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**THE PALAUAN AND YAP
MEDICINAL PLANT STUDIES OF
MASAYOSHI OKABE, 1941-1943**

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ABSTRACT

Masayoshi Okabe visited the Palau and Yap Islands to study the local medicinal plants and diseases treated through their use. He made reports of his findings (1941a, 1943a) in Japanese. In this paper the authors present for the first time in the English language a published record of Okabe's findings.

INTRODUCTION

On September 25, 1513, from a hilltop on the Isthmus of Panama, conquistador Vasco Nunez de Balboa looked down upon and, in the name of Ferdinand II of Spain, christened the vast ocean before him the "South Sea." Since then, the paradise islands of the Pacific have continued to be the setting for much enterprise in behalf of European, American and Asian powers.

Micronesia is one of three major geographic regions in Pacific Oceania. It comprises three main island chains, one of them being the Caroline Archipelago of which Palau and Yap are a part. Ruiz Lopez de Villalobos of Spain was the first European explorer to set foot on the shores of Palau, in 1543 (Smith, 1983a). Spain, though exerting little authority, would claim sovereignty over the islands for the next three centuries. In the meanwhile, British and American traders frequented the islands in an effort to expand their rich Far East trade lines by scouting the Pacific itself for tradeable items such as pearl shell and the sweet-smelling sandalwood. Whalers too roamed the Pacific in search of the luxurious North Pacific sea otter fur that so delighted the Oriental tastes (Oliver, 1961).

Following the Spanish-American War, Germany purchased the Caroline and Mariana Islands, excepting Guam, from Spain in 1899. For the next fifteen years, Palau and Yap were considered German protectorates during which time several new tropical industries prospered, most notably that of copra, the dried meat of the coconut from which oil was extracted for use in soap, margarine and nitroglycerine (Oliver, 1961). In 1909, the Germany South Sea Phosphate Company opened a phosphate mine in Angaur, the southernmost Palauan island (Okabe, 1940a).

In October 1914, the League of Nations mandated the Micronesian Islands to Japan. Although the Japanese did not move to Micronesia to stay until after World War I, they had since Spanish times been active traders in the Carolines, and hence there was a significant Japanese population already living on the islands (Oliver, 1961). The islands were awarded to Japan as a mandate, not a possession, and Japan was required to make certain agreements with other nations at the Peace Conference. However, Japan honored few of her promises, and Japanese Micronesia quickly became

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known to the rest of the world as the "Islands of Mystery." Japan later withdrew from the League of Nations and no longer held the islands under the "mandate" pretense. They were now a part of her walled empire whereto tens of thousands of Japanese colonists migrated (Oliver, 1961).

Palau was the strategic command center of the Japanese empire (Naval Intelligence Division, 1945). Though western Koror had been used by the Germans before 1914 as a government station, Palau's capital city was not developed into a modern settlement until Japan took occupancy. It was the site of Malakal Harbor, the principal port of call for overseas shipping, as well as the Nanyo Cho office (administrative headquarters), and several other offices such as the agricultural experimental station and hospital (Naval Intelligence Division, 1945). The Japanese Navy took control of Germany's phosphate mine in Angaur and also began a bauxite mining operation on Babelthuap, Palau's largest island. The only important Japanese settlement in the Yap Islands was Yap itself, on which bauxite and nickel mines were opened in 1937 (Naval Intelligence Division, 1945). Okabe (1943a) described Yap as being "the most primitive" of the Japanese islands.

Japan's Micronesia territories stored a new wealth of resources and potential economic harvest. In fact, during this time the Ministry of Welfare campaigned to prevent all importations (Okabe, 1940b). Although most Japanese colonists sent to the islands were military personnel, many were civilians with interests in the islands' natural resources and their potential to boost the Japanese economy in the world market. Masayoshi Okabe was one such person sent to the islands to study, in his case, the potential for medicinal plant cultivation.

Evidently medicinal plants had been of interest to Japan even before Okabe visited the Pacific. An earlier report, "Medicinal Plants of the South Seas," was completed by Shigenori Kawagoe in 1917. Kawagoe visited the Pacific in 1914-1915 and collected more than 650 economic plant species, of which seventy-two were medicinal, and he published immediately due to the "urgent need" of such a publication. Mention of Palau and Yap was scanty, for Kawagoe listed only five medicinal plants of Yap (Kawagoe, 1917a, 1917b).

GEOGRAPHY

The Palau and Yap Islands are two of the major groups of the Caroline Archipelago in the western Pacific Ocean. Their tropical geography makes them an ideal spot for a wealth of agricultural pursuits. When Japan took occupancy, the government was apparently interested in exploiting as much of the islands' ecology as possible, including, in addition to the numerous food resources, medicines from both indigenous and exotic wild plants.

The approximately two hundred or more Palauan Islands are at the westernmost end of the Carolines, about 800 km east of the Philippines, extending from lat. 6 50' to 8 15'N and long. 133 50' to 134 45'E. All of the islands excepting Angaur lie within a mostly barrier (separated from the coast by a lagoon) and sometimes fringing (attached to shore) reef system, 80 km long and 27 km wide at its widest point. In a recent magazine article (FitzGerald, 1987), it was noted that Palau's reef system, particularly that surrounding the 37 km Rock Island chain south of Babelthuap, with its 700 coral and 1500 fish species, attracts divers, photographers and biologists from all over the world. It is "as close as you could get to paradise in the Pacific" (Kluge, 1986).

The larger Palauan islands are mostly volcanic, and the smaller are raised limestone and low coral atolls. Vegetation consists mostly of lowland rain forest (Camposperma, Manilkara, Calophyllum, Eugenia, Ficus, tree ferns) and mixed forest in the southern end. The swamp alluvial soil near the coast supports dense belts of mangrove forest with interspersed stretches of barren, sandy beach. Some virgin forest still remains on various southern islands of the group. However, most of the original vegetation of the Palau Islands had been cleared through the centuries for coconut plantations and phosphate mines, as well as by the local people themselves through their slash and burn agricultural methods (Oliver, 1961). In addition to copra, Palau's subsistence crop production (their

main agricultural enterprise) includes cassava, taro, sweet potato and banana. Most soil types are well suited to agricultural forest cultivation and carefully managed clean-tilled crop cultivation (Smith, 1983a; see also Cole *et al.*, 1987).

The Yap Islands are located northeast of Palau, at lat. 9 33' and long. 138 09'E. They consist of four volcanic main islands including Yap itself, and 15 coral atolls. The island chain lies within a fringing reef system. ~~Vegetation consists of evergreen rain forest, savanna woodland, and mixed forest.~~ As in Palau, Yap's main agricultural enterprise is subsistence crop production. Its major crops are cassava, taro, sweet potatoes, yams, bananas and coconuts. Most soils are suitable for the production of agricultural forest crop and carefully managed clean-tilled crop (Smith, 1983b; see also Falanruw *et al.*, 1987).

OKABE'S TRAVELS AND OBSERVATIONS

The ancestral medicinal culture of the Palau and Yap islanders is based wholly on the medicinal properties of the wild plants of the islands. When Okabe visited the islands in the early 1940's, the secrets of this art were known only to the "omkar" (Palau) or "tafalai" (Yap), names by which the native practitioners were known, and passed down through the generations from one heir to the next. The traditional folk culture was however being diluted by the facilities and ways of modern Japanese medicine (Okabe, 1940b, 1941a, 1943a). Okabe's intent was to record the tradition so that scientists could in time use this information in their search for new medicines. In the introductory paragraph of one of his reports, Okabe observes: "thinking of the motive of discovery of such invaluable drugs as cocaine and quinine having originated in folk medicines of a native tribe in South America, study of folk medicine should not be disregarded" (Okabe, 1941a, 1943a). Two and one-fifth percent of all Japanese imported tropical plant materials in 1936 were medicines. Clearly tropical medicinal plant cultivation had great potential. There was a wealth of knowledge in the native tradition. It was Okabe's belief that medicinal plants could and ought to be cultivated for economic profit on the part of the Japanese pharmaceutical industry (Okabe, 1940b).

Okabe's first voyage to Palau was to the island of Peleliu to study its coral reef vegetation. There is no mention in his report (Okabe, 1940a) of the medicinal value of the plants he surveyed. During that same year, Okabe (1940b) published a synopsis of medicinal plants known to exist on all the Palau Islands, though this report was not based on his own observations but was rather a compilation from Makino and Nemeto, "Flora Japonica." Okabe lists 100 Palauan plant species. It is interesting that so many of these species are introduced (65 introduced compared to 35 indigenous). Presumably the native peoples had learned well through the generations the healing properties of the plants introduced by colonists. Apparently, experimental testing of the cultivability of medicinal plants was already underway at this time, for Okabe describes its progress in some detail.

Okabe published an account of his own observations on the Palau Islands the following year (Okabe, 1941a). He gathered his information from the native Palauan people designated as "Kanakas." Okabe collected specimens of each plant, altogether totalling eighty-two species. The family best represented is Euphorbiaceae with six species and next Verbenaceae with five species. Most species are herbs, and the plant part most often used is the young leaf.

Okabe's latest paper (Okabe, 1943a) contains a rewrite of the earlier paper on Palau as well as a list of plants known to be used for medicinal purposes on the Yap islands. The listing of plants in the present article is a reproduction of the lists from the 1941a and 1943a reports. There are some additions to the second draft of the Palau chapter that merit attention. The plants listed are those used by the indigenous Kanakas, as well as by people termed by the translator, and therefore we must presume by Okabe himself, as "Chamorro". It must be cautioned, however, that the term "Chamorro" is more properly referable to people of the Marianas; we are not aware of the true origin of the people designated as "Chamorro" by Okabe. A total of 88 species is listed.

A thorough investigation must include studies of all tribes and islands, for there were differences (Okabe, 1941a). This was evidently Okabe's intent. He had by 1943 extended his knowledge of the

medicinal plants on Palau by studying the Chamorros, and he surveyed the Yap Islands. Okabe's Yap list contains 95 species. The family best represented is Fabaceae with eleven species, and the plant part most often used is the leaf. As is the case with plants on Palau, the flower is least often used. Unlike the data of Palau, in his Yap list Okabe credits the persons from whom he received information. Most of it was gathered from native tribal persons, some from an earlier publication (Nakamura), and a few from a Columbian missionary.

LITERATURE

Other Okabe papers to which we had no access are listed in Johnston (1975). These include Okabe (1940c), cited in Uchinomi, of which no description of its contents are noted; Okabe (1941b), in which Okabe lists 88 species of plants used by the Kanakas; Okabe (1941c), which contains a listing of medicinal plants from Jaluit; Okabe (1941d), cited in Uchinomi, of which no description of its contents are noted; Okabe (1943b), a paper cited in Sachet and Fosberg (1955), of which no description of its contents are noted. Sachet and Fosberg (1955) does not include a citation for Okabe (1943b). It does however include Okabe (1941c) as well as Okabe (1941e) which was not included in Johnston's bibliography. The Okabe (1941e) article contains a listing of 179 plant species from Jaluit and a brief description of the vegetation of Jaluit.

Following is a list of the publications on medicinal flora of Palau and Yap cited by Okabe: Makino & Nemeto (1931)(Okabe's list of 100 species in his 1940b article come from this source); Nakamura (Okabe lists plants originally published by Nakamura in the chapter on Yap medicinal plants in the 1943a article. Okabe also cites Nakamura in a chapter on a comparative study of medicinal plants used on other islands, in the 1941a article but not included in the 1943a rewrite. In this chapter, Okabe lists 24 plants used medicinally in Yap as well as Palau); Narabayashi (Okabe cites Narabayashi in that same 1941a chapter). See Literature Cited for more complete information.

The Japanese horticulturist Yasuhei Ashizawa visited the Palau Islands in 1954 to report on the success of plants introduced during the Japanese administration. On his list of 99 plants are 13 species known to have been used medicinally (Ashizawa, 1954).

A more recent investigation into the medicinal flora of the Palau Islands was made by Salsedo & Smith (1987; see also Salsedo, 1970), who surveyed "every village and hamlet in Palau," from August 1968 through August 1970. They collected a total of 190 plant species. Their list does not coincide with that of Okabe. Plants used to treat venereal disease exemplify well the differences. Okabe observes that "there are a number of remedies for gonorrhoea" (Okabe, 1941a, 1943a). Venereal disease was introduced by the European and American colonists during their explorations and quests for economic treasure in the Pacific. An 1862 native population count in Yap was 10,000, and had since fallen to 3,713 by 1935. An earlier 1783 estimate was 40,000. Venereal disease as well as tuberculosis and dysentery are listed as "prime causes of depopulation" (Naval Intelligence Division, 1945). Okabe further remarks that medicinal plant cures for gonorrhoea are proven effective and ought to be scrutinized for pharmaceutical value. He lists a total of 13 treatments for gonorrhoea, including one of the Chamorros that was not listed in the 1941 report. There are two treatments listed for syphilis (Okabe, 1943a). Salsedo and Smith list only eight treatments for venereal disease, and furthermore some of the cures Okabe lists are not included in the Salsedo and Smith report, and vice versa. It appears that a number of formerly effective cures had fallen into disuse during the post-war era.

For example, one gonorrhoea treatment listed by Okabe is "young leaves of agaseel and of akabui, 10 each are mixed and eaten." Agaseel is Eugenia reinwardtiana DC. (Myrtaceae), and akabui is Piper betle L. (Piperaceae). In Salsedo and Smith, the young leaves of E. reinwardtiana are used to treat chest pains, and the local name is listed as kesiil. The young leaves of P. betel are used as an aborting agent, and its local name is listed as kebui. See also R.A. DeFilipps (1987) for additional references to other literature on medicinal plants of Palau and Yap, as well as on other floristic studies of the Pacific Islands.

For purposes of historical completeness we believe that it would be valuable to record here and have published for the first time in the English language the medicinal plants and their uses as found by Okabe on Palau and Yap. With very few exceptions, the nomenclature conforms to the checklists of Fosberg *et al.* (1979, 1982, 1988). For translation preparation of Okabe's reports, see Literature Cited. Other reports on Micronesian vegetation written in the Japanese language have been translated under circumstances described by Fosberg (1950). Dr. F. Raymond Fosberg, Smithsonian Institution, has noted (pers. comm., 1988) that only a few, if any, herbarium voucher specimens were collected by Okabe to afford later verification of species identification.

LISTING OF PLANTS AND THE DISEASES TREATED BY THEIR USE

In the listings by family presented alphabetically below, the sequence begins with ferns, followed by monocots and dicots. All information regarding Palauan medicinal plants is from Okabe (1941a, 1943a), unless otherwise specified. All information regarding Yap medicinal plants is from Okabe (1943a). In cases where Okabe, in his studies of Yap, noted in which district he learned of the treatment, the district is specified. When two or more plants are used in one treatment, the treatment is stated under the name of only one plant species, this plant being in almost all cases the first species named in the treatment. In most cases, the wording is Okabe's, but often we found it necessary to alter the grammatical structure of the sentences so they may read more easily. In some instances, however, the meaning of the sentences was not clear, and in this case we did not alter the grammar. Also included are poisonous plants of Palau (Okabe 1941a, 1943a). In addition to the plants listed below, there are three poisonous sea weeds of Palau which Okabe mentioned, but he did not include their Latin binomial nor indicate what part of the plant is poisonous. Okabe did not refer to any poisonous plants of Yap.

PTERIDOPHYTA

MARATTIACEAE

Angiopteris evecta (Forst. f.) Hoffm.

DERMARM, DERMULM (Palau); GOB (Yap; note: another "Gob" is Polypodium scolopendria (Polypodiaceae)). Palau: Leaves are tied around the head to cure headache. Yap: (1) (Ugiri Dist.) In the case of ptomaine poisoning, leaves of "gob" are crushed together with copra, and the sap is drunk three times a day. (2) (Ugiri Dist.) For sarcoma, leaves are crushed together with leaves of "agakai" (plant species not stated), and the sap is applied twice a day. See Antrophyum plantagineum (Polypodiaceae), Alpinia carolinensis (Zingiberaceae), Wollastonia biflora (Asteraceae), and Inocarpus edulis (Fabaceae) for other uses.

OPHIOGLOSSACEAE

Helminthostachys zeylanica (L.) Hook.

DODOAN. Yap (Map Dist.): For lacquer poisoning, coconut oil is heated and applied to the affected part by means of the "flower-stalk" of this plant. See Adenostemma lanceolatum (Asteraceae) and Solanum torvum (Solanaceae) for other uses.

Ophioglossum pendulum L.

TSCHAS. Yap: For usage, see Erythrina variegata (Fabaceae).

Ophioglossum reticulatum L.

RUUS, RUNS (Palau); GABACHAK (Yap). Palau: When stung by a swordfish, the plant is crushed and applied to the wound. Yap (Nif Dist.): When stung by a ray fish, sap of the plant is mixed with boiled coconut oil. The vapor is led to come into contact with the affected part, which is smeared with the oil when the oil cools down.

PARKERIACEAE

Ceratopteris thalictroides (L.) Brongn.

TIEL AWOEK, TEERA EK. Palau: For depilation, leaves are crushed together with leaves of "er-mar" and "ushikeraker" (plant species not stated), and sap is applied to the hair (1941a). In the 1943a listing, names are slightly different: leaves are crushed together with a species named "ermaruushkerarker" (plant not listed) and applied to hair as depilatory.

POLYPODIACEAE

Acrostichum aureum L.

WELBROB. Yap: For usage, see Polyscias grandiflora (Araliaceae) and Crateva speciosa (Capparidaceae).

Adiantum philippense L.

OMEEREL AKESEBEKU, OMEERELAKESEBEKU, OEREL AKESEBEKU. Palau: Leaves are crushed and applied to a wound.

Antrophyum plantagineum (Cav.) Kaulf.

REM. Yap: For bed-wetting, the sprouting leaves are crushed together with sprouting leaves of "gob" (Angiopteris evecta or Polypodium scolopendria), and the juice is drunk.

Asplenium nidus L. sensu lato

BUKL BURU, BKURBRU (Palau); KUYOP (Yap). Palau: For usage, see Polypodium scolopendria (Polypodiaceae) and Vittaria incurvata (Polypodiaceae). Yap: When bitten by a centipede, fronds are pressed and the sap is applied to the bite. See also Procris pedunculatum (Urticaceae).

Blechnum orientale L.

RILEG. Yap (Map Dist.): Young leaves are put into water until it smells badly, and a small quantity is taken daily for invigoration, chiefly for children between ages two and six.

Cheilanthes tenuifolia (Burm. f.) Sw.

TERIBUK. Yap: For usage, see Alpinia carolinensis (Zingiberaceae).

Davallia solida (Forst. f.) Sw.

TSCHOCHOROR. Yap: For usage, see Morinda citrifolia (Rubiaceae).

Polypodium scolopendria Burm. f.

EPAP (Palau); GOB (Yap; note: another "Gob" is Angiopteris evecta). Palau: For a cold, the Chamorros mix and crush the leaves with those of Asplenium nidus, Premna serratifolia, and Erythrina variegata, and the juice is drunk (1943a only). Yap: For uses of "gob," though never specified as to whether Polypodium or Angiopteris, see Angiopteris evecta (Marattiaceae), Antrophyum plantagineum (Polypodiaceae), Alpinia carolinensis (Zingiberaceae), Wollastonia biflora (Asteraceae), and Inocarpus fagifer (Fabaceae).

Pteris sp.

RIMATZ. Yap: see Alpinia carolinensis (Zingiberaceae).

Thelypteris parasitica (L.) Tard.

KILKURD, KIRKURD. Palau: For obstipantia, twenty young leaves are crushed together with ten young leaves of Melastoma malabathricum, to which half a cup of water is added, filtered through the fibrous network of a coconut leaf-base, and drunk.

Vittaria incurvata Cav.

ALBERU. Palau: Two or more (should be an "even number") new leaves are mixed with the same number of Asplenium nidus leaves, crushed, and the sap is applied to a wound; it will then work as a styptic. For other uses, see Averrhoa bilimbi (Oxalidaceae).

MONOCOTYLEDONAE

AMARYLLIDACEAE

Crinum asiaticum L.

BIS-ERAD (Palau); GIEIP, GIEIF (Yap). Palau: Root is crushed and applied to a bruise, then wrapped with a leaf of the plant. Yap: For beriberi, leaves and scapes are crushed together with aerial roots of Ficus prolixa, and scapes are crushed together with aerial roots of Ficus prolixa, and the sap is drunk. Vomiting afterwards does not affect the treatment. For another usage, see Alpinia carolinensis (Zingiberaceae).

ARACEAE

Alocasia sp.

ABIS, A-BIS. Palau: (1) Juice from rotten leaves is applied to a burn. (2) The stem is crushed and sap is obtained as an aphrodisiac (1941a; n.b. 1943a says as "narcotic.") (3) Sap of stem and leaves is poisonous. See also Codiaeum variegatum (Euphorbiaceae).

Alocasia macrorrhiza (L.) G. Don var. macrorrhiza

RAII. Yap: (1) (Giripes Dist.) To treat rat bite, the bud and leaves are crushed and applied to the affected part. (2) (Whole island) Sap of the crushed stem is drunk as an aphrodisiac. See also Rhus taitensis (Anacardiaceae).

Colocasia esculenta (L.) Schott

AB'RAK, ABRAK, ABR'RAK, ABRAKK (Palau); TARO (Yap). Palau: (1) For lacquer poisoning, scraped copra is wrapped up in a Colocasia leaf, roasted and then applied to the body. (2) Sap of stem and leaves is poisonous. Yap (Ugiri Dist.): Sprouts are crushed and the sap is applied to an aching tooth.

Cyrtosperma chamissonis (Schott) Merr.

RAKK. Yap: (1) (Ugiri Dist.) Leaves are roasted, and when hot enough are placed onto a bruise. (2) For intestinal parasites, bracts and sprouting leaves are crushed and the sap is drunk two or three times a day.

Epipremnum carolinense Volk.

TOILAL, TOIRAL (Palau); GMOI, GUMOI (Yap). Palau: (1) In childbirth, safe delivery is expected by taking the juice squeezed out of six leaves, diluted with water, three times a day. (2) As an emmenagogue, the leaves are crumpled and steeped in water, which turns red, and is filtered through the fibrous network of a coconut leaf-base and drunk. (3) Sap of leaves and stem is poisonous. Yap (Giripes Dist.): For tuberculosis, young leaves of this plant and of Costus speciosus are crushed together, and the sap is drunk together with coconut milk. Also see Decaspermum fruticosum (Myrtaceae).

Rhapidophora engleri Kanehira

ORII. Palau: (1) An afterbirth can easily be expelled by taking the juice pressed out of the leaves. (2) Sap of stem and leaves is poisonous.

ARECACEAE

Arecha catechu L.

A-BU, A-BUU, ABUU (Palau); BUH (Yap; n.b. another "buh" is Schizostachyum lima of

Poaceae). Palau: (1) Seed is wrapped in leaf of Piper betle and chewed for a cold; cold is cured after perspiration. (2) To cure stomach ache, eight roots are crushed together with young leaves about six centimeters long (1941a; n.b. 1943a says sprouts about six centimeters long) of Pandanus macrojeanneretia and eight leaves of Codiaeum variegatum with a cup of water, strained through the fibrous network of a coconut petiole-base, and added to copra which has been scraped from the end of the coconut bearing the germination pores ("eyes") and which has been strained through the coconut fiber; this mixture is then ingested. It is believed that the patient will not recover if this potion is "injured" by birds, insects, rats, or stepped on by humans. (3) To stop bed-wetting, the soft, unripe fruit is pressed, and the juice is diluted with water and drunk. (4) As an emmenagogue, new roots are crushed together with new leaves of Pandanus macrojeanneretia, eight leaves of Codiaeum variegatum, and copra shaved fresh from the end of the coconut with the germination pores, then filtered through the fibrous network of a coconut leaf-base, and drunk. See Codiaeum variegatum (Euphorbiaceae) for another usage.

Yap: (1) For arthritis, the sprouting buds of this plant and of Cocos nucifera are wrung together and the juice is drunk. (2) (Ugiri Dist.) Roots of this plant ("rikekembuh") are crushed together with pitcher-leaves of Nepenthes mirabilis and unripe fruit of Inocarpus fagifer, and the sap is warmed together with coconut milk and drunk for gonorrhoea. (3) (Whole island) As a condiment, the unripe fruit is wrapped in a leaf of Piper betle, some lime is added, and it is chewed. When leaf of Piper betle is unavailable, the leaf of Callicarpa candicans is substituted. Also see Aidia cochinchinensis (Rubiaceae).

Cocos nucifera L.

A-RYUS, ARYUS, ARIUS (Palau); NIU, NYU (Yap). Palau: (1) Oil is rubbed on head to treat a cold. (2) Sliced copra is applied to a wound. (3) Coconut oil is spread over an abscess. (4) Coconut oil is spread over arthritis-affected part two to three times a day. (5) Sap of young, red pericarp of coconut and coconut milk are mixed, and taken for amoebic dysentery. (6) As an emetic, the inner pericarp of a young, unripe coconut (should be red in color) is shaved and pulverized, and taken together with coconut milk. (7) As a febrifuge, coconut oil is spread over the head and body. (8) To stop bed-wetting, juice is pressed out of the exocarp of an unripe coconut and drunk. (9) Coconut oil is applied to a burn. (10) Juice squeezed out of rotten leaves is applied to a burn. (11) Hot coconut oil is dripped onto an insect bite. (12) When washing hair and body, grated copra wrapped in coconut fiber is used. (13) For seasickness, young pericarp of coconut is chewed.

The use of coconut for medicinal purposes in Palau is quite extensive; its usage is recorded under the names of twelve additional plant species: Colocasia esculenta (Araceae), Areca catechu (Arecaceae), Cordyline fruticosa (Liliaceae), Curcuma longa (Zingiberaceae), Acanthus ebracteatus (Acanthaceae), Ageratum conyzoides (Asteraceae), Terminalia catappa (Combretaceae), Ipomoea indica (Convolvulaceae), Codiaeum variegatum (Euphorbiaceae), Derris elliptica (Fabaceae), Abroma augusta (Sterculiaceae) and Phaleria nisidai (Thymelaeaceae). It is used mostly in the form of copra, then coconut oil, and lastly coconut milk.

Yap: (1) (Ugiri Dist.) For a headache cure, the petiole of a leaf is shaved finely and pushed into the nostrils to make them bleed. (2) Bark of coconut is beaten with the "mafalei," upon which "wech" (burned and pulverized limestone) is spread, and the juice which is pressed out is dripped onto a cut. For this treatment, a coconut palm should be selected from those growing near the road. (3) (Whole island) For a deficiency of mother's milk, coconut honey ("achief") is taken from flower-stalk and chewed together with copra, which eventually becomes mucilaginous; it is then taken. (4) (Ugiri Dist.) For diarrhoea, a young coconut ("etibai") is crushed together with the young leaves of Wollastonia biflora and the sap is drunk. (5) For leprosy, myriapods called "agur" are put into coconut oil, left until they are decomposed, and applied to the affected part, which has been stuck by a needle to release pus. (6) (Ugiri Dist.) To relieve over-eating effects, the outer skin (husk) of a coconut is squeezed and the sap is drunk. (7) To treat a husky voice, a leaf-base ("parei") is squeezed and the sap obtained, to which half the quantity of rain water is added, heated,

and taken twice a day. (8) (Whole island) To keep mosquitoes away, the rotten roots are burned. (9) (Whole island) As a toilette, the whole body is rubbed with copra, and then washed with sea water. The use of coconut for medicinal purposes in Yap is recorded under the names of thirty-two additional plant species, which due to the length of such a list are not included here. It is used mostly in the form of coconut milk, then coconut oil, copra, and lastly coconut leaf.

Cocos nucifera L. (young fruit)

IRIU. Yap (Ugiri Dist.): If wounded on a battlefield, a young coconut is roasted by fire and pressed over the cut to make juice drip onto it. Afterwards, the stem of Costus speciosus is tapped and the juice is spread on the cut. Then there will be no fear of swelling or suppuration.

BROMELIACEAE

Ananas comosus (L.) Merr.

ONGOL GOBARD, OGOROGO BALT. Palau: Unripe fruit is roasted and eaten as a vermifuge.

COMMELINACEAE

Murdannia nudiflora (L.) Brenan

FUNOO. Yap: For otitis media, ten young stems are pressed and the sap is dripped into the ear once a day. See also Premna serratifolia (Verbenaceae).

CYPERACEAE

Cyperus brevifolius (Rottb.) Hassk.

DEUS. Palau: To treat a wart, the tip of the wart is cut open, and juice pressed out of the plant is smeared over the wart.

DIOSCOREACEAE

Dioscorea sp.

DOOK. Yap: for usage, see Bulbophyllum profusum (Orchidaceae).

FLAGELLARIACEAE

Hanguana malayana (Jack) Merr.

EWOEIS, EWAIS. Palau: For ringworm, the juice from the basal white portion of young leaves is applied several times.

LILIACEAE

Cordyline fruticosa (L.) Chev.

ASIS (Palau); RICH (Yap). Palau: (1) For ophthalmia, young leaves are crushed, and the greenish juice is put into a shallow basin and diluted with water. The face is then dipped into the basin, and the eye is opened and washed. (2) For epistaxis, the root is crushed together with young leaves and fruit of Acanthus ebracteatus, and copra, a part of the juice is drunk, and the rest is poured into the ear. See also Acanthus ebracteatus (Acanthaceae) and Abroma augusta (Sterculiaceae) for other uses. Yap (Map Dist.): For lacquer poisoning, a young tree is taken and its leaves are rubbed on the affected part. See also Alpinia carolinensis (Zingiberaceae).

MUSACEAE

Musa sp.

ILASS, IRAS. Palau: For gonorrhoea, the juice of stem and leaves is drunk. See also Crateva speciosa (Capparidaceae).

Musa sp.

MURGUEB. Yap: (1) Young sprouts from an old stock are crushed with the stem and leaves of Costus speciosus, and the juice is drunk to alleviate stomach ache. (2) (Ugiri Dist.) Young plant is pressed, and the juice is used for rinsing a cut. (3) Juice from the stem is squeezed out and applied to a sarcoma, which is then tied around "with skin." (4) Unripe bananas are boiled in soup and taken to treat amoebic dysentery. (5) For tuberculosis, stem of banana is cut hollow and the sap accumulated in it is drunk. (6) For fainting, stem of the banana is squeezed and pushed into the mouth. (7) (Ugiri Dist.) Sprouts are crushed and the sap is applied to an aching tooth. (8) (Whole island) Outer skin of banana stem ("keginedinai") is made pliable and used as a bandage.

ORCHIDACEAE

Bulbophyllum profusum Ames

PAU. Yap: For insect bites, young leaves are crushed together with a germinating plant of Dioscorea sp., and the sap is applied to the bite.

Dendrobium brachyanthum Schltr.

BAGARUEL. Palau: For a deficiency of (mother's) milk, juice pressed from the crushed leaves is drunk. Deficiency of milk is also treated by drinking a broth of fish boiled in sea water.

Nervilia aragoana Gaud.

TIRIMOFON, TIRIMOF. Yap (Ganif Dist.): Root tubers are crushed, and the sap is drunk for tetrodon poisoning.

Nervilia palawensis Schltr.

ODODUTREGIL. Palau: For ophthalmia, the tuberous roots are pressed, and the juice squeezed out, which is applied to the eye (1943a; n.b. 1941a says applied to the eye drop by drop).

Taeniophyllum sp.

BUKITANG, BUKITAN. Palau: Swelling of an abscess goes down if a whole Taeniophyllum plant and leaves of Crateva speciosa are mixed and applied.

PANDANACEAE

Pandanus sp.

TYUYOI. Yap: For a deficiency of mother's milk, roots are crushed together with flower buds of Hibiscus tiliaceus, the sap is mixed with coconut oil and taken several times a day.

Pandanus macrojeanneretia Mart.

ELTOCHOT, ELTOOT. Palau: For usage, see Arecha catechu (Arecaceae), Codiaeum variegatum (Euphorbiaceae), and Hibiscus tiliaceus (Malvaceae).

POACEAE

Centosteca lappacea (L.) Desv.

MOIBIPUL, MOIBIPUUL. Palau: (1) Leaves are crushed with leaves of Glochidion ramiflorum, and the sap is applied to a wound. (2) Leaves are crushed, and the sap is applied to a wound.

TACCACEAE

Tacca leontopetaloides (L.) O. Ktze.

TSCHOBCHOB. Yap: For usage, see Hibiscus tiliaceus (Malvaceae).

ZINGIBERACEAE

Alpinia carolinensis Koidz.

TIFIF. Yap: (1) (Giripes Dist.) For a cold, leaves are mixed with the leaves of Eugenia javanica, Guettarda speciosa, "gob" (does not indicate whether Angiopteris evecta or Polypodium scolopendria), Cheilanthes tenuifolia and Decaspermum fruticosum, and rubbed over the whole body, starting with the head. (2) For a cold, leaves are crushed together with the young leaves of Cordyline fruticosa, leaves of Eugenia javanica and of Cheilanthes tenuifolia, Pteris sp., and roots of Carica papaya. The juice pressed out is taken three times a day for three days. New juice is to be had on the fourth day. (3) (Ururu Dist.) Young sprouting buds, leaves and root tuber are crushed together, and the juice is applied to sarcoma. (4) (Ugiri Dist.) Young leaves of this plant and of Crinum asiaticum are mixed and eaten as an emetic. (5) (Ugiri Dist.) This plant is crushed together with Curcuma longa, and the juice is drunk with coconut milk twice a day as an anti-emetic.

Costus speciosus (Koen.) Sm.

SAUER. Yap: For usage, see Epipremnum carolinense (Araceae), Cocos nucifera (Arecaceae), and Musa sp. (Musaceae).

Curcuma longa L.

TELAP, TERAPP (Palau); GUCHOL (Yap). Palau: As a cosmetic for the toilette, roots are ground into a fine powder, mixed with coconut oil, and put on forehead or other parts of the body. Yap (Whole island): The roots of "gchol" make up "rem" which is mixed with coconut oil and used in toilette. Also see Alpinia carolinensis (Zingiberaceae).

Zingiber sp.

IYOL. Yap (Rumon Dist., Rii Village): For leprosy, roots are ground down and mixed with lime and then applied to the affected part.

Zingiber sp.

YOI. Yap (Ugiri Dist.): Root is crushed together with young leaves of Ocimum sanctum and of lemon, and taken with coconut milk as a heart medicine.

DICOTYLEDONAE

ACANTHACEAE

Acanthus ebracteatus Vahl

KOL'LIL, KORIR. Palau: For otitis media, four fruits of Acanthus, two roots of Cordyline fruticosa, and four leaves and two young roots (about 3 cm. long) of Bruguiera gymnorhiza are mixed and pounded. Scrapings of copra (taken from the end of the seed bearing the three germination pores, or "eyes") are added. The mixture is filtered through the fiber of a coconut leaf-base, and the juice thus obtained is injected into the ear. Also see Cordyline fruticosa (Liliaceae).

Blechnum brownei Juss.

MALAI. Yap (Ururu Dist.): For framboesia, stems are leaves are squeezed, and the sap is applied to the affected part, which is then wrapped in a leaf of Morinda citrifolia and heated from above.

ANACARDIACEAE

Rhus taitensis Guill.

GARAHDE. Yap (Ururu and Giripes Dists.): New leaves of this plant and of Oxalis corniculata, Alocasia macrorrhiza, and Xylocarpus granatum are crushed, and the juice is applied to the wound.

Semecarpus venenosus Volk.

TONGET, TOHNGET. Palau: The latex of the trunk is poisonous.

Spondias pinnata (L.F.) Kurz

TITIMML, TI TIMML, TETIMML, TETIMMUL. Palau: (1) About one handful of shavings of the reddish part of the inner bark and a similar portion of the same from Eugenia javanica are crushed together. The juice is diluted with water and drunk for amoebic dysentery. (2) For ophthalmia, ten new leaves are squeezed, and the juice is applied to the eye (1943a; n.b. 1941a says applied to the eye drop by drop).

APOCYNACEAE

Cerbera manghas L.

KAMARIDECH, KAMARIDOKK. Palau: Fruit and latex are poisonous.

ARALIACEAE

Polyscias grandifolia Volk.

EBUN. Yap: And even number of branches of this plant and of Acrostichum aureum are gathered in secret, then chewed, and the resulting juice is spread onto a cut. Leaves are then put on the cut and replaced twice daily, in morning and evening.

ASTERACEAE

Adenostemma lanceolatum Miq.

RUBURB. Yap: For leprosy, leaves and stems are crushed together with leaves of Helminthostachys zeylanica and applied to the affected part.

Ageratum conyzoides L.

AGMAK, AGMAKK. Palau: To make the head of an abscess burst, coconut oil is first applied, and then a leaf of A. conyzoides is placed over it.

Glossogyne tenuifolia (Labill.) Cass. ex Less.

OHL. Yap (Ururu Dist.): Leaves and stems are pressed, and the juice thus obtained is applied to a cut.

Wollastonia biflora (L.) DC. sensu lato

GESIL, NGESIL (Palau); SUH (Yap). Palau: For gonorrhoea, a handful of young leaves is mixed with a handful of young leaves of Piper betle and eaten raw. Yap: (1) (Kamif) For stomach ache, the cortex is peeled off the stem, and the juice squeezed out of it is taken with copra once a day. (2) (Map and Giripes Dists.) Leaves and stems are squeezed, and the juice is spread onto a wound. (3) (Ugiri Dist.) When injured at sea, young leaves are crushed together with those of Morinda citrifolia, and the juice is applied to the wound. (4) (Ugiri Dist.) When injured in the mountains, young leaves are mixed and crushed together with those of Ocimum sanctum, "gob" (which of the two species is unspecified), and Piper betle, and the juice is applied to the wound twice a day. (5) Bark of the root is crushed together with young leaves of Ludwigia octovalvis, and the sap is then drunk together with coconut milk three times a day for gonorrhoea. See also Cocos nucifera (Arecaceae).

BIGNONIACEAE

Dolichandrone spathacea (Lit.) K. Schum.

RIRIU. Yap: For framboesia, bark is squeezed together with young stem and flower stalk of Croton sp., and the sap is poured into heated coconut oil; when cooled down, it is applied to the affected part of the body.

CAPPARIDACEAE

Crateva speciosa Volk.

EDEPSUMBEL, EDEPSUNBEL, EDEPSUMBERUW (Palau); ABEECH (Yap). Palau: A handful of young sprouts of this species and of Clerodendrum thomsonae from which skin has been pared, and of Allophylus ternatus (n.b. Allophylus included only in 1941a treatment) are mixed and crushed together, then applied to a bruise and wrapped with a banana leaf. The affected part will become hot in two minutes, at which time the poultice is replaced with another. Yap: (1) (Ugiri Dist.) For stomach ache, bark from a curved part of a branch is crushed, and the juice pressed out is drunk with water. (2) (Ururu and Giripes Dists.) Young leaf is bruised and applied to a cut, being replaced every other day. (3) (Ururu Dist.) Leaves are crumpled and applied to a bruise. (4) (Ururu Dist.) A leaf is applied to a sarcoma. (5) (Nif Dist.) For myelitis, leaves are crushed together with leaves of Acrostichum aureum and Allophylus timoriensis; the sap is then filtered through the brown fibrous network of petiole-base of a coconut leaf, and the sap is drunk three times. Dosage each time is half a coconut shell cup. (6) Leaves and bark are wrapped in "mareniw" (brown fibrous network from the base of coconut leaf), and put into a young coconut ("tob") cut crosswise, then squeezed in the sap several (an even number of) times, and then taken twice a day for gonorrhoea. (7) (Rumon Dist., Rii Village) For leprosy, bark is shaved, and the sap is applied to the affected part.

CARICACEAE

Carica papaya L.

BOBAI, BOPAI (Palau); POPAI (Yap). Palau: (1) Roots are mixed with leaves of Allophylus ternatus and sniffed to relieve headache. (2) If root of C. papaya is beaten and the bad odor is smelled, then "bad blood" will run, and cure will result for headache. (3) Decoction of the root is drunk by Chamorros as a febrifuge (1943a only). Yap: (1) (Ururu Dist.) Roots are sniffed to treat a headache. (2) Male flowers are put into hot water and taken as an anti-emetic.

CASUARINACEAE

Casuarina litorea L. var. litorea

AGASU, AGAS. Palau: (1) For toothache, juice pressed out of the bark is mixed with sea water and held in the mouth. If the mouth is rinsed every day, the teeth will be strengthened. (2) For abortion, the Chamorros take an infusion of the bark or a quantity of lemon juice (1943a only).

COMBRETACEAE

Lumnitzera littorea (Jack) Voigt

MEKEKAD, MEKEKAZ. Palau: Bark is poisonous.

Terminalia catappa L.

AMIKA (Palau); KER (Yap). Palau: (1) Bark is mixed well with a whole plant of Cassipoupa filiformis and copra, crushed together, and the juice which is squeezed out is drunk for gonorrhoea. (2) For gonorrhoea, bark from two pieces of stems, two to three centimeters in diameter and seven to eight centimeters in length, is shaved, crushed and filtered through the fibrous network of a coconut leaf-base. This is drunk with coconut milk. If a handful of Cassipoupa filiformis is crushed and filtered as usual and taken with water, no recurrence will take place. The coconut shell from which copra or milk has been taken should be buried in the earth. (3) For framboesia, young leaves are mixed together with young leaves of Glochidion ramiflorum, crushed and applied to the affected part. For other uses, see Pterocarpus indicus (Fabaceae) and Citrus limon (Rutaceae). Yap: (1) (Ururu Dist.) The bark is tapped, and the latex is spread on a cut. (2) (Ugiri Dist.) Leaves and fruit are crushed together and put onto a sarcoma. (3) (Whole island) As a stain for teeth, leaves are boiled together with a black clay ("buh") and applied to the teeth at bedtime. See also Allophylus timoriensis (Sapindaceae).

CONVOLVULACEAE

Ipomoea indica (Burm.) Merr. var. indica

ORI-YEMAD, ORIYEMAD, ORIEMAD. Palau: (1) Milky juice of the plant is applied to a wound and pressed down with a crumpled leaf of the plant. (2) Leaf of the plant, spread with coconut oil, is applied to an abscess; it will then draw pus very well.

Ipomoea littoralis Bl.

TOHRUH, TOHRUH, TOHRUH (Palau); GELEW, GELOW (Yap). Palau: (1) Leaves are mixed with a handful of young leaves of Pongamia pinnata, crushed, applied to an abscess and then warmed. (2) Crushed stem and leaves are applied to an abscess to draw out the pus. Yap: (1) (Nif Dist.) For stomach ache, leaves are beaten to squeeze out juice, which is taken once a day together with coconut milk. (2) (Ururu Dist.) Leaves and stem are crushed, and the juice is applied to a cut. (3) To treat fluor-albus, twenty flowers are gathered by the patient herself and eaten as they are.

Ipomoea pes-caprae ssp. brasiliensis (L.) v. Ooststr.

KOBEAS OL, KOBIAAS-OL. Palau: For usage, see Symplocos racemosa (Symplocaceae).

Merremia hederacea (Burm. f.) Hall. f.

WATCHAGAR. Yap: For usage, see Pueraria sp. (Fabaceae).

Merremia umbellata (L.) Hall. f.

KEBIAS. Palau: For fever in/of the mouth, the young buds (1941a only; n.b. 1943a says central leaves) are crushed and eaten.

CRASSULACEAE

Kalanchoe pinnata (Lam.) Pers.

No local name given. Yap: (1) (Ugiri Dist.) For headache, leaves are heated and placed on the affected part of the head. (2) Leaves are baked and plastered onto sarcoma.

EUPHORBIACEAE

Codiaeum variegatum (L.) Bl.

KESUK, KSUK. Palau: (1) Juice of the crushed leaves is drunk to cure diarrhoea. (2) For gonorrhoea, eight leaves are mixed and squeezed together with a handful of flowers of Averrhoa bilimbi and a bit of copra from the end of the coconut with the germination pores. The mixture is then diluted with water and drunk. (3) For gonorrhoea, the young leaves are mixed well with the soft, white part of the young leaves of Pandanus macrojeanneretia, coconut milk, and sap of the root of Areca catechu (1941a only; n.b. in 1943a: root of Alocasia sp.). The mixture is then drunk. (4) For syphilis, sap of the leaves is pressed out and mixed with copra, kneaded and applied to the affected part. (5) For framboesia, juice of the leaves is mixed with coconut milk and spread over the affected area. For other uses, see Areca catechu (Arecaceae), Pterocarpus indicus (Fabaceae) and Artocarpus altilis (Moraceae).

Croton sp.

GATUNG. Yap: For uses, see Dolichandrone spathacea (Bignoniaceae) and Ormocarpum cochinchinensis (Fabaceae).

Euphorbia chamissonis (Kl. & Gke.) Boiss.

OGEKAD. Palau: Latex of stem is poisonous.

Excoecaria agallocha L. var. agallocha

AYAS (Palau); BAT (Yap). Palau: Latex of trunk is poisonous. Yap (Map Dist.): To alleviate

constipation, sap obtained by tapping the bark is drunk with water once a day.

Glochidion ramiflorum Forst.

AGOLM, AGORM, AGOMAR (Palau); GOMOL (Yap). Palau: (1) Young leaves are crumpled and applied to a wound. (2) For obstipantia, fresh leaves are eaten. For other uses, see Terminalia catappa (Combretaceae), Macaranga carolinensis var. grandifolia (Euphorbiaceae), Centosteca lappacea (Poaceae) and Citrus limon (Rutaceae). Yap: For usage, see Decaspermum fruticosum (Myrtaceae).

Macaranga carolinensis var. grandifolia Pax & Hoffm.

ABDEL, ABUDOEL, ABDEEL, BEDEL (Palau); BIDI (Yap). Palau: (1) A handful of young leaves is crushed while fresh, and the sap is taken four to five times per day to relieve stomach ache. (2) A handful of fresh, young leaves of Macaranga and of Glochidion ramiflorum is mixed together when fresh, crushed, and the juice is drunk for stomach ache. (3) Juice pressed from the leaves is drunk to relieve diarrhoea. (4) For obstipantia, four to six young leaves are crushed, and the juice is drunk (in 1941a, translator notes that this plant may be "debe el" (Citrus limon) rather than "bedel"; in 1943a, plant is listed as "paderu," for which no Latin binomial is given). Yap: An even number of leaves, inflorescences and buds is crushed and mixed with a few drops of coconut oil. The paste is then plastered onto a bruise.

Phyllanthus amarus Sch. & Th.

UKERERALIP, UKURERALIP (Palau); RURUDAI (Yap). Palau: (1) For arthritis, a decoction of stem and leaves is taken several times a day. (2) Decoction of the whole boiled (1943a only; 1941a does not say "boiled") plant is taken for dyspepsia. (3) For gonorrhoea, a decoction of leaves and stems is drunk. (4) For hemorrhoids, a decoction of leaves and stems is taken (1941a); leaves and roots are boiled in water and taken (1943). See also Allophylus ternatus (Sapindaceae) and Piper ponapense (Piperaceae). Yap (Nif Dist.): A decoction is taken for gonorrhoea.

FABACEAE

Albizia lebbek Benth.

GMOGMOL. Yap: (1) (Ururu Dist.) For myelitis, the roots and bark are crushed together with the bark of Pterocarpus indicus, and the sap is drunk with coconut oil. (2) (Ugiri Dist.) For myelitis, bark of the root is crushed together with the leaves and fruit of Capsicum frutescens, and the sap is drunk with coconut milk.

Canavalia ensiformis (L.) DC.

WARIMOK. Yap (Ugiri Dist.): For neuralgia, leaves and stems are crushed together with the leaves of Morinda citrifolia, Allophylus timoriensis, Premna serratifolia, and of Derris trifoliata, and the sap is applied to the affected part of the body. New ingredients should be gathered and applied daily. For another usage, see Vigna marina (Fabaceae).

Cassia sophora L.

GIGIOL. Yap: For usage, see Pterocarpus indicus (Fabaceae).

Derris elliptica (Roxb.) Benth.

DUP, DUB, DUUP, DUUB (Palau); YUBU (Yap). Palau: (1) Root decoction mixed with coconut oil is spread onto prurigo-affected skin to relieve itch. (2) For ringworm, the juice of Derris is mixed together with coconut oil and applied to the affected part. (3) To exterminate crablice, juice obtained from a crushed root is applied, and the hair is then washed in sea water. (4) Roots are poisonous. Yap (Ururu and Giripes Dists.): Young leaves are crushed, and the juice is spread on a cut.

Derris trifoliata Lour.

KEMOGEM, KEMOKEM (Palau); GABATI (Yap). Palau: (1) Ten new leaves and ten full grown

leaves (1941a only; n.b. 1943a says instead of "full grown," "middle-aged") are crushed, kneaded with a small quantity of sea water, applied to the wound and bandaged. (2) Young leaves are crushed together with the young leaves of Callicarpa elegans, and the juice pressed out is drunk for amoebic dysentery. Yap: For usage, see Canavalia ensiformis (Fabaceae) and Allophylus timoriensis (Sapindaceae).

Erythrina variegata L.

No local name given (Palau); RAAL (Yap). Palau: For usage, see Polypodium scolopendria (Polypodiaceae). Yap: (1) (Map Dist.) For stomach ache, leaves and bark are finely cut, and the pressed out juice is drunk twice daily. (2) (Ugiri Dist.) For dyspepsia, the shaved bark is crushed together with the young leaves of Ophioglossum pendulum and taken three times a day with coconut milk.

Inocarpus fagifer (Park.) Fosb.

BOI. Yap: (1) (Ugiri Dist.) Leaves are crushed together with leaves of "gob" (species not designated between Angiopteris evecta and Polypodium scolopendria) and applied to a cut. See also Areca catechu (Areaceae).

Ormocarpum cochinchinense (Lour.) Merr.

GAGET. Yap: (1) (Map Dist.) In the case of tetrodon poisoning, two fresh fruits are eaten. (2) (Map Dist.) For framboesia, the sprouting buds of this plant and of Croton sp. and "warakuh" (Latin binomial not stated) are crushed together and applied to the affected part.

Pongamia pinnata (L.) Merr.

KISAKUS. Palau: To relieve diarrhoea, ten young leaves are crushed together with four new leaves of Phaleria nisidai and drunk with water. See also Ipomoea littoralis (Convolvulaceae).

Pterocarpus indicus Willd.

ARAS (Palau); RATZ (Yap). Palau: Leaves and bark are mixed with bark of Terminalia catappa and leaves and bark of Codiaeum variegatum, and the sap pressed out is taken three times a day for amoebic dysentery. Yap: (1) (Ururu Dist.) Bark of this plant (n.b. plant is spelled "ratch") and leaves of Cassia sophora are crushed together and the juice thus extracted is drunk for amoebic dysentery. (2) (Ururu Dist.) For exhaustion, the bark is shaved and crushed, and the sap is drunk with coconut milk three times a day. (3) (Map Dist.) For neuralgia, leaves and bark are crushed together, and the sap is drunk with water. (4) (Giripes Dist.) For neuralgia, young leaves are crushed together with young stems of Cayratia trifolia, and the juice is put into the sap of coconut and drunk together with coconut milk. See also Albizia lebbek (Fabaceae).

Pueraria sp.

DEDAI. Yap (Kanif): For stomach ache, the leaves are crushed together with leaves of Merremia hederacea and Eugenia javanica, and the juice thus obtained is filtered, put into coconut milk and drunk once a day. After being pressed three times, it is discarded.

Vigna marina (Burm.) Merr.

MAKEDERIP. Yap: For arthritis, young buds of this plant and of Premna serratifolia, Hibiscus tiliaceus and Canavalia ensiformis are crushed together, and the juice is taken with coconut milk three times a day. See also Morinda citrifolia (Rubiaceae).

FLACOURTIACEAE

Pangium edule Reinw. ex Bl.

ARIAMMEL, ARIAMML. Palau: Seeds and bark are poisonous. See also Symplocos racemosa (Symplocaceae).

GUTTIFERAE

Calophyllum inophyllum L. var. inophyllum

APTAHAS, APTAKAS, ABTAKAS. Palau: Young leaves are eaten to relieve stomach ache.

Mammea odorata (Raf.) Kosterm.

~~RUBODOR.~~ Yap: (1) (Ururu Dist.) For dyspepsia, the bark is shaved, and the sap is pressed out and drunk with coconut milk. (2) For treatment of swelling of lymphatic glands around the neck, the fruit, young leaves and bark are crushed, coconut oil is added, then squeezed. This is applied to the affected part two or three times a day and is renewed after four days. See also Xylocarpus granatum (Meliaceae).

HALORAGIDACEAE

Haloragis chinensis var. yapensis Tuyama

POFPOF. Yap: Leaves and stem are pressed, and a cupful of the sap thus obtained is drunk as a febrifuge.

LAMIACEAE

Ocimum sanctum L.

ERAMAL. Yap: For ophthalmia, the leaves and stem are pressed, and the sap is used. See also Zingiber sp. (Zingiberaceae), Wollastonia biflora (Asteraceae) and Premna serratifolia (Verbenaceae).

LAURACEAE

Cassytha filiformis L.

TECHELEL A CHULL, TEERELAU (Palau); BUKK (Yap). Palau: (1) For gonorrhoea, a decoction of the whole plant is drunk. (2) For gonorrhoea, decoction of leaves and stem is taken (1943a only). See also Terminalia catappa (Combretaceae). Yap: (1) (Ururu Dist.) Crushed plant is mixed with salt water and applied to a bruise. (2) (Ururu Dist.) For neuralgia, leaves and stems are pressed, and the sap is drunk with coconut milk twice a day.

LECYTHIDACEAE

Barringtonia asiatica (L.) Kurz

ABTUUL, ABDUUL. Palau: Fruit is poisonous.

Barringtonia racemosa (L.) Spreng.

KORANGES, KORAGAS. Palau: For usage, see Artocarpus altilis (Moraceae).

LYTHRACEAE

Pemphis acidula Forst.

AGIS, AGES, AZUS. Palau: The red bark is finely shaved, wrapped up in the fibrous network of a coconut leaf-base, dipped into warmed sea water and then applied to a toothache.

MALVACEAE

Hibiscus tiliaceus L.

KARAMAL (Palau); GAAL (Yap). Palau: For gonorrhoea, a handful of flower buds is crushed together with eight pieces of white, tender root of Pandanus macrojeanneretia (5-6 cm. long), filtered through the fibrous network of a coconut leaf-base and drunk. Yap: (1) (Ugiri Dist.) Young leaves are crushed together with new stems of Tacca leontopetaloides, and the sap is taken

with water to cure a bruise. (2) (Giripes Dist.) To have an easy delivery, when a woman is five months pregnant, she inserts crumpled leaves of this plant into "her privates," replacing them every other day. In certain villages, leaves of Vavaea pauciflora are used instead. (3) (Ugiri Dist.) To have an easy delivery, branches from which the bark has been stripped off are hung upside down, and the mucilage is then scraped by means of a coconut rope. Wood ash of Inocarpus edulis is mixed with this mucilage, and something like dough is made. This is put into a coconut shell and dissolved with coconut milk, to which coconut oil is added and then taken twice daily. It is commenced when throes are felt for the first time and is continued until the time of delivery. (4) For diarrhoea, the bark is pressed, and the sap is drunk once or twice together with juice of a young coconut. See also Vigna marina (Fabaceae), Pandanus sp. (Pandanaceae) and Premna serratifolia (Verbenaceae).

MELASTOMATACEAE

Melastoma malabathricum var. mariannum (Naudin) Fosb. & Sachet (ined.)

MATAKUI, MATAKUI. Palau: For usage, see Thelypteris parasitica (Polypodiaceae).

MELIACEAE

Vavaea pauciflora Volk.

MESEI. Yap (Giripes Dist.): Wood of this plant is used as an incense. See also Hibiscus tiliaceus (Malvaceae).

Xylocarpus granatum Koenig

EMOGUL. Yap: (1) (Giripes Dist.) For amoebic dysentery, the bark is crushed together with the young leaves and bark of Mammea odorata, and the sap is drunk. (2) (Otao Dist.) For hemiplegia, shaved bark is crushed, and the sap is drunk with coconut milk three times a day. See also Rhus taitensis (Anacardiaceae).

MORACEAE

Artocarpus altilis (Park.) Fosb.

AMUDU, AMDOW. Palau: Bracts of young Artocarpus bud (1941a only; in 1943a, leaves instead of buds), young leaves of Codiaeum variegatum and of Barringtonia racemosa are mixed and crushed, and the juice thus obtained is injected into the ear for otitis media.

Ficus prolixa var. carolinensis (Warb.) Fosb.

AU. Yap: For usage, see Crinum asiaticum (Amaryllidaceae).

Ficus tinctoria Forst. f. var. tinctoria

WOTCHOGAI. Yap: As a stimulant for throes (of childbirth), ten pieces of root about 30 cm. long, with the skin off, are ground together with coconut oil and taken with coconut milk.

MYRTACEAE

Decaspermum fruticosum Forst.

WARRARG, WARARG. Yap (Map Dist.): For treatment of stomach ache, young leaves of this plant are crushed together with those of Glochidion ramiflorum and Epipremnum carolinensis to press out the juice, which is taken together with coconut milk three times a day. A half coconut shell cup is one dose. See also Alpinia carolinensis (Zingiberaceae).

Eugenia javanica Lam.

ARBOTEL, ARBOTLE (Palau); ALPHAS (Yap). Palau: In childbirth, in case of injury at the time of delivery, smear a leaf-infusion onto the injured area. For another usage, see also Spondias pinnata (Anacardiaceae). Yap (Ugiri Dist.) As an anti-emetic, the hard leaves are crushed together

with old leaves of Abroma augusta, and the sap is taken with coconut milk from time to time. See also Alpinia carolinensis (Zingiberaceae) and Pueraria sp. (Fabaceae).

Eugenia reinwardtiana (Bl.) DC.

AGESIIL, AGASEEL. Palau: For gonorrhoea, ten young leaves are mixed with ten young leaves of Piper betle and eaten raw.

Psidium guajava L.

GUAVA. Yap: For gonorrhoea, a decoction of leaves is drunk.

NEPENTHACEAE

Nepenthes mirabilis (Lour.) Druce

No local name given (Palau); AAD (Yap). Palau: For gonorrhoea, the Chamorros use an infusion of the dried (in shade) whole plant (1943a only). Yap: For usage, see Inocarpus fagifer (Fabaceae).

ONAGRACEAE

Ludwigia octovalvis (Jacq.) Raven

MESEII. Yap (Ururu Dist.): For tuberculosis, heartwood (perhaps "mesei," Vavaea pauciflora, is actually referred to here) is shaved, and the decoction thereof is drunk about three times. For another usage, see Wollastonia biflora (Asteraceae).

OXALIDACEAE

Averrhoa bilimbi L.

EMGURUS, EMGURS. Palau: Young leaves are crumpled, and the sap is applied to a wound. If the wound is large, leaves of Vittaria incurvata are added, and the pressed out juice is applied. See also Codiaeum variegatum (Euphorbiaceae).

Oxalis corniculata L. var. corniculata

GOUGUS. Yap: For usage, see Rhus taitensis (Anacardiaceae).

PIPERACEAE

Piper sp.

ETOL. Palau: Six leaves are crushed, and the juice is applied to an aching tooth.

Piper betle L.

A-KABUI, AKABUI (Palau); AKABUI (Yap). Palau: For uses, see Areca catechu (Arecaceae), Wollastonia biflora (Asteraceae) and Eugenia reinwardtiana (Myrtaceae). Yap: For uses, see Areca catechu (Arecaceae) and Wollastonia biflora (Asteraceae).

Piper ponapense C. DC.

KESIBIBUI, KESHPIBUI. Palau: (1) Leaves are crushed together with the leaves of Phyllanthus amarus and leaves of Citrus limon, and the juice pressed out is drunk as an invigorator. (2) For ophthalmia, young leaves are mixed and crushed with leaves of Clerodendrum thomsonae, and the juice is applied to the eye, drop by drop.

RHAMNACEAE

Colubrina asiatica (L.) Brongn.

No local name given. Palau: Chamorros drink a decoction of this plant in the incipiency of amoebic dysentery (1943a only).

RHIZOPHORACEAE

Bruguiera gymnorhiza (L.) Lam. f. gymnorhiza

ADEGES, AGEKIS. Palau: For usage, see Acanthus ebracteatus (Acanthaceae).

RUBIACEAE

Aidia cochinchinensis Lour.

KELMUSU, KERMS (Palau); GASMATZ (Yap). Palau: (1) For syphilis, a decoction of the young leaves is drunk. (2) A decoction of leaves is taken like tea as a beverage. Yap (Ugiri Dist.): For tuberculosis, the bark is crushed together with the skin of betel nut ("kuruebuh") and young sprouts of "buh" (Schizostachyus lima or Areca catechu) and taken with coconut milk. In this case the coconut should be of a green color called "yowra."

Guettarda speciosa L.

WARAO. Yap: For monthly troubles, the fruit, young leaves and bark are crushed together, and the sap is drunk by the woman. See also Alpinia carolinensis (Zingiberaceae).

Hedyotis fruticulosa (Volk.) Merr.

EMUDELAUH, EMDERAW. Palau: For lacquer poisoning, leaves are crushed and the juice is applied.

Ixora casei Hance

GACHUW. Yap: (1) Leaves are mixed with crumb (sic) of copra and taken with coconut milk, for stomach ache. (2) Decoction of the young leaves is drunk to cure nausea.

Morinda citrifolia L. var. citrifolia

NGEL, AGERU (Palau); MAGARWEK (Yap). Palau: To cure diarrhea, two unripe fruits are pounded together with four new leaves of Phaleria nisidai and taken with water. For another usage, see Phaleria nisidai (Thymelaeaceae). Yap: (1) (Ururu Dist.) Leaf of this plant is wrapped around a wound to which bruised leaves of "sowari" (Latin binomial not given) have been applied. (2) (Ugiri Dist.) For neuralgia, young leaves and fruit are crushed together, and the sap is drunk with coconut milk three times a day. Dosage each time is one half a coconut shell cup. (3) (Map Dist.) Leaves are baked and placed on a chancre. (4) For pains in throat, fruit and young leaves are crushed together with leaves and stems of Davallia solida and of Vigna marina, and taken with coconut milk. (5) (Whole island) Roots are substituted for soap. See also Blechnum brownei (Acanthaceae), Wollastonia biflora (Asteraceae) and Canavalia ensiformis (Fabaceae).

Mussaenda frondosa L.

EREIROI (Palau); PETCH (Yap). Palau: (1) As an emetic, eight new ("new" 1943a only) green leaves and eight fruits are crushed together and taken together with a cup of water. (2) For lumbago, eight pieces each of young leaves and fruit are crushed together and drunk together with a cup of water. Anything bad inside will be thrown up, and swelling of the testicles will go down. Yap (Nif Dist.): The young fruit is pressed and taken with water for gonorrhoea.

Oldenlandia sp.

BUKBUKGININ, BUKBUKUGININ. Yap (Giripes Dist.): Leaves and stems are crushed and mixed with coconut oil and spread onto a sarcoma.

RUTACEAE

Citrus sp.

BEKERSIU, PEKERJUW. Palau: To exterminate crab-lice, juice is applied to the hair.

Citrus sp.

MALCHEIANGED, MARGEYAN-ID. Palau: For usage, see Citrus limon (Rutaceae).

Citrus sp.

GURGUR. Yap (Whole island): For lice, juice is applied to the hair, which is then rinsed.

Citrus limon (L.) Burm. f.

DEBE EL, DEPEER. Palau: (1) For stomach ache, four or six young leaves are crushed, and the juice is drunk. When pain is acute the bark of the same tree is also added. (2) For amoebic dysentery, young leaves and bark are mixed with young leaves and bark of Glochidion ramiflorum and young leaves and bark of Terminalia catappa, and the juice pressed out is drunk. (3) Juice from the roasted fruit is applied to a fish "sting." (4) For fainting, a handful of young leaves is mixed together with a handful each of young leaves of Citrus sp. and Clerodendrum thomsonae, crushed, rolled into a round pellet and put into the mouth. The patient will vomit bad blood and recover. (5) For seasickness, the fruit is eaten (1941a only). For other usages, see Macaranga carolinensis (Euphorbiaceae), Piper ponapense (Piperaceae) and Allophylus ternatus (Sapindaceae).

SAPINDACEAE

Allophylus ternatus (Forst.) Radlk.

EBERUDES, EBERDES. Palau: (1) Ten or twenty young leaves are mixed with six tender stems and leaves of Phyllanthus amarus, crushed together and the odor is smelled, to relieve headache. The Allophylus leaves are later eaten, or else six Phyllanthus stems are eaten raw, to complete the cure for headache. (2) Leaves crushed with leaves of Callicarpa candicans are applied to arthritis and warmed. (3) For tuberculosis, young leaves are crushed together with new leaves of Clerodendron thomsonae, Citrus limon (1941a only) and "urkerakar" (no Latin binomial given), and the juice thus obtained is drunk. For other uses, see also Carica papaya (Caricaceae) and Crateva speciosa (Capparidaceae).

Allophylus timoriensis (DC.) Bl.

AGER. Yap: (1) (Map Dist.) To treat headache, the leaf is crushed, rubbed and sniffed. (2) (Ugiri Dist.) Leaves and fruit are crushed together with those of Terminalia catappa, and the juice is applied to a cut. (3) (Giripes Dist.) When the eye, or eyes or nose ache, the leaves are chewed with young leaves of Derris trifoliata, and the vapor (breath) is blown onto the affected part of the body through a fine bamboo tube. For other uses, see also Crateva speciosa (Capparidaceae) and Canavalia ensiformis (Fabaceae).

Dodonaea viscosa (L.) Jacq.

GOICHAP. Yap (Map Dist.): Juice oozing from the crumpled leaves is applied to a wound.

SOLANACEAE

Capsicum frutescens L.

DEBIL. Yap: For usage, see Albizia lebbek (Fabaceae).

Nicotiana tabacum L.

TAMABOW. Yap (Ugiri Dist.): When stung by a ray fish, this plant and lime ("etch") are mixed and chewed in the mouth, and the sap is applied to the wound.

Physalis angulata L. var. angulata

No common name given. Palau (Chamorros): For hemorrhoids, a decoction of the leaves and roots is taken (1943a only).

Solanum torvum Sw.

RAWELNAGAFI. Yap: For leprosy, leaves are crushed together with leaves of Helminthostachys zeylanica, mixed with coconut oil and applied to the affected part. At the same time, four or five

ripe fruits of both species are eaten fresh every day.

SONNERATIACEAE

Sonneratia alba J.E.Sm.

ABRUK. Yap: For excessive bleeding during menstruation, branches and aerial roots of this plant are wrapped in a coconut leaf, chewed by the patient and the sap is swallowed down. It is taken three times a day until the bleeding stops.

STERCULIACEAE

Abroma augusta (L.) L.f.

LAP, RAP (Palau); RAP (Yap). Palau: (1) For gonorrhoea, the root is mixed and crushed together with young leaves of Cayratia trifolia, root of Cordyline fruticosa and copra. The pressed-out juice is filtered through the fibrous network of a coconut leaf-base, then diluted with water and drunk. (2) Sap of the roots is drunk as an aphrodisiac (1941a only; 1943a says as "narcotic"). (3) The spines are poisonous. Yap: For usage, see Eugenia javanica (Myrtaceae).

SYMPLOCACEAE

Symplocos racemosa var. palauensis (Koidz.) Nootb.

KAPTUI, KAPUTUI. Palau: For gonorrhoea, a handful of bark is mixed together with four pieces of young leaves of Pangium edule and young leaves of Ipomoea pes-caprae (cut about 3 cm. (1941a), 5 cm. (1943a) in length), crushed, and a cupful of water is added. The material is then pressed, filtered through the fibrous network of a coconut leaf-base and drunk.

THYMELAEACEAE

Phaleria nisidai Kaneh.

ONGAEL, ONGAEL. Palau: (1) Young leaves are mixed with coconut oil and applied to an abscess; then the pus oozes out. (2) Leaves are crumpled and wrapped in a leaf of Morinda citrifolia and applied to a bruise; bruise gradually will become hot, whereupon the leaves are replaced. (3) For constipation, four fresh leaves are eaten. (4) For constipation, four leaves are crushed together with two fruits of Morinda citrifolia, and the juice thus obtained is diluted with water and drunk. (5) For an abortion, about six fresh leaves are eaten. For other usages, see Pongamia pinnata (Leguminosae) and Morinda citrifolia (Rubiaceae).

URTICACEAE

Laportea interrupta (L.) Chew

YOYOL. Yap: To alleviate stomach ache, the red, ripe fruit is chewed.

Procris pedunculatum (Forst. f.) Wedd.

OFROP. Yap (Giripes Dist.): As treatment for rat bite, young leaves are crushed, and the sap is applied to the affected part. Then Asplenium nidus is crushed, and its sap is drunk.

VERBENACEAE

Callicarpa candicans (Burm. f.) Hochr. sensu lato

ADOPP, ADUP, ATOP (Palau); GARWAW (Yap). Palau: Branches and leaves are poisonous. See also Allophylus ternatus (Sapindaceae). Yap: For usage, see Areca catechu (Arecaceae).

Callicarpa elegans Hayek

EMRERT, EMLERT, EMULERT. Palau: Branches and leaves are poisonous. See also Derris trifoliata (Fabaceae).

Clerodendrum buchananii var. fallax (Lindl.) Bakh.

BUTE ELEAL, BUTEERAR, BTEERAL. Palau: (1) Young leaves are crushed, and the juice is drunk to cure stomach ache. (2) Chamorros apply the juice pressed out of the stem and leaves for ringworm (1941a only).

Clerodendrum thomsonae Balf.

IUTEKIL, INTEKIL, IUTEKIRA, IUTEKIRU. Palau: For uses, see Crateva speciosa (Capparidaceae), Piper ponapense (Piperaceae), Citrus limon (Rutaceae) and Allophylus ternatus (Sapindaceae).

Premna serratifolia L.

OSUM, OSUUM (Palau); AAL (Yap). Palau: For framboesia, the milky juice (latex) is spread over the affected part. See also Polypodium scolopendria (Polypodiaceae). Yap: (1) (Ururu Dist.) For an abortion, young leaves are cooked in a small quantity of sea water and taken while still hot. If taken within three months of pregnancy, it is said to be quite effective. (2) (Ugiri Dist.) For neuralgia, young leaves of this plant and of Hibiscus tiliaceus are crushed together with leaves of Ocimum sanctum and leaves and stems of Murdannia nudiflora, to which a small quantity of coconut oil is added, and then applied to the affected part of the body. For other uses, see Canavalia ensiformis and Vigna marina (both Fabaceae).

VITACEAE

Cayratia trifolia (L.) Domin

PERDAKL, PERTAKL, PERDAWAKL (Palau); SESEMTEMENIMEN, SESEMTEMENIN (Yap). Palau: (1) For framboesia, roasted stem and leaves are applied to the affected area. (2) Sap obtained from the stem is made use of as an aphrodisiac (1941a; n.b. 1943a says as "narcotic"). (3) Sap of stem and leaves is poisonous. See also Abroma augusta (Sterculiaceae). Yap: (1) (Nif Dist.) When a chicken has bad eyes (ophthalmia), the leaves and stem are crushed, and the juice is applied to the eye. (2) (Whole island) Juice of leaves and stems is drunk as an aphrodisiac. See also Pterocarpus indicus (Fabaceae).

Vitis vinifera L.

Referred to by Okabe as "GRAPE VINE." Yap (Ugiri Dist.): Decoction of leaves and stems is taken for a cold.

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