

Additions to the Flora of Guam

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The establishment of the College of Guam Herbarium has stimulated a considerable amount of collecting in Guam, and this in addition to the study visits to the island made by Dr. F. R. Fosberg has yielded a number of new records for the island flora. Many of the species here recorded are introduced plants, some accidental and some deliberate, but some clearly native species have also been discovered. The latter are especially evident among the lower cryptogams, which have been very poorly or not at all studied in Guam, although several new records of native tracheophytes are also at hand.

The criterion for a species being "additional" is the published literature. However, Dr. Fosberg's "Checklist of the Seed Plants of Guam" which was compiled in 1960 and distributed to a limited extent in mimeographed form is considered here as prior literature. While a complete botanical bibliography of Guam is beyond the scope of this paper, I cite herein most of the more recent reports which include reference to Guam plants.

Most of the specimens herein cited are deposited in the College of Guam Herbarium, with duplicates at Leiden, U. S. National Herbarium, Bishop Museum, or Duke University Herbarium. For determinations of the mosses I am grateful for the help of E. B. Bartram. Grateful acknowledgment is also due to Dr. Karl Kramer, of the University of Utrecht, for his examination of our ferns; to Dr. C. G. G. J. van Steenis and the staff of the Flora Malesiana Foundation; to Dr. Tetsuo Koyama, of the New York Botanical Garden; to Mr. Paul Souder, of Agana Heights; and to others too numerous to mention who have afforded their assistance.

Records of marine algae are accumulating, but are here excluded.

MUSCI

The most recent papers concerning mosses of this area are the following:

Bartram, E. B. 1945. Pacific Outpost Mosses. *The Bryologist* 48: 45-53.

1960. Mosses of Guam, Mariana Islands. *ibid.* 63: 101-105.

Dixon, H. N. 1943. War zone mosses. *ibid.* 46: 14-22.

Miller, H. A. 1960. A Preliminary list of Micronesian Bryophytes. *ibid.* 63: 116-125.

The following species have all been determined by E. B. Bartram.

FISSIDENTACEAE

Fissidens sylvaticus Griff.—Ugum River, Stone 3974.—New to Micronesia.

CALYMPERACEAE

Calymperes tenerum C. M.—Harmon Field, Stone 3953.

HYPNACEAE

Vesicularia montagnei (Bel.) Fleisch.—Harmon Field, *Stone* 3956-b; Mt. Almagosa, *Stone* 4346-b; Talofofu River banks, s.n.; Manengon, *Stone* 4968.—New to Micronesia.

NECKERACEAE

Neckeropsis lepineana (Mont.) Fleisch.—Harmon Field, *Stone* 3959; Mt. Almagosa, *Stone* 4343. This species was also collected in Palau (Toeruil Islet near Korrer, *Stone* 4547, Dec. 26, 1962).

PTERIDOPHYTA

The following paper summarizes all prior work on the ferns and their allies in Guam:

Wagner, W. H., and D. F. Grether. 1948. Pteridophytes of Guam. Occ. Pap. Bish. Mus. 19: 25-99.

PTERIDACEAE

Pteris vittata L.—La Cienaga, near Agana, *Stone* 4233; Nimitz Hill Road, *Stone* 4945.—This species, not mentioned in Wagner and Grether, is now a very common plant, particularly on rather steep bluffs, along roadside ditches, and in other more or less disturbed areas. If it was absent prior to 1948 it has spread quite rapidly, and is clearly now a permanent member of the flora. It is present both in Hawaii and in the Philippines, between which via Guam there is considerable air and sea traffic. I have no records of it elsewhere in Micronesia although an informal record of *P. longifolia* L. from Palau (I. E. Lane) may be this species; they are very similar. One may expect this species to spread into Micronesia elsewhere in time.

GYMNOSPERMAE

CYCADACEAE

Cycas revoluta Thunb.—Pago Bay, cultivated, *Stone* 4989.

ARAUCARIACEAE

Araucaria excelsa (Lamb.) R. Br.—Agana, cultivated, *Stone* 4679.

PINACEAE

Pinus (aff. *loochooensis*?)—Nimitz Hill, cultivated; observed.

CUPRESSACEAE

Juniperus sp.—Agana, cultivated; observed.

ANGIOSPERMAE

Monocotyledoneae

ALISMATACEAE

Sagittaria subulata (L.) Buch.—Agana Spring, *Stone* 4979. Probably introduced.

HYDROCHARITACEAE

Hydrilla verticillata (L.) Royle.—Fena Reservoir, *Stone* 4468. Also in the Talofofu River and the Agana River. The plants in Fena Reservoir were abundantly flowering on November 1st, 1962.

GRAMINEAE

Sporobolus diander (Retz.) P. Beauv.—Harmon Village, in lawns, *Stone* 4052.

Weedy. (Determination courtesy of the Flora Malesiana Foundation).

Trichachne insularis (L.) Nees—Barrigada Road, *Stone* 4230. Still somewhat uncommon, this species is spreading slowly along roadcuts.

CYPERACEAE

A complete treatment of Micronesian Cyperaceae by T. Koyama is found in this volume of *Micronesica*. The following species are new to Guam: *Scirpus littoralis* Schrad., ssp. *thermalis* (Trab.) T. Koyama.—Sasa River, near mouth, *Stone* 4150; Laguas River, near mangrove swamp, *Stone* 4396; Apra Harbor, *Stone* 4887.

Cyperus ligularis L.—Harmon Village, *Stone* 4053. Introduced, weedy.

Cyperus compactus Retz.—Barrigada-Harmon road, *Stone* 3836.

LILIACEAE

Asparagus sprengeri Regel.—Mangilao, *Stone* 4175. Cultivated.

Chlorophytum comosum (Thunb.) Bak.—Tumon High School, *Stone* 4384. Cultivated.

AMARYLLIDACEAE

Euryclis amboinensis (L.) Lindley.—Harmon village garden, *Stone* 4171.

STRELITZIACEAE

Strelitzia reginae Banks.—Observed in cultivation.

ZINGIBERACEAE

Hedychium coronarium Koenig.—Observed in cultivation.

Costus sp.—Observed in cultivation.

Alpinia purpurata (Vieill.) K. Schum.—Barrigada, *Stone* 4119. Cultivated.

Alpinia nutans (Andr.) Roscoe.—Barrigada, *Stone* 4961. Cultivated.

Dicotyledoneae

MORACEAE

Ficus ramentacea Roxb.—Agana, *Stone* 4913. Cultivated.

AMARANTHACEAE

Deeringia amaranthoides (Lamk) Merr.—Asdonlucas, *Stone* 4677. Native.

Previously known from other Marianas Islands; Philippines; Malaysia. One small colony found, in limestone forest association, under *Eugenia*, *Macaranga*, *Pandanus*, etc.

CRASSULACEAE

Kalanchoe tubiflora (Harv.) Hamet.—Tumon High School, cultivated.

LEGUMINOSAE

Cassia glauca Lamk.—Mangilao, *Stone* 4403. Probably introduced.

Cassia javanica L.—Barigada, *Stone* 4178. Cultivated.

Leucaena sp. aff. *L. insularum* and *L. leucocephala* (*glauca*).—Cocos Islet, *Stone* 4243; Asanite Point, *Stone* 4920; head of Talofof Bay, *Stone* 5042.

Clearly a native species, and quite different from the ubiquitous *L. leuco-*

cephala, or "tangantangan", in its smaller leaflets and flowering heads, different growth form and appearance, and in its habitat and ecological tolerances, this plant resembles both *L. insularum* (of Tahiti, the New Hebrides, New Caledonia, and Tonga), and *L. leucocephala*. According to Dr. Hans Hürlimann (in litt.) it is not *L. insularum*. Further investigations are being carried out.

Desmanthus virgatus (L.) Willd.—Mangilao, Stone 4182. Weedy.

Mucuna sp. aff. *urens*?—Northwest Field, Stone 5004. Native? or perhaps introduced.

MALPIGHIACEAE

Malpighia coccigera L.—Barrigada, Stone 4948. Cultivated. "Singapore holly."

Malpighia glabra L.?—Yona, Stone 5062. Cultivated. "Barbados cherry."

POLYGALACEAE

Polygala paniculata L.—Manengon, Stone 3861. Native.

EUPHORBIACEAE

Euphorbia tirucalli L.—Camp Witek, cultivated. "Pencil plant."

Euphorbia splendens Boj.—Harmon Village, cultivated. "Crown of Thorns."

VITACEAE

Cissus sp.—Agana, cultivated.

RHAMNACEAE

Zizyphus mauritiana Lamk.—Agana, cultivated; formerly reported as *L. jujuba* (L.) Lamk.

STERCULIACEAE

Melochia umbellata (Houtt.) Stapf.—Barrigada Hill, Stone 3833. (Determined by Dr. C. G. G. J. van Steenis).

PASSIFLORACEAE

Passiflora suberosa L.—La Cienaga, Stone 4235; Tamuning, Stone 4754. This species is a relatively aggressive weed and appears to be rather rapidly expanding its territory.

RHIZOPHORACEAE

Rhizophora stylosa Griff.—Apra Harbor edges, mangrove area, Stone 4437. (Determined by Ding Hou, Flora Malesiana Foundation). Formerly determined as *R. mucronata* Lamk.

MYRTACEAE

Callistemon lanceolatus DC.—Agana, cultivated.

Eugenia sp.—Piti, near the school; sterile; a large tree. Planted.

ASCLEPIADACEAE

Cryptostegia grandiflora (Roxb.) R. Br.—Agana, cultivated.

RUBIACEAE

Psychotria rotensis Kanehira.—Hills south of Agat, Stone 4191, 4389. Native. Originally described from Rota.

COMPOSITAE

Eclipta prostrata (L.) L.—Talofof River banks, Stone 4310. Weedy.

Bibliography of Recent Publications Concerning the Flora of Guam

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