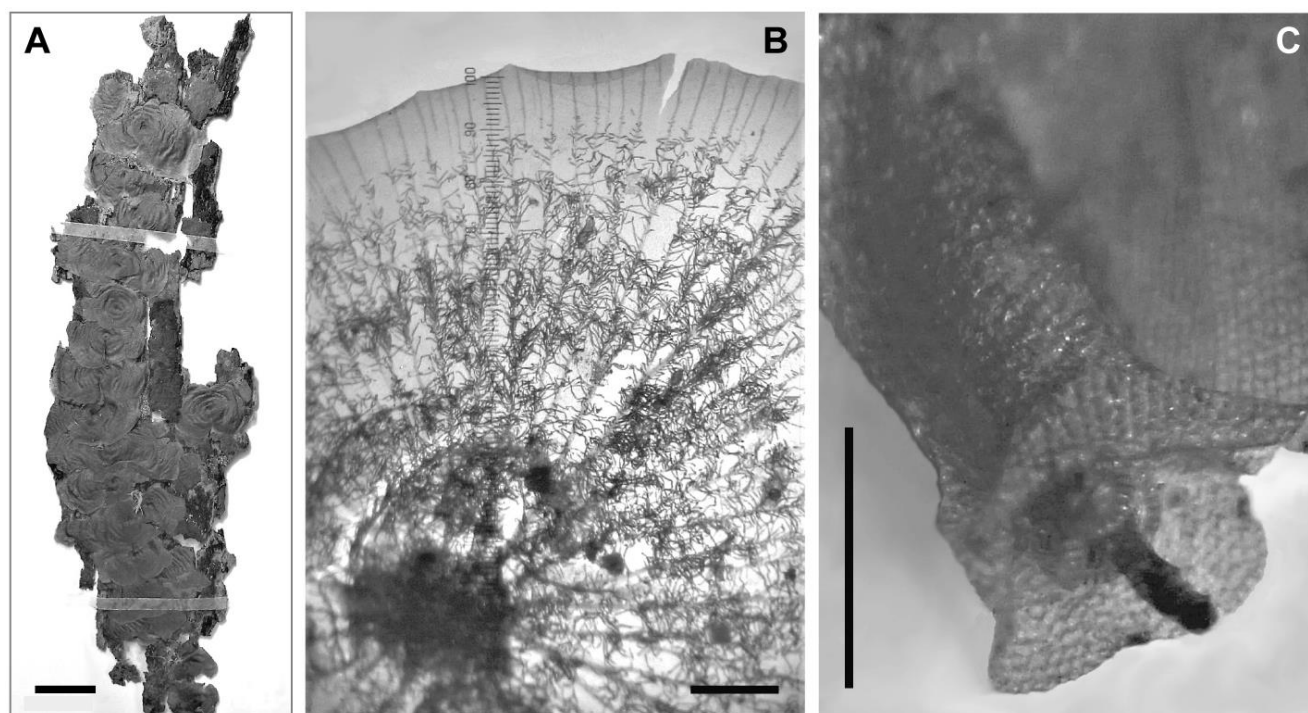
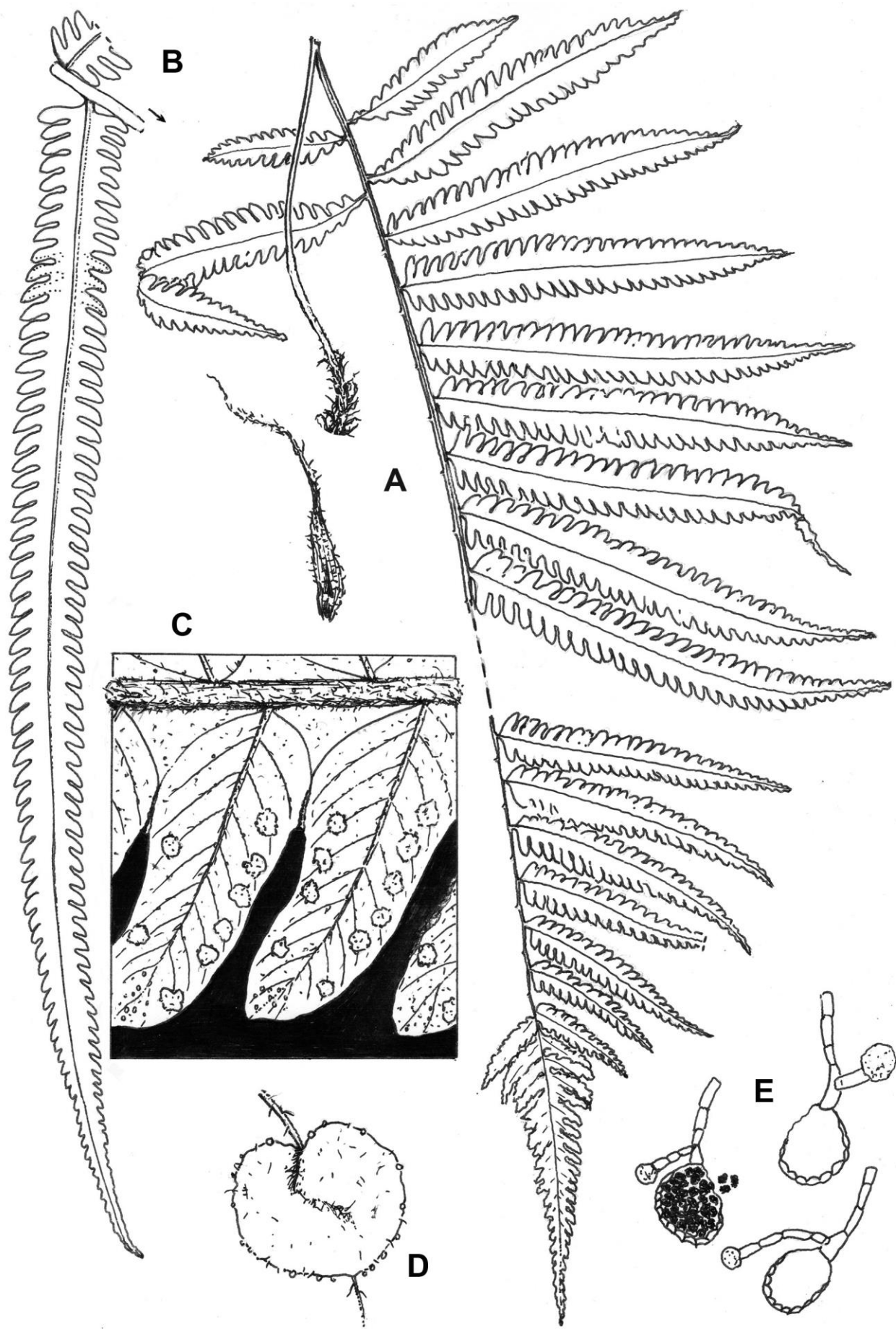


Fig. 1: *Trichomanes tahitense* (Hymenophyllaceae). **A.** Whole plant, creeping on bark of *Allophylus timoriensis* (Sapindaceae). AK 365424, Rarotonga. The almost circular leaves are up to 2.5 cm diam. Scale bar 1 cm. **B.** Part of a (subcircular) frond. Septate hairs dense on central attachment stalk and veins except for the outermost part, where the sori occur. (This frond is 1.2 cm diam.). AK 319831, Rarotonga. Scale bar 1 mm. **C.** Sorus. Most sporangia have been lost from the dark columnar receptacle. AK 355635, Rarotonga. Scale bar 1 mm.

Fig. 2 (facing page): *Amblovenatum opulentum* (Thelypteridaceae). Based on AK 112933, 18814, 327233, & 364884, from Cook Islands and Tonga. **A** Frond ($\times 0.5$), and stipe scale ($\times 6$). **B** Pinna, fertile only on a few of the lower pinna-lobes ($\times 1$). **C** Pinnae-lobes, undersurface showing indument and indusia; note the aggregation of spherical (yellow) sessile glands near the ends of the pinnae-lobes ($\times 8$). **D** Indusium, with marginal glands ($\times 40$). **E** Sporangia, their stalks with a stalked gland; one sporangium shown with its dark rugose spores ($\times 90$). Drawn by the author.



The list does not include a number of species that are native to Western Polynesia but on Niue seem to occur just in cultivation, or, if they have naturalised here, have done so in a very slight and geographically limited way (possibly because they are relatively recent introductions). These species (Gardner 2021) are: *Aglaia saltatorum*, *Bischofia javanica*, *Casuarina equisetifolia*, *Crinum asiaticum*, *Cycas celebica* (syn. *C. circinalis* subsp. *seemannii*), *Phaleria disperma*, and *Santalum yasi*. One species, *Litsea magnifolia* Gillespie (Lauraceae), can be excluded from Niue's flora, the record (Sykes 1970: 106) being based on a specimen of *Drypetes vitiensis* Croizat (CHR 317384, det. A.C. Smith 1980). The record of Sykes (1970: 109) for *Geniostoma insulare* A.C. Sm. & Stone var. *tongense* A.C. Sm. & Stone is not accepted, nor that of Clayton and Snow (2010: 87) for *Ischaemum byrone* (Trin.) Hitchc. (Poaceae). I have not seen veritable specimens of these taxa.

The five records here of Niuean novelties, except for that of *Solanum amicum*, are entirely based on collections made by the late W. A. Whistler (pers. comm. to ROG, c. 2018). At the time of writing (September 2020) only Whistler's voucher for *Ximenia americana* has been deposited in a herbarium. These five species are known elsewhere in Western Polynesia as native plants and therefore can be regarded as such with respect to Niue. They are, in the order of the list below:

—*Trichomanes tahitense* Nadeaud (syn. *Didymoglossum tahitense* (Nadeaud) Ebihara & K.Iwats.) Whistler 10749, coll. 1997, Vinivini track, seen once on tree trunk in deep forest. (Fig. 1)

—*Amblovenatum opulentum* (Kaulf.) J.P.Roux Whistler 10796, coll. 1997, one plant at roadside at Anato; Whistler 13003, coll. 2013, uncommon in shady native forest near Fetuna. (Until

recently, this fern has been known as *Amphineuron opulentum*). (Fig. 2)

—*Ximenia americana* L. Whistler 10861, coll. 1997, scrubby vegetation inland of Liku. [Specimen lodged in PTBG as "10862", T. Flynn pers. comm. July 2020].

—*Solanum amicum* Benth. The first collection appears to be *S.P. Smith* 63, AK 93685, coll. 1901. According to W.A. Whistler (pers. comm.) it was collected twice by Yuncker (his 10039 and 10103) in 1940 in coastal vegetation on the western side of the island. The only recent collection appears to be Whistler 10824, coll. 2013, Maleola near Makefu.

—*Wikstroemia coriacea* Sol. ex Seem. (*W. foetida* non (L.f.) A.Gray) Whistler 12995, coll. 2013, Matapa Chasm, a single plant seen.

Note 1. The statement is often made (and was incautiously repeated by myself; Gardner 2011, 2013) that Niue is the world's largest raised atoll. This is incorrect; it covers only 261.5 km², compared to the 1207 km² of Lifou in the Loyalty Islands archipelago east of New Caledonia. Also, an extensive area of raised coral forms the south-eastern part of Rennell I. in the Solomon Islands. Now the UNESCO Natural World Heritage Site of 'East Rennell', its 525 km² area includes a lake of 155 km². Rennell has been described as the world's second-largest raised atoll but this ignores the fact that the major part of the island is volcanic terrain. Aldabra in the Indian Ocean is another raised atoll, but its 380 km² extent includes a shallow lagoon of c. 200 km².

Note 2. Gardner (2021) accidentally omitted: *Sphagneticola trilobata* (L.) Pruski, Asteraceae. Sykes 1402/N CHR 659685, coll. 2006, Alofi North, shaded clearing of old house site. Present on Niue as a garden plant and as an invasive weed for at least the past twenty years (*Weed Biocontrol: What's New?* [Landcare Research New Zealand] **94**: 5, 2020).

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LYCOPHYTES

LYCOPODIACEAE

Huperzia phlegmaria (L.) Rothm.

PTERIDOPHYTES

ASPLENIACEAE

Asplenium laserpitiifolium Lam.

Asplenium nidus L.

Asplenium polydon G.Forst.

ATHYRIACEAE

Callipteris prolifera (Lam.) Bory

DAVALLIACEAE

Davallia heterophylla Sm.

Davallia solida (G.Forst.) Sw.

HYMENOPHYLLACEAE

Trichomanes tahitense Nadeaud

LOMARIOPSIDACEAE

Nephrolepis biserrata (Sw.) Schott

Nephrolepis hirsutula (G.Forst.) Presl

MARATTIACEAE

Angiopteris evecta (G.Forst.) Hoffm.

OPHIOGLOSSACEAE

Ophioglossum pendulum L.

POLYPODIACEAE

Microsorium scolopendria (Burm.f.) Copel.

PSILOACEAE

Psilotum nudum (L.) P.Beauv.

PTERIDACEAE

Acrostichum aureum L.

Antrophyum plantagineum (Cav.) Kaulf.

Monogramma paradoxa (Fée) Bedd.

Pteris tripartita Sw.

SCHIZAEACEAE

Schizaea dichotoma (L.) Sm.

TECTARIACEAE

Pleocnemia cumingiana C.Presl

Tectaria latifolia (G.Forst.) Copel.

THELYPTERIDACEAE

Amblovenatum opulentum (Kaulf.) J.P.Roux

Pneumatopteris rodigasiana (T.Moore) Holttum

Sphaerostephanos invisus (G.Forst.) Holttum

DICOTYLEDONS

AIZOACEAE

Sesuvium portulacastrum (L.) L.

AMARANTHACEAE

Achyranthes aspera L. *

ANACARDIACEAE

Rhus taitensis Guillemain

APIACEAE

Centella asiatica L. *

APOCYNACEAE

Alyxia stellata (J.R.Forst & G.Forst.) Roem. & Schult.

Ochrosia oppositifolia (Lam.) K.Schum.

ARALIACEAE

Polyscias multijuga (A.Gray) Harms

ASTERACEAE

Adenostemma viscosum J.R. & G.Forst. *

Wollastonia biflora (L.) DC.

BARRINGTONIACEAE

Barringtonia asiatica (L.) Kurz

BORAGINACEAE

Cordia subcordata Lam.

Heliotropium anomalum Hook. & Arn.

Heliotropium foertherianum Diane & Hilger

BRASSICACEAE

Rorippa sarmentosa (G.Forst. ex DC.) J.F. Macbr.

BURSERACEAE

Canarium harveyi Seem.

CAPPARIDACEAE

Capparis cordifolia Lam.

CELASTRACEAE

Maytenus vitiensis (A.Gray) Ding Hou

CLUSIACEAE

Calophyllum inophyllum L.

Calophyllum neoebudicum Guillaumin

COMBRETACEAE

Terminalia catappa L.

Terminalia richii A.Gray

CONNARACEAE

Rourea minor (Gaertn.) Alston

CONVOLVULACEAE

Ipomoea indica (Burm.) Merr. *

Ipomoea littoralis Blume

Ipomoea violacea L.

Merremia peltata (L.) Merr.

Operculina turpethum (L.) A.Silva Manso

CUCURBITACEAE

Neoachmandra samoensis (A.Gray) W.J. de Wilde & Duyfjes

EBENACEAE

Diospyros elliptica (J.R. & G.Forst.) P.S.Green

Diospyros samoensis A.Gray

ELAEOCARPACEAE

Elaeocarpus floridanus Hemsl.

EUPHORBIACEAE

Acalypha lanceolata Willd. *

Euphorbia atoto (G.Forst.) Croizat

Excoecaria agallocha L.

Homalanthus nutans (G.Forst.) Guillemin
Macaranga harveyana (Müll.Arg.) Müll.Arg.
Macaranga seemannii (Müll.Arg.) Müll.Arg.

GESNERIACEAE

Cyrtandra samoensis A.Gray

GOODENIACEAE

Scaevola sericea Vahl

HERNANDIACEAE

Hernandia nymphaeifolia (Presl) Kubitz

LAMIACEAE

Clerodendrum inerme (L.) Gaertn.
Leucas decemdentata (Willd.) Sm. *
Premna serratifolia L.
Teucrium vesicarium Mill. *
Vitex trifolia L.

LAURACEAE

Cassytha filiformis L.
Cryptocarya turbinata Gillespie

LEGUMINOSAE

Abrus precatorius L. *
Caesalpinia major (Medic.) Dandy & Exell
Canavalia rosea (Sw.) DC.
Canavalia sericea A. Gray
Dendrolobium umbellatum (L.) Benth.
Desmodium heterocarpon (L.) DC. *
Erythrina variegata L.
Mucuna gigantea (Willd.) DC.
Schleinitzia insularum (Guillemin) Burkart
Tephrosia purpurea (L.) Pers.
Vigna marina (Burm.f.) Merr.

LOGANIACEAE

Fagraea berteriana A.Gray ex Benth.
Geniostoma vitiense Gilg. & Benedict

LYTHRACEAE

Pemphis acidula J. R. & G. Forst.

MALVACEAE

Grewia crenata (J.R. & G.Forst.) Schinz & Guillaumin
Heritiera ornithocephala Kosterm.
Hibiscus abelmoschus L. *
Hibiscus tiliaceus L.
Sida parvifolia DC. *
Sterculia fanaiho Setchell
Thespesia populnea (L.) Sol. ex Correa
Triumfetta procumbens G.Forst.
Urena lobata L. *
Waltheria indica L. *

MELIACEAE

Dysoxylum mollissimum Miq.

MENISPERMACEAE

Pachygone vitiensis Diels

MORACEAE

Ficus obliqua G.Forst.
Ficus prolixa G.Forst.
Ficus scabra G.Forst.
Ficus tinctoria G.Forst.
Streblus anthropophagorum (Seem.) Corner

MYRTACEAE

Eugenia reinwardtiana (Blume) DC.
Syzygium dealatum (Burkill) A.C. Sm.
Syzygium inophylloides (A.Gray) C. Muell.

NYCTAGINACEAE

Boerhavia diffusa L. *
Pisonia grandis R. Br.

OLEACEAE

Chionanthus vitiensis (Seem.) A.C. Sm.
Jasminum betchei F. Muell.
Jasminum didymum G. Forst.

PASSIFLORACEAE

Passiflora aurantia G.Forst.

PIPERACEAE

Peperomia pallida (G.Forst.) Dietr.
Piper puberulum (Benth.) Maxim.

PHYLLANTHACEAE

Baccaurea seemannii (Müll.Arg.) Müll.Arg.
Glochidion ramiflorum J.R. & G.Forst.
Phyllanthus virgatus G.Forst. *

PITTOSPORACEAE

Pittosporum brackenridgei A.Gray

PORTULACACEAE

Portulaca lutea Sol.
Portulaca samoensis Poelln.

PUTRANJIVACEAE

Drypetes vitiensis Croizat

RHAMNACEAE

Alphitonia zizyphoides (Spreng.) A.Gray
Colubrina asiatica (L.) Brongn.

RUBIACEAE

Bikkia tetrandra (L.f.) A. Rich.
Gardenia taitensis DC.
Geophila repens (L.) I.M.Johnston
Guettarda speciosa L.
Gynochthodes ovalifolia (Valet.) Kanehira
Hedyotis biflora (L.) Lam. *
Hedyotis foetida (G.Forst.) J.E.Sm.
Ixora calcicola A.C.Sm.
Morinda citrifolia L.
Morinda myrtifolia A.Gray
Psychotria insularum A.Gray
Tarennia sambucina (G.Forst.) Durand ex Drake
Timonius polygamus (G.Forst.) Robinson

RUTACEAE

- Melicope retusa* (A.Gray) T.G. Hartley
Micromelum minutum (G. Forst.) Seem.

OLACACEAE

- Ximenia americana* L.

SALICACEAE

- Xylosma orbiculata* (J.R. & G.Forst.) G.Forst.

SANTALACEAE

- Korthalsella platycaula* (Tiegh.) Engl.

SAPINDACEAE

- Allophylus timoriensis* (DC.) Blume
Cardiospermum halicacabum L. *
Dodonaea viscosa Jacq.
Pometia pinnata J.R.& G. Forst.

SAPOTACEAE

- Planchonella garberi* Christophersen
Planchonella samoensis Lam ex Christophersen
Planchonella tahitensis (Nadeaud) Pierre ex
Dubard

SOLANACEAE

- Nicotiana forsteri* Roem. & Schult.
Solanum amicum Benth.

THYMELAEACEAE

- Wikstroemia coriacea* Sol. ex Seem.

ULMACEAE

- Celtis harperi* Horne ex Baker
Trema cannabina Lour.

URTICACEAE

- Dendrocnide harveyi* (Seem.) Chew
Laportea interrupta (L.) Chew *
Pipturus argenteus (G.Forst.) Wedd.
Procris pedunculata (J.R. & G.Forst.) Wedd.

MONOCOTYLEDONS

ARACEAE

- Amorphophallus paeonifolius* (Dennst.) Nicolson*

ARECACEAE

- Cocos nucifera* L. *

ASPARAGACEAE

- Cordyline fruticosa* (L.) A. Chev. *

CYPERACEAE

- Cyperus javanicus* Houtt.
Cyperus seemannianus Boeck.
Fimbristylis cymosa R.Br.

COMMELINACEAE

- Commelina diffusa* Burm.f. *

DIOSCOREACEAE

- Dioscorea bulbifera* L. *
Dioscorea pentaphylla L. *

FLAGELLARIACEAE

- Flagellaria gigantea* Hook.f.

ORCHIDACEAE

- Bulbophyllum distichobulbum* Cribb
Bulbophyllum longiscapum Rolfe
Dendrobium biflorum (G.Forst.) Sw.
Didymoplexis micradenia (Rchb.f.) Hemsl.
Eulophia pulchra (Thou.) Lindl.
Geodorum densiflorum (Lam.) Schltr
Hetaeria oblongifolia Blume
Malaxis resupinata (G.Forst.) Kuntze
Nervilia concolor (Blume) Schltr.
Oberonia equitans (G.Forst.) Mutel
Phaius tankervilleae (Banks) Blume
Phreatia matthewsii Rchb.f.
Phreatia micrantha (A.Rich.) Schltr.
Spathoglottis plicata Blume
Spiranthes sinensis (Pers.) Ames
Taeniophyllum fasciola (G.Forst.) Seem.
Trachoma papuanum (Schltr.) M.Clements,
J.J.Wood & D.Jones

PANDANACEAE

- Pandanus tectorius* Sol. ex Parkinson

POACEAE

- Cenchrus caliculatus* Cav.
Centotheca lappacea (L.) Desv.
Chrysopogon aciculatus (Retz.) Trin.
Digitaria setigera Roth. ex Roem.& Schult.
Ischaemum murinum G.Forst.
Lepturus repens (G.Forst.) R.Br.
Miscanthus floridulus (Labill.) Warb.
Oplismenus compositus P.Beauv.
Oplismenus hirtellus (L.) P.Beauv.
Paspalum orbiculare G.Forst.
Paspalum vaginatum Sw.
Stenotaphrum micranthum (Desv.) C.E.Hubb.
Urochloa glumaris (Trin.) Veldkamp *

TACCACEAE

- Tacca leontopetaloides* (L.) Kuntze *