

NOTE

Pacific Island Plants—Taxonomic and Distributional Notes

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Abstract—Taxonomic notes on Pacific Island plants in the genera *Polyodium*, *Lemmaphyllum*, *Nephrolepis*, *Spathoglottis*, *Vanilla*, *Peperomia*, *Lepidium*, *Erythrina*, *Tephrosia*, *Euphorbia*, *Phyllanthus*, *Passiflora*, *Luffa*, *Pouteria*, *Chionanthus*, and *Ochrosia*, with new varieties or varietal combinations in *Polyodium*, *Tephrosia*, *Euphorbia*, *Passiflora*, and *Pouteria*, new specific combinations in *Pouteria* and *Chionanthus* and an amplified description of the hitherto obscure *Ochrosia tahitensis* Lanesson ex Pichon. More than usual detail is included to explain taxonomic changes and my use of unfamiliar names. This is for the benefit of users who do not have ready access to large botanical libraries, who may want to know the reasons for such changes, and who may need help in recognizing newly introduced exotics.

Introduction

In the course of identification of a large range of Pacific island plant specimens, my own collections and those of my associates, as well as those sent in by other collectors for identification, new records, new taxa, and taxonomic problems come to light. This paper places on record a selection of the results of this research. Genera are arranged alphabetically in families which are in a modified Dalle Torre and Harms order.

This paper is, in part, intended to explain, for the benefit of users of plant names in Pacific Island places without access to adequate botanical library facilities, the reasons for using certain unfamiliar names in my identifications and publications. Occasionally I discuss matters which have already been adequately treated by others in monographs, revisions, and other technical botanical literature. This seems appropriate in a journal with wide circulation and availability to Pacific floristic botanists, ecologists, geographers, horticulturists, and other users of plant names. Unexplained name changes are not looked upon with favor by non-taxonomists. The synonymy provided in the present paper is not intended to be complete, but only includes names and references which have been used in the area under discussion, or which help to understand the nomenclature accepted by me for the plant being discussed. The reader may be helped to place an unfamiliar name by the inclusion of a familiar synonym. If so, the synonym is included. Reference citations by date in the text refer to references listed in

the synonymy of the species being discussed, or if not in the appropriate synonymy, to the list of references cited that is provided at the end of the paper.

Ferns—Filicales
POLYPODIACEAE (sensu lato)

My use of the family Polypodiaceae in a traditional rather broad sense should not be regarded as an indication that I am unfamiliar with the current plethora of systems of division of the family Polypodiaceae into more restricted families and rearrangements of the genera of ferns. There is an astonishing difference of opinion as to the contents, limits, names, and arrangement of these "families." Undoubtedly most or all of these attempts have merit, and the relationships and limits of the genera are better or more naturally shown. However, with such discrepancy, all of the systems cannot be completely right.

To be of practical value to users of the names and taxonomy of ferns, not all of whom are professional pteridologists, it seems that, where possible, the families, at least, and, genera, hopefully, should be recognizable without detailed research. I have not found any of the current schemes very satisfactory in this respect.

Of course, where even a minute or obscure feature unquestionably indicates that two superficially similar groups have different ancestry, I have no hesitation about separating them. For example, when 15 or more years back, Dr. Holttum pointed out the profound but not very obvious differences within what had traditionally been called *Dryopteris*, I had no difficulty in accepting *Thelypteris* as a separate genus.

However, until a scheme is evolved that enables me to recognize the families readily, and to be convinced that the proposed families are "natural" phylogenetically, I find it more convenient to use a broad Polypodiaceae, with subfamilies if desirable, but without committing myself to any of the existing schemes.

***POLYPODIUM* L.**

My use of *Polyodium* L., though excluding such discrepant elements of the Hookerian circumscription as *Grammitis*, *Sellaguea*, and *Pyrrosia*, is still very much broader than seems to be fashionable among many modern pteridologists. However, I try to exclude groups that, to me, do not seem to belong in traditional *Polyodium*, which can be recognized by its habit, texture, creeping rhizome, scales or lack of them, nature and distribution of sori, plus some features of aspect that are hard to describe. Admittedly, this is more a practical classification than a phylogenetic one. However, when I become convinced that an element had a clearly different origin from the aggregate genus, or when a group is so obviously distinct that it is easily recognized on sight, I may uphold its segregation. My main criterion is that it must be readily recognizable, or else, there must be a definite character or clear association of characters that preclude its belonging to the *Polyodium* relationship as I recognize it. One such group is the small genus

Lemmaphyllum Presl, discussed farther on. First a somewhat more traditional *Polypodium* is considered.

Polypodium polycarpon Cav. in Schrader, J. Bot. 1800(2): 21, 1801; Descr. 246, 1802; C. Christensen, Dansk. Bot. Ark. 9(3): 12, 1937 pointed out that *P. punctatum* (L.) Sw., (1801), as usually interpreted, should be called *P. polycarpon* Cav., probably from "Luzon or Marianas Islands, though the author believed it to be from San Antonio, Ecuador, Néef!".

Acrostichum punctatum L., Sp. Pl. ed. 2, 1524, 1762. Type: "Habitat in China. J. Fothergill."

Polypodium punctatum (L.) Sw. in Schrader, J. Bot. 1800(2): 21, 1801, non Thunb. 1784.

Microsorum punctatum (L.) Copel., Univ. Calif. Pub. Bot. 16:11, 1929.

Polypodium irioides Poir. in Lam., Encycl. Meth. 5: 513, 1804.

Polypodium myriocarpum sensu Nadeaud, Enum. Pl. Ind. Tahiti, no. 176, 1873, non Mett. 1856.

Drynaria obtusata Brack., Bot. U.S. Expl. Exped. 16: 44, 1854.

The rather common entire-leaved fern, commonly called *Polypodium punctatum* (L.) Sw. cannot be so named, as this binomial is preoccupied by the earlier *Polypodium punctatum* Thunb. As Christensen pointed out, "*P. punctatum* (L.) Sw.", (1801), as usually interpreted, cannot be used, and the plant should be called *P. polycarpon* Cav." Hence, for those of us who accept *Polypodium* in a broad sense the above, *P. polycarpon* Cav. is the earliest available.

Two varieties seem distinguishable in this species:

Polypodium polycarpon Cav. var. **polycarpon**

Fronds broadly lanceolate or oblong-lanceolate, blade often decurrent practically to base; sori tending to be scattered and not crowded.

This is represented by many collections, over a wide Indo-Pacific range, but not reaching Hawaii. Several may be cited from the Society Islands: Tahiti: s.l., Vieillard s.n. (US); Vallee de Papenoo, secteur S du plateau de Tupa, au-dessus de Faaiti, 730 m, Florence 4383 (US); Papeari, Jardin Botanique, 1 m, Florence 2595 (US). Moorea: District of Afareaiti, H. M. Smith 152. (US).

Polypodium polycarpon var. **obtusatum** (Brack.) Fosberg, comb. nov., stat. nov.

Drynaria obtusata Brack., Bot. U.S. Expl. Exped. 16: 44. 1854. Type. Fiji: Ovalau, U.S. Expl. Exped. 5 (US).

Fronds narrowly lanceolate to linear-lanceolate, usually shortly stipitate, apex obtuse or rounded to more usually acuminate; sori usually crowded in distal fourth or half, usually arranged in longitudinal lines and pinnately disposed in lines along pinnate veins (in type specimen less conspicuously so).

Plants of *P. polycarpon* from the western part of the broad range of the Cavanilles species frequently correspond to Brackenridge's taxon, *D. obtusata*, here regarded as the variety, *P. polycarpon* var. *obtusatum* (Brack.) Fosb. Immature specimens are difficult to distinguish.

Specimens examined: Fiji: Ovalau, U.S. Expl. Exped. 5 (US).

Marianas: Guam: Just S of North Field, 150 m, *Fosberg and Anderson* 32622 (BISH, L, US); Iste Point Conservation Area, 60–90 m, *Evans* 1818 (BISH, GUAM, K, POM, US); Talofofo Valley, Mt. Almagosa, 600 ft, *Hosaka* 3171 (BISH, BM, US).

Caroline Is: Palau: Babeldaob: Ngatpang, Ibocabang, 10 m, *Raulerson* 5690 (US); "Small volcanic island" in west reef just S of entrance to Ngatpang (Ngaremedu) Bay, 10 m, *Bowden-Kerby (Raulerson's)* 5617 (US).

New Caledonia: S.I., *M. Cribs* 1649 (US).

Thailand: Nakhon Sawan, Doi Musae Agr. Exp. Sta., 800 m, *Henipman* 3065 (US); Updawn, Phu (Mt.) Luang, 750–950 m, *Hennipman* 3531 (US); Chiang Rai, along Nam Mai Kok, 15 km W of Chiang Rai, 400 m, *Iwatsuki et al.* 10900 (US); Puket: Trang: Trang, *Tagawa & Yamada* T140 (US).

Andaman Islands: Middle Andaman, 24 km SW of Rangat, *Bhargawa et al.*, 6356 (US).

India: Tinnivelli Distr., S Tamil Nadu, E slope, W Ghats, 1000 m, *Kostermans* 26313 (US); Mysore. Hassan Distr., Banahala, *Saldanha* 16392 (US); Kampuhala, 250 m, *Jarrett & Saldanha* HFP773 (US); estate before Banganahalla, *Jarret & Saldanha* HFP784 (US); Kampuhola, Shiradi Ghat, *Saldanha & Ramamoorthy* HFP422 (US).

LEMMAPHYLLUM Presl

This is a small genus of perhaps five species, distributed from Nepal to southeast Asia, Indonesia, eastward to Ponape and Kusaie, Caroline Islands. Included in my present circumscription of the genus are *Lepisorus* (J. Sm.) Ching and *Weatherbya* Copeland; and *Drymoglossum* Presl is doubtfully maintained as separate, pending examination of more species. The rhizome is slender, string-like, scaly, creeping or climbing, bearing scattered small petiolate fronds, these tending to be dimorphic, sori discrete, distal on frond. One species enters our area, *L. accedens*, type of the genus *Weatherbya*, which is, by some, maintained, since its fronds are not, or scarcely dimorphic.

***Lemmaphyllum accedens* (Bl.) Donk,** Reinwardtia 2: 409, 1954.

Lepisorus accedens (Bl.) Hosokawa, Tr. Nat. Hist. Soc. Formosa 31: 477, 1941.

Polypodium accedens Bl. Enum. Pl. Java 121, 1828.

Weatherbya accedens (Bl.) Copel., Gen. Fil. 191, 1947; Glassman, Bishop Mus. Bull. 209: 52, 1952.

This diminutive fern, which I have hitherto called *Polypodium accedens*, seems amply distinct from *Polypodium*. Donk, loc. cit., in a detailed discussion of plants of this general relationship, ends by uniting several weak genera, including those listed above, as synonyms of *Lemmaphyllum*, which is where our plant belongs.

In Micronesia *L. accedens* grows epiphytically at all elevations in cloud forests, montane rain forests, and even in lowland wet swamp forests. Many specimens are cited by Hosokawa (loc. cit) under *Lepisorus accedens*, and by

Glassman under *Weatherbya accedens*, most of which I have seen. An interesting peculiarity of this species is a type of rhizome scale that is peltately attached, triangular acuminate, clathrate, with clear cells, black cell-walls, and hirtellous-ciliate margins.

***NEPHROLEPIS* Schott**

***Nephrolepis hirsutula* (Forst.f.) Presl, Tent. Pter. 73, 12838.**

Polypodium hirsutulum Forst. f., Prodr. Fl. Ins. Austr. 81, 1786.

Aspidium acutum Schkuhr, Kr. Gew. 1: 32, t. 31, 1809.

Nephrodiump acutum (Schkuhr) Presl, Rel. Haenk. 1: 31, 1825.

Nephrolepis acuta (Schkuhr) Presl, Tent. Pter. 79, 1836.

Nephrolepis acuta var. *subferruginea* Hook., Sp. Fil. 4: 15 1862. (Type not located, 1991).

Nephrolepis biserrata var. *subferruginea* Hook. [ex E. D. W. Brown] in Brown & Brown, Bishop Mus. Bull. 89: 44, 1931.

Study of the original material of *Polypodium hirsutulum* Forst. f. suggest that the populations referred by E. D. W. Brown in Brown & Brown (1931, p. 44) to *Nephrolepis biserrata* var. *subferruginea* Hook. (ex. E. D. W. Brown, loc. cit.) correspond well to the original form of *Polypodium hirsutulum* Forst.f., with reddish wool on the rhachises of the fronds. It is probable that *Nephrolepis acuta* var. *subferruginea* Hook. also belongs to *N. hirsutula*, but I have not seen the type. This has been the usual disposition of Hooker's variety.

Specimens examined: Tuamotu Island: Matia Is. U.S. Expl. Exped. 1 (US). (Matia as the locality for a U.S. Exploring Expedition collection may more probably refer to Makatea Island in the Tuamotus, rather than to Mehitea of the Society Group.) Society Islands: Tahiti: s.l.H. F. Moore (US); Punaruu Valley, Setchell & Parks 76 (US). Moorea: Vallee de Afareitu, 2 m, Florence 2084 (US). Tetiaroa Atoll: Oroatera I., Fosberg & Sachet 54618 (US); Tiaranu I., Fosberg & Sachet 54615 (US), 54648 (US). Maupiti: Fosberg 64779a (US), 64839 (US), 64847 (US).

***Nephrolepis saligna* Carr. in Seem., Fl. Vit. 361, 1873.**

This species, described from Fiji and known from most of the Carolines, but not previously recorded from Koror, seems a bit controversial. Certain annotations on herbarium sheets suggest that it is merely a variety of *N. hirsutula*. An anonymous reviewer, commenting on another paper, says of it that "if worth recognition, this is a variety of *N. biserrata*." With these suggestions in mind, I studied a large series of what I take, at the suggestion of Dr. Frances Jarrett, to be *N. saligna*, from the Carolines and Fiji, including an isotype, U.S. Expl. Exped. (US). I see little in common between these three taxa, other than that all are *Nephrolepis*. *N. saligna* laminae are a smooth, dark, rich green, and almost completely lack scales or wool. Its pinnae are somewhat falcate, lanceolate, and taper gradually, with margins notably crenate, with a sorus in each tiny lobe. This is not a description of either of the other two species.

Selected specimens examined: Caroline Islands; Hall Islands: Nomwin Atoll, Nomwin I., 1–2 m, *Fosberg* 24584 (US, K, BISH, NY, MO, L). Palau Islands: Angaur Island, E end of island, 3–5 m, *Fosberg* 31998 (US, BISH,). Woleai Atoll, Utegal I., 1–2 m, *Wong* 26 (US, BISH, CHR, K, UC, GH). Truk Islands: Pis I., 1–2 m, *Fosberg* 24678 (US, BISH, K, POM, KY). Nukuoro Atoll, Sinkutai I., 1–2 m, *Fosberg* 26172. Kusaie Island, summit ridge of Mt. Matante (Buache), 550–600 m, *Fosberg* 26635 (US, BISH, NSW, K. L.).

**Flowering Plants—Angiospermae
ORCHIDACEAE**

***SPATHOGLOTTIS* Bl.**

***Spathoglottis plicata* Bl.**, Bijdr. 401, t. 70, 1825; Cribb & Tang, Kew Bull. 36: 722–725, 1982.

The *Spathoglottis* commonly seen in the Society Islands has been thought to be *Spathoglottis pacifica* Reichb. f., a species described from Fiji and found also in the New Hebrides. The similarity in appearance of the Society Islands plants to the Philippine, western Pacific and Asiatic *S. plicata*, naturalized in Hawaii and Guam, caused Dr. M.-H. Sachet and me to look carefully at plants growing in Raiatea. We could find no difference from *S. plicata*. Study of the collections in the U.S. National Herbarium convinced us that the US collections of *Spathoglottis* from at least five of the Society Group belong to *S. plicata*, and that it was probably recently introduced there and is now widely naturalized. It favors disturbed habitats, often with bare mineral soil, such as road-cuts, plantations, and erosion scars.

S. plicata may be distinguished from *S. pacifica* by triangular calli, elongate undilated claw, triangular apical lamina, and bright purple-magenta color.

Specimens examined: Tahiti: Papenoo Valley, 5 km above mouth, 50 m, *Fosberg* 61245 (US, BISH, P); Ridge E of Vallee de Tuauru, *Fosberg* & *Stone* 61333 (US, BISH); above Hitiaa, km 39, Propriete de la Garde, *Fosberg* 62835 (US, BISH); NW slope up to Pic Vert, headwaters of side branches of Tipaerui River, 640–650 m, *Fosberg* 62930 (US, BISH, P, POM).

Huahine: Road up to Vaihi Hydraulic installation and water catchment, 170 m, *Fosberg* 61130 (US, BISH, P).

Raiatea: Faaroa Domain, bottom of valley at head of Faaroa Bay, 20–50m, *Fosberg* & *Sachet* 63151 (US, BISH).

Tahaa: Ridge W and S of Pueheu Valley, 300 m, *Fosberg* 63432 (US, BISH, P, POM); Motu Tautau, 1–2 m, *Fosberg* 63447 (US); Vallee de Puhune, 150–200 m, *Fosberg* 6352 (US).

Maupiti: Motu Auiria, *Fosberg* 64371 (US); *Fosberg* 64894 (US); *Fosberg* & Mount 64883 (US).

***VANILLA* Mill.**

***Vanilla planifolia* G. Jackson in Andr. Bot. Repos. 8: t. 538, 1808; Garay & Sweet, Orchidaceae in Howard, Fl. Lesser Antilles 44–46, 1974.**

Myobroma fragrans Salisb. Parad. Lond. 2: t. 82, 1807 (nom.superfl. illegit.).
Vanilla fragrans (Salisb.) Ames, Sched. Orch. 7: 36, 1924.

Vanilla mexicaana sensu auct., non Mill., Gard. Dict. ed. 8, 1768.

Garay and Sweet clearly distinguish the two species, *V. planifolia* Jackson and *V. mexicana* Miller, in their text and key, as well as in their excellent drawings, fig. 5 and 7. Though the authenticity of fig. 5, *V. mexicana*, i.e., its identity with the plant illustrated by Plumier in his Nov. Pl. Amer. Gen. 25, t. 28, 1703, type of *Epidendrum vanilla* L., basis of *V. mexicana*, might conceivably be questioned, I tentatively accept this identity for now.

In their treatment of *Vanilla planifolia* Jackson, Garay and Sweet note that Jackson regarded Plumier's unpublished plate of "Vanilla flore alba, fructa breviori, corallina" as representing his *V. planifolia*, but that this plate actually proves to represent *Vanilla eggersii* Rolfe. This led me to examine Jackson's treatment in Andrews' publication to make sure that Plumier's plate could not be regarded as the type of the name *Vanilla planifolia*. This would require the replacement of *V. eggersii* Rolfe (1888) by the name now regarded as belonging to the common vanilla.

The result of this examination is somewhat equivocal. Jackson clearly cites the Plumier plate as representing his species. However, he says equally clearly that his own plate 538, representing *V. planifolia*, was drawn from a plant flowering in the collection of Charles Greville. The drawing is a good representation of the common vanilla. There is no evidence that a herbarium specimen was preserved (though this is not impossible). I feel justified, hence, in accepting Jackson's plate 538 as lectotype of *Vanilla planifolia* Jackson, thus preserving current usage, both of *Vanilla planifolia* Jackson and of *Vanilla eggersii* Rolfe, for the West Indian plant currently bearing this name.

This species, *V. planifolia*, has been widely grown in the Society Islands for its fragrant pods, source of commercial vanilla flavoring. The insect that normally pollinates this species is apparently absent from the Society Islands, so the flowers must be pollinated by hand in order for the needed fruits to be set.

Specimens examined: Society Islands: Tahiti: s. l. Langby, U.S. Consul in Tahiti in 1928 (US). Raiatea: N side Faaroa Bay, cult., 30 m, St. John 17310 (US). Fiji: Viti Levu: Serua: Hills between Wainnggere and Waisese creeks, between Ngaloa and Wainiyambia, 50–100 m, A. C. Smith 9633 (US).

PIPERCEAE

PEPEROMIA R. & P.

Peperomia blanda Kunth in H. B. K., Nov. Gen. Sp. 1: 62, t. 13, 1815; C. DC., Prodr. 16(1): 458, 1869; Huber, Cyperaceae in Dassanayake and Fosberg, Rev. Handb. Fl. Ceylon 6: 293–295, 1987.

Piper blandum Jacquin, Collect. 3: 211, 1789.

Peperomia leptostachya H. & A., Bot. Beechey Voy. 96, 1832.

Peperomia blanda var. *leptostachya* (H. & A.) Döll, Bot. Jahrb. 93: 110, 1973.

The common Pacific lowland species long known as *Peperomia leptostachya* H. & A. is shown by H. Huber, (1987, pp. 293–295) to be synonymous with the widespread tropical American *Peperomia blanda* (Jacq.) Kunth. *P. blanda* is very variable, both in America and in the Indo-Pacific, having been treated as several species, and by some as including several varieties. For present purposes the above abbreviated synonymy is sufficient, and we are treating the species in a broad sense, as including a number of varieties. It is the commonest and most widespread of the Polynesian members of the genus. It grows on rocks, either wet or dry, at relatively low elevations.

In a series of specimens collected from Tahiti by various collectors between 1840 and 1880, borrowed from the Museum d'Histoire Naturelle, Paris, I noted that on five of these the spikes were all or partly abnormal. The inflorescences, or parts of them, are densely and intricately branched, and at the same time at least partly greatly swollen and lumpy, in some specimens broadened and fasciated, with thickly scattered abortive and also developed flowers, and, in one specimen, a few fully developed fruits. These inflorescences have the appearance of "witches' brooms", and may be caused by fungi or virus infections. In some specimens only some of the spikes, or parts of some spikes, are abnormal, the others seemingly perfectly normal.

Examination of a large series of specimens of *P. blanda* in the U.S. National Herbarium from the Pacific (including Tahiti), Ceylon, and tropical America showed no sign of this conspicuous abnormality. It would be interesting to know if this was only a temporary phenomenon, or if its absence from the available collections is, as seems likely, only the result of collectors' avoidance of messy-looking, unattractive individual plants for their specimens. In living condition these swollen masses of fleshy tissue must have been much larger than when dried and shrivelled.

Specimens showing abnormal inflorescences: Society Islands: Tahiti: s.l. *Nadeaud s.n.* (P); *Vesco* in 1847 (P); *Savatier* in 1876–1879 (P); Nara, *Savatier* 805 (P); Grott de Nara, *Savatier* in 1877 (P); s.l. with some normal spikes, *Nadeaud s.n.* (P).

Selected normal Polynesian specimens: Hawaiian Islands: Oahu: 3rd gulch S of Puu Kaupakuhale, Mokuleia, *Yuncker & Hosaka* 3366 (US). Molokai: Halawa Valley, base of Moaula Falls, *St. John et al.* 12700 (US). Hawaii: Kona Distr., above Alikapapa, *Yuncker* 3467. Kauai: Haena, *Yuncker* 3388 (US). Maui: Maui, W., Iao Valley, *Yuncker* 34223 (US). Maui, E., Kula, *Forbes* 2173.M. (US). Lanai: Maunalei Gulch, 300 m, *Fosberg* 12564 (US).

Tuamotu Islands: Makatea: Sud du Mt. Putuari, 65 m, *Florence* 3087 (US).

Gambier Islands: Mangareva, NW side Mt. Duff, 110 m. *St. John* 14454 (US).

Pitcairn Island: Parlver Valley Ridge, 300 m, *St. John* 14577 (US).

Society Islands: Tahiti: s.l., *Setchell & Parks* 233 (US); Papara Distr., *Leland Chase & Tilden* 21 (US).

Austral Islands: Rapa: Area, *St. John & Maireau* 15344 (US). Raivavae: S slope of Pic Rouge, 70 m, *St. John & Fosberg* 15984 (US). Tubuai: E slope Mt. Panee, 300–325 m, *Sohmer* 6719 (US).

Cook Islands: Rarotonga: s.l. *Parks & Parks* 32080, 22117 (US); Motu Tapu, Ngatangiia Harbour, *Stoddart* 2140 (US); Mangaia: E of Oneroa, *Whistler* 5418 (US).

Samoa: Upolu: Apiaberg, *Reinecke* 34 (US), 94 (US). Savaii: Asau, *Whistler* W1696 (US). Manu'a Island, *Whistler* W4566 (US). Olosega Island, Olosega Village, *Whistler* W3440 (US).

Tonga: Eu'a, above Fuai, 220 m, *Yuncker* 15680 (US); Tapatu, behind village, *Whistler* 6231 (US).

BRASSICACEAE

LEPIDIUM L.

Lepidium bidentatum Montin, Nov. Act. Leop.-Carol. D. Akad. Naturf. 5(6): 324–327, 1778.

Lepidium piscidium Forst. f., Prodr. Fl. Ins. Austr. 1786.

Lepidium bidentoides F. Brown, Bishop Mus. Bull. 130, 1935.

This is a comparatively coarse, large species, reaching 40–50 cm tall, becoming slightly indurate or woody at base, bright green, glabrous, leaf-blades narrowly obovate to elliptic or oblanceolate, rarely almost linear, usually coarsely dentate or serrate distally, rarely entire, petiolate; racemes elongating to 15 cm or more, pedicels spreading, flowers small, white; silicles several mm long, narrowly marginate.

It grows on coralline sandy or gravelly coastal and strand substrata, especially on coral atolls, throughout Polynesia, from its type locality on Botanist's Island, New Caledonia, eastward through the Tuamotu archipelago, north to Hawaii and Wake Island. It has not been collected in the Marquesas, and is known in Micronesia only from Wake Island. The type was collected by the Forsters on Botanist's Island. Three varieties are known, disregarding F. Brown's several varieties of *L. bidentoides*.

Lepidium bidentatum Montin var. **bidentatum**

This is the typical variety, with elliptic to narrowly oval silicles and usually dentate leaves. It is found throughout the range of the species except in the Hawaiian Islands. It is represented by scores of collections, variable in leaf shape and width of silicles.

Selected specimens: Society Islands: Moorea: Small islet off NW coast, *H. M. Smith* (US). Tetiaroa Atoll: s.l. *Quayle* 187 (US). Rimatuu I. *Fosberg* 54582 (US). Motu-Are, E. reef. *Fosberg & Sachet* 54626 (US).

Tuamotu Archipelago: Makatea (Aurora) Island: s.l. *H. F. Moore* 281 (US); Puoina, 25 ft., *Wilder* 1191 (US). Makemo Island, *H. F. Moore* 347 (US). Apataki Island, *H. F. Moore* 304 (US). Tikei Island, *H. F. Moore* 316 (US). Rangiroa Atoll *H. F. Moore* 193. Raroia Atoll, *Doty & Newhouse* 11452 (US). Gambier Islands: Mangareva, outer reef, *Agassiz et al.* 70 (US); Farauroa, 2.m. *St. John* 14590 (US).

Line Islands: Palmyra Island (Atoll), *Rock* 10277 (US); *Street* in 1874 (US). Washington Island: S Shore, *Long* 2825 (US); SW side, 1 mi from village, *Long*

1845 (US); 1.5 mi E of village, *Long 1837*. Fanning Island (Atoll): SE end of atoll, *Long 3554* (US). Christmas Island: 8 mi W on Carver's Way, *Long 3427* (US).

Wake Island (Atoll): Wilkes I. near Kuku Point, *Sachet 879*; *Fosberg 43526* (US).

Suwarrow Atoll: Anchorage I., *Stoddart 10090* (US); Seven Islands, Islet 1, *Stoddart 10037* (US); One Tree I., *Stoddart 10085* (US); Motu Tou, Big Island, *Stoddart 10066* (US).

Cook Islands: Aitutaki, Papou, Motu, *Stoddart 2347* (US).

Austral Islands: Tubuai: Tapapatauaui I., 1 m, *St. John 16403* (US).

New Caledonia: Ilô't Metre pres Noumea, *Baas-Becking 5089* (US) (sub-sterile, det?); Botanist's Island, *Forster s.n.* (S).

Lepidium bidentatum var. *o-waihiense* (Cham. & Schlecht.) *Fosberg*, Bishop Mus.

Occ. Pap. 24(2): 17, 1969.

Lepidium c-waihiense Chem. & Schlecht., Linnaea 1: 32, 1826.

Differs from var. *bidentatum* in having orbicular rather than elliptic silicles. It was described from the Hawaiian Islands as a species by Chamisso & Schlechtenda. A series of collections are available from seven of the islands in the Hawaiian group, but none from the high islands are very recent. They show fully as much variation as does var *bidentatum* but not exactly the same range. Leaf-shape varies from broadly obovate (cited nos. 325, 583, 5) to spatulate and narrowly elliptic, from entire to strongly serrate-dentate, from apices obtuse to rounded, slightly to strongly 3-5-dentate. The silicles vary from orbicular to slightly longer than wide, usually 4-5 × 3.5-4.5 (-5) mm. A few specimens (nos. 266.M, 343, 2234, 2259, 5852, 6405, 6458) have silicles slightly but perceptibly smaller, measuring 3-4 × 3-4 mm.)

In the Hawaiian Islands this variety is distributed especially on the Leeward atolls, in strand vegetation, and more rarely on Kauai, Oahu, Molokai, Lanai, Maui, and Hawaii, from sea-level well up into the mountains. In the uplands it is mostly on dry slopes, but also in wet areas, such as the Nuuanu Pali. On the high islands it has become rare in recent years, probably because of loss of habitat and competition with introduced weeds.

The records from Wake Island, such as *Fosberg 43426* (US), have elliptic fruits and should be referred to var. *bidentatum*.

Specimens examined:

Hawaiian Islands: Kure Atoll: *Caum 5* (US); *Long 2242* (US), 2234 (US); *Clay* in 1959 (US). Pearl and Hermes Reef: Southeast I.: *Long 2282* (US); *Herbst & Takeuchi 6487* (US). North I.: *Long 2209* (US); *Young 184* (US); *Herbst & Takeuchi 6473* (US). Green I.: *Herbst & Takeuchi 6458* (US). Midway Atoll: Eastern I.: *Long 2259* (US); *Herbst & Takeuchi 6406* (US). Kauai: Kipu Kai, *Herbst 2912* (US). Oahu: Waianae Side: Kaala Mts., *Mann & Brigham 593* (US); Mokuleia, grassy forehills, *Degener et al. 19601* (US); Mokuleia, E slope Keawepilau Gulch, 500 ft, *Hatheway 325* (US). Koolau Side: "at the Pali" [Nuuanu],

Heller 2365 (US); Waimanalo, coastal dune, *Degener* 17212 (US). Lanai: s.l. *Mann & Brigham* 343. Maui: Hana, *Forbes* 266.M (US); Hana Bay, Puukii Island, off Kauiki Head, 10 m, *Lammers et al.*, 5852 (US). Island not specified: Iles Hawaii, *Remy* in 1851–1853 (US); Sandwich Islands, *U.S. Expl. Exped.* (US, left hand piece only); Iles Sandwich, *Gaudichaud* 233 (US). A specimen collected in "Iles Sandwich" by *Remy* in 1851–1853 (US) has the leaf-shape unusually ovate, rather than obovate, and the teeth unusually prominent, narrow, and directed distally. This one specimen, with no locality, is scarcely sufficient to be the basis of a new variety.

A specimen of *Lepidium bidentatum* collected on Timoe Atoll, easternmost of the Tuamoto Archipelago, in 1934, by *St. John & Fosberg* no. 15212 (BISH) is morphologically identical with these Hawaiian plants, with orbicular silicles, and in spite of the geographical separation, must be assigned to var. *o-waihiense*. Although a common origin seems scarcely likely for plants growing at opposite corners of the Polynesian Triangle, I cannot exclude this specimen from var. *o-waihiense* on morphological grounds.

This distribution pattern is shared by at least one other species, *Heliotropium anomalum* H. & A., with var. *candidum* in Southeast Polynesia, and var. *argenteum* I. M. Jtn. in the Hawaiian Islands. These two varieties seem identical, though this is not the place to combine them.

***Lepidium bidentatum* var. *remyi* (Drake) Fosberg, B. P. Bishop Mus. Occ. Pap. 24(2): 18, 1969.**

Lepidium remyi Drake. Ill. Fl. Ins. Mar. Pac. 6: 186, 1890. Leaves broadly linear.

Hawaiian Islands, without locality, *U.S. Expl. Exped.* (US, right hand piece); *Remy* s.n., (US); "Iles Sandwich, *J. Remy* 522" (P, 2 sheets, holotype and isotype).

FABACEAE

ERYTHRINA L.

***Erythrina tahitensis* Nadeaud, Enum. Pl. Tahiti 80, 1873. Type: *Nadeaud* 499 (G, photo in US); Neill, Ann. Mo. Bot. Gard. 75:963, 1988; p. 672, in Wagner et al, Man. Fl. Pl. Haw. 1990.**

Erythrina montana Forst. in Cuzent, Tahiti, 240, 1860, nom. nud.

This species and the Hawaiian *Erythrina sandwicensis* Degener (*E. monosperma* sensu Gaudichaud 1830; Hillebrand 1888, non Lam. 1786) have been equated by some authors. St. John (1955) carefully compared very fragmentary material of *Erythrina tahitensis* Nadeaud with ample material of *E. sandwicensis* Degener, with which latter he had good familiarity. He concluded they were distinct. D. A. Neill (1988, 1990) also kept them separate, but with no significant discussion.

In 1976, Dr. Sachet, with the help of M. Henri Jay, of Papeete, was able to collect flowering specimens of *E. tahitensis* in Tahiti, *Sachet* 2282 (US), which she brought back to Washington in fresh condition by air. These had pale creamy

yellow flowers, turning pink. Studying these plants, I immediately had doubts of their identity with the Hawaiian species. However, I could not make a very positive statement on the basis of comparison with dried Hawaiian specimens and my memory of the flowers of the Hawaiian plant. Later, in 1982, Henri Jay took me to one of the two trees that he had located, on the E side of Tuauru Valley, on the high slopes of Mahina Valley, Tahiti, at about 650 meters, in remnants of montane rain-forest.

I collected ample material from this tree, including leafy twigs, and twigs with flowers and others with mature fruits and seeds, *Fosberg* 63588 (US, BISH, MO, POM). This tree did not at all resemble the Hawaiian one in aspect and grew in totally different habitat from the dry coastal lowland sclerophyll forest home of *E. sandwicensis*. It was completely without prickles, its branchlets were slender, and its leaves were firmly thin-chartaceous. Nadeaud (op. cit, pp. III-IV) said the tree loses its leaves during the dry season, May-September, and that the Tahitians call this tree *oporovainui*.

Specimens examined: (*E. tahitensis*) Society Islands: Tahiti: Mahina Distr., E side Tuauru Valley, E slope Mahina Valley, 665 m, *Sachet* 2282 (US); *Fosberg & Jay* 63588 (US, BISH, MO, POM). (*E. Sandwicensis*) Hawaiian Islands: selected specimens, Kauai, Hanapepe River near the Falls, *Heller* 2445 (US). Oahu: Koko Crater, *P. C. Hutchison* 2845 (US); Pico Trail, Makua side, *Yuncker* 2314 (US); Kealia Trail, Kawaihapai, *Degener* 12962 (US). Molokai: Lower Waikolu Valley, near Puu Lualiae, 610 ft., *Spence* 123 (US). Lanai: Maunalei Gulch, 300 m, *Fosberg* 12569 (US); *Degener* 24260 (US). Maui: E of Ulapalakua, on dry lava, *Herbst* 228 (US), 841 (US). Hawaii: Puu Waawaa, *Hitchcock* 14467 (US).

TEPHROSIA Pers.

Tephrosia purpurea (L.) Pers., Syn. Pl. n. Enchir. Bot. 2: 329, 1807; Bosman & de Haas, Blumea 28: 464-469, 1981.

Cracca purpurea L. Sp. Pl. 752, 1753. "Habitat in Zeylona".

Galega purpurea (L.) L., Syst. Nat. ed. 10, 2: 1172, 1759; Sp. Pl. ed. 2, 1063, 1763.

Galega piscatoria Ait., Hort. Kew. 3: 71, 1789.

Tephrosia piscatoria (Ait.) Pers., Syn. Pl. n. Enchir. Bot. 2: 32, 1807.

This species is said (Bosman & de Haas 1981, p. 465) to be pantropical, comprising many subspecies and varieties, and is certainly widespread in the Pacific region. It is treated in a vast literature, listed by Bosman & de Haas (op. cit.). Within the Pacific part of its area it was called *Tephrosia piscatoria* by most earlier writers, but more recently it has generally been called *T. purpurea*, using the earlier epithet.

Within the species, as defined by Bosman & de Haas (1981, pp. 464-465), the variation is bewildering. Their detailed character-analysis yielded practically no correlation of characters nor any recognizable geographic patterns, at least in the abundant Malesian material examined. They did not consider *T. piscatoria*, as material earlier referred to it did not come from the area of their study.

My examination of a considerable series of specimens from the Pacific islands gave no indication that these would not fall in their subspecies *purpurea* (op. cit. pp. 466–467). However, considerable field experience, both in Polynesia and Ceylon (type locality) and examination of much herbarium material from both areas suggested that two populations with different aspects were involved, roughly related to more favorable versus less favorable, more stressful habitats. The distribution of individual characters suggests genetic segregation rather than simple plasticity, though the difference in "luxuriance" seems related to wetter or drier climates.

Since this species was widely used by the Polynesians, both as a fish-poison and medicinally, it seems likely that it was carried into Polynesia and widely dispersed there by the Polynesians in their migrations. The fact that it is not known at all from Micronesia, where there are plenty of apparently suitable habitats, and that it usually occupies somewhat dry rocky sites in Polynesia, rather than the mesic sandy beaches where it is frequently found in Ceylon, suggest that the plant carried by the Polynesians had only a part of the genetic variability of the original stock. This is, of course, speculative, but might account for the rather poorly defined but perceptibly different aspect of the Polynesian population of this species.

The above considerations seem to justify recognition of the Polynesian population of *T. purpurea* at the varietal level, and, perhaps less firmly, the use of the epithet *piscatoria* for it. A specimen of the plant cultivated in 1778 at Kew may exist, though this is unlikely, as little attention was given at that early time to documenting the plants cultivated in botanical gardens.

Tephrosia purpurea (L.) Pers. var. *purpurea*

The plants observed on beach flats and inland in Ceylon were up to half meter or more tall, several herbaceous stems from the base, green, sparsely stri-gose, 13 or more leaflets, these tending to be oblong and acute, flowers a dull crimson red. Upland specimens, a large series in herb. US, are variable, but mostly of this green, more leafy form with dark red or purple flowers.

The pods of Ceylon specimens, though variable in length, are mostly straight or only very slightly falcate. Specimens with larger pink flowers are sometimes called *Tephrosia hamiltonii* Drumm. ex Gamble, but are in other respects are well within the range of variability of *T. purpurea* (Rudd, 1991, p. 154).

Selected Ceylon specimens examined: Puttalam District: Kandakuli, near seashore, *Cramer* 4672 (US); Kali Villu, *Fosberg* 50865 (US, GH, K, UC), 50966 (US). Anuradhapura Distr: Anuradhapura, *Maxwell & Jayasuriaya* 796 (US). Hambantota Distr: Ruhuna National Park, Bahina Wewa, near Gonabalbe Lewaya, 2 m, *Fosberg* 50266 (US). Amperai Distr: 7–8 miles W of Puttavil, *Fosberg & Sachet* 53014 (US). Batticaloa Distr: 14 miles W of Batticaloa, *Fosberg & Jayasinghe* 57162. (US).

Tephrosia purpurea var. *piscatoria* (Ait.) Fosberg, comb. nov. stat. nov.

Galega piscatoria Parkinson, Journal of the Voyage of the Endeavour 43, 1773, nom. nud.; Aiton, Hort. Kew. 3: 71, 1789.

Galega littoralis sensu Forst. f., Prodr., 52, no. 277, 1786, non L.
Tephrosia piscatoria (Ait.) Pers., Syn. Pl. n. Enchir. Bot. 2: 329, 1807; Seem.,
Fl. Vit. 55, 1865.

Compared with the typical Ceylon plant, the Polynesian plants are less luxuriant and less leafy, stiffer, tending to be somewhat woody below, subvillous to somewhat sericeous rather than thinly to sparsely strigose, grayish, leaves smaller and usually with fewer (7–11, rarely 13) leaflets, these usually (but not always) smaller, frequently narrower and more oblong, apices obtuse to rounded or subtruncate and seldom emarginate; flowers smaller, whitish to pale pink or pale lavender rather than deeper red or purple, calyx lobes narrower, linear to subulate; legumes usually somewhat broader, with more tendency to be falcate, seldom straight as is more common in var. *purpurea*, usually more strongly strigose. These characters are variable and not well-correlated. The most dependable character seems to be a noticeable pubescence, sericeous to spreading, villous or even tomentulose, in var. *piscatoria*.

Galega piscatoria was described (briefly) from plants introduced into cultivation at Kew in "1778 by Patrick Russell, M.D.", said to be "Nat. of India and the South Sea Islands". The exact origin of these cultivated plants is uncertain. That they were considered by Aiton to be the same as those collected in the Society Islands by Banks and Solander is indicated by his use of their unpublished name, *Galega piscatoria*, earlier used in 1773 in Parkinson's posthumously published journal, but without description.

Reported, either as *T. piscatoria* or *T. purpurea* from all of the high island groups in Polynesia north to Hawaii and east to the Marquesas and Gambier Islands, but not from Makatea or Henderson. I have seen no record of it from any low coral island, except by A. Gray (1854, p. 407) from "Coral islands".

EUPHORBIACEAE

EUPHORBIA

Euphorbia (Chamaesyce) prostrata Ait., Hort. Kew. 2: 139, 1789.

This common pantropical weedy species ordinarily appears to be an annual or perhaps a short-lived perennial, with a slender tap-root and several to many, usually rather few, prostrate slender branches. As in all *Euphorbia* (subg.) *Chamaesyce* species, the primary axis aborts above the first node, and the principal stems are prostrate to erect branches from this node.

A specimen collected on Niue Island by T. G. Yuncker, though matching *E. prostrata* in most respects, including the pubescence only on the under sides of the prostrate stems, is a perennial with many stems from a thick, somewhat woody root-crown and taproot. Examination of specimens of *E. prostrata* from the Pacific area in the Bishop Museum Herbarium yielded two similar specimens from Fiji. Ecological information on these three collections is not plentiful, except that they are all from near the seacoast. The Niue specimen was a plantation weed, from 65 m elevation, obviously on limestone soil, as the island is of elevated coral limestone. One from Fiji was from the seacoast. The other Fiji specimen was

from near the coast, labeled "Pernicious weed in sandy soils, killing grass on golf course." There seems no reason to believe that this growth form, unusual in this species, is an ecological response. Varietal status seems appropriate, to call attention to it.

Euphorbia prostrata Ait. var. **prostrata**

The common plant with a slender, apparently annual tap-root.
Widespread, ruderal and on bare soil, pantropical.

Euphorbia prostrata var. **caudirhiza** Fosberg, var. nov.

A var. *prostrata* radice crassa, semilignosa, caulis multisque differt. Type: Niue Island, south central Pacific, Yuncker 9861 (US, holotype).

Differs from var. *prostrata* in its thickened, semi-woody rootstock, with many slender prostrate branches. This growth-form has only been observed, in this species, in Fiji and Niue. It resembles, in this respect, *Euphorbia stoddartii* Fosberg, of the Aldabra group of slightly elevated coral islands in the Western Indian Ocean. The resemblance is probably only superficial.

Specimens examined: Niue Island: Fonokula Plantation, 65 m, Yuncker 9861 (BISH, holotype).

Fiji Islands: Viti Levu: Mba: Lautoka, sea level, Greenwood 1284 BISH; Nandrolonga-Navosa: Thuvu, near Singatoka, Greenwood 822 (BISH).

Two other collections from Niue, Yuncker 8931 (BISH) and Sykes 169736 (BISH) and a number more from Fiji are of the normal slender-rooted form.

PHYLLANTHUS L.

Phyllanthus societatis Muell.-Arg. in DC. Prodr. 15(2): 364 1866. Type: U.S.

Expl. Exped. from "Maitea", which could be either Makatea (Tuamotus) or Mehitea (Societies). Perusal of Peale's (ed. Poesch 1961, p. 156) account of the expedition show that its members landed on Makatea but not on Mehitea.

Main stem woody, not or only sparsely branched, to 1 m tall, but usually less, upper 1–2 cm with many slender ascending to spreading fertile "phyllanthoid" leafy branchlets; leaves oblong, to 25 × 9 mm, rounded or obtusish, rarely acutish, base slightly oblique, blade thin, veins distinct but not prominent, about 10 on a side, 2 or 3 close together at base, petiole less than 1 mm long; flowers monoecious, subtended by triangular, very acuminate stipular bracts, flowers shortly pedicellate in dense scaly clusters in leaf axils, or pistillate ones may be solitary; perianth segments 6, erect, concave distally, oblong, marginate; anthers oblong, erect; pistillate flowers with ovary-surface covered by minute flap-like scales which persist on the enlarging fruit as irregularly or longitudinally disposed rugosities, becoming obscure with age of fruit; mature capsule globose to slightly depressed globose, 3 mm wide; seeds tan color, with a few somewhat irregular or broken transverse grooves on the convex surface.

The Nauru population, described above, is more robust and woody than the few specimens available from Makatea, and much more so than the ones from Atiu and Mauke, Cook Islands. When more ample material is available from

these or other elevated coral islands, 2 or more varieties may be recognized. This is only suggestive with present collections.

Specimens examined: Nauru Island: Meneng, on escarpment, *Fosberg* 58801 (US, BISH); Plateau back of Meneng, *Fosberg and Wood* 58795 (US, BISH); Anabar, among dissected limestone pinnacles, *Fosberg* 38748 (US); near Hole-in-the-Wall, in dissected limestone, *Fosberg* 38636a (US). Tuamotu Archipelago: Makatea: s.l., *Wilder* 1126 (BISH, US); S of Vaitepaua, 40 m, *Florence* 3071 (BISH). Cook Islands: Atiu Island, NW part of island, *Merlin* 332 (BISH); s.l. *Philipson* 10545 (US). Mauke Island, Kumeangatau, *Whistler* 5494 (US).

My appreciation is due to Prof. Grady L. Webster for confirming my surmise that the Nauru and Makatea specimens belong to *P. societatis* Muell.-Arg.

Phyllanthus tenellus Roxb., Hort. Beng. 69, 1814; Fl. Ind. 3: 668, 1832 (or 683 of the 1874 reprint); Hook.f. in Hook. Ic. Pl. t. 1569, 1887; Webster, J. Arnold Arb. 38: 94, 1957; Coode, Fl. Mascare. 160: 16, 1982.

A delicate, slender *Phyllanthus* with broad, oval, thin leaves and very small flowers has recently become a garden- and potted-plant weed in shaded moist places in the Society Islands. It was recently confirmed by Dr. Grady Webster to be *Phyllanthus tenellus* Roxburgh. This is a pantropical weed, but has only recently been noticed in Eastern Polynesia. It was originally described in India, but from "Mauritius, Captain Blake". Presumably this was cultivated in the Calcutta Botanical Garden from seeds or live plants brought from Mauritius.

Roxburgh's original publication indicated it to be perennial and erect. In 1832 he gave a full description, but as a shrub, "ligneous" and three feet tall. This is so different from the delicate plants seen in the Society Islands that I had doubts that we were dealing with the same species. However, examination of a considerable series of specimens (in US) showed a gradual transition to fairly large herbs, a few of which had stems approaching woodiness. One of the Polynesian specimens cited below (*Florence* 6033 (BISH)), is 58 cm tall and has the lower part of the stem thick and woody.

Dr. Peter S. Green has gone to considerable trouble to provide me with information on this species available at Kew. He has established that a sheet of this species, *Wallich* 7892A at Kew bears a specimen that was available to Roxburgh, which was indicated as type by Webster, (1957), and accepted as type by Coode (1982), certainly effective lectotypification. The specimen, mounted on the sheet with other material, is rather poor, but apparently identifiable. This sheet was referred to by J. D. Hooker in the text accompanying his drawing in Hooker's *Icones* Pl., T. 1569 (1887), so may have been at least part of the material that was drawn, and may be taken as illustrating the type. Green calls attention to Coode's (1982) statement "that it is short-lived, but occasionally living longer, becoming larger and woody at the base," and that Webster (1957) says that "when grown in a greenhouse . . . it may persist for three years or more, and become definitely shrubby at the base, and branch many times above". In light of all of this, Roxburgh's plant, grown in the botanic garden, is well within the limits of his *P. tenella*.

Specimens examined: Society Is.: Tahiti: Auwe, W of Papeete, 1982, *Fosberg* 63579 (US); Grotte de Maraa, 1982, *Florence* 2251 (BISH); near Papara Village, 1981, *Fosberg* 61291 (US), 61282 (US, BISH); Veetia, 1982, *Fosberg* 61271 (US); Paapeari, 1982, *Florence* 2633 (BISH); Mitirapa, W end of Presqueile de Taravao, 1982, *Fosberg* 62745 (US).

Tetiaroa Atoll: Onetahi I., July 19, 1982, *Fosberg & Sachet* 63785 (US).

Raiatea: Uturoa, June 30, 1982, *Fosberg* 63117 (US, BISH).

Tahaa: Otuone, July 15, 1982, *Fosberg & Sachet* 63563 (US, BISH).

Austral Is: Rurutu: Una, Rurutu Village, 15m, *Florence* 6033 (BISH).

Hawaiian Is.: Oahu: Mokuleia, 1963, *Degener & Degener* 282148 (US).

PASSIFLORACEAE

PASSIFLORA L.

Passiflora foetida L., Sp. Pl. 959, 1753; Killip, Field Mus. Publ. Bot. 19: 474–512, 1938.

This is a common, very polymorphic tropical American species. Killip, in his monograph of the American *Passiflora* species (1938) recognized 38 varieties and discussed at length the puzzling variability of these units. Several of them have become widespread tropical weeds, of which three have for many years been found in Hawaii. One of these, *P. foetida* var. *hispida* (DC.) Killip, is widespread and well-known in the Pacific Islands. It can be recognized by its very finely dissected and interwoven involucral bracts, which closely enclose the small globose bright orange berry. One of the others, not yet very satisfactorily accommodated in Killip's scheme, is not densely pubescent, but notably glandular and ill-scented, bracts bipinnatisect to tripinnatisect but not interwoven, with deep crimson-red berries, 2 or more cm in diameter. It may be close to or identical with *P. foetida* var. *salvadorensis* Killip. It does not seem to have spread in the Pacific beyond Hawaii, where it has long been common.

The third of the Hawaiian varieties, though much less common, is var. *gossypifolia* (Desv.) Masters. It has more recently become established in the South Pacific, and is the principal subject of this note.

Passiflora foetida* var. *gossypifolia (Desv.) Masters, Tr. Linn. Soc. Lond. 27: 231, 1871.

Passiflora gossypifolia Desv. in Hamilton, Prodr. Pl. Ind. Occ. 1: 48, 1825.

This is a densely pubescent small climber with trilobed leaves, bi- to tripinnatisect but not interlacing bracts, and dull yellow or yellow-green minutely velutinous or hirtellous berry up to 2 or more cm in diameter. It is reported to be of pantropical distribution. In Hawaii it has been present at least since 1929, in Tahiti since 1899, and in Rurutu, Austral Islands since 1981.

Polynesian specimens examined: Hawaiian Islands: Oahu: Kahana Valley, *Degener et al.* 3705 (US); main ridge of Ulupau Head, *Fosberg and E. C. Evans* 58842 (US); Waimanalo, *Fosberg* 22073 (US); Koko Head, *Bruegmann* 117 (US);

Red Hill Naval Fuel Storage Area S of Halawa Gulch, *Fosberg* 65043 (US). Hawaii: W side of South Point, Kalae, 10 m, *Fosberg* 39282 (US).

Society Islands: Tahiti: Papehue, Paea, *Tilden* 356 (US); road to Papenoo River, *Setchell & Parks* 3 (US); Papeete, *Leland, Chase & Tilden* 15 (US); Pic Rouge above Papeete, 80 m, *Fosberg* 62919; ORSTOM Geophysical Laboratory, above Paea, 325 m, *Fosberg* 61057; Pirae, route du Belvedere, km 1.9, *Florence* 2276; Small hanging valley on side of upper Tuauru Valley, 700–750 m, *Fosberg* 63810; ridge E of Valee du Tuauru above Mahina, *Fosberg & Stone* 61320 (US); s.l. *H. E. Moore* 248 (US). Moorea: Faaroa, *H. M. Smith* 96 (US, BISH). Huahine: S side Fauna Nui Lagoon, *Fosberg* 61170 (US); bet. Maeva and Faie, 100 m, *D. Bare* 107 (US). Taha'a: ridge W and S of Pueheru Valley, 300 m, *Fosberg* 63430 (US) (berry exceptionally large, 3 cm or more long).

Tuamotu Archipelago: Makatea Island: Cote Oueste, N de Temao, 1 m, *Florence* (US); central depression between Vaitepaua and Moumou, *Fosberg* 64680 (US).

Austral Islands: Rurutu, Savanne de Aviation, au nord de l'ile, *N. Halle* (US).

Marquesas Islands: Mohotani Island, 50 m, *Mumford & Adamson* 543 (BISH). Hiva O'a Island, Makamake, 159 m, *Mumford & Adamson* 10 (BISH); s.l., *F. Brown* 364 (BISH). Uapou Island, *Quayle* 1088 (BISH); *F. Brown* 1045. Nukuhiva Island: western, *Quayle* 1579 (BISH); s.l. *F. Brown* 477 (BISH). Uahuka Island, s.l. *Quayle* 1707 (BISH). Eiau Island, *Jones* 1540 (BISH). Hatutaa Island: W end, 200 m. *Decker* 331 (BISH); 100–400 m, *Jones* 1552 (BISH).

***Passiflora suberosa* L. Sp. Pl. 958, 1753.**

Passiflora pallida L. Sp. Pl. 951, 1753.

Small slender tendrilliferous vine; leaves variously lobed; flowers small, about 2 cm across, notable for complete lack of a corolla, sepals rather petaloid, pale green, as is the rest of the flower; berry blue-black when ripe, thin-walled, soft, sweetish, subglobose.

This widespread species, while usually constant in its reproductive characters, is extremely variable in leaf-shape, with, in some cases, entire to lobed leaf margins on the same plant. The normal range of variation is from entire to broadly lobed with more or less rounded sinuses, the base often sub hastate, with no geographic pattern to the variation. This type of lobing, to varying degree, I have observed in living populations over a wide geographic range from the western Indian Ocean islands to southern Polynesia, Micronesia and Hawaii, also in the Caribbean.

However, in Tahiti, especially in Papenoo Valley, a population with a conspicuously different type of lobing was observed, with narrow acute and very hastate lobing and acute sinuses. This was given scant attention when first observed. However, when it was noticed elsewhere in Tahiti, varying very little, it seemed more important. Then it became evident that all available specimens, as well as living plants seen on Tahiti were of this strikingly distinct form. All of the collections seen since from Tahiti seem uniform in the characters listed above.

It is, therefore, described below as a new variety. A number of collections from Oahu, Hawaiian Islands, match the Tahiti ones and are sharply distinct from the ordinary form, which is rather common in Hawaii. *P. suberosa* is commonly regarded as introduced in Hawaii, and rather than considering that a similar mutation has occurred independently on two islands thousands of km apart, it is tempting to think there may have been an accidental, or even deliberate introduction from Tahiti to Oahu. Several specimens from Fiji also show this type of lobing, and must be referred here.

Passiflora suberosa L. var. suberosa

This is the ordinary, widespread form of the species, with leaves entire to broadly lobed. Available specimens from Hawaii and the Marianas tend to have entire to shallowly lobed leaves.

Hawaiian and Marianas specimens examined: Hawaiian Islands: Oahu: Kappa Islet, 1.5 m, *Herbst* 6114 (US); Hauula, Koolau Mts, *N. Krauss s.n.* (US). Maui: Lahaina, 400 ft., *Hosaka* 2683 (US).

Marianas Islands: Guam: La Cienaga (Agana Swamp), *Stone* 4235 (US); NAS Agana, 70 m, *Fosberg* 46212 (US). Saipan: E of Ogso Tapochau, just N of Kannal Tadung Laulau, 170–190 m, *Fosberg* 50550 (US); Tantan, Puntan Tahgong, 5 m, *Herbst & Falanruw* 2683 (US).

Passiflora suberosa var. per hastata Fosberg, var. nov.

A var. *suberosa* foliis trilobatis valde hastatis, lobis valde acutis vel acuminate differt.

Differs from var. *suberosa* in its deeply trilobate conspicuously hastate leaves, with strongly acute or acuminate lobes and acute sinuses. Type: Tahiti, *Fosberg* 63810 (US, holotype, several isotypes distributed as *S. suberosa* var. before this study was carried out).

Common in Tahiti, where it seems, from all of the available specimens and field observations, to make up the entire population of the species. Found also in Hawaii and Fiji, along with var. *suberosa*.

Specimens examined: Society Islands: Tahiti: Pamalai, ORSTOM Geophysical Laboratory, 150 m, *Fosberg* 61056 (US); Tavairahi, above Farearea Bay, *Fosberg* 61155b, (US); Road to Pic Rouge, above Papeete, 80 m, *Fosberg* 62824 (US); Mahina Distr., ridge E of Valee de Tuaruru above Mahina, *Fosberg and Stone* 61320 (US); small hanging Valley on N side of upper Tuaruru Valley, 700–750 m, *Fosberg* 63610 (US, holotype, a number of isotypes distributed to other herbaria with no record); Pirae, route du Belvedere, km 1.8, *Florence* 2275 (US); s.l. *Krauss* 626 (US).

Hawaiian Islands: Oahu: Round Top Road. 599 ft. *Herbst* 762 (BISH); Manoa Valley, *Egler* 37-173 (BISH); Pupukea, *Krauss* 1005 (BISH); Aiea Loop Trail, *W. L. Wagner et al.* 5327 (BISH); Aiea, *Sasakawa s.n.* (BISH); above Aiea, *Iltis* H-610 (BISH, US); 1 mile from Camp Timberline, on jeep trail to bench lookout on pali above Nanakuli, 1600 ft., *L. Hume* 342 (PTBG); Kupehau Gulch, *Webster* 1072 (US).

Fiji: Ovalau: Hills E of Loomi Valley, 100–300 m *A. C. Smith* 7288 (US); slopes of Mt. Koronimoke, vic. Thrawathi, 250–300 m, *A. C. Smith* 8087. (US). Ngau Island: shore of Herald Bay, vic., of Sawaike, sea level–30 m, *A. C. Smith* 7923 (US).

CUCURBITACEAE

LUFFA Mill.

Luffa cylindrica (L.) Roemer, Fam. Nat. Regn. Veg. Syn. Monogr. 2: 63, 1846; Exell, J. Bot. 71: 352, 1935; Jeffrey, Kew Bull. 15: 356, 1962.

Momordica cylindrica L., Sp. Pl. 1009, 1753.

Luffa aegyptiaca Miller, Gard. Dict. ed. 8, 1768; Schubert, Taxon 24: 171–177, 1975; Heiser & Schilling, Biotropica 20: 186, 1988.

Noting that specimens of this widespread, usually wild, vegetable sponge, in herbaria, are being annotated as *Luffa aegyptiaca* Mill. (e.g. by Heiser & Schilling), I looked at the pertinent literature, beginning with a recent paper by Heiser & Schilling (1988). They use the name *Luffa aegyptiaca*, and merely say they are following Schubert (1975), rather than Jeffrey (1962).

Schubert, in her list of important economic plants, (1975), makes no critical observations, but refers back to a paper by Exell (1935). Exell says that Roemer (1846) based *L. cylindrica* on *Momordica cylindrica* Loureiro (1790), not Linnaeus (1753), excluding *L. cylindrica* L. Therefore it would be a separate name, beginning with Roemer (1846). This would leave *L. aegyptiaca* Miller (1768) as the earliest available name. Jeffrey (1962) points out that Loureiro cites "Lin. sp. 5" [ed. 2], thereby including *L. cylindrica*, and therefore its type, in his concept, and so did not create a new name. Roemer, correctly, had made a new combination, based on the Linnaean basionym, rather than creating a new name. Merrill, in his Commentary on Loureiro's "Flora Cochinchinensis" (1935, p. 378) correctly indicated this. Taxonomically only one species is involved, Jeffrey's position is nomenclaturally sound, and *Luffa cylindrica* (L.) Roemer should continue to be used.

***Luffa cylindrica* var. *insularum* (A. Gray) Cogniaux in DC. Monogr. Phan. 459, 1881.**

Luffa insularum A. Gray, Bot U.S. Expl. Exped. 1:644, 1854; A. C. Smith, Fl. Vit. Nov. 2: 682, 1981 (includes a series of references).

The widespread wild form, with rather small fruit, doubtfully distinct from var. *cylindrica*, is commonly known by the above varietal name. Smith does not maintain this as a distinct variety, saying that it may have been modified by selection. He lectotypified *Luffa insularum* A. Gray, indicating *U.S. Expl. Exped.* in 1840 (US) as lectotype. As no type is known for *Momordica cylindrica* L., on which *M. insularum* is based, it seems best to maintain the variety *insularum*, at least to include the Polynesian introduction. This, itself, is variable, at least in the depth and lobing of the leaves. Only the Micronesian and Polynesian specimens will be cited here.

Specimens examined: Micronesia: Marianas: Guam: s.l. *Nelson* 402 (BISH); s.l. *G.E.S. 409* (BISH). Caroline Is.: Truk: Natsushima (Dublon), *Takamatsu* 112 (BISH), 154 (BISH); Tol I., Munien, *Hosokawa* 8337 (BISH); s.l. 150 ft., *Wong* 297 (BISH). Ponape I. Anapeng-pa, *Takamatsu* 733 (BISH); s.l., *Ward* in 1973 (BISH); Nauru Island; Uaboe, 0.35 km in from coast, *Fosberg* 58731 (BISH, US).

Polynesia: Tonga: Vavau I., NW side of island, 150 m, *Yuncker* 16165 (BISH). Samoa: Savaii: Salailua, 150 m, *Christophersen* 2996 (BISH); Vaisala swamp, 0 m, *Christophersen* 3349 (BISH). Upolu: Vailele Mt. 100–200 m, *Christophersen* 361 (BISH); Falavao, *Whistler* W251 (BISH); Lauli'a, 3 m, *Whistler* W4117 (BISH). Tutuila: Pagopago, *Meebold* 16695 (BISH); Pago-Faleasau Trail, 150 m, *Yuncker* 9300 (BISH). Ofu: Alaupau beach, *Garber* 1119 (BISH); NW shore, *Yuncker* 9560 (BISH). Olosenga: SE side of island, *Whistler* W3067 (BISH). Wallis Is.: Futuna; Nuku, Siagave, Sausau stream below Fanuangala, 25 m, *Kirch* 138 (BISH). Society Is.: Tahiti: Fautaua Valley, *Setchell & Parks* 219 (BISH); Marquesas: Nukuhiva: Taiohae, 5 m, *F. Brown* 783 (BISH).

A second variety, with smooth fruit, is recognized by Heiser and Schilling, in *L. aegyptia*. To maintain this under the name recognized here requires that we go back to Naudin's original publication of the variety, placing Heiser and Schilling's combination in synonymy.

***Luffa cylindrica* var. *leiocarpa* Naudin, Ann. Sci. Nat., Bot. Ser. IV, 12, 1859.**

Luffa leiocarpa F. Muell., Fragm. 3: 107, 1859.

Luffa aegyptiaca var. *leiocarpa* (Naud.) Heiser and Schilling, Biotropica 20: 186, 1988.

This variety is maintained on the authority of Heiser and Schilling, but they do not state distinguishing characters from var. *insularum*.

SAPOTACEAE

POUTERIA Aublet

Lactiferous trees, with alternate, often leathery obovate leaves; axillary, solitary, racemose or fasciculate pedicellate flowers; sepals 4–5, imbricate, corolla lobes 4–6, stamens and staminodes inserted in corolla throat, anthers usually included, extrorse; ovary often hirsute, locules 1–12, style included or exserted, stigma weakly capitate; fruit a berry with up to 5 vertical radially arranged somewhat compressed hard seeds, scar the length of the seed, linear to wide, then elliptic.

Geographical distribution pantropical, with a number of Polynesian species, more numerous westward. The genus *Planchonella* Pierre is, by many Pacific botanists, separated to accommodate the Polynesian and many other Old World species, but the distinction between the two lies only in the thickness of the cotyledons, which seems unconvincing, and I have been using *Pouteria* in the broad sense, hence the need for the following new combination.

Pouteria grayana (St. John) Fosberg, comb. nov.

Planchonella grayana St. John, Bishop Mus. Bull. 120: 38, 1934.

St. John gives a complicated synonymy for this species which was originally described as *Sapota ? vitiensis* A. Gray, which cannot be transferred to *Pouteria* because of the already existing *Pouteria vitiensis* (Gilespie) Degener. The species was described originally from Fiji, and extends eastward at least to Makatea. Sterile specimens from Henderson Island determined as this turned out to be *Myrsine*. A specimen recently collected in Tahiti, where the species was not previously known, seems to represent at least a distinct variety.

Pouteria grayana (St. John) Fosberg var. *grayana*

Known from Fiji, Cook Is., Austral Is. and Makatea in the western Tuamotus.

Specimens examined: Cook Is.: Rarotonga: s.l. *Parks & Parks* 22356 (BISH); s.l. *Bouchier for Wilder* in 1932 (BISH); Mt. Tereora, 700 ft., *Wilder* 7774 (BISH). Mauke I.: Kemiangatau, *Whistler* 5529 (BISH). Mitiaro I.: s.l. *Whistler* 5571 (BISH); SW part of island, *Merlin* 350 (BISH).

Austral Is.: Rurutu: NW slopes of Teatoi, *St. John* 16769a (BISH); Mato Arei, 75 m, *St. John* 16738; Avera, route de Vitaria, Paaiao, 230 m, *Florence* 6027 (BISH). Tubuai.: Pass N of Tunaruutu, 150m, *St. John* 16513 (BISH), 16514 (BISH).

Tuamotu Is.: Makatea: s.l. *Wilder* 1145 (BISH); 350 ft., *Wilder* 950 (BISH).

Pouteria grayana var. *florenciei* Fosberg var. nov.

Arbor mediocris vel grandis ad 30 m, caulis ad 80 cm diametro; foliis late lanceolatis, supra viridis nitidis, infra vix pallidis, floribus calycibus lobis late rotundis; corollis viridis pallidis.

Large tree to 30 m tall, trunk diameter 80 cm; leaves broadly lanceolate, apex obtuse to rounded; pedicels in tight axillary fascicles, only one or two pedicels elongating at a time fascicles closely invested by white, scale-like bracteoles; calyx 5-lobed, lobes broadly rounded; corolla pale green; fruit not available on specimen.

This large tree is described as uncommon in the *Rhus-Xylosma* forest in valley bottoms in Tahiti. Except for the characters noted above, it does not seem to differ from var. *grayana*, which is not known from the Society Islands.

Specimen examined: Society Islands: Tahiti: "Basse vallee de Papenoo, flanc gauche, environ a 4 km de la cote, 290 m, 17-10-1982, J. *Florence* 3967" (BISH, holotype, isotypes in K, NY, P, US, Papeete, only BISH and US seen). Known only from the type collection.

OLEACEAE

CHIONANTHUS Gaertn.

Chionanthus Gaertn., Fruct. et Sem. 1: 189, 1786; Stearn, Ann. Mo. Bot. Gard. 63: 355-357, 1976. *Linociera* Sw. in Schreb. Gen. 2: 784, 1791.

The genus *Linociera* Sw. is now usually merged with *Chionanthus* Gaertn. (Stearn, loc. cit.). The one Micronesian species has not, to my knowledge, been transferred and this is hereby done.

***Chionanthus sessiliflorus* (Hemsley) Fosberg, comb. nov.**

Linociera sessiliflora Hemsley, Ann. Bot. 6:504, 1891; Lingelsheim, Bot. Jahrb. 63: 279, 1930; Kaneh. Bot. Mag. (Tokyo) 45: 340, 1931; Fl. Micr. 312, 1933; Enum. Micr. Pl. 390, 1935; Fosberg, Sachet, & Oliver, Micronesica 15: 209, 1974.

Linociera pallida Lauterb. & K. Schum. in K. Schum. & Lauterb., Fl. Deutsch. Schutzgeb. Süds. 497, 1901.

Small slender tree or tall shrub; leaves opposite, elliptic, subcoriaceous, very shortly petiolate; flowers fasciculate, sessile, in leaf axils; corolla lobes 4, linear, yellow; stamens 2; fruit a drupe, ovoid, somewhat compressed or sulcate, 2.5–3.6 × 1.5–1.7 cm, shortly pubescent.

Found from New Guinea, Solomon Islands, to Palau.

Specimens examined: Caroline Is.: Palau: Babeldaob: Aimiriik, *Kanehira* 2298 (US, NY), 276 (NY, BISH), 2363 (BISH).

APOCYNACEAE

***OCHROSIA* Juss.**

***Ochrosia tahitensis* Baill. ex Lanesson, Pl. Utiles col. Fr. 865, 1886, nom. nud;**
Ochrosia tahitensis Lanesson ex Pichon, Bull. Mus. d'Hist Nat. Paris II, 19: 207, 1947.

"Feuilles adultes à pétiole court et à limbe étroit (1.3–2.8 cm). Sepales 1.5–1.7 × 0.7–1.2 mm. Mericarpes 19–27 × 9–15 × 6–11 mm. (Tahiti)."

No indication is given of a type or of any previous publication. Rather abundant material has turned up in several herbaria, that in the Paris herbarium mostly collected by Nadeaud, who, curiously, failed to describe the species. Publication of Lanesson's name was effected by Pichon, validated only by a brief characterization in a key. Lanesson had given the Tahitian name, "Tamaramoua". The following amplified description is based on Nadeaud's ample material, cited below.

***Ochrosia tahitensis* Lanesson ex Pichon, emend. Fosberg.**

Branchlets glabrous; leaves usually in whorls of 3 (rarely 2 or 4), blades lanceolate, up to 2.8 × 21 cm, usually much smaller, apex acuminate, veins many, indistinct above, clearly visible beneath but not prominent, 0.5–1.0 mm apart, very widely diverging, almost perpendicular to midrib, somewhat anastomosing by an obscure network of connecting veinlets, marginal vein very close to leaf-margin, usually hidden by closely revolute margin; inflorescence an axillary, minutely puberulent slender cyme, 2–9 cm long, peduncle 2–4 (–7) cm, loosely several times trichotomous, with terminal, very shortly pedicellate flowers, 1–2 at a node and with two branchlets, one of the two often abortive, or reduced

to a single flower, internodes of the inflorescence short, to 1 cm long, with scale-like ovate somewhat carinate bracts, cyme branches with up to 4–5 (–6) ramifications, but these mostly with one branch abortive, resulting in a somewhat zig-zag rhachis with very few flowers; sepals triangular-ovate, bluntly acute, puberulent, 1.5–2 mm long; one open corolla available, tube about 1 mm thick, at least 5 mm long, lobes narrowly oblong, 7 × 2 mm, apex rounded, buds blunt; fruit with mericarps somewhat obovoid, dorsiventrally somewhat compressed, 2 (–2.8) cm long, 1–1.2 (–1.4) cm wide, 0.8–1.0 cm thick, sides scarcely carinate, apex obtuse, sometimes slightly beaked, endocarp smooth, but with large cavities on sides toward apex.

The specimens cited below were found misidentified in various other genera.

Specimens cited: Society Island: Tahiti; without precise localities; *Banks and Solander* (BM); *Nelson* (BM); *Bertero and Moerenhout* in 1831 (P); *Nadeaud s.n.* (P, 5 sheets); *Nadeaud* 366 (P, 5 sheets); "sur les flancs des ravins secs et pierreux Pinae, Ahouu, Pirae, etc." *Nadeaud* in 1858; Mont. Fataua, 7–800 m, *Lepine* 187 (P).

Two collections made in Tahiti in 1852 by Andersson differ slightly from the above. The veins are 1–1.5 mm apart, and the cymes (fruiting) are smaller, 3–3.5 cm long, and apparently much less branched, though some of their complexity may have been lost as the fruit matured. More collections from Fautaua Valley are needed to show whether these specimens represent a population or only a casual variation.

Specimens examined: Tahiti: "a m kring Fatuahua", *Andersson* in 1852 (S); s.l. *Andersson*, Sept. 1852 (S).

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