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STUDIES OF PACIFIC ISLAND PLANTS, VI

NEW AND NOTEWORTHY FLOWERING PLANTS FROM FIJI

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THE PURPOSE of this and some of the following studies in this series is to discuss the novelties and other unusual plants collected by the writer in 1947.¹ Following the Engler and Prantl sequence, the present paper takes up the angiosperm families from Gramineae to Leguminosae, inclusive, with the exception of certain families which need detailed study in Fiji and the adjacent archipelagos. It is hoped to present limited revisions of such families in the near future. No attempt is made in this series to list all the species collected; since the basic publication on the flora of Fiji, Seemann's *Flora Vitiensis* (1865–1873), so much material from Fiji has been assembled that a new Flora is urgently needed. Until such a work can be undertaken, it seems a matter of minor interest to list repeated collections of a species, unless thereby noteworthy distributional or morphological data can be presented.

In studying my 1947 collection I have been generously aided by the following specialists, who have undertaken identifications in their respective groups: Mr. A. H. G. Alston (*Selaginella*), Mr. E. B. Bartram (Musci), Prof. J. T. Buchholz (Coniferae), Prof. E. B. Copeland (Filicales),² Dr. C. W. Dodge (Lichenes), Dr. Francis Drouet (Algae), Dr. Margaret Fulford (Hepaticae), Dr. R. A. Howard (Icacinaeae), Dr. C. E. Kobuski (Theaceae, *Jasminum*), Prof. H. J. Lam (Sapotaceae),

¹ The collections upon which these studies will be primarily based were obtained in Fiji between April, 1947, and January, 1948, during a trip made under the auspices of the Arnold Arboretum of Harvard University and the John Simon Guggenheim Memorial Foundation. Generous financial assistance is also gratefully acknowledged from the Penrose Fund of the American Philosophical Society and the Bache Fund of the National Academy of Sciences.

² COPELAND, EDWIN B. Further Notes on the Ferns of Fiji. *Jour. Arnold Arb.* 30: 433–442. 1949.

Dr. H. N. Moldenke (Verbenaceae),³ Dr. S. J. Van Ooststroom (Convolvulaceae), Dr. L. M. Perry (Pandanaeae, Myrtaceae), Mr. Charles Schweinfurth (Orchidaceae), Dr. E. E. Sherff (*Dodonaea*, *Bidens*), Mr. V. S. Summerhayes (*Ficus*), Dr. H. K. Svenson (Cyperaceae), Mr. J. R. Swallen (Gramineae), Dr. W. L. White (Fungi), and Prof. T. G. Yuncker (*Peperomia*, *Cuscuta*).⁴ I am greatly indebted to these students for their coöperation. Thanks are also due Dr. E. D. Merrill for his assistance in certain preliminary identifications; the card-catalogue of Polynesian references compiled by Dr. Merrill, now deposited at the Arnold Arboretum, has been a source of valuable information.

ITINERARY

The part of Fiji most in need of botanical exploration, in 1947, still seemed to be the interior of Viti Levu, in spite of large collections made by Gillespie, Degener, and others during the last two decades. My principal objectives were certain isolated upland areas in western Viti Levu and the central plateau of the island.

The western half of Viti Levu and a strip along the north coast are relatively dry, characterized by grassland and thickets, interspersed with limited valley patches of forest. This type of country is locally known as the *talasinga*, in contrast to the *veikau*, or rain-forested area which covers southeastern Viti Levu. The *talasinga* of western Viti Levu is interrupted by two major mountain masses which are high enough to receive a heavy rainfall on their upper slopes. The higher of these mountain systems, the Mt. Evans Range, lies about ten miles east of Lautoka and the same distance southwest of Mba. About five weeks, in April and May, 1947, were spent in collecting on the eastern slopes of this range, with the village of Nalotawa as a base. Several trips were made up the slopes and some time was spent on the summit of the highest peak, Koroyanitu (1195 meters). The Mt. Evans Range has been occasionally visited by Mr. William Greenwood, whose collections from it proved of unusual interest, but his work was done on the western side of the range, above Lautoka, from which side Koroyanitu is practically inaccessible. A brief report on this part of my trip has been published.⁵

The second forested mountain mass arising from the *talasinga* of western Viti Levu is the range dominated by Mt. Koromba [Pickering Peak], which lies about twelve miles southeast of Nandi. For two weeks, in May and June, I collected in this area, with the village of Tumbenasolo as a base, visiting the slopes and summit of Mt. Koromba (1075 meters) and also the area to the east, in the drainage of Singatoka River tributaries.

Headquarters from the middle of June to the first part of October were

³ In *Phytologia* 3: 60. 1949, Dr. Moldenke describes a new variety of *Faradaya vitiensis* based on the present collection.

⁴ YUNCKER, T. G. Additional Notes on the Fijian Species of *Peperomia*. *Jour. Arnold Arb.* 30: 443-449. 1949.

⁵ SMITH, A. C. An Ascent of Koroyanitu. *Proc. Nat. Acad. Sci.* 34: 579-585. 1948.

made at Nandarivatu, situated on the edge of the northern escarpment of the island, about ten miles inland from the north coast. Nandarivatu until recently was the government station for the Province of Tholo North, which has now been divided among four other provinces. For years it was a popular resort for Europeans, but it is now deserted and its European-type buildings are falling into decay. Dr. J. W. Gillespie (cf. Bishop Mus. Bull. 74: 3. 1930), who spent about two months at Nandarivatu, describes it as "one of the finest locations for botanical study I have ever seen." This description is still merited, although the amenities of a government rest-house and of companionship are in the past. Mr. Otto Degener⁶ also spent some time in the vicinity of Nandarivatu in 1941. The settlement is located on the northern edge of the rain-forest which continues unbroken for nearly 50 miles to the south and east coasts of Viti Levu.

In order not to duplicate too closely the work of Gillespie and Degener, nor of Gibbs and im Thurn, who made earlier and smaller collections in this general region, I attempted to reach areas not visited by them. Some weeks were spent on the northern portion of the Rairaimatuku Plateau, the central upland of Viti Levu which occupies an area of about 25 by 15 miles to the south of Mt. Tomanivi (Mt. Victoria, the highest peak in Fiji, with an elevation of 1323 meters). The Rairaimatuku Plateau has an average elevation of perhaps 700 or 800 meters; it is a heavily forested, rough, and often poorly drained area demarcated by eroded escarpments except on the north, where it rises into the slopes of Mt. Tomanivi. The western edge of the plateau, paralleling the Singatoka River, rather sharply marks the line between forest and grassland in this part of Viti Levu. My headquarters here was the village of Nandrau, below the western edge of the plateau, upon which trips were made to the east and south. Insufficient time was spent in this area; the more heavily forested eastern part of the plateau, in the drainage of tributaries of the Wainimala River, would repay intensive field-work.

Although other botanists have ascended Mt. Tomanivi, I did not try to resist the temptation to climb this highest Fijian peak. Two ascents were made, in July and September, by means of a southwestern spur which has served nearly every party to climb this mountain, which offers no real difficulties. The summit of Mt. Tomanivi is the type locality of several species of plants. I spent many days on various parts of the southern and western slopes of the mountain, hoping to reach areas not previously botanized.

Provincial boundaries in central Viti Levu will prove confusing to botanists who do not have available the most recent maps published by the Lands and Survey Department, Suva. A few years ago a sweeping change was made in the limits of these provinces, in order to make them conform more closely to traditional clan lines of the population. The three "hill provinces," Tholo North, Tholo East, and Tholo West, have now

⁶ DEGENER, OTTO. Naturalist's South Pacific Expedition: Fiji, 82-98. 1949.

been discontinued as administrative entities. Tholo North has been largely absorbed into the enlarged Province of Mba, which now also includes the whole of the former Provinces of Lautoka and Nandi. However, the southern part of Tholo North, together with most of Tholo West and Nandronga, now falls into the new Province of Nandronga & Navosa. The northeastern portion of Tholo North is now incorporated into the Province of Ra. A small portion of southeastern Tholo North, together with most of Tholo East, is now absorbed by the greatly enlarged Province of Naitasiri. The southern and eastern provinces, Serua, Namosi, Rewa, and Tailevu, remain essentially unchanged. Therefore Viti Levu is now divided into only eight administrative provinces rather than thirteen, as formerly. In this paper the new provincial boundaries are utilized. I also continue to use the phonetic spelling of place names which has now been adopted by the Lands and Survey Department. The use of arbitrary letters for certain sounds, as adopted locally in Fiji (cf. Degener, Naturalist's South Pacific Expedition: Fiji, 35-36. 1949), can only add confusion to scientific writings.

My last two months of field work were spent in northern Vanua Levu. This island, second in size in Fiji, is of great interest botanically, and I had desired to revisit it since my first trip there in 1933 and 1934.⁷ At that time I collected in the southern and western provinces of the island, Thakaundrove and Mbua, which are predominantly forest-covered. From October to December, 1947, I worked in the northern province, Mathuata. The northern part of Vanua Levu somewhat resembles western Viti Levu in general aspect, being *talasinga* country, but some of the hills are covered with a fairly thick forest. Two headquarters were established, the first at Lambasa, the only town of any size on Vanua Levu. The nearby hill known as Mt. Numbuiloa was collected fairly intensively; this hill (590 meters) supports a very dense forest of a comparatively dry type. In spite of its accessibility the region had not been botanized, except to a certain extent by Mr. William Greenwood, who for a time was resident in Lambasa.

Final headquarters were in the village of Natua, which lies about twelve miles inland from Nanduri, near the center of the island. This part of Vanua Levu is locally known as the Seanggangga Plateau, a slightly elevated area (100-200 meters) drained by the Korovuli River and other tributaries of the Ndreketi River. The grassland is interrupted by many small patches of dense forest which afford excellent collecting, and visits were made to the Mathuata Range, a coastal ridge which dominates north-central Vanua Levu and is well forested on its southern and upper slopes. The Mathuata coast of Vanua Levu is botanically a historical locality, as members of the U. S. Exploring Expedition and also Seemann worked along it briefly, although presumably they did not penetrate inland; it is the type locality of many species proposed by Gray, Seemann, and others.

⁷ SMITH, A. C. Plant Collecting in Fiji. Jour. N. Y. Bot. Gard. 35: 261-280. figs. 1-7. 1934.

As a result of my 1947 work, 2912 numbers, in sets of 10, were collected. The first set is deposited in the herbarium of the Arnold Arboretum (with special groups at other Harvard herbaria), and an essentially complete second set is placed in the U. S. National Herbarium. The remaining sets will be distributed from the Arnold Arboretum when identifications have been completed. It is not to be expected that a trip of this sort can succeed in filling in all the botanical "blind spots" in a rich and varied country like Fiji, although this archipelago is now better known to botanists than many of the southwestern Pacific groups. Considerable areas of forest land, including some little known mountains, remain to be botanically explored on Viti Levu and Vanua Levu, while many of the smaller islands have never been botanized.

The place of deposit of specimens cited in this paper is indicated by the usual abbreviations: Arnold Arboretum (A); Gray Herbarium (GH); New York Botanical Garden (NY); and U. S. National Herbarium (US). Mr. Swallen has kindly prepared the portion dealing with new and unusual grasses.

GRAMINEAE

by Jason R. Swallen

Ischaemum ciliare Retz. Obs. Bot. 6: 26. 1791.

VITI LEVU: Tailevu: Near Nausori, *Greenwood 1138* (GH, US) (recently seen prostrate grass in shady places); Naitasiri: Mbatiki & Government Station, *B. E. Parham 2623* (GH).

Apparently a recent introduction.

Digitaria fuscescens (Presl) Henr. in Meded. Rijks Herb. Leiden 61: 8. 1930.

VITI LEVU: Mba: Southern slopes of Mt. Ndelainathovu, on the escarpment west of Nandarivatu, alt. 870–970 m., *Smith 4953* (GH, US) (prostrate, naturalized along trail in dense forest).

Differs from *Digitaria longiflora* (Retz.) Pers. in having rather densely hairy spikelets. Not previously recorded from Fiji.

Digitaria violascens Link, Hort. Berol. 1: 229. 1827.

VANUA LEVU: Mathuata: Banks of lower Lambasa River, at sea-level, *Smith 6632* (GH, US) (along inner edge of mangrove swamp).

Specimens reported from Fiji as *Digitaria chinensis* Hornem. are probably referable to this species. The record of *D. violascens* is new to Fiji.

Brachiaria subquadripara (Trin.) Hitchc. in Lingnan Sci. Jour. 7: 214. 1931.

VITI LEVU: Mba: Lautoka, *Greenwood 93A* (GH, US); Naitasiri: Near Nanduruloulou, *Greenwood 93B* (GH, US).

The Fijian specimens which have previously been reported as *Brachiaria distachya* (L.) Stapf are probably referable to this species. *Brachiaria distachya*, of India, differs in being a usually smaller plant, having short ovate-lanceolate blades and usually only two racemes, the peduncle being

pilose toward the summit. Some apparently intermediate plants occur, and *B. subquadripara* may be only a variety of *B. distachya*.

Brachiaria erucaeformis (Smith) Griseb. in Ledeb. Fl. Ross. 4: 469. 1853.

VITI LEVU: Mba: Lautoka, near sea-level, *Greenwood 1194* (GH, US) (on edge of drain).

The first record of this species from Fiji.

Isachne dispar Trin. Gram. Icon. 1: 8. pl. 86. 1827.

VITI LEVU: Mba: Nandarivatu, alt. 800 m., *Greenwood 1178* (GH, US) (in open sunny swampy ground near creek).

This specimen represents a second species of *Isachne* in Fiji. It compares very well with specimens cited in Hooker's Flora of British India, but in leaf characters it does not compare well with Trinius' plate. Since the spikelets are in rather poor condition and the range extension is so great, the record should be considered doubtful until more adequate material is available.

Eragrostis scabriflora Swallen in Jour. Wash. Acad. Sci. 26: 179. 1936.

VITI LEVU: Nandronga & Navosa: Southern slopes of Nausori Highlands, above Tumbenasolo, alt. 360 m., *Greenwood 1190* (GH, US) (on dry open ridges). KANDAVU: Between Richmond and Naloto, *B. E. Parham 3001* (GH, US).

The first specimen cited differs from the type in having longer, spreading panicle branches. The species was described from the island of Aiwa, southeast of Lakemba, in the central Lau Group of Fiji.

Garnotia foliosa Swallen, sp. nov.

Perennis; culmi dense caespitosi, erecti, 48–85 cm. alti, glabri, nodis appresso-pilosis; vaginae plus minusve carinatae, glabrae vel sparse papilloso-pilosae, collo densissime pilosae, inferiores internodiis longiores, superiores internodiis multo breviores; ligula membranacea, minute ciliata, 0.5 mm. longa; laminae 5–13 cm. longae, 6–10 mm. latae, erectae, acuminatae, planae, supra papilloso-pilosae vel subglabrae, marginibus scabrae, infra purpureae; paniculae 6–10 cm. longae, erectae, ramis paucis appressis; spiculae breviter pedicellatae, appressae, callo brevissime barbatae; glumae nervis scabrae, aristatae, arista 1.5–3 mm. longa scabra, prima 3.5 mm. longa, secunda 4.3 mm. longa; lemma 3.5 mm. longum, glabrum, arista scabra 6–7.5 mm. longa; palea lemmate ca. 1/3 brevior.

VANUA LEVU: Mathuata: Summit ridge of Mt. Numbuiloa, east of Lambasa, alt. 500–590 m., Nov. 6, 1947, *Smith 6520* (GH, US TYPE) (in dense crest forest).

The broad, purplish, erect blades and narrow, long-exserted panicles give this species a very distinctive appearance.

Garnotia gracilis Swallen, sp. nov.

Perennis; culmi gracillimi, ramosissimi, erecti vel adscendentes, glabri, 18–36 cm. alti; vaginae internodiis longiores, sparse papilloso-pilosae

pilis longis; ligula membranacea, ca. 0.3 mm. longa; laminae 3–6 cm. longae, 1.5–2.5 mm. latae, planae, acuminatae, tenuës, rigide divergentes vel reflexae, glabrae vel sparse pilosae; paniculae longe exsertae, 3–8 cm. longae, ramis brevibus, appressis, paucifloris; spiculae callo brevissime barbatae; glumae nervis scabrae, acuminatae vel brevissime aristatae, secunda 4.5 mm. longa, prima paulo brevior; lemma 4 mm. longum, glabrum, arista scabra 5–8.5 mm. longa; palea angusta lemma aequans.

VITI LEVU: Mba: Slopes of Mt. Nairoso, eastern flank of Mt. Evans Range, alt. 700–1050 m., May 14, 1947, *Smith 4413* (GH, US TYPE) (in dense mats on open summit); northern portion of Mt. Evans Range, between Mt. Vatuyanitu and Mt. Natondra, alt. 700–900 m., *Smith 4338* (GH, US).

The very slender branching culms, relatively short, stiffly spreading or reflexed blades, and narrow, few-flowered panicles are characteristic.

***Garnotia divergens* Swallen, sp. nov.**

Perennis; culmi graciles, ramosissimi, glabri, 35–40 cm. alti; vaginae internodiis longiores, glabrae, in ore et collo longe pilosae; ligula membranacea, 1 mm. longa; laminae usque ad 12 cm. longae, 2.5 mm. latae, attenuatae, glabrae, adscendentes, planae vel subconvolutae, plus minusve curvatae; paniculae 4–8 cm. longae, longe exsertae, ramis solitariis vel binis, rigide divergentibus, inferioribus usque ad 3 cm. longis; spiculae 3 mm. longae, callo glabrae; glumae acutae, aequales; lemma glumam aequans, arista 1–3 mm. longa.

VANUA LEVU: Mathuata: Summit ridge of Mt. Numbuiloa, east of Lambasa, alt. 500–590 m., Nov. 6, 1947, *Smith 6519* (GH, US TYPE) (in dense mats in dense forest).

This species resembles the preceding in having branching culms, but the blades are erect or ascending, usually convolute, and the panicle branches are much longer and stiffly spreading.

***Garnotia villosa* Swallen, sp. nov.**

Perennis; culmi adscendentes, circiter 50 cm. alti, multinodosi; vaginae internodiis multo longiores, summo dense villosae; ligula brevissima; laminae 12.5–16 cm. longae, usque ad 10 mm. latae, planae, subattenuatae, marginibus basi ciliatae; paniculae 16–20 cm. longae, laxae, ramis gracilibus, verticillatis, inferioribus usque ad 7 cm. longis; spiculae 3.5–4 mm. longae, paulo distantes, breviter vel longe pedicellatae, callo sparse et breviter barbatae; glumae acuminatae secunda quam prima paulo longior; lemma glabrum, acuminatum vel breviter aristatum.

VITI LEVU: Namosi: Mt. Korombasambasanga, *B. E. Parham 2162* (GH TYPE).

In spikelet characters this species is similar to *Garnotia stricta* Brongn., but the numerous, overlapping, villous sheaths, the broad blades, and the lax panicles readily distinguish it.

***Garnotia linearis* Swallen sp. nov.**

Perennis; culmi 38–±60 cm. alti, erecti vel adscendentes, nodis inferioribus radicales, glabri; vaginae carinatae, internodiis longiores, summo

longe pilosae, collo dense villosae; ligula membranacea, eroso-ciliata, 0.5 mm. longa; laminae 6–14 cm. longae, 3–4 mm. latae, planae, attenuatae, glabrae, basi longe pilosae; paniculae circiter 18 cm. longae, angustae, ramis solitariis, distantibus, appressis, inferioribus usque ad 4.5 cm. longis; spiculae breviter pedicellatae, callo glabrae vel breviter barbatae; glumae subaequales vel secunda paulo longior, acuminatae, secunda arista gracili 1–6 mm. longa praedita; lemma 3.5 mm. longum, glabrum, acuminatum, arista gracillima, flexuosa, 8–10 mm. longa; palea angusta, lemma subaequans.

KANDAVU: Near Ndaku Village, *B. E. Parham 2964* (GH TYPE).

This species differs from all the others described above in the long linear blades, and in the long, very slender flexuous awn of the lemma.

The only species of *Garnotia* reported from the Fiji Islands is *G. stricta* Brongn., described from Tahiti. No specimens have been seen which agree with the original description and the excellent accompanying illustration. Since the species of *Garnotia* are apparently localized and limited in distribution, it seems very unlikely that *G. stricta* occurs in Fiji. The species described above are very distinct from each other, and have characters very different from those of *G. stricta*.

Leptaspis angustifolia Summerh. & C. E. Hubb. in *Kew Bull.* 1927: 40, 78. 1927.

VANUA LEVU: Mathuata: Southern slopes of Mt. Numbuiloa, east of Lambasa, alt. 350–500 m., *Smith 6583* (GH, US) (on steep rocky slope in open forest); Mbambuambua or Nasuvu Hill, near Lambasa, *Fil. Raiqiso 1506* (GH); near Lambasa, *B. E. Parham 2413* (GH).

The species was described from near Lambasa and is apparently restricted to this region.

Erianthus maximus Brongn. in *Duperrey, Bot. Voy. Coquille* 2(2): 97. 1831.

VITI LEVU: Mba: Vicinity of Nalotowa, eastern base of Mt. Evans Range, alt. 550–600 m., *Smith 4309* (GH, US).

The specimen is a cultivated form, locally called “Ndule,” in which the inflorescence remains undeveloped. It is commonly boiled and eaten by the natives. Grassl (in *Jour. Arnold Arb.* 27: 247. 1946) refers to it as “hort. var. Abortive,” considering it to be of different origin than *Saccharum edule* Hassk., which is similarly used in New Guinea. Specimens of these abortive forms are rare in herbaria, the one cited being the only one in the U. S. National Herbarium.

PALMAE

Calamus vitiensis Warb. ex Becc. in *Ann. Bot. Gard. Calcutta* 11: 350. *pl.* 143. 1908.

VITI LEVU: Naitasiri: Navuakethe, Nanduna, *B. E. Parham 5642* (A).

The cited specimen, although consisting only of the middle portion of a leaf with four complete leaflets, so precisely agrees with Beccari's description and plate that one can refer it to *C. vitiensis* with confidence. The collection, in spite of its incomplete nature, is of great interest as apparently being the only specimen known other than the type, *Weber 111*, from Taveuni, deposited in the Berlin herbarium and presumably destroyed.

Vitiphoenix pedionoma sp. nov.

Palma ad 10 m. alta, caudice circiter 20 cm. diametro, frondis vagina cylindrica ampla; petiolis rhachibusque primo inconspicue pallido-leprosis mox glabris, frondibus circiter 4 m. longis superne cernuis, segmentis inferioribus 6–10 cm. inter se distantibus, superioribus densius dispositis; petiolo 40–60 cm. longo, rhachi robusta ad 2 cm. lata utrinque rotundata marginibus subacuta; frondis segmentis utrinsecus circiter 50 apicalibus exceptis subsimilibus lanceolatis, 55–75 cm. longis, 4–5.5 cm. latis, subrigidis, inferne gradatim angustatis, basi curvatis, superne attenuatis, apice bifidis vel irregulariter fissis plus minusve destructis, subtus basim versus paleis anguste linearibus tortis ad 1 cm. longis sparsim praeditis, nervis marginalibus validis, segmentis superioribus longitudine et latitudine decrescentibus, apicalibus circiter 20 cm. longis; spadice 3- vel 4-plo ramoso circiter 60 cm. longo et lato haud pedunculato, rhachi ramis ramulisque glabris inferne valde angulosis, ramis primariis numerosis conspicue (ad 10 cm.) pedunculatis, ramulis copiosis, floriferis 12–16 cm. longis in internodiis dimidia partis circiter 2 mm. diametro ad apicem glomerulis in spira laxa dispositis; florum glomerulis 3-floris, flore femineo intermedio bracteis surgentibus conspicuis circiter 1 mm. altis persistentibus circumdato; floribus masculis anguste ellipsoideis 7–8 mm. longis, calyce circiter 2.5 mm. diametro, sepalis late rotundatis $1.5-2 \times 2.5-3.5$ mm., petalis oblongis circiter $6.5 \times 2.5-3$ mm. apice obtusis, staminibus 30–35, filamentis filiformibus 1.5–2 mm. longis, antheris linearibus 3.5–4.5 mm. longis basi sagittatis apice incis, connectivo in sicco fusco-castaneo, pistillodio filiformi quam staminibus paullo longiore; floribus femineis triquetris-subglobosis sub anthesi 3–3.5 mm. diametro, sepalis late rotundatis $1.5-2 \times 2.5-3.5$ mm., petalis triangulari-ovatis circiter 2 mm. longis apice subacutis valvatis, gynaeceo ovoideo stigmatibus 3 triangularibus; fructu maturo ellipsoideo rubro cum perianthio in sicco circiter 15 mm. longo et 7 mm. lato, apice breviter rostrato, extus sclerosomatibus densissime lineolato, pericarpio tenui haud 0.3 mm. crasso, semine utrinque rotundato; perianthio fructifero cupuliformi 4–5 mm. alto et 5–6 mm. diametro, sepalis rotundatis, petalis apice breviter triangularibus.

VANUA LEVU: Mathuata: Seanggangga Plateau, in drainage of Korovuli River, vicinity of Natua, alt. 100–200 m., Nov. 25, 1947, *Smith 6635* (A TYPE, US) ("niuniu"; palm in patches of forest in open rolling country; caudex to 10 m. high and about 20 cm. in diameter; fronds in a dense crown, about 4 m. long, the base expanded into a long sheath surrounding the trunk, the petiole 40–60 cm. long, the pinnae about 50 pairs, crowded distally; inflorescences several below leaves, freely branched, each

forming a mass about 60 cm. in diameter; perianth and stamens white, the fruit at length red; leaves used for thatching; wood used for canoe-ribs, etc.).

Of the two described species of Burret's subgenus *Acmophoenix*, like which it has conspicuous broad bracts subtending the pistillate flowers, *V. pedionoma* is more closely allied to *V. petiolata* Burret. It differs, however, in its larger and longer-petiolate fronds with more numerous and broader segments, which are irregularly and more deeply split distally, in its larger and more copiously divided spadix, in its proportionately narrower staminate flowers and fewer stamens, and in its shorter and proportionately broader fruit. From the other known species of the subgenus *Acmophoenix*, *V. sessilifolia* Burret, the new species differs in obvious proportions of its fronds and in its more robust inflorescence-parts.

***Balaka leprosa* sp. nov.**

Palma 3–7 m. alta, caudice 2–5 cm. diametro; frondibus 1–2 m. longis, vagina ut petiolis rhachibusque copiose et subpersisterenter leprosis, squamulis teneris circiter 1 mm. diametro, centro badiis, margine ramulis gracilibus albidis numerosis ornatis; vagina cylindrica robusta ad 5 cm. lata apice contracta; petiolo subnullo 6–10 mm. diametro segmentos 1–3 valde reductos utrinsecus margine gerente; frondis segmentis (basalibus minutis exceptis) utrinsecus 11–13 regulariter dispositis; segmentis mediis ad 15 cm. longis et 10 cm. latis, nervis 3 utrinque prominentibus, apice oblique praemorsis, basi valde contractis; segmentis apicalibus suboppositis oblique truncato-praemorsis apice 9–20 cm. latis, basi contractis rhachi 2.5–8 cm. adnatis; spadice fructifero pedunculo incluso ad 40 cm. longo duplicato-ramoso, ramis angularibus fusco-furfuraceis, primariis 3–7 fructiferis 10–18 cm. longis; pedunculo sub fructu (4–)8–13 cm. longo gracili 6–8 mm. lato basi amplexante ad 4 cm. lato medium versus spatharum cicatricibus 2 vel 3 ornato, spathis ad 22 cm. longis et 3 cm. latis deciduis; glomerulis distichis demum 4–6 mm. distantibus, 3-floris, flore intermedio femineo, glomerulis apicem versus plerumque 1-floris masculis; floribus masculis circiter 5 mm. longis, sepalis ovatis late imbricatis circiter 1.5 × 2 mm. apice rotundatis margine inconspicue ciliatis, petalis valvatis oblongis circiter 4.5 × 2 mm. striatis apice obtusis, staminibus inclusis circiter 25, filamentis gracilibus circiter 1 mm. longis, antheris 2.5–3.5 mm. longis basi sagittatis, connectivo in sicco rubro, pistillodio petalos subaequante; floribus femineis triquetris-subglobosis sub anthesi ad 6 mm. diametro, sepalis late convolutivo-imbricatis circiter 5 mm. longis et 10 mm. latis apice rotundatis extus inconspicue leprosis, petalis sepalis subsimilibus apice valvato obtusis margine scariosis ciliatis, gynaecio sub anthesi ad 5 mm. longo; perianthio fructifero cupuliformi ad 15 mm. alto et 20 mm. diametro, sepalis rotundatis parvis, petalis imbricatis valde striatis apice breviter mucronatis; fructu maturo aurantiaco oblongo-ovoideo, in vivo tereti ad 4 cm. longo et 1.7 cm. lato, in sicco obtuse angulari, basi obtuso, apice in rostrum gradatim contracto; epicarpio tenui sclerosomatibus densis lineolatis ornato; endocarpio lignoso ad 40 mm. longo et 13 mm. lato 4-angulari, angulis 3 valde prominentibus apice ad

2 mm. productis, inter angulos inconspicue oblique costato, in rostrum angustum 12–14 mm. longum subito contracto; semine maturo 4-angulati, 21–24 mm. longo, circiter 7 mm. diametro, basi rotundato, apice in rostrum plus minusve conspicuum ad 6 mm. longum producto.

VITI LEVU: Mba: Hills east of Nandala Creek, about 3 miles south of Nandarivatu, alt. 850–970 m., Sept. 25, 1947, *Smith 6219* (A TYPE, US) (“mbalaka”; slender palms 3–5 m. high, in dense forest; caudex straight, 3–5 cm. in diameter; fronds in a crown at apex, usually 1–1.5 m. long; inflorescence lateral below leaves, up to 40 cm. long with 3–7 lateral branches; perianth green; stamens white; mature fruit bright orange, about 3–4 cm. long); Vuninatambua, Navai, alt. about 900 m., *Degener 14764* (A, US) (“mbalaka”; palm about 7 m. high, in dark forest; fronds to 2 m. long; fruit bright orange-red, succulent, the kernel edible; ceremonial spears made from caudex).

The new species is characterized by its essentially sessile fronds, the copious scurfy indument of the leaf-rachis and inflorescence-branches, and its large fruits. In the last character it suggests *B. macrocarpa* Burret, from which it differs not only in its insignificant petioles and more copious indument, but also in its much shorter and broader leaf-segments. *Balaka longirostris* Becc. is another large-fruited Fijian species, described from fruits alone; in comparison with this species, *B. leprosa* has the endocarp longer, narrower, and with the three sharp angles distally produced into acute appendages rather than distally obtuse.

Goniocladus petiolatus Burret in Notizbl. Bot. Gart. Berlin 15: 87. 1940.

VITI LEVU: Ra: Ridge from Mt. Namama (east of Nandarivatu) toward Mt. Tomanivi [Mt. Victoria], alt. 1050–1120 m., *Smith 5700* (A, US) (palm 8 m. high, in dense forest; trunk slender, about 10 cm. in diameter near base, slightly narrowed distally; fronds about 1.5 m. long, the stipe about 15 cm. long, expanded into a broad sheathing base up to 30 cm. long surrounding apex of trunk, the pinnae 25–30 pairs; inflorescences clustered below fronds, about 25 cm. long, with 8–10 lateral branches); Mba: Vuninatambua, Navai, alt. about 900 m., *Degener 14792* (A, US) (“tangandanu”; in forest; trunk about 2 m. high, the fronds up to 2 m. long; entire inflorescence purple-brown); Nandronga & Navosa: Vicinity of Nandrau, alt. about 600 m., *Degener 14893* (A) (“tangandanu”; juvenile palm, in forest).

The cited specimens agree very closely with Burret’s detailed description of the only species of his new genus. The plant is otherwise known from the type, collected on the southern part of the central plateau of Viti Levu. The collections cited above are from the northern extension of the same mountain-complex.

ZINGIBERACEAE

Alpinia Hemsleyana K. Schum. in Pflanzenr. 20[IV. 46]: 348. 1904.

VITI LEVU: Mba: Slopes of Mt. Nairoso, eastern flank of Mt. Evans Range, alt. 700–1050 m., *Smith 4087* (A, US) (coarse herb to 3 m. high, in dense forest; leaves 1–1.5 m. long; inflorescence terminal, nodding, 50–60 cm. long; corolla at length dull orange); Naitasiri: Waindina River

basin, alt. 75 m., *MacDaniels 1058* (GH) ("vava"; perennial herb 4 m. high, in rain-forest; rachis 60 cm. long, the peduncle about 40 cm. long).

The species has otherwise been recorded only from the type specimen, *Horne 593*, from the island of Rambi.

***Alpinia macrocephala* K. Schum.** in *Pflanzenr.* 20[IV. 46]: 350. 1904.

VITI LEVU: Mba: Hills between Nggaliwana and Tumbeindreketi Creeks, east of the sawmill at Navai, alt. 725–800 m., *Smith 5873* (A, US) ("mboia"; coarse simple-stemmed herb up to 6 m. high, in dense forest; leaves alternating on distal part of stem, about 1.5 m. long; inflorescence apical, composed of a compact subspherical mass of flowers about 20 cm. in diameter, the outer bracts oblong, about 15 × 8 cm.; calyx white with brown sericeous pubescence; corolla, filaments, and style white; fruit green, about 3 × 2 cm.). OVALAU: *U. S. Expl. Exped.* (GH).

The species has previously been recorded only from the type, a Horne specimen without definite locality. It is a striking and highly characteristic plant, being the only Fijian member of the small section *Amomiceps* K. Schum.

PIPERACEAE

***Piper crispatum* A. C. Sm.** in *Jour. Arnold Arb.* 24: 354. 1943, 27: 319. 1946.

VITI LEVU: Mba: Summit of Mt. Koroyanitu, high point of Mt. Evans Range, alt. 1165–1195 m., *Smith 4196* (A, US) (liana; abundant but uncommonly flowering; spikes ivory-white; also occurring on upper slopes).

The cited collection is the third of the species known to me. The type lacked locality data, but Mr. Greenwood has also obtained a specimen from the Mt. Evans Range. The present collection, like the type, bears pistillate spikes, and offers no essential points of difference.

***Piper stipulare* A. C. Sm.** in *Jour. Arnold Arb.* 24: 354. 1943.

VITI LEVU: Mba: Western and southern slopes of Mt. Tomanivi [Mt. Victoria], alt. 850–1150 m., *Smith 5245* (A, US) ("wa ndai"; liana, in dense forest; fruiting spikes up to 12 mm. in diameter).

The three previously known collections of this species have also come from Viti Levu, two of them from lower elevations in the southeastern part of the island and the third without definite locality. The new collection differs slightly in having its leaf-blades shallowly cordate at base rather than obtuse or rounded, while the principal nerves are not quite so highly concurrent, sometimes diverging essentially from the base of the blade. The fruiting spikes are 5–7 cm. long excluding the peduncle, which is 14–17 mm. long. The fruits are obovoid, semi-immersed in the rachis, and 2–3 mm. in apical diameter.

***Piper oxycarpum* C. DC.** in *Jour. Linn. Soc. Bot.* 39: 164. 1909; A. C. Sm. in *Jour. Arnold Arb.* 24: 355. 1943.

VITI LEVU: Mba: Northern slopes of Mt. Namendre, east of Mt. Koromba [Pickering Peak], alt. 750–900 m., *Smith 4552* (A, US).

The previously known representatives of this well marked species have

been obtained, as far as locality-data are available, near Nandarivatu, in the old Province of Tholo North. My locality cited above is in the old Province of Nandi, now incorporated into Mba. Although it is sterile, no. 4552 clearly represents *P. oxycarpum*; its petioles are sometimes as long as 5 cm. and its leaf-blades up to 20×15 cm. and obviously cordate at base.

BALANOPSIDACEAE

Balanops vitiensis (A. C. Sm.) Hjelmqvist in Bot. Notiser Suppl. 2: 64. fig. 24, G-K, 25, e. 1948.

Trilocularia vitiensis A. C. Sm. in Sargentia 1: 11. fig. 2. 1942.

VITI LEVU: Without locality, *B. E. Parham* 858 (A); Mba: Hills between Nandāla and Nukunuku Creeks, alt. 750–850 m., *Smith* 6180 (A, US); hills between Nggaliwana and Nandala Creeks, south of Nauwanga, alt. 725–850 m., *Smith* 5853 (A, US) (“mataumasima”); hills between Nggaliwana and Tumbeindreketi Creeks, east of the sawmill at Navai, alt. 725–800 m., *Smith* 5986 (A, US); summit of Mt. Tomanivi [Mt. Victoria], alt. 1290–1323 m., *Smith* 5194 (A, US); Ra: Ridge from Mt. Namama toward Mt. Tomanivi, alt. 1050–1120 m., *Smith* 5699 (A, US); Nandronga & Navosa: Northern portion of Rairaimatuku Plateau, between Nandrau and Rewasau, alt. 725–825 m., *Smith* 5404 (A, US) (“wailanga”); Serua: Uluvatu, vicinity of Mbelo, near Vatukarasa, *Tabualewa* 15630 (A, US); Mburetolu Mt., Taunovo, *B. E. Parham* 2859 (A). VANUA LEVU: Mathuata: Seanggangga Plateau, in drainage of Korovuli River, vicinity of Natua, alt. 100–200 m., *Smith* 6693 (A, US); summit ridge of Mt. Numbuiloa, east of Lambasa, alt. 500–590 m., *Smith* 6461 (A, US).

The suggestion that *Trilocularia* be reduced to *Balanops*, made in Hjelmqvist’s very informative paper on the floral morphology and phylogeny of the Amentiferae (op. cit. 68), is herewith adopted. The diagnostic character separating the two genera, whether the gynaecium is dimerous or trimerous, is seen to be invalid in *B. vitiensis*, as pointed out by Hjelmqvist.

The eleven collections cited above represent a species heretofore considered rare, known only from the four Degener specimens which I cited in 1942; it is curious that this plant should now appear to be a fairly frequent element of the vegetation in parts of Fiji. It is usually found in dry semi-open forest or in the forest-grassland transitional belt, but I have also noted it in fairly dense wet forest on Viti Levu, and the habitat noted on Mt. Tomanivi was dense mossy forest. If all the specimens here cited are correctly placed in one species, its altitudinal range is remarkable; but morphological variations of some degree should also be noted.

Smith 5194, the specimen from Tomanivi, differs in appearance from typical material of the species, having comparatively small leaves (petioles 2–4 mm. long; blades $3\text{--}5.5 \times 1.5\text{--}2.5$ cm.); its ♂ inflorescences are very slender, 1–2 cm. long, and with the lower flowers obviously pedicellate (pedicels 2.5–4 mm. long) rather than sessile as in the type of the species. Whether these differences are of consequence or due merely to

the exposed position of the individual on a high ridge is open to question.

Parham 858 is a very robust specimen, with leaf-blades up to 16×6 cm. and obviously undulate at margin; its δ inflorescences are often 3 cm. long and the lower flowers have pedicels 3–5 mm. long. This specimen has its flower-subtending bracts lanceolate and 2–2.5 mm. long.

The remaining specimens cited show all gradations in foliage between the extremes, the largest available leaves occurring on *Smith 5986* (petioles up to 15 mm. long; blades up to 17×9 cm.). The type of the species and the other three specimens cited by me in 1942 are approximately average in foliage.

Among the available fruiting specimens there is also a high degree of variation. The pedicel may be up to 18 mm. long (*Smith 6693*). The mature fruits of *Smith 6180* and *6461* are quite similar to those described in 1942, but no. *6693* has longer and proportionately narrower mature fruits (up to 20×10 mm.).

These notes indicate so much variation among the known Fijian specimens of *Balanops* that the advisability of further nomenclatural division is to be considered. At least such an extreme form as the Tomanivi specimen should probably not be left in *B. vitiensis*. For the time being, however, I am unable to designate satisfactory lines for further division of the population.

ULMACEAE

Celtis Harperi Horne ex Baker in Jour. Linn. Soc. Bot. 20: 371. 1883;
A. C. Sm. in Bull. Torrey Club 70: 535. 1943.

VITI LEVU: Mba: Upper slopes of Mt. Koromba [Pickering Peak], alt. 800–1075 m., *Smith 4637* (A, US) (slender tree 6 m. high, in forest on ridges and spurs); Naitasiri: Tholo-i-suva, alt. about 150 m., *V. C. Raiqiso 460* (A) (small tree, in forest; "mala-ni-via").

The cited specimens are the first of this species definitely known from Viti Levu, the type and the other specimens cited by me in 1943 having been collected on Vanua Levu.

Celtis vitiensis A. C. Sm. in Bull. Torrey Club 70: 536. 1943.

VITI LEVU: Mba: Western and southern slopes of Mt. Tomanivi [Mt. Victoria], alt. 850–1150 m., *Smith 5281* (A, US) ("tandili"; tree 25 m. high, in dense forest; flowers greenish white).

This species appears to be local in the uplands of Viti Levu, on the basis of material thus far known; three specimens were originally cited. *Degener 14897* was obtained at Nandrau, which is now in the Province of Nandronga & Navosa; the other specimens cited in 1943 are in the Province of Mba, the old Province of Tholo North having been divided.

URTICACEAE

Elatostema fruticosum Gibbs in Jour. Linn. Soc. Bot. 39: 171. *pl.* 16. 1909; A. C. Sm. in Sargentia 1: 19. 1942.

VITI LEVU: Mba: Slopes of Mt. Nairosa, eastern flank of Mt. Evans

Range, alt. 700–1050 m., *Smith 4099* (A, US); immediate vicinity of Nandarivatu, alt. 800–900 m., *Smith 5034* (A, US); western slopes of Mt. Nanggaranambuluta [Lomalangi], east of Nandarivatu, alt. 850–1000 m., *Smith 4764* (A, US); hills between Nggaliwana and Tumbeindreketi Creeks, east of the sawmill at Navai, alt. 725–800 m., *Smith 5976* (A, US); western and southern slopes of Mt. Tomanivi [Mt. Victoria], alt. 850–1150 m., *Smith 5092* (A, US); Nandronga & Navosa: Northern portion of Rairaimatuku Plateau, between Nandrau and Nanga, alt. 725–825 m., *Smith 5513* (A, US), between Nandrau and Rewasau, alt. 725–825 m., *Smith 5598* (A, US).

This species has previously been known with certainty from three collections, all from the vicinity of Nandarivatu; it is one of the characteristic and abundant components of the undergrowth in the dense wet forest of montane Viti Levu, but it has not yet been obtained on other islands. Usually *E. fruticosum* is a freely branching coarse herb (suffrutescent at base) or succulent shrub 1–4 m. in height. Fijian names are *mbeta* (more or less generic) or *ndraindraia* (more commonly used for *E. australe* (Wedd.) Hall. f.). Some of the present specimens have the leaf-blades up to 21×8.5 cm.

Elatostema Greenwoodii A. C. Sm. in Jour. Arnold Arb. 27: 319. 1946.

VITI LEVU: Mba: Eastern slopes of Mt. Koroyanitu, Mt. Evans Range, alt. 950–1050 m., *Smith 4143* (A, US) (abundant shrub 2–3 m. high, in dense low forest).

The cited specimen, from essentially the type locality, resembles the type very closely but is slightly more robust. Its petioles are up to 4 mm. or rarely 5 mm. in length, and the largest leaf-blades observed are about 12.5×3.5 cm.

Elatostema palustre A. C. Sm. in Sargentia 1: 20. 1942.

VITI LEVU: Naitasiri: Northern portion of Rairaimatuku Plateau, between Mt. Tomanivi [Mt. Victoria] and Nasonggo, alt. 870–970 m., *Smith 5769* (A, US) (simple-stemmed succulent herb 30–80 cm. high, rarely branched, in dense forest; heads 1–1.5 cm. in diameter; perianth-segments and filaments translucent, the stamens white).

The second collection of this distinctive species agrees in essential details with the type, which was collected on the southern portion of the Rairaimatuku Plateau; the type-locality, cited as being in the province of Tholo East, by a realignment of provincial boundaries now falls approximately on the boundary between Naitasiri and Nandronga & Navosa. From the type, my collection differs chiefly in its glabrous foliage (with a few scattered hairs similar to those of the type), and in having its peduncles up to 35 mm. in length, with the receptacle up to 15 mm. in diameter. The prominent stipules which characterize the species were erroneously described in 1942 as being 1.5–2 “mm.” long; this figure, of course, should have been 1.5–2 cm.

Elatostema tenellum A. C. Sm. in Sargentia 1: 22. 1942.

VITI LEVU: Mba: Hills east of Nandala Creek, about 3 miles south of

Nandarivatu, alt. 850–970 m., *Smith 6231* (A, US) (on wet banks along stream in dense forest; bracts dull pink); summit of Mt. Tomanivi [Mt. Victoria], alt. 1290–1323 m., *Smith 5196* (A, US) (sprawling repent herb, in a dense colony in dense mossy forest); Ra : Ridge from Mt. Namama (east of Nandarivatu) toward Mt. Tomanivi, alt. 1050–1120 m., *Smith 5686* (A, US) (succulent herb, in dense forest).

The three cited specimens precisely match the type of this species; it has previously been known from two collections, the type (from Vanua Levu) and a specimen from Namosi Province on Viti Levu.

Two collections which weaken the specific lines between *E. tenellum* and *E. eximium* A. C. Sm. were made on Viti Levu in 1947. The first of these, *Smith 4873* (A, US) (from the summit of Mt. Nanggaranambuluta [Lomalangi], east of Nandarivatu, Mba, alt. 1100–1120 m., in dense forest) was taken from a dense colony in which the majority of the individual plants precisely agreed with *E. tenellum*. However, the colony included some plants with leaves approaching in size those of *E. eximium*, and a few plants intermediate in size were observed and collected. A second puzzling collection is *Smith 5728* (A, US) (from the same locality as no. 5686, cited above). In general the individuals of this dense colony agreed excellently with *E. eximium*, but other plants had foliage tending toward that of *E. tenellum* in size. At the time of their description, *E. tenellum* and *E. eximium* seemed entirely distinct, but the existence of the colonies here discussed can lead one to conclude either that (1) the two species hybridize at least on the ridges east of Nandarivatu, or (2) only one species, with tremendous foliar variability, should be recognized for the plants of this immediate affinity.

Elatostema (§*Euelatostema*) *epallocaulum* sp. nov.

Herba epiphytica, caule arborum truncis appresso glabro pauciramoso cystolithis minutis confertissime lineolato; foliis alternatis, petiolis gracilibus 1–2 mm. longis, laminis in sicco papyraceis fusco-viridibus lanceolatis, 5–7.5 cm. longis, 1.2–2 cm. latis, basi inaequilateraliter attenuatis (basi ipsa minute rotundata haud auriculata), apice gradatim attenuatis, margine dentibus subacutis circiter 1 per centimetrum grosse serratis, utrinque cystolithis 3–5-partitis circiter 0.15 mm. diametro paullo elevatis manifeste ornatis, utrinque glabris vel supra pilis paucis rigidis subappressis circiter 1 mm. longis inconspicue strigosis, pinnatinerviis, costa utrinque paullo elevata, nervis lateralibus utrinsecus 3–5 brevibus subobscuris; stipulis membranaceis lanceolatis, 10–14 mm. longis, 2–3 mm. latis, glanduloso-lineolatis, mox caducis; receptaculis ♂ solis visis breviter (1–1.5 mm.) pedicellatis calcaribus exceptis 7–8 mm. latis (calcaribus inclusis ad 24 mm. latis), bracteis exterioribus 6 late suborbicularibus glabris, liberis, extus cystolithis minutis copiose ornatis, 2 maximis circiter 6 × 9 mm. apicem versus calcar gracili recto 8–9 mm. longo conspicue corniculatis, bracteis lateralibus circiter 4 × 6 mm. calcar ad 3 mm. longum gerentibus; bracteolis membranaceis oblongo-obovatis 4–4.5 mm. longis 1–2 mm. latis breviter glanduloso-lineolatis; floribus paucis, pedicellis tenuibus ad 2 mm.

longis, perianthii segmentis 4 circiter 1.5 mm. longis apicem versus minutissime corniculatis, filamentis 1.5–2 mm. longis, antheris circiter 1.5 mm. longis.

VITI LEVU: Ra: Ridge from Mt. Namama (east of Nandarivatu) toward Mt. Tomanivi [Mt. Victoria], alt. 1050–1120 m., Aug. 18, 1947, *Smith 5692* (A TYPE, US) (epiphyte in dense forest, the stems appressed to tree-trunks; perianth and anthers white).

The new species is marked by its climbing habit (whence the specific epithet) and the conspicuous lateral spurs of its staminate receptacles, characters which differentiate it from *E. humile* A. C. Sm., to which it seems most closely allied. It is further distinguished by its more coarsely serrate leaf-blades, smaller foliar cystoliths, and less obvious venation.

Procis Archboldiana A. C. Sm. in *Sargentia* 1: 25. 1942.

VITI LEVU: Mba: Hills between Nandala and Nukunuku Creeks, alt. 750–850 m., *Smith 6182* (A, US); western slopes and summit of Mt. Nanggaranambuluta [Lomalangi], east of Nandarivatu, alt. 1000–1120 m., *Smith 4819* (A), *4863* (A, US); hills between Nggaliwana and Tumbeindreketi Creeks, east of the sawmill at Navai, alt. 725–800 m., *Smith 5984* (A, US), *5987* (A, US); upper western slopes of Mt. Tomanivi [Mt. Victoria], alt. 1250 m., *Smith 5206* (A, US); Naitasiri: Northern portion of Rairaimatuku Plateau, between Mt. Tomanivi and Nasonggo, alt. 870–970 m., *Smith 5758* (A, US).

This species has previously been known with certainty only from the two collections originally cited, but it is quite frequent in the dense shady forest of north-central Viti Levu. I did not observe it at lower elevations than about 750 m., from which it extends upward to the mossy forest of higher ridges, as on Mt. Tomanivi. In this montane forest it is one of the more attractive and striking plants, with its small red fruiting heads. In habit it is a liana, often high-climbing and with the lower parts of the stems appressed to tree-trunks, or it may appear to be an epiphytic shrub. The cited specimens are all pistillate with the exception of no. 5987, which bears staminate flowers. The following slight amplification of the original description is now permitted:

Petioles up to 10 mm. long; leaf-blades up to 11×3 cm.; ♂ inflorescences solitary or paired, the cymes simple, the peduncles 10–15 mm. long at anthesis, the receptacle swollen; flowers 8–15 per cyme, the pedicels slender, at anthesis 5–6 mm. long; sepals about 2 mm. long and 1.5 mm. broad; stamens 5, the filaments about 1.5 mm. long, the anthers about 1.2 mm. long, the thecae divergent.

LORANTHACEAE

Korthalsella Horneana v. Tiegh. in *Bull. Soc. Bot. France* 43: 164. 1896; Danser in *Bull. Jard. Bot. Buitenz. III.* 14: 128. *fig. 5.* 1937.

VITI LEVU: Mba: Summit of Mt. Koroyanitu, high point of Mt. Evans Range, alt. 1165–1195 m., *Smith 4227* (A, US), *4228* (A, US) (parasitic shrubs, in dense ridge forest and thickets, the branches up to 50 cm. long,

copiously branching); Nandarivatu, alt. about 830 m., *Greenwood* 840 (A) (on *Geissois ternata*). Fiji, without definite locality: *U. S. Expl. Exped.* (US); *Horne* 894 (TYPE COLL., GH).

The cited material is of interest because Danser mentioned only the type collection as representing the species. My numbers 4227 and 4228, although growing together, were separately numbered because of a slight difference observed in the field. No. 4227 is quite typical, with terete branches. In no. 4228, however, the lower internodes of the branches have a distinct tendency toward flattening, although they do not approach in form the conspicuously flattened internodes of *K. platycaula* var. *vitiensis* (v. Tiegh.) Danser, the only other entity of the genus known from Fiji (cf. Danser in *Bull. Jard. Bot. Buitenz.* III. 16: 337. 1940). The diverse character of the colony examined on Mt. Koroyanitu indicates that some variation must be expected in the branch-shape of *K. Horneana*.

SANTALACEAE

Exocarpus vitiensis A. C. Sm. in *Sargentia* 1: 29. 1942.

VITI LEVU: Mba [formerly Nandi]: Vuniyasi, alt. about 60 m., *P. Lasalaba* 2356 (A) (tree, on open hills). VANUA LEVU: Mathuata: Southern slopes of Mt. Numbuloa, east of Lambasa, alt. 100–350 m., *Smith* 6391 (A, US) (compact tree to 7 m. high, in open forest, the trunk straight, slender; flower-buds green).

This species has previously been known only from the two specimens originally cited, from Nandarivatu on Viti Levu and from Vanua Mbalavu. Although the specimens mentioned above have somewhat smaller leaves than the original material, and although no. 6391 has occasionally branched inflorescences, they may be referred to the species with confidence.

OLACACEAE

Anacolosa lutea Gillespie in *Bishop Mus. Bull.* 91: 5. fig. 3. 1932.

VITI LEVU: Mba: Immediate vicinity of Nandarivatu, alt. 800–900 m., *Smith* 5042 (A, US) (slender tree 5 m. high, in dense forest along stream; fruit yellow). VANUA LEVU: Mathuata: Seanggangga Plateau, in drainage of Korovuli River, vicinity of Natua, alt. 100–200 m., *Smith* 6726 (A, US) (tree 6 m. high, in patches of forest in open rolling country; petals white); southern slopes of Mt. Numbuloa, east of Lambasa, alt. 100–350 m., *Smith* 6377 (A, US) (tree 4 m. high, in open forest; fruit yellow); summit ridge of Mt. Numbuloa, alt. 500–590 m., *Smith* 6455 (A, US) (slender tree 4 m. high, in dense forest; calyx and petals pink-tinged; fruit yellow, becoming pink); Thakauandrove: Hills between Vatukawa and Wainigio Rivers, Ndrekeniwai Valley, alt. 200–500 m., *Smith* 582 (NY, US, etc.) (tree, in forest; petals white); southwestern slopes of Mt. Mbatini, alt. 300–700 m., *Smith* 625 (NY, US, etc.) (slender shrub 5 m. high, in dense forest). TAVEUNI: Western slope, between Somosomo and Wairiki, alt. 300–600 m., *Smith* 914 (NY, US, etc.) (tree 8 m. high, in forest; petals white). KORO: Eastern slope of main ridge, alt. 200–300 m., *Smith* 947 (NY, US, etc.) (tree 10 m. high, in forest; fruit dull yellow to salmon-pink).

In describing this interesting species, Gillespie cited his no. 4040, from Nandarivatu, as the type, mentioning six other collections, without detailed localities, from Naitasiri and Tholo North [i.e. for the most part now Mba] Provinces. As it has apparently not been discussed since the original description, I venture to cite the collections above to give a more complete picture of its distribution throughout the group. There is more variation in size and pubescence of parts than indicated by Gillespie, but at this time I find no reason to subdivide his concept.

BALANOPHORACEAE

Balanophora fungosa J. R. & G. Forst. Char. Gen. 100. 1776; A. C. Sm. in *Sargentia* 1: 30. 1942.

VITI LEVU: Mba [formerly Nandi]: Northern slopes of Mt. Namendre, east of Mt. Koromba [Pickering Peak], alt. 750–900 m., *Smith* 4525 (A, US) (root-parasite in dense forest; plant-body, including perianth and stamens, white).

The cited collection is only the third of the species from Fiji known to me, and represents the only locality in which I have seen the plant growing. Here it occurred with some frequency, and one may assume that it is more common in Fiji than the sparse herbarium record indicates.

ARISTOLOCHIACEAE

Aristolochia vitiensis sp. nov.

Frutex volubilis alte scandens, partibus juvenilibus fulvo-retrorso-pilosis, caule gracili inferne haud 3 mm. diametro tereti striato mox glabro; petiolis gracilibus ut caulibus evanescenter pilosis foliorum maturorum 5–8 cm. longis; laminis in sicco subpapyraceis fuscis late ovatis, maturitate 9–15 cm. longis et 7–10.5 cm. latis, basi leviter cordatis vel truncato-rotundatis, apice in acuminem subobtusum ad 15 mm. longum abrupte angustatis, margine planis haud undulatis, utrinque glabris vel juvenilibus secus nervos obscure fusco-pilosis, e basi 7-nerviis, costa nervisque primariis utrinque valde elevatis, nervis secundariis et rete venularum intricato minus prominulis; inflorescentia post anthesin racemosa vel paniculata pauciramosa, rhachi gracili ad 4 cm. longa ut bracteis oblongo-deltoides obtusis 2–2.5 mm. longis fusco-pilosa, pilis bractearum breviter crispatis, pilis pedicellorum fructuumque juvenilium retrorsis subappressis circiter 0.5 mm. longis; pedicellis sub fructu maturo ad 15 mm. longis; capsula oblongo-ellipsoidea hexagona stipite excluso 3–3.2 cm. longa, circiter 2 cm. lata, apice rotundata, basi in stipitem 1.5–2 cm. longum abrupte angustata, a basi dehiscente, pericarpio inferne pilis paucis obscure piloso demum glabro, angulis validis in stipitem conspicue decurrentibus; seminibus numerosis horizontalibus cuneato-obovatis, 7–9 mm. longis, 6–7 mm. latis, utrinque inconspicue verruculosus.

VITI LEVU: Nandronga & Navosa: Northern portion of Rairaimatuku Plateau, between Nandrau and Nanga, alt. 725–825 m., Aug. 4,

1947, *Smith 5484* (A TYPE, US) ("wa sou"; vine in dense forest). Fiji, without definite locality, *Horne 735* (GH).

Although the genus *Aristolochia* has hitherto been mentioned from Fiji only by Horne (A Year in Fiji, 257. 1881), without a specific designation, Mr. William Greenwood (in an unpublished list) also records a specimen of the genus, possibly of the species described above. Although neither the Horne collection nor mine has flowers, I venture to describe what appears to be a very distinct entity. Its closest ally is probably the Samoan *A. cortinata* Reinecke, than which it has leaf-blades more broadly ovate and merely truncate or shallowly (not deeply) cordate at base. *Aristolochia vitiensis* has the inflorescence-branches, bracts, pedicels, and young fruits obviously pilose, whereas these parts are glabrous in *A. cortinata*. The mature fruits and seeds of the Fijian species are substantially smaller than those of *A. cortinata*.

ANNONACEAE

Desmos leucanthus sp. nov.

Frutex gracilis ad 2 m. altus, ramulis gracilibus teretibus juventute castaneis minute hispidulis mox glabris cinerascentibus; petiolis inconspicuis 2–3 mm. longis validis (1.5–2 mm. diametro) rugulosis mox glabris; laminis chartaceis in sicco pallide viridibus ovato-oblongis, 9–16 cm. longis, 4–7 cm. latis, basi rotundato-cordatis, apice obtusis vel obtuse cuspidatis, margine subplanis, costa subtus interdum obscure strigillosa excepta utrinque glabris, costa supra plana subtus prominente, nervis secundariis utrinsecus 8–10 subpatentibus irregularibus marginem versus copiose anastomosantibus cum rete venularum intricato utrinque prominulis; inflorescentiis 1-floris axillaribus, rhachi valde reducta haud 1 mm. longa, pedicello sub anthesi subtereti valde ruguloso valido (circiter 1.5 mm. diametro) circiter 1 cm. longo parce strigilloso bracteis 2 vel 3 minutis deltoideis subtento; calyce rotato sub anthesi circiter 10 mm. diametro utrinque ruguloso, lobis 3 valvatis late deltoideis circiter 4 mm. longis et 5 mm. latis subacutis, utrinque apicem versus obscure ferrugineo-tomentellis, margine ciliolatis, alioqui glabris; petalis 6 biseriatis valvatis patentibus crasso-carnosis copiose immerso-luteo-glandulosis, utrinque (intus sparsius) cinereo-tomentellis, exterioribus 3 ovato-deltoideis 18–20 mm. longis 10–11 mm. latis basi leviter contractis apice subacutis margine demum paullo reflexis, interioribus 3 ovato-lanceolatis 15–16 mm. longis 5–6 mm. latis basi angustatis apice subacutis; receptaculo complanato pilis stramineis circiter 0.5 mm. longis copiose hispido; staminibus numerosis pluriseriatis 2–2.3 mm. longis, filamentis subnullis, connectivo carnoso superne valde incrassato et complanato apice 1–1.2 mm. lato, thecis lineari-oblongis; carpellis circiter 7 liberis, ovario oblongo-ellipsoideo sub anthesi 2.5–3 mm. longo basi obtuso apice rotundato, immerso-luteo-glanduloso, pilis circiter 0.3 mm. longis copiose aureo-sericeis, ovulis circiter 7 oblique superpositis.

VITI LEVU: Nandronga & Navosa: Northern portion of Rairaimatuku Plateau, between Nandrau and Rewasau, alt. 725–825 m., Aug. 11, 1947, *Smith 5613* (A TYPE) (slender shrub 2 m. high, in dense forest; perianth-segments dull white, the three inner ones pinkish at base; stamens dull white; carpels brownish).

The characters of the plant described above seem so definitely to be those of *Desmos* that I venture to describe it, despite the fact that it is a unicate specimen with only a single flower. From the only previously known Fijian species of the genus, *D. insularis* A. C. Sm., the new species differs in its essentially glabrous habit and its larger and proportionately broader leaf-blades. The flowers of *D. leucanthus* are apparently considerably the larger, with less copiously pubescent perianth-segments, and its carpels are densely golden-sericeous rather than sparsely setulose.

***Polyalthia habrotricha* sp. nov.**

Frutex gracilis ad 2 m. altus, ramulis gracilibus teretibus apicem versus 1–2 mm. diametro pilis subtilibus ochraceis 0.3–0.6 mm. longis copiose setulosis, demum glabrescentibus cinereis; petiolis subteretibus rugulosis 1–1.5 mm. diametro 2–3 mm. longis ut ramulis pilosis glabrescentibus; laminis chartaceis siccitate fusco-viridibus elliptico- vel ovato-oblongis, 6–10.5 cm. longis, 3–4.5 cm. latis, basi inaequilateraliter rotundatis vel subcordatis, apice obtusis, margine leviter recurvatis, marginibus et costa utrinque et nervis principalibus subtus ut ramulis subtiliter ochraceo-setulosis alioqui glabris, costa supra subplana vel leviter sulcata subtus elevata, nervis secundariis utrinsecus 6–9 subpatentibus anastomosantibus cum rete venularum utrinque prominulis; infructescentiis solitariis interdum apicem versus ramulorum lateralium brevium enatis, pedicello tereti valido circiter 2.5 mm. diametro et 5 mm. longo copiose et arcte hispidulo, lobis calycis persistentibus 3 subcoriaceis deltoideis acutis circiter 3×4 mm. extus et apicem versus intus breviter sericeis; receptaculo subcapitato circiter 5 mm. diametro strigilloso-puberulo; carpellis maturis ut videtur 5 vel 6 breviter stipitatis copiose et arcte ochraceo-velutino-puberulis, stipitibus validis teretibus 1–2 mm. longis, carpellis subglobosis 14–17 mm. diametro basi et apice rotundatis, pericarpio coriaceo 1.5–2 mm. crasso, semine unico subgloboso.

VITI LEVU: Nandronga & Navosa: Northern portion of Rairaimatuku Plateau, between Nandrau and Rewasau, alt. 725–825 m., Aug. 11, 1947, *Smith 5614* (A TYPE) (slender shrub 2 m. high, in dense forest).

From *P. amygdalina* (A. Gray) Gillespie, to which it is closely related, *P. habrotricha* differs in the copious pubescence of its branchlets, petioles, and fruits, and in having its mature carpels rounded rather than obtusely cuspidate at apex. In 1936 (in Bishop Mus. Bull. 141: 60) I indicated that *P. amygdalina* has the receptacle and fruiting carpels glabrous, but a closer examination of the type shows these parts to be sparsely brown-puberulent, although not as densely velutinous-puberulent as in the new species. *Polyalthia amygdalina* is thus far known only from Ovalau. The new species differs from *P. Laddiana* A. C. Sm., which it resembles in

foliage, in its pubescent vegetative parts and its very differently shaped fruiting carpels.

The type of *P. habrotricha* grew near the plant described above as *Desmos leucanthus*; of each of these two species only a single specimen was observed and no duplicates could be made.

Polyalthia pedicellata A. C. Sm. in Bishop Mus. Bull. 141: 61. fig. 29. 1936, in *Sargentia* 1: 32. 1942.

VITI LEVU: Mba: Hills east of Nandala Creek, about 3 miles south of Nandarivatu, alt. 850–970 m., *Smith 6220* (A, US) (tree 6 m. high, in dense forest; fruit, as far as observed, composed of a single green carpel); hills between Nggaliwana and Tumbeindreketi Creeks, east of the sawmill at Navai, alt. 725–800 m., *Smith 6009* (A, US) (slender tree 12 m. high, in dense forest; fruit green, on trunk); western and southern slopes of Mt. Tomanivi [Mt. Victoria], alt. 850–1150 m., *Smith 5116* (A, US) (“kai sou”; tree 20 m. high, in dense forest; perianth-segments and genitalia yellowish green; fruit associated with leaves or on branchlets); Nandronga & Navosa: Northern portion of Rairaimatuku Plateau, between Nandrau and Rewasau, alt. 725–825 m., *Smith 5629* (A, US) (“singasa”; tree 20 m. high, in dense forest; fruit on trunk and branches, the mature carpels orange).

Previously known from the type, from Vanua Levu, and two specimens from upland Viti Levu, all in fruit. The present collections make possible a slight amplification of the original description; all bear fruit and no. 5116 is also in flower.

Petioles slender, 2–5 m. high, the leaf-blades sometimes as small as 8×2.5 cm., often acute at base; flowers glabrous throughout (except ovaries), solitary at anthesis if associated with leaves, but apparently aggregated when occurring on branches and trunk, the much reduced peduncle bearing 1–3 abortive buds in the axils of obscure bracts; pedicels slender, (20–)35–40 mm. long at anthesis; calyx about 5 mm. in diameter, the lobes deltoid, subacute, about 1×2.5 mm.; petals of both whorls essentially similar, subcarinose, narrowly elliptic-lanceolate, 28–32 mm. long, 8–10 mm. broad, narrowed at base, rounded-obtuse at apex; stamens about 55, 4- or 5-seriate, 1.4–1.6 mm. long, 1–1.4 mm. in diameter at apex, the thecae 0.8–1 mm. long; carpels 15–20, about 1.5 mm. long, the ovary 0.8–1 mm. long, strigose with hairs 0.1–0.2 mm. long but presumably soon glabrescent, 1-ovulate, the stigma carinose, irregular, glabrous; mature carpels usually 8–11 but rarely (no. 6220) apparently solitary, the stalks up to 8 mm. long, stout, the carpels up to 4.5 cm. long and 1.5 cm. broad, rounded to obtuse at apex.

Polyalthia capillata sp. nov.

Arbor gracilis ad 5 m. alta, ramulis gracilibus teretibus rugulosis pilis 0.2–0.3 mm. longis subpersistentibus fulvo-crispato-pilosis vel parce sericeis; petiolis validis (2–3 mm. diametro) rugulosis leviter canaliculatis 8–12 mm. longis ut ramulis pilosis; laminis in sicco papyraceis pallide viridibus elliptico-oblongis, 15–22 cm. longis, 7–9 cm. latis, basi rotundato-obtusis

et in petiolum subito decurrentibus, apice in acuminem circiter 1.5 cm. longum obtusum cuspidatis, margine leviter recurvatis, costa nervisque principalibus inferne ut ramulis pilosis exceptis subglabris, costa valida supra subplana subtus prominente, nervis secundariis utrinsecus 7–10 leviter curvatis copiose anastomosantibus utrinque valde elevatis, rete venularum intricato utrinque prominulo; infructescentiis cauligeris ubique (pedicello, receptaculo, carpellis maturis) pilis ut eis ramulorum parcius pilosis, pedicello circiter 2 mm. diametro sub fructu 3–4 cm. longo, lobis calycis persistentibus 3 coriaceis deltoideis obtusis 3–4 mm. longis latisque; receptaculo subcapitato circiter 7 mm. diametro basibus stipitum conspicue tuberculato; carpellis maturis circiter 10–12 stipitatis (stipitibus crassis 5–10 mm. longis) anguste conico-ellipsoideis, 25–30 mm. longis, inferne 6–8 mm. diametro superne sensim angustato, basi in stipitem abrupte angustatis, apice subacutis, pericarpio coriaceo minute ruguloso maturitate forsan glabrescente; semine unico erecto.

VITI LEVU: Nandronga & Navosa: Southern slopes of Nausori Highlands, in drainage of Namosi Creek above Tumbenasolo, alt. 300–450 m., May 29, 1947, *Smith 4581* (A TYPE, US) (slender tree 5 m. high, in dense forest; fruit borne on trunk).

Polyalthia capillata is closely related only to *P. pedicellata* A. C. Sm., which it resembles in its leaf-base, its elongate fruiting pedicel, and in the general proportions of its mature carpels. It differs from *P. pedicellata*, however, in the subpersistent crispate or sericeous pubescence of its branchlets, leaves, and fruits, in its larger leaves, and in having its fruiting carpels somewhat conical rather than oblong-ellipsoid.

Polyalthia amoena sp. nov.

Arbor ad 7 m. alta partibus novellis pilis 0.2–0.3 mm. longis ochraceo-sericeis fructibusque exceptis glabra; ramulis gracilibus teretibus, annotinis cinereis inconspicue lenticellatis, hornotinis purpurascensibus flexuosis; petiolis gracilibus (1–1.3 mm. diametro) canaliculatis 2–5 mm. longis; laminis in sicco papyraceis fusco-viridibus lanceolatis, 6.5–13 cm. longis, 1.7–3.5 cm. latis, basi acutis et in petiolum decurrentibus, apice in acuminem subobtusum ad 1.5 cm. longum sensim angustatis, margine integris, inconspicue sed conferte pellucido-punctatis, costa supra subplana subtus prominente utrinque basim versus verruculosa, nervis secundariis utrinsecus 6–9 brevibus 3–8 mm. infra marginem arcuato-anastomosantibus utrinque peracute prominulis, rete venularum utrinque plus minusve prominulo; infructescentiis axillaribus solitariis pedicellatis, pedicello sub fructu 2–3.5 cm. longo gracili tereti inferne circiter 1 mm. diametro apicem versus paullo incrassato, receptaculo subcapitato circiter 5 mm. diametro inconspicue ochraceo-piloso glabrescente basibus stipitum tuberculato; carpellis maturis ut videtur plerumque 10–20 stipitatis (stipitibus 1–2 cm. longis inferne gracilibus superne incrassatis) oblongo-ellipsoideis, 15–17 mm. longis, 7–10 mm. latis, basi in stipitem abrupte angustatis, apice obtusis, pericarpio coriaceo minute ruguloso superne subpersistententer brevi-ochraceo-sericeo; semine unico adscendente.

VANUA LEVU: Mathuata: Summit ridge of Mt. Numbuiloa, east of Lambasa, alt. 500–590 m., Oct. 29, 1947, *Smith 6423* (A TYPE, US) (tree 7 m. high, in dense forest; fruiting carpels orange); southern slopes of Mt. Numbuiloa, alt. 100–350 m., *Smith 6380* (A, US fragm.) (“sitiloa”; slender tree 4 m. high, in open forest; fruit becoming orange).

In foliage the new species suggests, among Fijian species, only *P. angustifolia* A. C. Sm., from which it differs in having its petioles shorter and its leaf-blades thinner in texture, with straighter secondaries and more obvious venation. *Polyalthia amoena* has its fruiting carpels comparatively narrow and with conspicuous long stipes; the carpel-stipes of *P. angustifolia* are scarcely 2 mm. long.

CYATHOCALYX Champion

Several Fijian specimens that have been identified as *Cananga odorata* (Lam.) Hook. f. & Thoms., upon close examination, prove not to belong to that widespread species, from which they differ superficially in having the leaf-blades somewhat thicker in texture and obtusely rounded to acute (but scarcely truncate or subcordate, like typical *C. odorata*) at base. At least some of the specimens in question have fragrant flowers and are called by the Fijians “makosoi,” thus resembling *Cananga odorata*, which does occur in Fiji and is represented by such specimens as *Seemann 5* and *Smith 1291* and *4449*. From *Cananga* the specimens under discussion differ in the readily discernible technical characters of having the petals connivent about the genitalia rather than spreading from the base, and in having the anthers truncate rather than apiculate at apex. Apparently these specimens can be referred only to the genus *Cyathocalyx*, hitherto supposed to be represented in Fiji by the single species *C. vitiensis*.

The Fijian material of *Cyathocalyx* now available appears to me to fall into four species, of which three are here described as new. Apparently dependable characters are the shape and pubescence of perianth-segments and, within certain limits, the number of stamens, carpels, and ovules. The inter-relationships of the four species may be indicated by the following key.

Petals 15–25 mm. long at anthesis, the spreading portions oblong-elliptic or elliptic-lanceolate from a contracted base, at anthesis 4–8 mm. broad; sepals broadly ovate, the base obviously narrowed.

Leaf-blades obovate or elliptic, 10–16 × 5–8.5 cm., obtuse or rounded or emarginate at apex, the secondary nerves 10–14 per side, straight or slightly curved, spreading; stamens about 150; carpels about 20, the ovules several per carpel.....*C. vitiensis*.

Leaf-blades comparatively narrow, 9–20 × 4–8 cm., obtusely cuspidate at apex with an acumen 3–7 mm. long, the secondary nerves 9–12 per side, curved-ascending; stamens 55–85; carpels 8–10, the ovules 2 or 3 per carpel, rarely 5 or 6 in early stages but apparently only 2 or 3 developing.....*C. insularis*.

Petals 30–50 mm. long at anthesis, the spreading portions ligulate, hardly contracted at base, at anthesis 2–4.5 mm. broad; sepals ovate-deltoid, hardly narrowed at base.

Leaf-blades 9–17 × 4.5–8 cm., obtuse or subacute at base, the secondary nerves 7–10 per side; flowers (pedicels, calyx, and petals) puberulent, glabrescent; carpels 9 or 10, the ovules 2 per carpel... *C. stenopetalus*.

Leaf-blades usually 15–32 × 8–12 cm., rounded or broadly obtuse at base, the secondary nerves 11–15 per side; flowers (pedicels, calyx, and petals) closely and persistently tomentellous; carpels 5–7, the ovules 6 or 7 per carpel..... *C. suaveolens*.

Cyathocalyx vitiensis A. C. Sm. in Bishop Mus. Bull. 141: 64. fig. 31. 1936.

Among the Fijian material of *Cyathocalyx* now available, *C. vitiensis* seems to be represented only by the two collections from Vanua Levu which I originally cited. The Degener specimens which in 1942 I mentioned as representing this species are better referred to *C. insularis*, described below. My description of 1936 was in error in mentioning the seeds as very numerous and only 2 mm. long; they appear to be usually 3 and to occupy the entire carpellary cavity.

Cyathocalyx insularis sp. nov.

Cyathocalyx vitiensis sensu A. C. Sm. in Sargentia 1: 33. 1942, non sensu typi.

Arbor ad 18 m. alta, partibus novellis et inflorescentiis puberulis exceptis ubique glabra; ramulis subteretibus, annotinis cinereis sat robustis, hornotinis saepe purpurascentibus subflexuosis gracilibus; petiolis gracilibus leviter canaliculatis 17–30(–38) mm. longis; laminis subcoriaceis siccitate fuscis vel fusco-olivaceis, oblongo- vel obovato-ellipticis, 9–20 cm. longis, 4–8 cm. latis, basi acutis vel obtusis saepe inaequalibus et in petiolum decurrentibus, apice in acuminem 3–7 mm. longum obtuse cuspidatis, margine leviter recurvatis, costa supra canaliculata subtus prominente, nervis secundariis utrinsecus 9–12 curvato-adscendentibus marginem versus anastomosantibus supra prominulis subtus acute elevatis, rete venularum utrinque subprominulo vel subimmerso; inflorescentiis glomerulatis oppositifoliis vel infra folia enatis 1–3-floris, bracteis papyraceis oblongo-delloideis obtusis circiter 1 mm. longis subglabris; pedicellis gracilibus sub anthesi 20–30 mm. longis glabris basim versus unibracteolatis, bracteola oblonga obtusa 3–5 × 2 mm. apice rotundata albido-puberula mox glabra; sepalis 3 papyraceis late ovatis, 6.5–8 mm. longis, 5–7 mm. latis, glabris vel obscure puberulis, basi conspicue angustatis, apice obtusis vel subacutis; petalis 6 carnosius sub anthesi 15–25 mm. longis, partibus basalibus concavis suborbicularibus 2.5–5.5 mm. latis extus obscure puberulis, petalorum interiorum apicem versus ventro glanduloso-pilosis, petalorum partibus patentibus oblongo-ellipticis 4–8 mm. latis obtusis parce albido-puberulis basi contractis, petalorum interiorum paullo angustioribus et basi connatis; receptaculo complanato glabro vel inconspicue hispidulo; staminibus 3–5-seriatis 55–85 oblongo-obovoideis, 1.5–1.8 mm. longis, apice 0.7–1 mm. latis, filamento subclavato 0.2–0.5 mm. longo, connectivo carnoso saepe obscure luteo-glanduloso superne incrassato truncato, thecis oblongis; carpellis 8–10 glabris vel debiliter hispidulis,

ovario oblongo-ellipsoideo sub anthesi 1–1.5 mm. longo, ovulis 2 vel 3 (raro juventute ad 5 vel 6), stigmatibus coalitis; infructescentiis ubique glabris, receptaculo subcapitato 4–5 mm. diametro, pedicello 35–50 mm. longo, stipitibus 4–7 mm. longis, carpellis maturis 3–7 ellipsoideis saepe inter semina contractis 10–16 mm. longis 8–12 mm. latis, pericarpio coriaceo subtiliter ruguloso circiter 0.5 mm. crasso, seminibus plerumque 2 (interdum 1 vel 3) oblique superpositis.

VITI LEVU: Mba: Hills between Nggaliwana and Tumbeindreketi Creeks, east of the sawmill at Navai, alt. 725–800 m., Sept. 2, 1947, *Smith 5868* (A TYPE, US) (tree 18 m. high, in dense forest; perianth greenish, becoming dull yellow; fruiting carpels green, at length deep purple); same locality, Sept. 12, 1947, *Smith 6003* (A, US) (tree 15 m. high; young perianth-segments greenish yellow); Mt. Natomba, Nandala, vicinity of Nandarivatu, alt. 750 m., *Degener 14638* (A, US) ("makosoi"; tree, in forest; perianth green; bark used for rope); vicinity of Nandarivatu, alt. 900 m., *Gillespie 3854* (GH); Namosi: Woods above waterfall near Namuamua, alt. 400 m., *Gillespie 3252* (GH, US); Mt. Naitarandamu, alt. 1100 m., *Gillespie 3145* (GH, US); Naitasiri: Vicinity of Nasinu, alt. 150 m., *Gillespie 3524* (GH), *3612* (GH, US); Suva Pumping Station, alt. 30 m., *Degener & Ordonez 13744* (A, US) (few-branched tree 5 m. high, in open forest; flowers greenish). Fiji, without definite locality: *Horne 987* (GH).

From *C. vitiensis* A. C. Sm., which it resembles in perianth-characters, the new species differs slightly in foliage and more definitely in the reduced number of stamens and carpels. The observed number of ovules per carpel has been usually 2, rarely 3, and in only one case (*Smith 6003*) are they more numerous, but here the flowers are immature and it is doubtful that all the ovules develop.

***Cyathocalyx stenopetalus* sp. nov.**

Arbor ad 15 m. alta, partibus novellis puberulis et inflorescentiis exceptis ubique glabra; ramulis teretibus, annotinis fusco-cinereis parce lenticellatis, hornotinis purpurascensibus gracilibus; petiolis leviter rugulosis canaliculatis 20–37 mm. longis; laminis subcoriaceis in sicco fusco-viridibus, ellipticis vel obovato-ellipticis, 9–17 cm. longis, 4.5–8 cm. latis, basi obtusis vel subacutis et in petiolum inaequilateraliter decurrentibus, apice rotundatis vel obtuse cuspidatis, margine haud recurvatis, costa supra canaliculata subtus prominente, nervis secundariis utrinsecus 7–10 erecto-patentibus subrectis vel leviter curvatis marginem versus anastomosantibus supra paullo subtus valde elevatis, rete venularum subtus evidenter prominulo; inflorescentiis glomerulatis vel breviter racemosis oppositifoliis vel infra folia enatis 1–5-floris; glomerulis vel rhachibus (interdum ad 1 cm. longis) parce brevi-pilosis glabrescentibus saepe cicatricosis, bracteis papyraceis deltoideis subacutis circiter 1.5 mm. longis extus puberulis; pedicellis gracilibus sub anthesi 20–35 mm. longis parce puberulis glabrescentibus paullo infra medium unibracteolatis, bracteola oblonga obtusa 2–3 mm. longa obscure puberula; sepalis 3 papyraceis ovato-deltoideis, 4–6 mm. longis, 3–4.5 mm. latis, apice apiculatis et saepe

reflexis, extus inconspicue puberulis; petalis 6 carnosis sub anthesi 30–45 mm. longis, partibus basalibus concavis 3.5–5 mm. latis extus puberulis, petalorum partibus patentibus lanceolato-ligulatis obtusis 2–4.5 mm. latis ubique parce albido-puberulis demum subglabrescentibus, petalorum interiorum paullo angustioribus et basi connatis; receptaculo complanato obscure setuloso; staminibus circiter 3-seriatis 40 (vel ultra?) oblongo-obovoideis, 1.2–1.5 mm. longis, apice 0.6–0.7 mm. latis, filamento minuto, connectivo superne incrassato et truncato, thecis oblongis; carpellis 9 vel 10 parce stramineo-sericeis, ovario oblongo-ovoideo sub anthesi 1–1.2 mm. longo, ovulis 2 oblique superpositis, stigmatibus coalitis; infructescentiis mox glabrescentibus, receptaculo circiter 5 mm. diametro, pedicello 35–45 mm. longo, stipitibus 7–8 mm. longis, carpellis submaturis 3–7 oblongo-ellipsoideis ad 15×10 mm. saepe inter semina contractis, pericarpio coriaceo sublevi, seminibus 2 raro 1.

VANUA LEVU: Mathuata: Southern base of Mathuata Range, north of Natua, alt. 100–250 m., Dec. 1, 1947, *Smith 6778* (A TYPE, US) (tree 15 m. high, in dense forest; perianth-segments yellowish green); Mbuu: Southern slope of Mt. Seatura, alt. 600 m., *Smith 1681* (GH, NY, US) ("mako"; tree 15 m. high, in dense forest; perianth-segments yellowish green). Fiji, without definite locality: *Horne 430* (GH).

Cyathocalyx stenopetalus is most readily distinguished from *C. vitiensis* and *C. insularis* by its narrow ligulate petals and smaller sepals; in foliage it closely resembles *C. insularis*, but its leaves usually have fewer secondary nerves. The new species also has comparatively few stamens, but variability in this character is apparently considerable in *Cyathocalyx*.

Cyathocalyx suaveolens sp. nov.

Arbor ad 20 m. alta, partibus novellis dense sericeis, ramulis sat robustis teretibus primo purpurascenscentibus et ferrugineo-puberulis demum glabrescentibus cinereis; petiolis validis (2–3 mm. diametro) rugulosis leviter canaliculatis mox glabrescentibus 20–30 mm. longis; laminis coriaceis vel subpapyraceis siccitate fusco-olivaceis, oblongo-ellipticis, (11–)15–32 cm. longis, (6–)8–12 cm. latis, basi rotundatis vel late obtusis et in petiolum saepe inaequilateraliter decurrentibus, apice in acuminem circiter 5 mm. longum obtuse cuspidatis, margine leviter recurvatis, utrinque costa et nervis principalibus inconspicue puberulis mox glabrescentibus, costa valida supra canaliculata subtus prominente, nervis secundariis utrinsecus 11–15 subpatentibus leviter curvatis vel subrectis anastomosantibus utrinque evidenter elevatis, rete venularum inconspicuo utrinque plerumque prominulo; inflorescentiis breviter racemosis vel subglomerulatis oppositifoliis vel infra folia enatis, rhachi solitaria vel 2–4 aggregata circiter 3 mm. diametro plerumque 5–15 mm. longa conspicue cicatricosa apicem versus 1–3-flora pilis ferrugineis circiter 0.1 mm. longis arcte tomentella, bracteis papyraceis late deltoideis circiter 1.5 mm. longis extus tomentellis mox caducis; pedicellis calyce petalisque ut rhachi dense et persistenter ferrugineo- vel fusco-tomentellis, pedicello gracili sub anthesi 15–25 mm. longo basim versus obscure unibracteolato, bracteola oblonga obtusa 2–3 mm.

longa; sepalis 3 carnis ovato-deltoides, 5–7 mm. longis, 4–6 mm. latis, apice subacutis et saepe reflexis, intus basim versus glabris; petalis 6 carnis sub anthesi 30–50 mm. longis, partibus basalibus concavis sub-orbicularibus 5–6 mm. latis intus glabris, petalorum interiorum apicem versus ventro glanduloso-pilosis, petalorum partibus patentibus ligulatis 3–4.5 mm. latis, petalorum interiorum paullo angustioribus et basi connatis; receptaculo complanato obscure hispidulo; staminibus 3–5-seriatis circiter 55–75 obovoideis, 1.2–1.5 mm. longis, apice 0.6–1 mm. latis, filamento carnosio ad 0.2 mm. longo, connectivo superne incrassato et truncato, thecis lineari-oblongis; carpellis 5–7 parce albido-villosis, ovario oblongo-ovoideo sub anthesi 1.5–2 mm. longo, ovulis 6 vel 7, stigmatibus coalitis; pedicello sub fructu valido 30–35 mm. longo et receptaculo subcapitato circiter 5 mm. diametro subpersistenter tomentellis, stipitibus 3–5 mm. longis, carpellis maturis 3–6 subglobosis 18–20 mm. diametro, pericarpio coriaceo valde ruguloso primo piloso demum glabrescente, seminibus saepe 3 magnis.

VITI LEVU: Mba: Valley of Nggaliwana Creek, north of the sawmill at Navai, alt. 725–850 m., July 21, 1947, *Smith 5342* (A TYPE, US) (“makosoi”; tree 20 m. high, in dense forest; flowers very fragrant, the perianth-segments yellowish green); vicinity of Nandarivatu, alt. 900 m., *Gillespie 4267* (GH) (tree in dense forest, the trunk about 13 cm. in diameter, tapering, the wood white, very soft; flowers slightly fragrant, the perianth-segments pale green or yellowish). VANUA LEVU: Thakaundrove: Southern slopes of Valanga Range, alt. 200–400 m., *Smith 392* (GH, NY, US) (tree 13 m. high, in dense forest; perianth green). TAVEUNI: Vicinity of Waiyevo, in woods above coconut plantations, alt. 600 m., *Gillespie 4741* (GH, US).

This new species appears to be the most distinct of the Fijian representatives of *Cyathocalyx*, being distinguished not only by its persistently tomentellous flowers, but also by its comparatively large leaf-blades which are rounded or broadly obtuse at base.

Oxymitra monosperma (A. Gray) A. C. Sm. in Bishop Mus. Bull. 141: 62. 1936, in *Sargentia* 1: 33. 1942.

VITI LEVU: Mba: Hills east of Nandala Creek, about 3 miles south of Nandarivatu, alt. 850–970 m., *Smith 5932* (A, US) (slender tree 10 m. high, in dense forest; fruit from branchlets or associated with leaves); western and southern slopes of Mt. Tomanivi [Mt. Victoria], alt. 850–1150 m., *Smith 5111* (A, US) (“vavaloa”; tree 10 m. high, in dense forest; fruit on branches; mature carpels yellowish brown).

The cited specimens, both in fruit, are interesting additions to the known occurrence of this infrequent endemic. The Fijian name “vavaloa” is applied to *Degeneria vitiensis* Bailey & A. C. Sm., and its use for the present species may be questioned (cf. footnote in *Jour. Arnold Arb.* 30: 3. 1949).

The generic name *Oxymitra* Bl. ex Hook. f. & Thoms. is a later homonym of *Oxymitra* Bischoff, as pointed out by van Steenis (in *Bull. Bot. Gard. Buitenz.* III. 17: 458. 1948), who proposes the name *Frieso-*

dielsia for the annonaceous genus, without making specific combinations. *Oxymitra* Bl. ex Hook. f. & Thoms. has been proposed for conservation at the next International Botanical Congress.

LEGUMINOSAE

Acacia mathuataensis sp. nov.

Arbor ramis patentibus ubique glabra, ramulis junioribus gracilibus purpurascens angulatis rugulosis copiose lenticellatis demum cinereis subteretibusque; phyllodiis planis in sicco subcoriaceis olivaceo-viridibus, lanceolato- vel obovato-ellipticis, (3.5-)4-5 cm. longis, 1.3-2.3 cm. latis, basi in stipitem rugulosum inconspicuum gradatim attenuatis, apice obtusis et abrupte calloso-hamatis, nervis principalibus 9-14 utrinque acute prominulis inter se 1-2 mm. distantibus reticulo inconspicuo interconnexis; pedunculis solitariis vel binis et brevissime racemosis, rhachi inflorescentiae 0.5-2 mm. longa cum pedunculo obscure articulata, bracteis ovato-deltaideis 0.5-0.8 mm. longis subacutis obscure glanduloso-ciliolatis, pedunculo tereti gracili sub anthesi 4-5 mm. longo; capitulis sub anthesi staminibus inclusis circiter 5 mm. diametro, floribus sessilibus circiter 45, bracteolis 0.6-0.8 mm. longis inaequilateraliter peltatis, stipite gracili, lamina ovata obscure glanduloso-ciliolata; calyce submembranaceo campanulato circiter 0.7 mm. longo brevidentato, lobis 5 subacutis 0.2-0.3 mm. longis; corolla campanulata circiter 1.5 mm. longa fere ad basim 5-lobata, petalis obovato-lanceolatis obtusis; staminibus liberis 40-45, filamentis filiformibus sub anthesi circiter 2 mm. longis, antheris minutis; stylo sub anthesi 3-4 mm. longo.

VANUA LEVU: Mathuata: Summit ridge of Mt. Numbuiloa, east of Lambasa, alt. 500-590 m., Nov. 6, 1947, *Smith 6521* (A TYPE, US) ("tatanggia"; spreading tree to 6 m. high, in dense summit thickets; petals and stamens bright yellow).

The plant described above is evidently of the general relationship of *A. simplicifolia* (L. f.) Druce [*A. laurifolia* Willd.], differing in its much smaller phyllodia, which have closer primary nerves. *Acacia simplicifolia*, in contrast to *A. mathuataensis*, has the calyx-lobes subspatulate, more nearly free, and distally glandular-pilose; it is the common "tatanggia" of the Fijians and is a widespread strand plant, which I have never observed inland. *Acacia Richii* A. Gray has flowers more nearly resembling those of the new species, but they are fewer per head, the inflorescences are more densely aggregated, and the phyllodia are lanceolate, acuminate at apex, and proportionately much narrower than those of *A. mathuataensis*.

Cynometra falcata A. Gray, Bot. U. S. Expl. Exped. 1: 472. 1854; Horne, A Year in Fiji 260. 1881; A. C. Sm. in *Sargentia* 1: 38. 1942.

VANUA LEVU: Mathuata: Southern slopes of Mt. Numbuiloa, east of Lambasa, alt. 350-500 m., *Smith 6574* (A, US) ("thimbithimbi"; slender tree 4 m. high, in steep open forest; upper branches subscandent). Fiji, without locality or number, *Horne* (GH).

The cited Mathuata collection, which is sterile, was taken from a group of several plants occurring on a very steep rocky hillside in comparatively dry forest; the species has not been elsewhere observed by me. Careful examination of the locality failed to reveal any fertile plants. These are apparently the only collections of *C. falcata* since the type material was obtained in 1840, at or near Mba, in northwestern Viti Levu. No. 6574 agrees precisely with the type in the details of its essentially sessile unjugate leaves, while the Horne specimen has petioles up to 6 mm. in length and leaflets up to 16×5 cm. However, both collections may be referred to *C. falcata* with confidence.

Cynometra insularis A. C. Sm. in *Sargentia* 1: 38. 1942.

VITI LEVU: Mba: Dry gullies and hillsides near Ndrasa, near Lautoka, alt. about 180 m., *Greenwood 717A* (A). VANUA LEVU: Mathuata: Ndreketi River Valley, *R. A. Sykes 325* (or 47) (A) ("thimbithimbi"; common riverside tree); southern slopes of Mt. Numbuiloa, east of Lambasa, alt. 100–350 m., *Smith 6382* (A, US) ("thimbithimbi"; tree 25 m. high, in open forest).

The cited collections precisely agree with the type and earlier cited material of the species, which has been known from Viti Levu and Taveuni.

MANILTOA Scheff.

In discussing the Fijian species of *Maniltoa* in 1942 (in *Sargentia* 1: 36–38), I recognized only two species. *Maniltoa grandiflora* (A. Gray) Scheff. has been a puzzling entity since its original description, and subsequent authors have noted that the usual concept of it includes at least two or three forms. Entirely satisfactory analysis of the genus in Fiji is still not possible, but my collections of 1947 permit at least a better understanding of it, and it is seen that more than two species must be admitted. Below I describe three additional species as new, but I suspect that at least one or two more entities in *Maniltoa* in Fiji will eventually be found worthy of specific recognition. The five species now known may be keyed as follows:

Inflorescence-rachis and pedicels glabrous or very sparsely and obscurely puberulent; ovary glabrous or sparsely ferruginous-strigillose distally.

Leaves 10–15 cm. long or more, the leaflets predominantly 3 pairs, rarely 4 pairs (often 2 pairs on distal leaves), $4.5\text{--}10 \times 2\text{--}5.5$ cm.; flowers comparatively large, the sepals and petals at least 10 mm. long, the filaments at least 15 mm. long.

Inflorescence comparatively ample and large-flowered; rachis about 3 cm. long and pedicels 20–25 mm. long at anthesis; sepals $10\text{--}15 \times 4\text{--}7$ mm.; petals $12\text{--}19 \times 3\text{--}4$ mm.; filaments 15–25 mm. long; bracts enclosing leaf- and flower-buds densely sericeous dorsally.
.....*M. grandiflora*.

Inflorescence comparatively compact and small-flowered; rachis about 1 cm. long and pedicels 8–12 mm. long at anthesis; sepals $10\text{--}12 \times 2.5\text{--}5$ mm.; filaments about 15 mm. long; bracts enclosing leaf- and flower-buds glabrous.....*M. brevipes*.

Leaves short, not exceeding 7 cm. in length, the leaflets predominantly 2 pairs (1 pair on distal leaves), small, $2.5-4 \times 1.7-2.5$ cm.; flowers comparatively small, the sepals $6.5-7 \times 2-4$ mm., the petals $7-8 \times 1.5$ mm., the filaments 10-12 mm. long.....*M. minor*.

Inflorescence-rachis and pedicels obviously puberulent or hispidulous; ovary copiously velutinous-puberulent or uniformly hispidulous.

Leaves predominantly 3-jugate (rarely 4- or 2-jugate), usually more than 15 cm. long; inflorescence-rachis and pedicels copiously pale-puberulent; lateral flower-subtending bracteoles tufted-strigose dorsally near apex, glabrous below; sepals 15-16 mm. long, faintly puberulent dorsally; petals 15-17 mm. long; ovary velutinous-puberulent.....

.....*M. floribunda*.

Leaves predominantly bijugate (rarely unijugate), up to 10 cm. long; inflorescence-rachis and pedicels copiously ferruginous-hispidulous with hairs 0.3-0.5 mm. long; lateral flower-subtending bracteoles copiously hispidulous along the median dorsal line; sepals 10-13 mm. long, hispidulous-puberulent dorsally; petals 11-14 mm. long; ovary velutinous-hispidulous.....*M. vestita*.

Maniltoa grandiflora (A. Gray) Scheff. in Ann. Jard. Bot. Buitenz. 1: 20. 1876; A. C. Sm. in Sargentia 1: 36. 1942.

In 1942 I discussed the various forms of this species upon which Gray based his concept, designating the specimen (US) from which his *figure B* (of Bot. U. S. Expl. Exped. 1: *pl.* 52. 1854) was drawn as the lectotype. Interpreting the species broadly in 1942, I cited as representing it several specimens which now appear to me to represent a novelty, described below as *M. floribunda*. It is very difficult to identify specimens of *Maniltoa* from foliage alone, and so a thoroughly satisfactory analysis of the limits of *M. grandiflora* must await the collection of better material, with adequate geographical data.

Among the specimens available at present, the best match for the type of *M. grandiflora* is *Seemann 138* in part (GH), without definite locality beyond "Ovalau and Vanua Levu" (Seem. Fl. Vit. 71. 1865). *Seemann 138* is composed of material from three different trees; a second part is referable to *M. minor* A. C. Sm. and a third part is suggestive of *M. floribunda*. The Exploring Expedition specimen (GH) which served as the basis of Gray's *figure A* may also be referred to typical *M. grandiflora*, although its leaflets are narrower than those of the actual type. A sterile specimen from Thakaundrove, Vanua Levu, *Degener & Ordonez 13949* (A), resembles the type of *M. grandiflora* in foliage but cannot confidently be placed here.

The specimens (GH, US) upon which Gray's *figure C* is based are sterile; they come from Ovalau and agree fairly well with the type in foliage, but have the leaves predominantly bijugate. With this Ovalau material the following sterile specimens seem to agree: *Gillespie 4540* (US), from Ovalau, *Smith 1022* (GH, NY, US), from Koro, and *Parham 2463* (A), from the Navua River, Serua, Viti Levu. These four collections cannot confidently be referred to any described species of *Maniltoa* at this time.

Maniltoa brevipes sp. nov.

Arbor ad 20 m. alta partibus inflorescentiae obscure puberulis exceptis ubique glabra dense foliata, ramulis teretibus cinereis conspicue lenticellatis apicem versus subflexuosis; foliis plerumque 10–15 cm. longis 3-jugis vel apicem ramulorum versus 2-jugis, petiolis teretibus rugulosis 8–12 mm. longis, rhachi gracili interdum subflexuosa, petiolulis inconspicuis 1–4 mm. longis; laminis foliolorum subcoriaceis siccitate viridi-olivaceis inaequilateraliter oblongo-ellipticis, (4–)5–7 cm. longis, (1.5–)2–3.5 cm. latis, basi obtusis, apice late obtusis saepe emarginatis, margine integris leviter recurvatis, costa recta vel leviter curvata utrinque valde elevata, nervis secundariis utrinsecus 6–8 marginem versus et cum rete venularum anastomosantibus supra subplanis vel immersis subtus inconspicue prominulis; inflorescentia apicem ramulorum versus axillari breviter racemosa circiter 15-flora juventute bracteis numerosis involucreta, bracteis papyraceis, maximis suborbicularibus ad 15 × 20 mm. dorso glabris margine inconspicue ciliatis apice rotundatis mox caducis; rhachi valida sub anthesi circiter 1 cm. longa basibus florum incrassata, bracteis floriferis medianis oblongo-linearibus 12–13 mm. longis circiter 2 mm. latis dorso hispidulis mox caducis, bracteolis lateralibus oblongo-lanceolatis circiter 2 mm. longis dorso ferrugineo-hispido-strigosis; pedicellis teretibus sub anthesi 8–12 mm. longis glabris vel obscure et evanescenter puberulis in receptaculum cupulatum 2.5–3 mm. diametro et margine in tubum circiter 1 mm. altum productum incrassatis; sepalis 4 sub anthesi reflexis submembranaceis oblongis, 10–12 mm. longis, 2.5–5 mm. latis, glabris vel dorso minutissime puberulis, apice obtusis; petalis non visis; staminibus circiter 35, 1- vel 2-seriatis, filamentis circiter 15 mm. longis, antheris ellipsoideis 1.2–1.5 mm. longis apice apiculatis; ovario glabro breviter stipitato, ovulo solitario, stylo gracili 10–11 mm. longo; pedicello sub fructu valde incrassato 10–14 mm. longo, sepalis staminibusque subpersistentibus, legumine oblique ellipsoideo leviter complanato ad 5 cm. longo et 3.5 cm. lato, basi rotundato, apice obtuse cuspidato, pericarpio valde incrassato et ruguloso.

VANUA LEVU: Mathuata: Near summit of Mt. Uluimbau ["The Three Sisters"], south of Lambasa, alt. 360–369 m., Nov. 13, 1947, *Smith 6600* (A TYPE, US) ("thimbithimbi"; tree 5–10 m. high, in open forest; buds glaucous-green); banks of lower Lambasa River, near sea-level, *Smith 6629* (A, US) ("thimbithimbi"; tree to 20 m. high, with wide-spreading branches, at inner edge of mangrove-swamp).

From *M. grandiflora* (A. Gray) Scheff. the new species differs in its comparatively compact and small-flowered inflorescence, the short pedicels being especially noteworthy, and in having the bracts of its buds glabrous rather than obviously sericeous dorsally. As compared with the actual type of *M. grandiflora*, the new species has obviously narrower leaflets, but foliage characters are not too dependable in this complex; for instance, the leaflets of the specimen upon which Gray based his *figure A* (of Bot. U. S. Expl. Exped. 1: *pl.* 52. 1854) are very similar to those of *M. brevipes*. However, this Exploring Expedition specimen in inflorescence agrees excellently with the type of *M. grandiflora*. I have seen no older collec-

tions which seem conspecific with those described above as *M. brevipes*.

Maniltoa minor A. C. Sm. in *Sargentia* 1: 37. 1942.

No additional specimens of this species have come to my attention since its description. It is well marked in foliage and inflorescence characters, but my original discussion overemphasized the marginal prolongation of the receptacle. This development of the receptacle is perhaps more pronounced in *M. minor* than in other Fijian species of the genus, but the character is not a fundamental one.

Maniltoa floribunda sp. nov.

Arbor ad 23 m. alta partibus juvenilibus et inflorescentiis exceptis glabra, ramulis et foliorum petiolis rhachibus petiolulisque minute cinereo-vel ferrugineo-puberulis mox glabrescentibus, ramulis teretibus validis rugulosis cinereis inconspicue lenticellatis; foliis (10-)15-25(-30) cm. longis, plerumque 3-jugis (raro 4-jugis, apicem ramulorum versus raro 2-jugis), petiolis crassis teretibus 15-25 mm. longis, rhachi plerumque recta, petiolulis rugulosis 2-8 mm. longis; laminis foliolorum subcoriaceis in sicco viridi-olivaceis inaequilateraliter ellipticis vel obovato-oblongis, (6-)7-10 cm. longis, 3-5.5 cm. latis, basi obtusis vel subacutis, apice obtusis vel obtuse mucronatis et saepe emarginatis, margine integris et paullo recurvatis, costa subrecta utrinque prominente, nervis secundariis utrinsecus 6-8 obscure anastomosantibus utrinque immersis vel paullo elevatis, rete venularum intricato utrinque immerso vel prominulo; inflorescentia axillari vel ramulis defoliatis enata breviter racemosa 25-50-flora juventute bracteis numerosis magnis involucrata, bracteis papyraceis, maximis suborbicularibus ad 30 × 40 mm. apice rotundatis dorso copiose brevi-sericeis margine ferrugineo-ciliatis mox caducis; rhachi crassa sub anthesi 1-3 cm. longa copiose cinereo-puberula basibus florum conspicue incrassata, bracteolis lateralibus lineari-lanceolatis 2-5 mm. longis dorso apicem versus copiose strigosis inferne glabris mox caducis; pedicellis teretibus sub anthesi 20-35 mm. longis ut rhachi copiose puberulis in receptaculum circiter 3 mm. diametro incrassatis; sepalis 4 sub anthesi reflexis submembranaceis elliptico-oblongis, 15-16 mm. longis, 4-8 mm. latis, dorso inconspicue puberulis, apice obtusis; petalis 5 membranaceis obovato-lanceolatis, 15-17 mm. longis, 3-4 mm. latis, inferne angustatis, apice subacutis; staminibus circiter 40, 1- vel 2-seriatis, filamentis circiter 25 mm. longis, antheris ellipsoideis circiter 2 mm. longis apice apiculatis; ovario ubique velutino-puberulo interdum basim versus parce setuloso, breviter stipitato, ovulo solitario, stylo gracili circiter 17 mm. longo inferne puberulo superne glabro.

VITI LEVU: Mba [formerly Nandi]: Vicinity of Tumbenasolo, valley of Namosi Creek, alt. 200-450 m., *Smith* 4502 (A, US), 4627 (A, US) ("yamo"; trees 15-20 m. high, in forest along stream; bud-bracts rich brown); Nandronga & Navosa: Southern slopes of Nausori Highlands, in drainage of Namosi Creek above Tumbenasolo, alt. 300-450 m., May 29, 1947, *Smith* 4588 (A TYPE, US) ("yamo"; tree 20 m. high, in dense forest; petals and filaments pure white; ovary pinkish); valley of Singatoka

River, *Greenwood 423B* (A, US) (tree to 23 m. high, in forest along creek; bark gray); Naruku, vicinity of Mbalo, near Vatukarasa, alt. 250 m., *Degener 15317* (A, US) ("yamo"; tree 8 m. high, in forest; timbers used for house-posts). Fiji, without definite locality, *Horne 519* (GH).

The new species is readily distinguished from typical *M. grandiflora* (A. Gray) Scheff. by its copiously puberulent rachis and pedicels and its velutinous-puberulent ovary. An additional, but evanescent, difference is seen in the lateral flower-subtending bracteoles, those of *M. grandiflora* being hispidulous all along the median dorsal line or distally glabrous, whereas those of the new species are tufted-strigose distally and glabrous below. *Maniltoa floribunda* is a frequent component of the comparatively dry forest of southwestern Viti Levu, but it has not yet been noted elsewhere. That the Horne specimen cited above may also have come from this general region is indicated by the fact that he visited the Singatoka valley and the adjacent region toward Nandi (A Year in Fiji, 42. 1881); Horne (op. cit. 260) listed his no. 519 as a probable new species distinct from *Cynometra grandiflora*. The typical form of *M. grandiflora* is not yet known with certainty to occur on Viti Levu.

In discussing *M. grandiflora*, above, I mentioned that one of the three specimens composing *Seemann 138* (GH) is suggestive of *M. floribunda*. The specimen in question, mounted on the upper left portion of the sheet, has inflorescences like those of *M. floribunda*, but the pubescence of its pedicels is more pronounced, minutely hispidulous rather than merely puberulent. Furthermore its leaves are bijugate, as far as seen, and the leaflets are thicker in texture and with a more definitely curved midrib than those of *M. floribunda*. I believe that this part of *Seemann 138*, which comes from either Ovalau or Vanua Levu, represents still another entity in *Maniltoa*, but material for verification is inadequate.

Maniltoa vestita sp. nov.

Arbor ad 20 m. alta ramulis juvenilibus et foliorum petiolis rhachibus petiolulisque minutissime et evanescenter puberulis et inflorescentiis exceptis glabra; ramulis teretibus sat crassis rugulosis cinereis lenticellatis, hornotinis subflexuosis; foliis ad 10 cm. longis bijugis vel apicem ramulorum versus unijugis, petiolis subteretibus rugulosis 8–12 mm. longis, rhachi saepe flexuosa, petiolulis inconspicuis rugulosis haud 2 mm. longis; laminis foliolorum subcoriaceis in sicco olivaceis inaequilateraliter oblongo-ellipsoideis, 4–7 cm. longis, 2.5–4 cm. latis, basi latere inferiore rotundatis vel late obtusis superiore gradatim angustatis, apice late obtusis et leviter emarginatis, margine integris et leviter recurvatis, costa subrecta vel paullo curvata utrinque elevata, nervis secundariis utrinsecus 3–6 anastomosantibus cum rete venularum intricato utrinque prominulis vel subimmersis; inflorescentia axillari vel e ramulis defoliatis oriente breviter racemosa 20–25-flora juventute bracteis numerosis involucratis, bracteis papyraceis, maximis suborbiculari-obovatis ad 25 × 20 mm. apice rotundatis dorso copiose ferrugineo-puberulis margine ciliatis mox caducis; rhachi sub anthesi circiter 1 cm. longa pilis ferrugineis 0.3–0.5 mm. longis copiosissime hispidula, bracteolis lateralibus lineari-lanceolatis 2–4 mm. longis dorso

copiose hispidulis; pedicellis obscure striatis sub anthesi 15–20 mm. longis ut rhachi dense hispidulis in receptaculum circiter 2 mm. diametro incrassatis; sepalis 4 sub anthesi reflexis submembranaceis oblongis, 10–13 mm. longis, 3–5 mm. latis, apice obtusis, dorso copiose hispidulo-puberulis; petalis 5 submembranaceis obovato-lanceolatis, 11–14 mm. longis, 2–3 mm. latis, inferne angustatis, apice subacutis; staminibus circiter 40, 1- vel 2-seriatis, filamentis sub anthesi 12–17 mm. longis, antheris ellipsoideo-oblongis circiter 1.5 mm. longis apice obtusis; ovario omnino velutino-hispidulo etiam interdum parce setuloso, breviter stipitato, ovulo solitario, stylo gracili circiter 10 mm. longo distaliter glabro.

VANUA LEVU: Mathuata: Southern slopes of Mt. Numbuiloa, east of Lambasa, alt. 350–500 m., Nov. 3, 1947, *Smith 6442* (A TYPE, US) ("thimbithimbi"; tree 20 m. high, in thin forest on rocky slope; bracts whitish brown; petals, filaments, and style white).

Maniltoa vestita, apparently the most sharply distinct entity of the genus in Fiji, is readily distinguished from its closest ally, *M. floribunda*, described above, by the obvious characters pointed out in my key.

DESMODIUM Desv.

Three weedy species of this genus which have apparently not otherwise been recorded from Fiji in the taxonomic literature are listed below. I am indebted to Dr. Bernice G. Schubert, of the Gray Herbarium, for her verifications of identifications in *Desmodium*.

Desmodium purpureum (Mill.) Fawc. & Rendle, Fl. Jam. 4: 36. 1920.

VITI LEVU: Naitasiri: Central Agricultural Station, on cultivated land, *B. E. Parham 2411* (A) (shrub 2 m. high).

This American species has apparently not previously been recorded as occurring in Fiji.

Desmodium heterocarpum (L.) DC. Prodr. 2: 337. 1825.

VANUA LEVU: Mathuata: Seanggangga Plateau, in drainage of Korovuli River, vicinity of Natua, alt. 100–200 m., *Smith 6811* (A, US) (shrub 1–2 m. high, naturalized along trail in patches of forest in open rolling country; petals pale blue). TAVEUNI: Vicinity of Somosomo, in gardens, *Gillespie 4774* (A, US) (flowers purple).

Although it has been reported from several Pacific archipelagos, I have found no published record of the occurrence of this widespread species in Fiji. Mr. William Greenwood mentions the species in an unpublished list, indicating that he has also collected it in Fiji.

Desmodium gangeticum (L.) DC. Prodr. 2: 327. 1825.

KANDAVU: Vunisea, *B. E. Parham 2999* (A), *3000* (A).

Apparently this weed has not otherwise been noted from Fiji, although its occurrence has been recorded in Micronesia, the Austral Islands, and on Rarotonga.

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