

Plants of Southeastern Polynesia. 1.

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Large collections made by Bryce G. Decker, J.-N. Maclet, and M.-H. Sachet in the Marquesas and other islands of southeastern Polynesia have brought to light a considerable number of noteworthy records and critical observations that should be placed on record, looking toward eventual floras of certain of the islands. This series is initiated for this purpose. The present paper contains notes on *Panicum*, *Crotalaria*, *Goethea*, *Hibiscus*, *Pavonia*, *Terminalia*, *Cordia*, *Hyptis*, *Jacaranda*, *Blumea*, and *Vernonia*, with a new species in *Hibiscus*. The explorations by Decker were carried out under a Foreign Field Research Program of the National Academy of Sciences, sponsored by the Office of Naval Research. Maclet is a local official of the Tahiti Department of Agriculture, Papeete. The collections of the junior author were made during trips in French Polynesia, sponsored by the Fondation Singer-Polignac and the Centre National de la Recherche Scientifique of France, and aided by a grant from the American Philosophical Society (Penrose Fund). The help of these organizations is deeply appreciated, as well as that received from local officials and friends in the islands.

***Panicum reptans* L.**

The fact that a number of recent collections of this species from the Marquesas Islands all have the pubescent spikelets which are the main basis for *Panicum prostratum* var. *marquisense* F. Br. suggests that this is a recognizable geographic entity, rather than a casual variant. This led to the examination of a considerable amount of material of the species from the Pacific Islands and Asia. The species is pan-tropical, but none of the variants described from America is known to have pubescent spikelets.

In the abundant material examined of this species, most of the specimens have strictly glabrous spikelets, and the great majority have from a few to abundant long glistening white hairs in the inflorescence, originating on the "pedicels" of the spikelets. A few specimens lack these hairs but their distribution seems sporadic and intermingled with that of specimens with hairs. Hence we hesitate to ascribe any taxonomic significance to them.

Specimens with pubescent spikelets occur in the Marquesas and in India, with a very few scattered between. A tendency toward hairiness on the leaf-blades is found in the plants with pubescent spikelets, as indicated by Brown, but this is very inconstant. The plants of this type from Timor, Burma, and India have long hairs on the "pedicels" while those from farther east in the Pacific Islands mostly have no such hairs. Hence it seems appropriate to recognize both of the varieties that have been described showing the pubescent spikelet character. The three varieties of *Panicum reptans* L. recognized from the Indo-Pacific region are as follows:

Panicum reptans* L. var. *reptans*Brachiaria reptans* (L.) Hubb. & Gardn.*Panicum prostratum* Lam., Tabl. Encycl. 1: 171, 1791 (ex Insulis Caribaeis.)*Panicum prostratum* var. β Lam. loc. cit. (Id. racheos dentibus setigeris. E China. Sonner.)*Panicum grossarium* L., Syst. Nat. ed. 10, 2: 871, 1759.*Panicum sieberi* Link, Hort. Berol. 1: 207, 1827 (Mauritius, *Sieber 30*, type)

Material of this variety was seen from Guam, Fiji, and the Solomon Islands westward to China, the Philippines, Malaysia, New Guinea, Indo China, India, Ceylon and Mauritius (*Sieber 30*, US), as well as from tropical America. There is much variation in habit, from fully as small and depauperate as most Marquesan material, to quite luxuriant, but still very slender. Perhaps 5% of the material examined lacked the long hairs in the inflorescence. Such specimens occurred from Guam to India. The type of *P. reptans* L., from Jamaica and collected by P. Browne, now in the Linnean Herbarium, was kindly examined for me by C. E. Hubbard, who reports glabrous spikelets and long glistening hairs on the pedicels.

Panicum reptans* var. *burmanicum* (Hook. f.) Fosberg, n. comb.Panicum prostratum* var. *burmanicum* Hook. f., Fl. Brit. Ind. 7: 34, 1896.

This has pubescent spikelets (glumes and sterile lemmas) and long white hairs on the "pedicels".

India: Godavery District, Vadapulli, *Bourne 3331* (US); Kistna District, Madras, canal w. Gizwada, *Gamble 12741* (US). Upper Burma: Merktela, *Collett 7* (US, type coll.?). Lesser Sunda Is., Timor: Kp. Obe Naik, 300 m, *Bloembergen 3311* (US). The Timor specimen has plumper spikelets than the others and the hairs on the nerves of the sterile lemma are more prominent than those between.

Panicum reptans* var. *marquisense* (F. Brown) Fosberg, n. comb.Panicum prostratum* var. *marquisense* F. Brown, Bishop Mus. Bull. 84: 71, 1931 (Marquesas, Nukuhiva, *Brown 717*, type)

Reliably characterized by the pubescent (puberulent) glumes, lemma and nodes, and usually by the absence of long white hairs in the panicle. Other characters given by Brown—small habit, puberulent under surface of blade—are inconstant.

Marquesas Islands: Nukuhiva: Mauu, 500 m, *Brown & Brown 717* (BISH, type, US); Taiohae, to 500 m, *Brown & Brown 738* (BISH); e. flank of Taiohae Bay, 200 m, *Decker 2221* (Fo, P); eastern Taiohae Bay front from old Fort Collet westward, 1-3 m, *Decker 2106* (Fo, P, US); Uea valley near Baie Marquisienne, strand above beach, 2 m, *Decker 2030* (Fo).

Hatutaa: s.w. coast, 100 m, *Decker 315* (BISH); Uapou: west flank, Hakahetua valley, 50-250 m (approx.), *Decker 2234* (Fo, P).

Uahuka: plateau west of Himaehi Bay, along Vaipae'e-Hane trail, 100-150 m, *Decker 1436* (Fo); crest of ridge west of Vaipae'e valley, 280-300 m, *Decker 1712* (Fo); ridge on east flank of Vaipae'e valley, below Tahoatikikau crater, 40-60 m, *Decker 1734* (Fo, P); ridge between Vaipae'e canyon and shallow upland basin to east, 2½ km inland from bay head, 175-185 m (approx.), *Decker 1811* (Fo); ridge crest south of central Vaipae'e valley, approx. 2 km east of bend, 450 m (approx.), *Decker 1887* (Fo); village of Vaipae'e, 1/4-1 km inland from bay head, Raioha

yard, 1-10 m (approx.), *Decker 1619* (Fo); broad basin in upland east of main Vaipae'e canyon and north of Tahoatikikau crater, 150 m (approx.), *Decker 1601* (Fo); southwestern outer slope and south and west rim of Tahoatikikau crater, 230-240 m (approx.), *Decker 1565* (Fo); east rim of Vaipae'e valley, approx. 50 m inland (north) from Hane-Hokatu trail, 75 m (approx.), *Decker 1558* (Fo); upper Ha'avei valley-Tehope'ote ahu, 200-250 m (approx.), *Decker 1459* (Fo); east flank of Hane Bay along trail, 30-40 m (approx.), *Decker 1383* (Fo).

Hiva'oa: Hanamenu valley, dunes behind beach, near sea level to 6 m (approx.), *Decker 1319* (Fo); Hanamenu valley, 0-15 m, *Decker 1301* (US, Fo, P); northwestern Puamau, 25-125 m (approx.), *Decker 963* (Fo, P), *Decker 948* (Fo); eastern Puamau valley, slope above sea about 1/2 km beyond Catholic Mission, 15-30 m (approx.), *Decker 720* (US, Fo, P), *Decker 706* (Fo); Miti taua'o'o, hill on southwest corner of Puamau Bay, 35 m (approx.), *Decker 658* (US, BISH, Fo, P); peninsula east of Puamau Bay, 150-250 m (approx.), *Decker 634* (Fo), *Decker 631* (Fo, P); ridge east of Motu'ua Bay, 30 m (approx.), *Decker 595* (Fo, P); central Puamau valley, house yard, home of Teaike André, 58 m (approx.), *Decker 522* (Fo); Puamau, *Decker 870*; Atuona, near sea level, *Mumford & Adamson 343 bis* (BISH), *Mumford & Adamson 265* (BISH); Atuona Beach, 1-2 m, *Sachet 1217* (Fo); road from Atuona to Tahauku, 10-20 m, *Sachet 1237* (Fo, P).

Mohotani, Momoei, *Mumford & Adamson 544* (BISH, Fo).

New Caledonia: Belade, *Vieillard 1476* (US)

New Hebrides: Espiritu Santo, *Burton S-28* (US)

Several Marquesan specimens, *Decker 1301*, *1436*, and *2030*, cited above, have a very few long hairs in the panicle, as well as being fairly luxuriant and having unusually ample panicles. These exceptions are scarcely such as to affect taxonomic separation of these populations on a varietal level. Vernacular name recorded on Uahuka "tapuvaehu'u."

***Crotalaria verrucosa* L.**

Society Islands: Tahiti, Faaa, *Macllet 125* (Fo). Mopelia Atoll, main islet, *Sachet 935* (Fo, P, US, BISH).

These seem to be the first collections of this species from the Society Islands. It was collected on Rarotonga, *Wilder 993* (BISH) and reported as *C. angulosa* Lam. by Wilder, Bishop Mus. Bull. 86: 57, 1931.

***Crotalaria spectabilis* Roth, Nov. Spec. 341, 1821.**

Crotalaria sericea Retz., Obs. Bot. 5: 26, 1789 (not *C. sericea* Burm. f. 1768). This homonymy was overlooked by de Munk, *Reinwardtia* 6: 214, 1962, who uses *C. sericea* Retz. for this species.

Marquesas Islands: s.l. *Moore 172* (US); Taiohae, *Brown 639* (BISH); Taio Haé Bay, *Chapin 708* (BISH); Taiohae Valley, 500-700 m, *Decker 2075* (Fo); Taiohae-Hatiheu trail, 500 m, *Decker 2156* (Fo); Taipivai, *Quayle 1595* (BISH).

Society Islands: Tahiti, s.l., *Setchell & Parks 166* (US, BISH); *Moore 214* (US).

Tuamotu Islands: Kaukura, *Whitney Exped. 2172* (US, BISH).

This has previously been known from eastern Polynesia as *C. sericea* Retz.

***Crotalaria retusa* L.**

Marquesas Islands: Hiva'oa: Atuona beach, *Sachet 1211* (US, BISH, Fo, P); eastern Puamau valley, about 1 km inland, 175 m, *Decker 1142* (Fo).

Society Islands: Huahine I., Fare, *McKee 3115* (BISH).

Evidently the first record from the Marquesas and from Huahine. It may be distinguished from *C. spectabilis* by the tiny subulate, rather than large, ovate stipules and bracts.

***Crotalaria semperflorens* Vent. ?**

Society Islands: Tahiti: Arue, *Maclet 73* (Fo)

This plant matches very well the scanty material available for comparison, but it is not certain that the latter is authentic. It is a blue-flowered plant, found growing in sandy soil near the sea, not previously recorded from southeastern Polynesia.

***Goethea strictiflora* Hook., Bot. Mag. t. 4677, 1852.**

This ornamental species, native of Brazil, is planted in Tahiti, at Papeari (*Maclet 19*).

***Hibiscus australense* Fosb. n. sp.**

Frutex stellato-tomentosus foliis ovatis vel cordatis sparse stellatis, flores racemosi breve pedicellati bracteis involucri integris calicibus hirsutis petalis purpureis sparse stellatis, filamentis apice ad basim staminalis columnae emersis, stigmatibus vix exsertis, capsulis late ovatis valde hirsutis.

Decumbent to erect shrub 2-3 m tall, stems up to 4 cm thick at base, densely stellate-tomentose, leaves with blades as much as 9 cm long, very broadly ovate to cordate, apex obtuse to acute or slightly acuminate, thinly stellate-pubescent especially on veins beneath, margins irregularly repand dentate, teeth very low and broad, petioles mostly 2-5 or 7 cm long; flowers racemosely arranged toward the tips of branches, pedicels very short to as much as 1 cm long, densely hirsute; involucre segments mostly 7-8 linear to linear-lanceolate, entire, not bifurcate at tips, 1-1.5 cm long, sepals ovate acuminate, united to about half-way up, up to 2 cm long, somewhat carinate, densely hirsute; corolla pale to deep magenta, darker in center, petals obovate, up to 7 or more cm long, at least 3 cm wide, sparsely stellate pubescent, rotate or recurved; staminal column 2-3.5 cm high, with anthers on short free filaments emerging all the way to the base, not crowded, anthers strongly bent back on themselves when dry, pollen brownish-orange; stigmas scarcely exserted, black or blackish magenta, with a narrow fringe of magenta hairs; fruit broadly ovoid, 1.5-2 cm long, blunt or rounded at apex, densely long hirsute, hairs very stiff.

Austral Islands: Rapa, 1/4 mile east of Ahurei, top of gravelly sea beach, 1 m, *St. John & Fosberg 15259* (BISH, type). Raivavae, w. slope of Mt. Raraterepa, base of basalt cliff, 190 m, *St. John & Fosberg 16053* (BISH); w. cliffs of Mt. Muatapu, base of cliff, 180 m, *Fosberg 11766* (BISH). Tubuai, n.e. slope Taitaa, rocky knoll, edge of forest, 330 m, *St. John 16337* (BISH); n. ridge of Tunarutu, base of cliffs on open slope, 140 m, *St. John 16511* (BISH).

This superficially resembles *H. youngianus* Gaud. of Hawaii but is softly stellate tomentose rather than hispid, involucre bracts not bifurcate at tips, sepals acute rather than acuminate, much shorter, not so strongly carinate; petals more coarsely and more sparsely stellate hairy; capsule shorter. The material was collected on the Mangarevan Expedition in 1934.

***Hibiscus hastatus* L.f., Suppl. 310, 1781 (non Cav. 1790).**

Hibiscus tricuspis Cav., Diss. 152, pl. 55 f. 2, 1790 (1787 acc. O. Ktze.)

Pariti hastatum (L.f.) Degener and Greenwell in Degener Fl. Haw. Fam. 221

Malvaceae, Pariti 2/15/57.

Cavanilles cites *H. hastatus* L.f. in synonymy of *H. tricuspis* so the latter name is superfluous and therefore illegitimate. This is a curious plant, with leaves varying from strongly trilobed to entire and ovate, or ovate-lanceolate, or oblong lanceolate, and with a drawn-down appearance to the veins at the base, reminding one of some mutant forms of *Gossypium* cultivated in experimental gardens, also suggesting attack by a mosaic disease. The following Tahitian specimens represent this species:

Papeari, garden of Motu-Ovini, 1-3 m, *Maclet 34* (Fo); Papeete, jardin de Mamao, 5 m, *Maclet 56* (Fo); Pirae, Service d'Agriculture, 5 m, *Maclet 88* (Fo) (the last a cultivated form with dark reddish green leaves, imported from New Caledonia).

***Pavonia papilionacea* Cav.**

An inquiry about this Tahitian species led to examination and study of the available material to determine if it were really a *Pavonia*, since this genus is otherwise unknown from Polynesia. Judging from the complete lack of collections during the last hundred years, the species must be extremely rare, possibly extinct. The plant looks much like a *Hibiscus*, and indeed was transferred to that genus by Poiret (Encycl. 5: 109, 1804), so a search was made in *Hibiscus*, but without results. Only the five collections cited below were found. Fortunately one sheet of the type collection at the British Museum has a part of a fruit in a pocket, which shows that the plant is actually a *Pavonia*.

The plant is apparently a suffrutescent herb; leaves cordate, tending to be obscurely lobed, stems and petioles stellate-tomentose, blades sparsely so beneath; leaves decreasing to bracts, buds few but crowded at tips of stems and small lateral branches, pedicels, involucre and calyces densely rusty short pilose tomentose, petals about 3 cm long, staminal column 25 mm long with free filament tips sparse below, denser above, up to about 1 cm long, style 3 cm long, branches 10, stigmas minute; fruit separating into (possibly) 5 carpids, these about 5 mm long, unarmed, with two lateral rugose ridges, slight median dorsal keel, apex slightly retuse but mucronulate, a constriction above the base.

Society Islands: Tahiti: without locality, *Banks and Solander* (BM, 2 sheets, one marked "D. D. Banks, Otaheite", the other "Tahiti—Capt. Cook, HB 14", P, 2 sheets, US); *Wiles L. Smith*, Voyage of Providence, 1792 (BM); *Barclay* (K); Hinds in 1841 (K); Fautaua Valley, very rare, *Bidwill* (K). The Banks and Solander collection is the type material, and since the sheet in the British Museum labelled *HB 14* is quite full, even though of small fragments, and has the fruit, which is diagnostic of the genus, it is here designated lectotype. The plant should be looked for in the lower valleys of the island. The Tahitian name "Fautea" is given on the labels of the *Barclay* and *Hinds* specimens.

***Terminalia samoensis* Rech.**

The plant referred to as *Terminalia littoralis* Seem. by Gerrit P. Wilder in his Flora of Makatea (Bish. Mus. Bull. 120: 36, 1934) is this species, common on strands in the western Pacific, but otherwise unknown in eastern Polynesia.

Makatea: Moumu, on sandy coral strand, 50 ft., *Wilder 1207* (BISH).

***Cordia lutea* Lam. Tabl. Encycl. 1: 421, 1792.**

Cordia rotundifolia R. & P., Fl. Per. 2: 24, t. 148, 1799.

Cordia marchionica Drake, Ill. Fl. Ins. Mar Pacif. 240, 1892; Fl. Polyn. Fr. 129, 1892.

This beautiful yellow-flowered species was reported by Brown (Bish. Mus. Bull. 130: 243, 1935) (as *C. marchionica*), and recently again by Decker (pers. comm.) as common in dry situations in the Marquesas where it is a component of thickets and scrub. That it is a strictly American component of the Marquesan flora was not even suspected by Brown, who tended to emphasize American relationships of the flora whenever he could find or even imagine them. However, comparison of the original material in Paris with type material of both *C. lutea* and *C. rotundifolia* shows that they are all undoubtedly conspecific. Marquesan material, "Groupe Sud-Est, *Henry 1916*" (P) and "commun, lieux secs, rochers, *Herb. S. F. I. M. 167*" (P) has the branchlets puberulent and sparsely hirsute, leaves pustulate scabrous above, sparsely hispidulous beneath, petioles appressed hirsute, and are in general less pubescent than the general run of American specimens. Specimens from Guayaquil, Ecuador (*Hartweg 679* (P)) and from Peru without locality (*Dombey* (P)) are less pubescent than most American specimens but still more so than *C. marchionica*. A specimen from Manabi, Ecuador (*Eggers* (P)) is fully as glabrous as the Marquesan sheets. A number of other sheets from Ecuador in the Kew herbarium (*Andre K. 1384*, *Hall 23*, *Heilborn 21* and especially *Lehmann B. T. 922*) are scarcely pubescent but not so venulose as most Marquesan specimens. *Eggers 15115* (K) seems an excellent match for *C. marchionica*, with leaves subglabrous, rough, and venulose beneath. There seems no doubt that this reduction should be made, and not even any reason for recognizing the Marquesan plants as a geographic variety.

Recent collections from the Marquesas are: Uahuka: east flank of Hane Bay, 30-40 m, "mako mako", *Decker 1399* (US, BISH, Fo, P). Hiva'oa: Hanamenu Valley, sea level to 15 m, *Decker 1340* (P, Fo); Hanatekea, between Nahoe and Eiaone Valleys, 30-92 m, "ma'o ma'o", *Decker 601* (US, BISH, Fo, P). Of these collections only No. 601 is as rough and venulose as are the collections from the Marquesas cited above. The other two are relatively smooth. All are nearly glabrous, as is a specimen just received from Hoho'i Valley Ua Pou Island, *Lavondès 24*.

That this species is native in South America, even though very weedy, is borne out by its occurrence in a situation that has scarcely, if ever, been visited by man, on a peak on one of the most inaccessible and undisturbed of the Galapagos, Wenman Island (*Fosberg 44960*).

Hyptis mutabilis* var. *polystachya (H. B. K.) Briq., in E. & P., Nat. Pfl. 4 (3A): 339, 1897.

H. polystachya H. B. K., Nov. Gen. Sp. 2: 321, 1817.

This variety, characterized by scabrous angles on the stems, calyx up to 4 mm long, and the peduncles of the capitulae 3-5 mm long, may be reported from Tahiti. The species is a widespread one of American origin.

Society Islands: Tahiti, Papeari *Maclet 131* (Fo).

Jacaranda obtusifolia H. & B.

This cultivated species may be reported from Tahiti, on the basis of *Maclet 151* (Fo). The obliquely oblong leaflets, obtuse at the apex, most readily distinguish it from the much more commonly planted *J. mimosifolia*. It is a native

of Venezuela and Colombia, South America.

Blumea sinuata (Lour.) Merr., Mem. Amer. Phil. Soc. 24(2): 388, 1935.

Gnaphalium sinuatum Lour., Fl. Coch. 497, 1790.

Conyza laciniata Roxb., Hort. Beng. 61, 1814, Fl. Ind. Ed. 2, 3: 427, 1832.

Blumea laciniata D.C. Prodr. 5: 436, 1836.

Society Islands: Mopelia Atoll, *Sachet 954a* (Fo, P, US, BISH).

This is the plant called *B. laciniata* (Roxb.) DC. by Randeria, *Blumea* 10: 258-260, 1960. She places *B. sinuata* among names of uncertain status, which scarcely seems justified as there has been no serious question about the identity of *Gnaphalium sinuatum* Lour. since Merrill identified it. This is the first record from the South Pacific east of New Caledonia, though it is known from Guam and Hawaii. It is doubtless introduced in the Pacific Islands, at least east of the Philippines and Indonesia.

Vernonia cinerea (L.) Less.

This weed, in its typical form, seems to be practically pantropic. Abundant material collected by Bryce Decker and M.-H. Sachet in the Marquesas Islands, Tahiti, Mopelia Atoll (*Sachet 931*) and Rangiroa Atoll (*Sachet 1351*) is, according to the treatment by Koster (*Blumea* 5: 408-414, 1935), all to be referred to var. *parviflora* (Bl.) DC., distinguished by the heads only 4-5 mm long, rather than 6-7 mm, and the often much broader leaves. Dr. Koster cites the Tuamotu Islands in the distribution of this variety, which occurs westward to the Keeling Islands, Ceylon and India.