

STUDIES OF PACIFIC ISLAND PLANTS, XII
THE CUNONIACEAE OF FIJI AND SAMOA

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ALTHOUGH THE CUNONIACEAE, a family of considerable size and diversity in New Guinea and New Caledonia, are represented eastward in the Pacific by a sharply decreasing number of members, they are nevertheless a puzzling group in the area under consideration, to judge from the uncertainty of herbarium identifications and the difficulty of analyzing specific criteria. While attempting to place the specimens of the family which I collected in 1947¹, it seemed desirable to assemble earlier material, to prepare keys, and to redescribe the species, the original descriptions having been based upon too few specimens to show their variability. The place of deposit of specimens cited in this paper is shown as follows: Arnold Arboretum (A); Bernice P. Bishop Museum (Bish); British Museum (BM); Gray Herbarium (GH); New York Botanical Garden (NY); and U. S. National Herbarium (US). The kindness of the authorities of these institutions in permitting study of their material is greatly appreciated.

The Cunoniaceae do not occur in Tonga, on the basis of available records, but in Fiji the family is represented by 14 species and in Samoa by three species, all being endemic to one or the other archipelago. Of the four genera occurring in this area, only *Weinmannia* is widespread, with an extensive distribution mostly in the Southern Hemisphere. *Spiraeanthemum* is found from New Guinea and Australia eastward to Samoa, where its range is terminated by a single species; *Geissois* is more limited, occurring in New Caledonia, Australia, and the New Hebrides, with four species terminating its range in Fiji. Of special interest is the occurrence in Fiji of a species of *Pullea*, a genus previously believed limited to New Guinea.

In this paper three species and three varieties are described as new. Criteria for the demarcation of species in the Cunoniaceae are often neither obvious nor constant, but the genera are well marked. The following key to genera utilizes only characters found in the species of our region:

Inflorescence racemose, the racemes solitary or 2-4 at apex of a short common peduncle or arising from inconspicuous glomerules; ovary 2-carpellate, the capsule septicidally 2-valved; leaves compound or sometimes simple.

Flowers large, the calyx and filaments red, the stamens 8-26, with filaments 11-20 mm. long; petals none; disk pulvinate, entire; ovules numerous,

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- 20–42 per locule, 2-seriate; seeds distally winged; plants with hermaphrodite flowers and 3-foliolate leaves1. *Geissois*.
 Flowers small, the petals and filaments white or greenish, the stamens 8, with filaments up to 4 mm. long; petals 4; disk divided into 8 free lobes; ovules 3–12 per locule; seeds comate at both ends, not winged; plants polygamo-dioecious, the leaves pinnate or 3-foliolate or simple2. *Weinmannia*.
 Inflorescence paniculate; flowers small, the calyx and filaments white to yellowish or greenish, the petals none, the stamens (6 –) 8–12; the disk divided into lobes; leaves simple.
 Plants dioecious or possibly polygamo-dioecious; inflorescences solitary; ♂ flowers with (3 –) 4–6 free or loosely connate disk-lobes and no carpels; ♀ flowers with (6 –) 8–12 disk-lobes and 4 or 5 (rarely 3 or 6) free carpels, each 1- or 2-ovulate; follicles ventrally dehiscent, the seeds distally winged and usually with a basal wing as well. 3. *Spiraeanthemum*.
 Plants with hermaphrodite flowers; inflorescences paired or ternate, superposed; disk-lobes 10 or 12, often coherent in pairs; ovary 2-carpellate, the ovules 4 per locule.4. *Pullea*.

1. GEISSOIS Labill.

Geissois, originally based on a species from New Caledonia, is now considered to include about 17 species; its range centers in New Caledonia, but species also occur in Australia and the New Hebrides and eastward to Fiji, beyond which the genus does not extend.

In Fiji the local names *vure* and *vota* are usually applicable to *Geissois*, and in some localities *G. ternata* is a frequent and striking component of the vegetation, conspicuous for its beautiful red-flowered inflorescences. Criteria for the recognition of species, insofar as they refer to the size and indument of vegetative parts, are satisfactory within limits. The stipules in particular provide reliable characters, and in the case of *G. superba* the extreme length of the raceme is very obvious. Floral characters are usually too uniform to be of much taxonomic value, although the indument of the ovary, on the contrary, is too variable. In both *G. imthurnii* and *G. ternata* the ovary may vary from glabrous to strigillose or even densely sericeous, and as this variation seems uncorrelated with other characters I have not emphasized it.

In Fiji four species can be discerned, of which one is described as new. By far the greater part of the Fijian population of the genus represents *G. ternata*, which I here divide into four varieties, three of them new.

KEY TO THE SPECIES

- Inflorescence robust, 22–45 cm. long, the stamens 14–26; leaves comparatively large, the petiole 1.5–8 cm. long, the petiolules 1.5–8 cm. long, the leaflet-blades usually 24–50 × 10–19 cm., with 13–20 secondary nerves per side; stipules large, ovate-oblong, comparatively persistent, up to 60 × 45 mm., proximally laterally connate.1. *G. superba*.
 Inflorescence much smaller, not exceeding 10.5 cm. in length, the stamens 8–15; leaves smaller, the petiole not exceeding 5 cm. and the petiolules 6 cm. (usually less than 2.5 cm.) in length, the leaflet-blades not more than

23 × 10.5 cm., usually much smaller, with not more than 15 secondary nerves per side; stipules usually not persistent after attaining a length of about 7 mm., if persistent oblong or elliptic, not more than 20 mm. broad, and laterally free.

Leaflets nearly sessile, the blades rounded to subacute at base, the petiolules of lateral ones up to 2 mm. (rarely to 3 mm.) and of terminal one up to 3 mm. (rarely to 6 mm.) long; leaflet-blades hispidulous on both surfaces, the hairs usually persistent, densest on costa and secondaries; branchlets, petioles, and petiolules copiously setulose or strigillose, rarely subglabrate; inflorescence-rachis and pedicels hispidulous, the calyx-lobes sparsely strigillose on both sides. 2. *G. imthurnii*.

Leaflets obviously petiolulate, the petiolules usually 4 mm. or more long (if shorter, the leaflet-base attenuate and long-decurrent); leaflet-blades glabrous or faintly strigillose on costa.

Stipules subpersistent, at length ligulate-oblong, up to 10 × 2 cm., copiously hispid without with hairs 1.5–2.5 mm. long, glabrous within; branchlets robust, distally conspicuously flattened, the petioles similarly flattened, copiously hispidulous or strigillose, the petiolules 1.5–6 cm. long, the leaflet-blades 11–23 × 6.5–10.5 cm.; calyx-lobes 6.5–7 mm. long. 3. *G. stipularis*.

Stipules usually early caducous, if subpersistent apparently not exceeding a size of about 3 × 1 cm., variously pilose or glabrous on both sides; branchlets subterete or distally slightly flattened, the petioles semiterete, sparsely strigillose and glabrate, the petiolules up to 2.5 cm. long, the leaflet-blades usually 2–17 × 1.5–9 cm.; calyx-lobes 4.5–6 mm. long. 4. *G. ternata*.

1. ***Geissois superba*** Gillespie in Bishop Mus. Bull 83: 9. fig. 9. 1931.

Tree 10–13 m. or more in height, the branchlets stout (0.8–1.5 cm. in diameter toward apex and there subquadrate or slightly flattened), distally hispidulous or puberulent (hairs 0.1–0.5 mm. long), the older parts glabrate and lenticellate; stipules subcoriaceous, ovate-oblong, rapidly enlarging to about 6 cm. long and 4.5 cm. broad before falling, laterally connate at base, forming a bilobed cupule, recurved at margin, very densely velutinous-hispidulous on both sides (hairs 0.3–0.5 mm. long), rarely glabrate, the scars forming a conspicuous continuous ring; leaves opposite, 3-foliolate, the petioles semiterete, stout, 1.5–8 cm. long, hispidulous like branchlets, sometimes glabrate, the petiolules stout, shallowly canaliculate or subterete, 1.5–8 cm. long (terminal slightly the longest), pilose like petioles; leaflet-blades chartaceous to subcoriaceous, elliptic or obovate-elliptic, (15–) 24–50 cm. long, (6–) 10–19 cm. broad, acute to obtuse at base and decurrent on the petiolules, rounded at apex, entire and narrowly recurved at margin, glabrous above or sparsely strigillose on costa and secondaries, beneath strigillose on principal nerves and sometimes on surface, the costa elevated or prominent above, very prominent beneath, the secondary nerves 13–20 per side, erecto-patent, nearly straight, plane or slightly elevated above, prominent beneath, the veinlet-reticulation intricate, prominulous on both surfaces; racemes axillary and borne within the stipule-cupule or lateral below leaves, solitary or paired,

pendent, 22–45 cm. long, the peduncle 3–12 cm. long, stout, terete, curved, with the conspicuously striate rachis sparsely hispidulous; flower-subtending bracts lanceolate, 2–2.5 mm. long, dorsally strigillose, soon caducous, the pedicels strigillose, 7–12 mm. long, articulate near or slightly below middle; calyx-lobes 4, carnose, becoming subcoriaceous, narrowly deltoid or lanceolate, $5-6 \times 1.8-2.5$ mm., acute, sparsely strigillose without and more densely hispidulous-tomentellous within (hairs 0.2–0.5 mm. long); stamens 14–26, the filaments 15–20 mm. long, the anthers oblong, about 1 mm. long; disk pulvinate, inconspicuously grooved, 0.5–1 mm. high and about 2 mm. in diameter; ovary copiously hispidulous-tomentellous or merely sparsely strigillose (hairs 0.8–1.3 mm. long), the styles 10–12 mm. long, the ovules about 40 per locule, imbricate, biseriate; receptacle swollen in fruit, the calyx-lobes soon caducous; capsule cylindric, falcate, 15–22 mm. long, persistently strigillose-hispidulous but the hairs often sparse, the pericarp coriaceous, the seeds about 3 mm. long.

DISTRIBUTION: Endemic to Fiji and thus far known only from Viti Levu, at elevations up to 900 m. The species is a tree up to 13 m. high or perhaps larger, occurring in forest; the calyx and filaments are crimson and the anthers yellow. *Vure* is a reported local name. The type is *Gillespie* 4274, cited below.

FIJI: VITI LEVU: Mba: Between Nandarivatu and Vatuthere, *Gillespie* 3178 (Bish, GH), 4274 (Bish TYPE, GH, K); Nandronga & Navosa: Northern portion of Rairaimatuku Plateau, between Nandrau and Rewasau, *Smith* 5434 (A, US); Serua: Korovisilou, *B. E. Parham* 1434 (A); Rewa or Naitasiri: "Central Road, Suva," *Tothill* 471 (K); Viti Levu, without further locality, *Tothill* 189c (K).

The very distinct *G. superba* is readily distinguished from its congeners in Fiji by its robust leaves and elongate inflorescence, and by its characteristically large stipules, which are comparatively persistent and connate into a bilobed cupule.

2. *Geissois imthurnii* Turrill in Jour. Linn. Soc. Bot. 43: 19. 1915, in Hook. Ic. Pl. 31: pl. 3053. 1916.

Tree, to 20 m. high, the branchlets stout, lenticellate, terete or distally flattened, copiously setulose or strigillose with dull yellow hairs 0.3–1 mm. long, rarely subglabrate; stipules elliptic-oblong, usually caducous when very small, very densely setulose on both sides, rarely persisting to a size of about 5×1.5 cm., free to base, the scars elongate, straight or slightly curved; leaves opposite, 3-foliolate, the petioles subterete or slightly flattened above, (1–) 1.5–3 cm. long, copiously setulose like young branchlets, rarely glabrate, the petiolules comparatively inconspicuous, copiously setulose, of lateral leaflets 0–2 (–3) mm. long, of terminal leaflet 1–3 (–6) mm. long; leaflet-blades chartaceous to subcoriaceous, oblong- or obovate-elliptic, 6–11.5 (–18.5) cm. long, (2.5–) 3.5–6 (–8.5) cm. broad, broadly obtuse or rounded and inequilateral (lateral leaflets) or subacute (terminal leaflet) at base, obtusely cuspidate to broadly obtuse at apex, entire and slightly recurved at margin, hispidu-

lous on both surfaces with spreading hairs 0.3–0.8 mm. long, rarely subglabrate but usually with persistent indument at least on costa and secondaries, the costa plane or slightly elevated above, prominent beneath, the secondary nerves 9–15 per side, subspreading, curved, prominulous or plane above, strongly elevated beneath, the veinlet-reticulation intricate, slightly prominulous or plane on both surfaces; racemes borne on defoliate branchlets, axillary to leaf-scars, solitary or 2 or 3 arising from an inconspicuous glomerule, 3–10 cm. long, the peduncle 0.5–3.5 cm. long, with the rachis sparsely hispidulous (hairs 0.2–0.4 mm. long); flower-subtending bracts deltoid or lanceolate, 0.8–1.6 mm. long, sparsely setulose without, soon caducous, the pedicels pilose like rachis, 3.5–8 mm. long, articulate slightly below middle; calyx-lobes 4, papyraceous, deltoid-lanceolate, $4.5-6 \times 2-2.5$ mm., acute, sparsely strigillose on both sides; stamens 9–12, the filaments 13–16 mm. long, the anthers oblong, 1–1.2 mm. long; disk pulvinate, 0.8–1 mm. high, 2–2.5 mm. in diameter; ovary glabrous or with a few stiff hairs or setulose-strigose with hairs 0.5–1 mm. long (sometimes variable on same individual), the styles 9–15 mm. long, the ovules about 40 per locule, biseriate; capsule linear-oblong, falcate, 18–28 mm. long, 3–5 mm. in diameter, glabrous or persistently strigillose, the seeds 4–5 mm. long, the nucellus ellipsoid, about 2.5 mm. long, the wing distal, rounded at apex.

DISTRIBUTION: Endemic to Fiji and thus far obtained only from a limited area near Nandarivatu, Viti Levu, at elevations of 750 to 900 m. It is a tree, recorded as 10–20 m. in height and with a trunk diameter up to 1 m., occurring in forest and on hillsides, mentioned by some collectors as locally common. The calyx and filaments are bright red to deep rose-pink. The local name, as for other species of *Geissois*, is *vure*; im Thurn mentions the name *vunga*, which is usually applicable to *Metrosideros*.

FIJI: VITI LEVU: Mba: Nandarivatu and immediate vicinity, *im Thurn* 137 (Bm, K TYPE), *Parks* 20671 (Bish), *Greenwood* 886 (A, K), *Degener* 14265 (A, Bish, K, NY, US), *Reay* 17 (A, K, US), *Vaughan* 3432 (BM); Nukunuku Creek, *Vaughan* 3401 (BM).

The nearly sessile leaflets and the general pubescence of this plant, which usually persists on the leaflet-blades, differentiate it without difficulty from *G. ternata*. However, transitional forms, in which the petiolules are comparatively obvious (e. g. *Reay* 17), indicate that *G. imthurnii* is not as isolated a taxon as might be inferred from the type specimen alone.

3. *Geissois stipularis* sp. nov.

Arbor, ramulis crassis apices versus conspicue complanatis et pilis 0.2–0.5 mm. longis parce strigilloso-puberulis, demum glabratibus cinereisque inconspicue lenticellatis; stipulis papyraceis juventute in gemma compacta subglobosa cohaerentibus, mox accrescentibus subpersistentibus, demum ligulato-oblongis 6–10 cm. longis 1.2–2 cm. latis ad basim liberis apice rotundatis, extus pilis 1.5–2.5 mm. longis copiose hispidis ac etiam minute puberulis, margine puberulo-tomentellis, intus glabris, cicatricibus con-

spicuis leviter curvatis; foliis oppositis 3-foliolatis, petiolis crassis valde complanatis 1.5–5 cm. longis pilis 0.4–0.7 mm. longis copiose hispidulis vel strigillosis, petiolulis canaliculatis vel semiteretibus 1.5–6 cm. longis ut petiolis pilosis vel subglabris; foliolorum laminis coriaceis in sicco brunnescentibus elliptico- vel obovato-oblongis, 11–23 cm. longis, 6.5–10.5 cm. latis, basi obtusis vel subacutis et in petiolulum decurrentibus, apice obtuse cuspidatis, margine integris anguste recurvatis, utrinque glabris vel costa parce strigillosis, costa valida supra leviter elevata subtus prominente, nervis secundariis utrinsecus 8–12 erecto-patentibus supra subplanis subtus prominentibus, rete venularum conspicuo intricato utrinque prominulo vel supra subimmerso; racemis infra folia enatis solitariis 4–8 cm. longis, pedunculo brevi tereti et rhachi striata gracilibus strigilloso-puberulis; bracteis caducis, pedicellis sub anthesi 5–7 mm. longis medium versus articulatis, infra articulationem ut rhachi pilosis superne glabris; calycis lobis 4 carnosus deltoideo-lanceolatis, 6.5–7 mm. longis, 2.5–3 mm. latis, extus glabris, intus pilis pallidis 0.4–0.7 mm. longis hispidulis; staminibus 12 vel 13, filamentis ligulatis sub anthesi 12–15 mm. longis, antheris oblongis 1.2–1.4 mm. longis utroque emarginatis; disco carnosus pulvinatus 0.8–1 mm. alto circiter 2.5 mm. diametro; ovario oblongo-conico glabro, stylis 10–12 mm. longis, ovulis biseriatis circiter 30 in quoque loculo.

DISTRIBUTION: Known only from the two collections cited below and perhaps limited to southeastern Viti Levu, Fiji.

FIJI: VITI LEVU: Naitasiri: Tamavua woods, 7 miles from Suva, alt. 150 m., Aug. 9, 1927, *Gillespie 2118* (Bish TYPE, GH, US); Viti Levu, without further data, *Parks 20940* (Bish).

Although the number cited as the type collection is sterile, it bears locality data and shows the foliar and stipular characters that are diagnostic for the species. The Parks specimen is accompanied by inflorescences but is without data; some of his plants were also obtained in southeastern Viti Levu.

Superficially the new species, in its large and long-petiolulate leaflets, suggests *G. superba*, but its leaflets are actually considerably smaller and fewer-nerved than in that species, and its stipules are entirely different. In inflorescence it seems closer to *G. ternata*, but characters pertaining to the stipules and branchlets differentiate it, while the predominantly larger leaves and calyx-lobes of *G. stipularis* are also characteristic.

4. *Geissois ternata* A. Gray, Bot. U. S. Expl. Exped. 1: 679. *pl.* 86. 1854.

Shrub or tree, up to 25 m. high, the branchlets subterete or distally flattened, sparsely strigillose with hairs 0.2–0.3 mm. long, soon glabrate, lenticellate; stipules ovate to oblong or elliptic, usually caducous when small, copiously setulose or strigillose to glabrous, rarely persisting to a size of 3 cm. long, free to base, the scars elongate, callose-thickened; leaves opposite, 3-foliolate, the petioles semiterete, 7–35 (–50) mm. long, sparsely strigillose when young, glabrate, the petiolules slender, shallowly

canaliculate, strigillose like petioles and soon glabrate, of lateral leaflets 1–20 mm. long, of terminal leaflet to 25 mm. long; leaflet-blades subcoriaceous or chartaceous, elliptic or obovate-elliptic, 3–17 (–19) cm. long, (1.2–) 1.5–9 (–10.5) cm. broad, obtuse to attenuate at base and decurrent on the petiolule, rounded to obtusely cuspidate or acuminate at apex, entire at margin and plane or narrowly recurved (rarely denticulate-serrulate), glabrous on both surfaces or faintly strigillose on costa beneath, the costa plane or slightly elevated above, prominent beneath, the secondary nerves 5–13 per side, spreading or ascending, slightly curved, plane or prominulous above, slightly elevated beneath, the veinlet-reticulation intricate, prominulous on both surfaces or immersed above; racemes borne on defoliate branchlets, solitary or 2 or 3 arising from a small glomerule, 2.5–10.5 cm. long, the peduncle subterete, 0.5–2 cm. long, with the slightly angled rachis glabrous or faintly strigillose-puberulent; flower-subtending bracts lanceolate, 1.2–1.5 mm. long, glabrous or very sparsely strigillose dorsally, soon caducous, the pedicels 4–10 mm. long, articulate near middle or slightly above middle or sometimes near base, glabrous; calyx-lobes 4, papyraceous or carnose, lanceolate or narrowly deltoid, $4.5-6 \times 1.4-3$ mm., glabrous on both sides or sparsely strigose to crispate-pilose within; stamens 8–15, the filaments 11–18 mm. long, the anthers ellipsoid or oblong, 0.8–1.2 mm. long; disk pulvinate, 0.5–1.2 mm. high, 1.5–2 mm. in diameter; ovary glabrous or sparsely strigillose with hairs 0.3–0.7 mm. long (rarely densely strigose-sericeous), the styles 8–13 mm. long, the ovules 20–42 per locule, biseriate; capsule cylindric, falcate, 12–27 mm. long, 3–5 mm. in diameter, glabrous or strigillose to setulose-puberulent, the seeds about 5 mm. long, the nucellus ellipsoid, the wing distal, rounded at apex.

DISTRIBUTION: Throughout Fiji, endemic, at elevations up to 1050 m. The species is a shrub or tree, up to 25 m. in height, occurring in a variety of habitats, including forest, hillside thickets, open places, etc. The calyx, filaments, and styles are deep red or bright red, the anthers, disk, and ovary yellow, and the fruit dull yellow or red-tinged, becoming brown. Local names for this common species are *vure* and *vota*, sometimes *vurevure*, and rarely *vunga*.

The residual population of *Geissois* in Fiji, when reasonably well characterized taxa like *G. superba*, *G. imthurnii*, and *G. stipularis* have been segregated, may be designated as *G. ternata*. Superficial acquaintance with this population shows that it is fairly heterogeneous, but detailed examination does not disclose obvious lines of differentiation. Nevertheless the available material seems too diverse to be left in a single taxon, and one is able to discern in it various morphological tendencies that seem usable for the establishment of infraspecific groups. The four groups here proposed as varieties are far from satisfactory, but I believe that their recognition permits a better understanding of *G. ternata*.

Of the proposed varieties, the best marked is characterized by a reduction in size of leaves and number of floral parts; the leaflet-blades tend to be blunter at apex and more attenuate at base, and concomitantly the

stamens are reduced in number (8–12), the disk is shorter, and the ovules are comparatively few (20–34 per locule). The latter character, although impracticable for general use, suggests that the tendencies here recognized are not entirely superficial. This variety (var. *minor*) usually occurs at high elevations or in exposed places.

A proposed variety (var. *serrata*) known only from the Yasawa Group differs from the typical form in its comparatively large leaflets with serrulate margins (the species otherwise having entire leaflets), and also in the longer indument of its stipules. The value of this variety can scarcely be assessed without more material, but it seems inadvisable to include a form with toothed leaflets with typical material.

The remaining specimens are more homogeneous, although there is still a great deal of variation in leaf-size. Two types of stipule-indument are discernible; these organs may be copiously setulose with spreading hairs or they may be essentially glabrous (with hairs, when present, of a closely appressed type). This character may not be very consequential, but it is readily observed and is fairly constant, the apical stipules being present even on specimens in advanced fruiting stages. The type of the species falls into the first group, with setulose stipules (var. *ternata*), and the other group I propose as var. *glabrior*. Elsewhere in the Cunoniaceae the type of stipule-indument is a reliable character and is correlated with other criteria; in the present case it seems to be supported by no other consistent characters.

KEY TO THE VARIETIES

Leaves comparatively large, the petiolules (2–) 4–25 mm. long, the leaflet-blades usually $5-17 \times 3-9$ cm., obtuse to acute at base, obtusely cuspidate to acuminate at apex; inflorescence 4–10.5 cm. long, the stamens 12–15, the disk 0.8–1.2 mm. high, the ovules 36–42 per locule.

Leaflet-blades entire, usually $5-15 \times 3-7.5$ cm., the secondary nerves 5–11 per side.

Stipules copiously setulose with spreading hairs 0.2–1 mm. long. 4a. var. *ternata*.

Stipules glabrous on both sides or strigillose with appressed hairs 0.1–0.4 mm. long, sometimes puberulent-tomentellous at margin. 4b. var. *glabrior*.

Leaflet-blades obviously denticulate-serrulate at margin, large, usually $9-17 \times 4-9$ cm., the secondary nerves 9–13 per side; stipules copiously setulose with hairs 1.5–2 mm. long. 4c. var. *serrata*.

Leaves comparatively small, the petiolules 1–11 mm. long, the leaflet-blades usually $3-9.5 \times 1.5-5$ cm., attenuate at base, obtuse to rounded at apex, entire; stipules copiously setulose; inflorescence 2.5–8 cm. long, the stamens 8–12, the disk 0.5–0.6 mm. high, the ovules 20–34 per locule. 4d. var. *minor*.

4a. *Geissois ternata* var. *ternata*.

Geissois ternata A. Gray, Bot. U. S. Expl. Exped. 1: 679. pl. 86. 1854; Seem. Fl. Vit. 109. 1865; Pampan. in Ann. di Bot. 2: 58. 1905; Gibbs in Jour. Linn. Soc. Bot. 39: 144. 1909.

The typical variety, characterized by having stipules copiously setulose with spreading hairs 0.2–1 mm. long; petiolules (2–) 4–25 mm. long; leaflet-blades (4–) 5–15 (–19) cm. long, (2–) 3–7.5 (–10.5) cm. broad, acute to obtuse at base, obtusely cuspidate at apex, entire at margin, the secondary nerves 5–11 per side; racemes 4–10.5 cm. long, the stamens 12–15, the disk 0.8–1.2 mm. high, the ovules 36–42 per locule.

DISTRIBUTION: Known from several of the islands, at elevations from near sea-level up to 900 m., and apparently the most abundant variety on Viti Levu. The type material, obtained by the U. S. Exploring Expedition, comes from at least two plants, obtained on Ovalau and in the Province of Mathuata, Vanua Levu.

FIJI: VITI LEVU: *Graeffe* (K), 27 (BM); Mba : Northern portion of Mt. Evans Range, between Mt. Vatuyanitu and Mt. Natondra, *Smith* 4271 (A, US); vicinity of Nandarivatu, *Gibbs* 591 (BM), *Smith* 5969 (A, US); Nandronga & Navosa : Southern slopes of Nausori Highlands, in drainage of Namosi Creek above Tumbenasolo, *Smith* 4605 (A, US); vicinity of Mbelo, near Vatukarasa, *Degener* 15274 (A, Bish, K, NY, US); Serua : Mbuyombuyo, near Namboutini, *Tabualewa* 15609 (A, Bish, K, NY, US); Thulanuku, near Ngaloa, *Degener* 15120 (A, Bish, K, NY, US). KANDAVU: *Seemann* 201 (BM, GH, K); hills above Namalata and Ngaloa Bays, *Smith* 76 (Bish, GH, K, NY, US). OVALAU and VANUA LEVU: *U. S. Expl. Exped.* (GH, K, NY, US 47817 and 47818 TYPE). Fiji, without definite locality: *Horne* (GH).

4b. *Geissois ternata* var. *glabrior* var. nov.

Frutex vel arbor grandis a var. *ternata* stipulis utrinque glabris vel pilis adpressis 0.1–0.4 mm. longis strigillosis interdum margine puberulotomentellis differt.

DISTRIBUTION: Recorded from several islands in Fiji, at elevations from near sea-level up to 500 m.; it seems to have a more easterly distribution within the group than var. *ternata*. As type I designate *Smith* 1590, from Vanua Levu, a collection with flowers and fruits which also shows the diagnostic stipule character.

FIJI: VITI LEVU: Namosi : Between Namuamua and Laselase, *Gillespie* 3213 (Bish, GH, K, NY). VANUA LEVU: Mba : Upper Ndama River Valley, Apr. 24, 1934, in dense forest at 100–300 m., *Smith* 1590 (Bish, GH, K, NY TYPE, US); Thakaundrove : Hills south of Nakula Valley, *Smith* 343 (Bish, GH, K, NY, US); Valanga, Savu Savu Bay region, *Degener & Ordonez* 14034 (A). TAVEUNI: Vicinity of Waiyevo, *Gillespie* 4699 (Bish, K, NY, US); western slope, between Somosomo and Wairiki, *Smith* 847 (Bish, GH, K, NY, US). Koro: Western slope, *Smith* 1085 (Bish, GH, K, NY, US). VANUA MBALAVU: Slopes of highest peak, *Bryan* 583 (Bish); near Lomaloma, *Smith* 1424 (Bish, K, NY). LAKEMBA: *Harvey* (GH, K).

4c. *Geissois ternata* var. *serrata* var. nov.

Arbor ad 15 m. alta, stipulis pilis 1.5–2 mm. longis dense setosis, petiolis (10–) 17–25 mm. longis, petiolulis (5–) 12–25 mm. longis, foliolorum laminis ovatis vel ellipticis, (6–) 9–17 × (2.5–) 4–9 cm., apice obtuse cuspidatis vel acuminatis, margine saltem supra medium denticulato-

serrulatis (dentibus 1–3 per centimetrum parvis superne callosio-apiculatis), nervis secundariis utrinsecus 9–13; a var. *ternata* foliolorum laminis manifeste serrulatis, magnis, apice saepe acuminatis, nervis secundariis numerosis, stipularum pilis longioribus differt.

DISTRIBUTION: Known only from the type collection, from Waya Island in the Yasawa Group, northwest of Viti Levu.

FIJI: WAYA, Yasawa Group: North of Yalombi, woods along Olo Creek, alt. 120–240 m., July 19, 1937, *St. John 18128* (Bish TYPE, US) (“vunga”; tree 15 m. high, common, the trunk 8–10 cm. in diameter; flowers red; wood used for houses; birds visit the flowers).

4d. *Geissois ternata* var. *minor* var. nov.

Frutex vel arbor ad 4 m. alta, stipulis eis var. *ternatae* similibus; petiolis 7–25 mm. longis, petiolulis 1–11 mm. longis, foliolorum laminis anguste ellipticis vel lanceolato-ellipticis, 3–9.5 × (1.2–) 1.5–5 cm., basi attenuatis, apice obtusis vel rotundatis, nervis secundariis utrinsecus 5–8; racemis 2.5–8 cm. longis, staminibus 8–12, disco 0.5–0.6 mm. alto, ovulis 20–34 in quoque loculo; a var. *ternata* foliis minoribus, foliolorum laminis basi attenuatis apice saepe rotundatis, inflorescentia minore, staminibus et ovulis paucis, disco brevior differt.

DISTRIBUTION: Known from the two large islands of Fiji, often at comparatively high elevations (500–1050 m.), where it occurs in forest, dense thickets, or in exposed places. It is a comparatively small plant, noted as a gnarled shrub or a tree 2–4 m. high. The type, a specimen with flowers, young fruits, and characteristically small leaves, is *Smith 679*, from Vanua Levu.

FIJI: VITI LEVU: Mba: Mt. Evans Range, *Greenwood 119* (K); Tholo-i-Nandarivatu, *Gillespie 3898* (Bish); Namosi: Summit of Mt. Voma, *Gillespie 2730* (Bish). VANUA LEVU: Mathuata: Summit ridge of Mt. Numbuiloa, east of Lambasa, *Smith 6514* (A, US); Thakaundrove: Summit of Mt. Mbatini, alt. 1030 m., Nov. 29, 1933, *Smith 679* (Bish, GH, K, NY TYPE, US).

2. WEINMANNIA L.

The genus *Weinmannia*, as here considered, is represented by five species in Fiji and two in Samoa, being absent from Tonga as far as known. The Fijian and Samoan species appear to be endemic, records of their occurrence in more than one archipelago being discussed below. The genus is not a common component of the vegetation in either group. Criteria for specific delimitation in *Weinmannia* are not satisfactory, such characters as simple vs. pinnate leaves and degree of indument being highly variable. To a certain extent more dependable characters are found in the shape of stipules, the persistent or caducous nature of the calyx, and the number of ovules. In my observation, the Fijian species have the ovules 3–6 per locule as opposed to 8–12 in the Samoan species. Leaflet-shape is a usable character only within very broad limits; one species, here described as new, is characterized by very small leaves and compact

inflorescences. All the species of our region are probably polygamodioecious; staminate flowers have comparatively long filaments, short styles, and sterile carpels, while hermaphrodite flowers have shorter filaments, longer styles, and readily observed ovules in the carpels. Superficially the two types of flower are not easily distinguished. It may be noted that the Fijians seem to have no common name for *Weinmannia* which is generic in nature, as they do for *Spiraeanthemum* and *Geissois*.

KEY TO THE SPECIES

- Leaves simple, rarely 2- or 3-foliolate, the blades up to 11×6 cm.; stipules ovate to elliptic or suborbicular-obovate, entire, often nearly as broad as long; perianth (at least in no. 1) comparatively large, the sepals 1.2–1.5 mm. long, the petals 1.6–1.8 mm. long; perianth caducous in fruit.
- Stipules comparatively large, $13\text{--}25 \times 10\text{--}15$ mm., conspicuously barbellate in axils, the tufts of hairs often subpersistent; leaves nearly always simple, very rarely 2-foliolate, the blades oblong-elliptic, usually $7\text{--}11 \times 2.5\text{--}6$ cm., the marginal crenations usually 1 or 2 per centimeter; ovules usually 4 per locule; seeds copiously comate at both ends, the hairs 0.7–1 mm. long, with obvious cross-walls; Fiji 1. *W. affinis*.
- Stipules smaller, $6\text{--}12 \times 2\text{--}9$ mm., not barbellate in axils or very inconspicuously so; leaves simple or 3-foliolate, the blades predominantly lanceolate, usually $4\text{--}10 \times 1.3\text{--}4$ cm., the marginal crenations usually 3 or 4 per centimeter; ovules 10–12 per locule; seeds more sparsely comate at both ends, the hairs 0.4–0.5 mm. long, the cross-walls inconspicuous; Samoa 2. *W. manuana*.
- Leaves compound, 3–9-foliolate, rarely 1-foliolate; perianth (not known for no. 3) comparatively small, the sepals less than 1.2 mm. long, the petals less than 1.6 mm. long.
- Leaflets comparatively large, only rarely less than 2×1 cm., usually much larger, the marginal crenations only rarely as few as 8 per side; racemes more than 4 cm. long, often up to 12 cm. or longer.
- Leaves with the petiole, rachis, and lower leaflet-surfaces hispidulous (hairs 0.5–1 mm. long); stipules suborbicular or ovate-oblong, about $10 \times 7\text{--}10$ mm., conspicuously dentate; known only in sterile condition; Fiji 3. *W. spiraeoides*.
- Leaves glabrous or with the petiole, rachis, and costa of lower leaflet-surfaces puberulent (hairs up to 0.2 mm. long), or in the Samoan species the petiole and costa sometimes strigose (hairs 0.5–1 mm. long); stipules entire.
- Stipules suborbicular, very variable in size but usually slightly broader than long; leaves variable, with (1–) 3–9 leaflets, these predominantly elliptic or oblong-elliptic; sepals 0.5–0.7 mm. long; petals 1–1.3 mm. long; ovules 4–6 per locule; perianth persistent in fruit; Fiji 4. *W. richii*.
- Stipules oblong or ovate to lanceolate, longer than broad; leaflets predominantly lanceolate or lanceolate-elliptic; sepals 0.7–1.2 mm. long; petals 1.1–1.6 mm. long; perianth caducous in fruit.
- Ovules usually 4 per locule; leaves (as far as known) 3-foliolate, all of the leaflet-blades attenuate at base; Fiji. 5. *W. vitiensis*.
- Ovules 8–12 per locule; lateral leaflet-blades with the lower basal margins obtuse or rounded; Samoa.

- Leaves 3–9-foliolate (very rarely simple), the leaflet-blades 1–2.5 cm. broad. 6. *W. samoensis*.
 Leaves sometimes 3-foliolate, usually simple, the blades 1.3–4 cm. broad. 2. *W. manuana*.
 Leaflets small, 8–16 mm. long, 3–6 mm. broad, with 3–6 marginal crenations per side; stipules suborbicular, 2–4 mm. in diameter, strongly revolute; racemes 2–3 cm. long; Fiji. 7. *W. exigua*.
1. **Weinmannia affinis** A. Gray, Bot. U. S. Expl. Exped. 1: 674. 1854; C. Muell. in Walp. Ann. Bot. Syst. 5: 30. 1858; Seem. Fl. Vit. 110. 1865; Engl. in Linnaea 36: 648. 1870; Pampan. in Ann. di Bot. 2: 92. 1905; Gibbs in Jour. Linn. Soc. Bot. 39: 145. 1909.

Shrub or small tree, the branchlets glabrous or inconspicuously puberulent distally; stipules chartaceous or subcoriaceous, elliptic or suborbicular-obovate, entire, 13–25 × 10–15 mm., obtuse at apex, conspicuously barbellate in axils, the hairs (pale, stiff, 1–1.5 mm. long) often subpersistent; leaves glabrous, simple, rarely 2-foliolate, the petioles (4–) 8–17 mm. long (20–25 mm. long in compound leaves, then the leaflets sessile), the blades subcoriaceous, oblong-elliptic, (3.5–) 7–11 cm. long, (1.5–) 2.5–6 cm. broad, acute to obtuse at base and decurrent, obtuse or obtusely cuspidate at apex, conspicuously crenate-serrate with 1 or 2 crenations per centimeter, the venation obvious, the secondary nerves 7–14 per side, the veinlet-reticulation usually prominulous on both surfaces; racemes usually paired or ternate at apices of peduncles (1.5–4 cm. long), 4–9 cm. long, the peduncle, rachis, and pedicels puberulent (hairs 0.1–0.2 mm. long), sometimes glabrate; flowers crowded, sometimes pseudoverticillate, the pedicels 1.3–2 mm. long or slightly shorter at anthesis; sepals essentially glabrous, oblong, 1.2–1.5 × 0.7–1 mm., rounded at apex; petals membranaceous, oblong, 1.6–1.8 × 0.9–1.2 mm., rounded at apex; disk-lobes oblong-clavate, 0.5–0.7 mm. long; stamens with filiform filaments up to 4 mm. long (in ♂ flowers) and anthers 0.3–0.4 mm. in diameter; carpels ovoid, minutely hispidulous-puberulent, the styles less than 1 mm. long at anthesis, the ovules usually 4 per locule (in ♀ flowers, none or undeveloped in ♂ flowers); perianth soon caducous; capsule ellipsoid, 2.5–4 mm. long, usually persistently puberulent, the styles up to 1.5 mm. long; seeds 0.5–0.8 mm. long, copiously and persistently comate at both ends, the hairs 0.7–1 mm. long, many-celled, crispate.

DISTRIBUTION: Endemic to Fiji, thus far known from Viti Levu, Ovalau, and Taveuni but doubtless to be expected from other high islands, at elevations of 350–1200 m. (as far as recorded). It is a shrub or small tree, up to 7 m. in height, usually occurring in dry forest or ridge forest or on dry open ridges, occasionally in wetter localities. The petals and filaments are white and the capsules red. Recorded local names are *vure* (Gillespie 2736) and *katakata* (Smith 4905), names usually referred to the genera *Geissois* and *Spiraeanthemum* respectively. The type, cited below, is an Exploring Expedition specimen from Ovalau.

FIIJ: VITI LEVU: *Seemann* 197 (BM, GH, K); Mba: Mountains near Lautoka, *Greenwood* 247 (K); vicinity of Nandarivatu, *Gibbs* 642 (BM, K),

733 (BM), 881 (BM, K), *Greenwood* 864 (A, K, US), *Smith* 4905 (A, US), *Vaughan* 3405 (BM); Nandronga & Navosa: Southern slopes of Nausori Highlands, above Tumbenasolo, *Greenwood* 1188 (A); Namosi: Mt. Korombasambasanga, *B. E. Parham* 2201 (A); Mt. Voma, *Gillespie* 2736 (Bish), *B. E. Parham* 602 (A), 2598 (A). OVALAU: *U. S. Expl. Exped.* (GH, K, NY, US 48070 TYPE), *Graeffe* (K). TAVEUNI: Borders of lake east of Somosomo, *Smith* 878 (Bish, K, NY); Vuna, *Seemann* 200 (BM, GH, K). Fiji, without definite locality: *Horne* 916 (GH, K), *Gillespie* 2730 (Bish).

The cited specimens probably give a fair picture of the variation to be expected in *W. affinis*, which is without difficulty recognized by its simple (only very rarely 2-foliolate) leaves with proportionately broad and coarsely crenate blades. Its flowers are slightly larger than those of other species of our region, and in general the indument is negligible. The type material is among the larger in foliage-dimensions, and from it there is a series of specimens toward such small-leaved forms as that found on Taveuni (e. g. *Smith* 878, which also has the inflorescence strictly glabrous). Gray's var. β , with 3-foliolate leaves, may be referred to *W. vitiensis*, as suggested by Seemann. The closest ally of *W. affinis* seems to be the Samoan *W. manuana*, as noted below.

2. **Weinmannia manuana** Christophersen in Bishop Mus. Bull. 154: 10. fig. 2. 1938.

Weinmannia affinis sensu Reinecke in Bot. Jahrb. 25: 635. 1898; Christophersen in Bishop Mus. Bull. 154: 9. 1938; non A. Gray.

Shrub or small tree, rarely epiphytic, the branchlets in distal internodes strigose with hairs up to 1 mm. long or glabrous; stipules ovate or elliptic, entire, $6-12 \times 2-9$ mm., obtuse or subacute at apex, soon glabrate, not (or very obscurely) barbellate in axils; leaves simple or 3-foliolate, the petioles 3-30 mm. long, often strigose like young branchlets but soon glabrate, the blades (sessile in lateral leaflets of compound leaves, with petiolules 5-10 mm. long and winged in terminal leaflets) chartaceous, lanceolate, (3-) 4-10 cm. long, (1-) 1.3-4 cm. broad, acute to attenuate at base and decurrent (or lateral leaflets of compound leaves with the lower edge of base rounded), obtusely cuspidate or short-acuminate at apex, crenate with (2-) 3 or 4 crenations per centimeter, the costa often hirtellous beneath but soon glabrate, the secondary nerves 8-14 per side, prominulous or nearly plane, the veinlet-reticulation copious, essentially plane; racemes usually ternate at apices of peduncles (0.8-1.5 cm. long), 4-8 cm. long, the peduncle, rachis, and pedicels pale-puberulent, subglabrate, the subtending bracts lanceolate, about 1 mm. long, caducous; pedicels 1.5-2 mm. long (or slightly shorter at anthesis); sepals ovate-oblong, $0.7-1.1 \times 0.7-0.9$ mm., rounded at apex; petals membranaceous, oblong, $1.3-1.6 \times 0.8-1$ mm., rounded at apex; disk-lobes 0.4-0.5 mm. long; stamens with filiform filaments 1-1.5 mm. long (in ♀ flowers) or up to 3 mm. long (in ♂ flowers), the anthers 0.3-0.4 mm. in diameter; carpels ovoid, strigose in bud, the ovules 10-12 (in ♀ flowers, undeveloped

in ♂ flowers); perianth soon caducous; capsules ellipsoid, 3.5–4 mm. long, obscurely puberulent or glabrate, the styles 1–1.5 mm. long; seeds 0.6–0.8 mm. long, comate at both ends, the hairs comparatively sparse, 0.4–0.5 mm. long and with inconspicuous cross-walls.

DISTRIBUTION: Limited to Samoa and apparently to be expected throughout the group, at elevations of 480–1500 m. It has been recorded as a shrub or tree 1–7 m. in height, occurring in forest, in wet scrub-forest, on high ridges, and on open old lava fields. The type is *Garber 1031*, from Olosenga, cited below.

SAMOA: SAVAI: Above Aopo, *Christophersen 889* (Bish, NY); Aopo-Gagamalae, *Christophersen 3446* (Bish); Matavanu crater, 828 (Bish, US), 2222 (Bish). TUTUILA: Le Pioa, at top, *Christophersen 1201* (Bish, NY), 3565 (Bish). OLOSENGA: Piumafua Mt., at top, *Garber 1027* (Bish), 1031 (Bish TYPE); Piumafua ridge, *Garber 1066* (Bish). TAU: Trail to peak, *Garber 720* (Bish, US). Samoa, without definite locality: *U. S. Expl. Exped.* (US 66032).

The specimens which Christophersen referred to *W. affinis* have been carefully compared with the type and other Fijian specimens, and also with *W. manuana*, and it appears to me that they represent the latter and that true *W. affinis* does not occur in Samoa. In proposing *W. manuana*, Christophersen separated it from *W. affinis* on the basis of its densely hirtellous young branches and inflorescences and the more prominent crenation of the leaves. While these characters are valid as far as the two type collections are concerned, examination of other material of this relationship shows that the indument is too variable to be very useful; in the Fijian material the young branchlets and inflorescence vary from copiously puberulent to glabrous, and in the Samoan material from somewhat strigose or merely puberulent to glabrous. Characters pertaining to leaf-shape and marginal crenations are apparent but are also very variable, while the flowers (sepals, petals, and disk-lobes) of *W. affinis* are slightly larger than the corresponding parts in *W. manuana*. More dependable characters in differentiating these species pertain to the stipules, number of ovules, and seed-indument, but these characters are either minute or transitory. Nevertheless it seems reasonable to separate the Fijian and Samoan populations as indicated in my key.

3. *Weinmannia spiraeoides* A. Gray, Bot. U. S. Expl. Exped. 1: 677. 1854; C. Muell. in Walp. Ann. Bot. Syst. 5: 30. 1858; Seem. Fl. Vit. 110. 1865; Engl. in Linnaea 36: 644. 1870.

Small tree, the branchlets, at least distally, copiously setulose with pale hairs 0.5–0.8 mm. long; stipules suborbicular or ovate-oblong, about 10 × 7–10 mm., conspicuously dentate with 7–9 teeth, sparsely setulose on both surfaces; leaves 5-foliolate (as far as known), the petioles 13–27 mm. long, like the rachis and petiolules very slender, copiously hispidulous with hairs 0.5–1 mm. long, the petiolules (of lateral leaflets) 1 mm. long or less, of terminal leaflet 5–10 mm. long, the leaflet-blades chartaceous,

lanceolate-elliptic, (2.5-) 3-6 cm. long, 1-2.5 cm. broad, acute to attenuate at base, acute or obtusely cuspidate at apex, conspicuously serrate with 3 or 4 teeth per centimeter, copiously hispidulous beneath especially on nerves, often subglabrate above except on costa, the secondary nerves 5-9 per side, prominulous or nearly plane like the veinlet-reticulation; inflorescences unknown.

DISTRIBUTION: Known only from the type collection, from the island of Ovalau, Fiji, at about 150 m.

FIJI: OVALAU: *U. S. Expl. Exped.* (US 48073 TYPE).

The sterile specimen so optimistically described by Gray as a new species has not yet been matched among more recent collections, and it may conceivably represent a distinct species. However, the possibility cannot be ignored that this specimen may be merely a juvenile form of some other taxon, perhaps of *W. richii*. Nevertheless, juvenile forms of *W. richii* so far available do not show the dentate stipules or the type of leaf-indument described for *W. spiraeoides*, which for the time being is accepted as a separate, if quite unsatisfactory, entity.

4. *Weinmannia richii* A. Gray, Bot. U. S. Expl. Exped. 1: 675. pl. 85, B. 1854; C. Muell. in Walp. Ann. Bot. Syst. 5: 30. 1858; Seem. Fl. Vit. 110. 1865; Engl. in Linnaea 36: 643. 1870.

Weinmannia rhodogyne Gibbs in Jour. Linn. Soc. Bot. 39: 145. 1909; Turrill in Jour. Linn. Soc. Bot. 43: 20. 1915.

Shrub or small tree, often compact, up to 7 m. high, the branchlets sparsely to copiously puberulent distally with hairs 0.1-0.2 mm. long, often glabrate; stipules chartaceous, suborbicular, 1.5-12 \times 1.5-16 mm., rounded at apex, entire, sericeous-puberulent on both sides but usually glabrate, strigose-tufted in axils; leaves 3-9-foliolate (very rarely simple), the petioles 0.7-3 cm. long, puberulent like young branchlets or glabrous, the rachis similar, narrowly winged or flattened above in distal internode, the lateral petiolules up to 2 mm. long or essentially none, the terminal petiolule 3-15 mm. long, distally winged, often puberulent, the blades subcoriaceous or chartaceous, elliptic or oblong-elliptic, (1.5-) 3-7 cm. long, (1-) 1.2-3.8 cm. broad (terminal rarely to 9.5 \times 4.5 cm.), acute to attenuate at base and decurrent, obtusely cuspidate at apex, crenulate with 2 or 3 crenations per centimeter, glabrous (or puberulent beneath on costa and rarely on lower part of blades), the secondary nerves 7-9 per side, with the veinlet-reticulation prominulous on both surfaces, or the veinlets subimmersed; racemes 2-4 (often ternate) at apices of peduncles (1-10 mm. long) or sometimes solitary, the peduncle, rachis, and pedicels puberulent like young branchlets, rarely glabrate, the racemes 4-12 (-14.5) cm. long, the flowers crowded, subfasciculate in groups of 2-8; pedicels at anthesis 0.7-1.5 mm. long, in fruit up to 2 mm. long; sepals oblong-ovate, 0.5-0.7 \times 0.4-0.6 mm., obtuse at apex, essentially glabrous but sometimes sparsely pilose distally or ciliolate; petals membranaceous,

obovate-oblong, 1–1.3 \times 0.6–0.8 mm., rounded or obscurely retuse at apex; disk-lobes 0.2–0.4 mm. long; stamens with filiform filaments up to 2.5 mm. long, the anthers about 0.3 mm. in diameter; carpels ovoid, crispate-pilose with pale hairs 0.2–0.4 mm. long, the styles up to 1.5 mm. long, the ovules 4–6 per locule in \varnothing flowers; calyx and often petals usually persistent, even after carpel has shattered; capsules narrowly ellipsoid, up to 3.5 mm. long, sparsely soft-pilose, eventually subglabrate, the styles persistent; seeds about 0.7 mm. long, comate at both ends, the hairs 0.7–1.5 mm. long, with obscure cross-walls.

DISTRIBUTION: Limited to Fiji, thus far known from Viti Levu, Vanua Levu, and Taveuni but doubtless occurring on other islands. Elevations of 100 to 1100 m. have been recorded, as well as a variety of habitats, such as open forest, thickets, scrub, dry slopes, open country, etc. The species is a shrub or small tree up to 7 m. in height, with pinkish to dark red peduncles, rachises, and pedicels, white or greenish white petals and stamens, and white carpels which become deep red during development and in fruit. A recorded local name is *vota* (Smith 6813). The type is an Exploring Expedition specimen from Mbua Bay [Sandalwood Bay], Vanua Levu, cited below.

FIJI: VITI LEVU: Mba: Mountains near Lautoka, Greenwood 230 (K), 384 (A, K), 401 (K); vicinity of Nandarivatu, Gibbs 594 (BM type of *W. rhodogyne*, K), *im Thurn* 73 (BM, K), Mead 1989 (K), Gillespie 4035 (Bish, GH, K, NY), 4233 (Bish, GH, K), Degener & Ordonez 13599 (A, Bish, K, NY), Degener 14379 (A, Bish, K, NY, US), Smith 5052 (A, US), Vaughan 3228 (BM); slopes and ridges of Mt. Nanggaranambuluta [Lomalangi], east of Nandarivatu, Gillespie 4333 (Bish, GH, NY), 4071.1 (Bish), Smith 5739 (A, US); Nandronga & Navosa: Southern slopes of Nausori Highlands, in drainage of Namosi Creek above Tumbenasolo, Smith 4710 (A, US). VANUA LEVU: Mbua: H. B. R. Parham, Jan. 3, 1937 (A, BM); Mbua Bay, U. S. Expl. Exped. (GH, K, NY, US 48071 TYPE); Ndama, B. E. Parham & M. Sealolo 2277 (A); Wairiki, B. E. Parham 1122 (A); Mathuata: Seang-gangga Plateau, in drainage of Korovuli River, vicinity of Natua, Smith 6813 (A, US). TAVEUNI: Above Somosomo, Gillespie 4837 (Bish, GH). Fiji, without definite locality: Storck, June 1883 (BM, K), 25 (GH), Horne 1097 (K).

Although *W. richii* is the most abundant species of the genus in Fiji, it does not seem widely dispersed throughout the group, and in my observation it is nowhere abundant; even at Nandarivatu, where many collectors have obtained it, it is not a conspicuous element of the vegetation. As here delimited, *W. richii* is readily distinguished from its closest relative, *W. vitiensis*, by its suborbicular stipules, proportionately broader leaflets, somewhat smaller flowers, and persistent perianth.

The characters utilized by Gibbs to separate *W. rhodogyne* from *W. richii* are seen to be inconsequential when a series of specimens is examined. It is true that the branchlets and leaves of the type of *W. rhodogyne* are glabrous, whereas in the type of *W. richii* the young branchlets, as well as the petiole, leaf-rachis, and costae of the leaflets beneath are setulose-puberulent. However, every stage between these conditions is to be found, even among plants from the vicinity of Nandarivatu, the type

locality of *W. rhodogyne*. Stipules of the two type specimens are similar in shape, those of *W. rhodogyne* being much the smaller, but this appears to be a matter of stage of development, as on other specimens stipules are to be seen varying in diameter from about 2 to 15 mm., often on the same plant. Differences in size of sepals and petals are inconsequential, and filament-length seems to be a matter of state of development of the flower. The ovary is similarly pilose in both concepts. Number of leaflets cannot be utilized to divide the series of specimens cited above. In the type of *W. richii* the leaflets vary between 3 and 9, whereas they seem to be always 3 on Gibbs' type. Other material shows the entire range in this character, and occasionally even unifoliate leaves are found. In general, it can only be stated that the type of *W. rhodogyne* and much of the other material from the Nandarivatu region is comparatively delicate and inclines to be less pubescent than typical specimens of *W. richii* from the drier regions of leeward Vanua Levu. No reasonable means has been found to separate *W. rhodogyne* from the older concept, even variately.

5. *Weinmannia vitiensis* Seem. Fl. Vit. 110. 1865; Pampan. in Ann. di Bot. 2: 93. 1905.

Weinmannia affinis var. β A. Gray, Bot. U. S. Expl. Exped. 1: 674. 1854; C. Muell. in Walp. Ann. Bot. Syst. 5: 30. 1858; Engl. in Linnaea 36: 649. 1870.

Shrub or small tree, the young parts and branchlets strigose-puberulent or strigillose with whitish hairs 0.1–0.5 mm. long, soon glabrate; stipules chartaceous, oblong or narrowly elliptic, $3\text{--}10 \times 1.5\text{--}5$ mm., rounded or obtuse at apex, sparsely puberulent without or glabrate, strigose-tufted in axils; leaves 3-foliate (as far as seen), the petioles 4–18 mm. long, glabrous, often narrowly winged distally, the petiolules winged nearly to base (in lateral leaflets essentially none or up to 7 mm. long, slightly longer in terminal leaflets), the blades subcoriaceous, lanceolate or lanceolate-elliptic, (2.5–) 3–5.5 cm. long, 1–2 cm. broad (terminal sometimes up to 7.5×2.8 cm.), attenuate at base and decurrent, obtuse or obtusely cuspidate at apex, crenulate with about 3 crenations per centimeter, glabrous on both sides, the secondary nerves 6–12 per side, with the veinlet-reticulation sharply prominulous on both sides, or the veinlets nearly plane; racemes ternate at apices of peduncles (these very short and insignificant or up to 2 cm. long) or perhaps sometimes solitary, the peduncle, rachis, and pedicels strigose-puberulent like young branchlets, at length glabrate, the racemes 4–7 cm. long; flowers scattered or subfasciculate in groups of 2–4, subtended by caducous oblong bracts up to 1 mm. long, the pedicels slender, about 1 mm. long at anthesis and up to 2 mm. long in fruit; sepals oblong, $1\text{--}1.2 \times 0.7\text{--}0.8$ mm., rounded at apex, glabrous; petals oblong, $1.4\text{--}1.6 \times 0.8\text{--}1$ mm., rounded at apex; disk-lobes 0.5–0.6 mm. long; stamens with filiform filaments up to 1.7 mm. long, the anthers about 0.3 mm. in diameter; carpels ovoid, sparsely strigose, the styles at anthesis less than 1 mm. long, the ovules 4 per locule in \varnothing

flowers; calyx and petals caducous in fruit, leaving a flattened receptacle; capsules narrowly ellipsoid, 3–3.5 mm. long, sparsely puberulent or soon glabrate, the styles up to 1 mm. long; seeds narrowly ellipsoid, about 0.8 mm. long, comate at both ends, the hairs 0.5–1 mm. long, with obscure cross-walls.

DISTRIBUTION: Endemic to Fiji, thus far known from three of the smaller islands but to be expected elsewhere in the group. The species occurs at elevations up to 400 m., from the scanty data thus far available, in dense forest or in open places as a compact shrub or tree up to 8 m. in height. The petals and filaments are white and the mature capsules brown. On Moala I recorded the local name as *molau ndamu*.

FIJI: KANDAVU: *Seemann 199* (GH, K TYPE). OVALAU: *U. S. Expl. Exped.* (source of the reference to *W. affinis* var. β , GH, NY). MOALA: Summit ridge, *Bryan 317* (Bish); Ndelaipoala, *Smith 1354* (Bish, GH, K, NY, US). Fiji, without definite locality: *Harvey* (GH, K).

This apparently uncommon species is distinguished from *W. richii* by characters pertaining to stipules, foliage, and perianth, as noted above. The species is one of the conspicuous elements in the rather dry, low forest and open scrub on the island of Moala, but I have not personally observed it elsewhere.

6. *Weinmannia samoensis* A. Gray, Bot. U. S. Expl. Exped. 1: 677. 1854; C. Muell. in Walp. Ann. Bot. Syst. 5: 30. 1858; Engl. in Linnaea 36: 647. 1870; Reinecke in Bot. Jahrb. 25: 634. 1898; Pampan. in Ann. di Bot. 2: 92. 1905; Rechinger in Denkschr. Akad. Wiss. Wien 85: 286. 1910; Setchell in Carnegie Inst. Publ. 341: 92. 1924; Christophersen in Bishop Mus. Bull. 154: 11. 1938.

Weinmannia samoensis f. *glabrescens* Pampan. in Ann. di Bot. 2: 92. 1905.

Shrub or small tree, the branchlets hispidulous-puberulent with hairs 0.1–0.7 mm. long, at length glabrate; stipules elliptic or lanceolate-elliptic, 5–15 \times 3.5–10 mm., entire, rounded or obtuse at apex, sparsely puberulent and glabrate; leaves 3–7-foliolate (rarely 9-foliolate, very rarely simple), the petioles (1–) 1.5–4 (rarely to 6) cm. long, at first hispidulous, soon glabrate, the rachis similar, usually narrowly winged in distal internode, the petiolules essentially none in lateral leaflets, 3–8 (–13) mm. long in terminal leaflets, winged nearly to base and sometimes hispidulous; leaflet-blades chartaceous, lanceolate, (3–) 4–9 (–12) cm. long, (0.7–) 1–2.5 cm. broad, attenuate at base and decurrent (lateral leaflets with lower basal margin obtuse or narrowly rounded), narrowed to an acuminate or obtusely cuspidate apex, crenulate with 2 or 3 crenations per centimeter, glabrous except the costa sometimes hispidulous like petiole, the secondary nerves 8–14 per side, short, prominulous on both surfaces, the veinlet-reticulation immersed or faintly prominulous; racemes usually ternate (sometimes paired) at apex of peduncles, a subsidiary pair sometimes arising from a lower node of inflorescence-rachis, the peduncle 1.5–2.5 cm. long, like the rachis and pedicels puberulent, even-

tually glabrate, the racemes 5–8 cm. long; flowers mostly single on the rachis, on pedicels 1.5–2.3 mm. long; sepals deltoid-oblong, $0.8-1 \times 0.5-0.7$ mm., subacute, sometimes faintly puberulent without; petals membranaceous, oblong-ovate, $1.1-1.5 \times 0.7-1$ mm., rounded at apex; disklobes elongate, 0.4–0.7 mm. long; stamens with filiform filaments 2–3 mm. long (in ♂ flowers) or up to 1.5 mm. long (in ♀ flowers), the anthers about 0.4 mm. in diameter; carpels ovoid, faintly hispidulous-puberulent, glabrate, the styles up to 1.2 mm. long (in ♀ flowers) or shorter (in ♂ flowers), the ovules 8–10 per locule in ♀ flowers, undeveloped in ♂ flowers; calyx and petals caducous in fruit, the receptacle flattened; capsule ellipsoid, 2.5–3 mm. long, puberulent like rachis but soon glabrate; seeds narrowly ellipsoid, 0.6–0.7 mm. long, comate at both ends, the hairs usually about 0.7 mm. long.

DISTRIBUTION: Samoa, recorded from the three large islands at elevations of 300–1000 m. The species is said to be a shrub or tree 2–6 m. in height; habitat data are sparse, but Christophersen describes it as growing on lava fields and on river-banks. The type is an Exploring Expedition specimen from Tutuila, cited below. Additional collections were cited by Reinecke and Rechinger.

SAMOA: SAVAI: Central region, *Reinecke* 538 (BM, K, US); Asana, back of Sologa, *Vaupel* 373 (Bish, K, NY, US); Matavanu lava field, *Christophersen & Hume* 1943 (Bish); above Sili, *Christophersen* 3163 (Bish, US). UPOLU: Above Vailele, *Reinecke* 567 (Bish). TUTUILA: *U. S. Expl. Exped.* (GH, K, US 48072 TYPE). Samoa, without definite locality: *Whitmee* 218 (K), *Powell* (GH), 323 (K).

Weinmannia samoensis, a species characterized by its narrow lanceolate leaflet-blades, is distinguished from the preceding, *W. vitiensis*, by the greater number of ovules. This character, being observable only in pistillate flowers, is not very practical but nevertheless seems dependable in the material at hand. The difference in the base of the lateral leaflets, utilized in my key, also seems fairly constant. It is not always easy to separate specimens of *W. samoensis* and *W. manuana*, the only other described Samoan species, when the latter has 3-foliolate leaves. In general the leaves of *W. samoensis* are 5–7-foliolate and those of *W. manuana* are simple; when 3-foliolate leaves occur on Samoan plants they are also accompanied by one or the other more characteristic type, in my observation. Nevertheless this character is not entirely satisfactory and must be supplemented by the shape of the leaflet-blades, which are somewhat broader in *W. manuana*. I find no consistent differences between the two species in indument or inflorescence.

Pampanini's forma *glabrescens* is based upon *Reinecke* 502, 538, and 567. Two of these numbers have been examined and I do not observe any reason to separate them from the population as a whole.

7. *Weinmannia exigua* sp. nov.

Frutex, partibus novellis copiose cinereo-strigoso-puberulis, ramulis superne subcomplanatis et puberulis demum teretibus glabratibus; stipulis

chartaceis suborbicularibus 2–4 mm. diametro, dorso copiose strigosis, margine valde revolutis, caducis, basi intus strigoso-barbellatis; foliis apices ramulorum versus congestis 3- vel 5-foliolatis raro simplicibus vel 7-foliolatis, petiolis 4–9 mm. longis (vel 2–4 mm. in foliis simplicibus) superne anguste alatis, rhachi etiam anguste alata ut petiolulis puberula, petiolulis lateralibus subnullis terminalibus 1–4 mm. longis alatis, laminis chartaceis in sicco fuscis anguste ellipticis, (5-) 8–16 mm. longis, 3–6 mm. latis, basi (lateralibus) obtusis vel (terminalibus) attenuatis, apice obtusis vel obtuse cuspidatis, margine dentibus utrinsecus 3–6 crenatis, supra glabris, subtus praecipue costa pilis 0.2–0.3 mm. longis strigoso-puberulis demum subglabratibus, costa supra subplana subtus elevata, nervis secundariis utrinsecus 3–6 inconspicuis subtus prominulis, rete venularum saepe immerso; racemis summo pedicelli brevis (ad 5 mm. longi) 2 vel 3 vel videtur solitariis 2–3 cm. longis, pedunculo ut rhachi pedicellisque minute puberulo; pedicellis sub anthesi 1–1.5 mm. longis; sepalis 4 subliberis papyraceis oblongis, 0.7–0.8 mm. longis, 0.4–0.5 mm. latis, apice obtusis, superne obscure ciliolatis; petalis 4 membranaceis obovatis, 1.2–1.3 mm. longis, 0.6–0.7 mm. latis, apice rotundatis, basi angustatis; disci lobis 8 oblongis 0.3–0.4 mm. longis apice truncatis; staminibus 8, in floribus ♂ filamentis filiformibus 1.2–1.5 mm. longis, antheris circiter 0.3 mm. diametro; carpellis ovoideis sub anthesi 1–1.5 mm. longis, pilis pallidis 0.2–0.3 mm. longis copiose hirtellis, stylis erectis circiter 1.5 mm. longis, ovulis 3–6 per loculo; perianthio videtur caduco; capsulis ellipsoideis circiter 3 mm. longis glabratibus, seminibus ellipsoideis 0.6–0.7 mm. longis utroque conspicue comatis, pilis stramineis circiter 1.5 mm. longis.

DISTRIBUTION: Fiji, known only from the type collection.

FIJI: VANUA LEVU: Thakaundrove or Mathuata: Between Waiwai and Lomaloma, May 1878, *Horne 632* (K TYPE) (large shrub about 3 m. high, on top of the mountains).

The very distinct entity here described differs from other species of the region in its very small leaves and compact inflorescences.

Weinmannia sp.

Weinmannia richii (?) sensu Christophersen in Bishop Mus. Bull. 154: 11. 1938; non A. Gray.

SAMOA: SAVAI: Tuisivi Range, alt. 1600–1700 m., *Christophersen 787* (Bish, NY); above Matavanu, alt. about 1600 m., *Christophersen 2561* (Bish); rim of Papafu crater, alt. 1500 m., *Christophersen 2735* (Bish).

Although the cited specimens are sterile, they apparently do not represent either known Samoan species, *W. samoensis* or *W. manuana*, unless juvenile forms in this alliance are extremely variable. Although these specimens bear a general resemblance to *W. richii*, I see no reason to refer them here on the basis of present material; the sterile Samoan specimens are inclined to have crenulate stipules and longer petiole-indument, although they do not agree too well among themselves. These collections

suggest that an undescribed species is present on Savaii, unless they are extreme juvenile variants.

A sterile specimen from Upolu (above Saluafata, ridge to Maunga Tele, alt. 830 m., *Christophersen 534* [Bish, US]) cannot be placed at present; it is neither precisely like the Savaii specimens mentioned above nor does it seem to represent either *W. samoensis* or *W. manuana*.

3. SPIRAEANTHEMUM A. Gray

Spiraeanthemum was described by Gray (Bot. U. S. Expl. Exped. 1: 666. 1854) on the basis of two species, one Samoan and one Fijian. Although these two species have been taken as congeneric by subsequent students, and although in my opinion this is a reasonable interpretation, it is possible they will eventually be placed in at least different sections or perhaps subgenera. I do not find that anyone has made the selection of a genotype, and therefore I should like so to designate *S. samoense*, Gray's first species and the one which in basic characters seems best to agree with the greater number of subsequently described species of *Spiraeanthemum*.

Approximately 27 binomials have thus far been proposed in *Spiraeanthemum*, which has a range from New Guinea, Australia, and New Caledonia to Samoa; it is evidently lacking in Tonga. Like so many of the genera first described from Fiji or Polynesia, *Spiraeanthemum* proves to have its center of distribution in New Guinea and New Caledonia; from the former island eight species are discussed by L. M. Perry (in Jour. Arnold Arb. 30: 139-143. 1949). In our area five species are discernible, four from Fiji and one from Samoa. Although individuals of the genus are seen fairly frequently in Fiji and Samoa, for the most part they occur singly and do not form a striking feature of the vegetation. A common name for the genus in Fiji is *katakata*.

Spiraeanthemum vitiense differs markedly from the other species of our region in its verticillate leaves, short stipule-scars, solitary ovules, and seeds with a distal wing only; the remaining species have opposite leaves, elongate and curved stipule-scars, paired ovules, and seeds winged at both ends. Usable characters to differentiate the species are found in the type of indument, leaf-margins, stipule-shape and indument, etc. In general these characters are not strong, but they seem more adequate than those one is forced to utilize in *Weinmannia*. All of our species are probably dioecious, the staminate flowers lacking carpels and the pistillate flowers having probably sterile anthers; it is possible, however, that these anthers are sometimes fertile and the species thus occasionally polygamo-dioecious.

KEY TO THE SPECIES

Leaves verticillate; stipules leaving inconspicuous, transversely elliptic, nearly straight scars; leaf-blades obovate-elliptic, rounded or broadly obtuse at apex, the secondary nerves 4-6 per side; inflorescence 2-6 cm. long, the branches usually ternate; carpels 1-ovulate, the seed with a distal wing only, the nucellus basal; Fiji. 1. *S. vitiense*.

Leaves opposite; stipules leaving curved, elongate scars; leaf-blades lanceolate to ovate- or elliptic-oblong, acuminate or cuspidate or callose-apiculate at apex, the secondary nerves 5–11 per side; inflorescence 5–17 cm. long, the branches opposite or subopposite; carpels 2-ovulate, the seeds with distal and basal wings, the nucellus median.

Branchlets and petioles glabrous or distally evanescently strigose-puberulent, the leaf-blades glabrous on both surfaces (rarely sparsely puberulent on costa when young); Fijian species.

Leaf-blades usually less than twice as long as broad, obtuse at base and abruptly decurrent on the petiole, entire or inconspicuously serrulate at margin, the teeth obsolete or 1 or 2 per centimeter; peduncle of inflorescence usually more than 4 cm. long. 2. *S. graeffei*.

Leaf-blades usually more than twice as long as broad, attenuate to acute at base and long-decurrent on the petiole, conspicuously serrate at margin with 3 or 4 teeth per centimeter; peduncle of inflorescence less than 4 cm. long. 3. *S. serratum*.

Branchlets and petioles copiously velutinous-puberulent or hispidulous, tardily glabrate, the leaf-blades puberulent or strigillose at least on costa and secondaries beneath, the indument persistent.

Indument of branchlets and petioles velutinous-puberulent (hairs 0.1–0.15 mm. long, very dense, long-persistent); stipules oblong-ovate, up to 15×10 mm., velutinous-puberulent or sericeous on both surfaces; leaf-blades entire or inconspicuously denticulate, the costa and secondaries minutely puberulent beneath (hairs scarcely 0.1 mm. long); ultimate branchlets of inflorescence (below pedicel-articulation) insignificant or to 0.6 mm. long; disk-lobes usually obviously setulose at apex; Fiji. 4. *S. katakata*.

Indument of branchlets and petioles hispidulous (hairs 0.3–1 mm. long); stipules lanceolate-oblong, comparatively narrow, up to 35×10 mm., sericeous or hispidulous without, glabrous within; leaf-blades conspicuously serrulate with 2–4 teeth per centimeter, the costa and secondaries strigose-puberulent beneath (hairs 0.2–0.7 mm. long); ultimate branchlets of inflorescence (below pedicel-articulation) 0.7–2.5 mm. long; disk-lobes sparsely hispidulous or glabrous; Samoa. 5. *S. samoense*.

1. *Spiraeanthemum vitiense* A. Gray, Bot. U. S. Expl. Exped. 1: 669. *pl.* 83, B. 1854, in Ann. Sci. Nat. IV. Bot. 4: 177. 1855, in Proc. Am. Acad. 3: 128. 1857; C. Muell. in Walp. Ann. Bot. Syst. 5: 24. 1858; Seem. Fl. Vit. 111. 1865; Gibbs in Jour. Linn. Soc. Bot. 39: 144. 1909.

Shrub or small tree, up to 3 m. high, presumably dioecious or possibly polygamo-dioecious, the branchlets terete, glabrous, the young parts obscurely glandular; very young stipules ovate, glabrous and obscurely glandular, soon caducous, the scars inconspicuous, transversely elliptic, nearly straight; leaves verticillate, in threes or fours (rarely in fives), the petioles shallowly canaliculate or semiterete, 4–20 (–23) mm. long, glabrous or obscurely glandular, distally winged; leaf-blades coriaceous, obovate-elliptic, 4–8 (–10.5) cm. long, 1.5–4.5 (–5) cm. broad, acute to attenuate at base and long-decurrent on the petiole, rounded or broadly obtuse at apex, narrowly recurved and entire at margin, glabrous, the costa

slightly elevated above and prominent beneath, the secondary nerves 4–6 per side, arcuate-ascending, usually nearly plane above and elevated beneath, often with inconspicuous domatia in the axils beneath, the veinlet-reticulation intricate, usually plane or immersed above and prominulous beneath; inflorescence paniculate, axillary, solitary, compact, many-flowered, 2–6 cm. long and nearly as broad, the peduncle slender, 7–16 mm. long, very minutely puberulent and soon glabrate, the branches usually ternately arranged, more obviously puberulent than peduncle but subglabrate, the bracts lanceolate-oblong or subfoliaceous, up to 7 mm. long or even approximating leaves in size, soon glabrate, the ultimate bracteoles minute, 0.2–0.3 mm. long; ♂ flowers not seen; ♀ (or perhaps ♂) flowers in clusters of 2–6, each actually solitary at apex of a minute (0.1–0.5 mm. long) ultimate branchlet, the pedicels (above articulation) 0.5–1 mm. long (to 2.3 mm. long in fruit), minutely puberulent, glabrate; calyx 1.2–1.5 mm. long, glabrous or very sparsely puberulent without, deeply 4-lobed (rarely 5- or 6-lobed), the lobes ovate, 0.7–1 mm. broad, subacute; stamens 8 (rarely 10 or 12), the filaments glabrous or very sparsely pale-pilose, 0.7–1.5 mm. long, the anthers broadly ellipsoid, 0.2–0.4 mm. long, dubiously functional; disk-lobes 8 (rarely 10 or 12), free or rarely a pair connate, carnose, angular-obovoid, 0.3–0.4 mm. long, truncate at apex, glabrous; carpels 4 (rarely 5 or 6), ovoid, faintly sericeous, the style 0.7–1.2 mm. long, the ovule solitary, pendulous from near middle; calyx and stamens persistent in fruit, some carpels often aborting; mature carpels ovoid, 2.2–3 mm. long, sparsely hirtellous (hairs 0.1–0.2 mm. long) or essentially glabrate, the style persistent; seed solitary, oblong, 2–2.5 mm. long, 0.8–1 mm. broad, the nucellus ellipsoid, exceeded distally by a wing 0.8–1.2 mm. long, this rounded at apex, the basal wing lacking.

DISTRIBUTION: Endemic to Fiji and apparently infrequent, known only from Viti Levu and Vanua Levu, at elevations of 450–1200 m. The species has been noted as a shrub or small tree, up to 3 m. in height, growing in open or ridge-scrub (Parham) or in a forest clearing (Gibbs). The type is an Exploring Expedition collection, cited below, apparently obtained from two localities, Sandalwood Bay [Mbua Bay] and Mathuata, Vanua Levu.

FIJI: VITI LEVU: *Graeffe 16* in part (BM, K); M b a : Tholo-i-Nandarivatu, *Gibbs 732* (BM); N a m o s i : Summit of Mt. Voma, *B. E. Parham 1743* (A), *1910* (A). VANUA LEVU: M b u a and M a t h u a t a : Mbua Bay (part) and presumably Mathuata coast (part), *U. S. Expl. Exped.* (GH, K, NY, US 47621 TYPE). Fiji, without definite locality: *Horne 759* (GH, K), *1104* (K), *1113* (K).

As indicated in my key and generic discussion, *S. vitiense* is a strikingly distinct species both in vegetative features and in the more fundamental characters of the ovulation and seed-shape.

2. *Spiraeanthemum graeffei* Seem. Fl. Vit. 111. 1865; Gibbs in Jour. Linn. Soc. Bot. 39: 145. 1909.

Shrub or tree up to 6 m. high, dioecious, the branchlets slender, glabrous or the youngest parts very obscurely strigillose-puberulent; very young

stipules ovate and dorsally sericeous, the older ones oblong or ovate-oblong, up to 22 mm. long and 10 mm. broad, obtuse, very sparsely strigose-puberulent on both surfaces or glabrate, soon caducous, the scars elongate, curved; leaves opposite, the petioles semiterete, 1–3 cm. long, glabrous, distally winged; leaf-blades coriaceous or subcoriaceous, lanceolate or ovate-elliptic, 5–10 cm. long, (2–) 2.5–6 cm. broad, obtuse at base and abruptly decurrent on the petiole, acuminate or obtusely cuspidate at apex, entire or inconspicuously serrulate at margin (teeth minute, callose-glandular, 1 or 2 per centimeter, or obsolete), glabrous on both surfaces, sometimes with inconspicuous axillary domatia on lower surface, the costa nearly plane above and prominent beneath, the secondary nerves 5–9 per side, arcuate-ascending, plane above, elevated beneath, the veinlet-reticulation intricate, prominulous on both surfaces; inflorescence paniculate, solitary, axillary, ample, many-flowered, 6–15 cm. long and nearly as broad, the peduncle slender, glabrous, (1–) 4–7 cm. long, the branches opposite or subopposite, very sparsely puberulent with hairs about 0.1 mm. long, often glabrate, the bracts oblong or lanceolate, up to 7 mm. long, essentially glabrous, the ultimate bracteoles about 0.5 mm. long; flowers solitary at apices of short ultimate branchlets (0.2–1.5 mm. long), the pedicels (above articulation) 0.5–1.5 mm. long, essentially glabrous; calyx subcarinose, 1.5–2.2 mm. long, deeply 4-lobed, the lobes $1-1.3 \times 0.7-1$ mm., subacute; stamens 8, the filaments glabrous, in ♂ flowers 2.5–3 mm. long, in ♀ flowers 0.8–1.3 mm. long, the anthers broadly ellipsoid, in ♂ flowers about 0.4 mm. long, in ♀ flowers minute and apparently sterile; disk-lobes in ♂ flowers 4, obovoid-angled, 0.4–0.6 mm. long, free or loosely connate, truncate or often emarginate at apex and hispidulous there and ventrally with hairs 0.3–0.4 mm. long; disk-lobes in ♀ flowers 8, essentially similar but sometimes more obscurely setulose or strictly glabrous; carpels in ♀ flowers 4, ovoid, copiously sericeous-puberulent (hairs 0.1–0.2 mm. long), the style 0.3–0.5 mm. long, the ovules 2, collateral, narrowed at both ends; calyx and stamens persistent in fruit; mature carpels (1 or more sometimes aborted) elongate-ovoid, 3.5–4 mm. long, 0.7–1 mm. broad, persistently pilose, the style persistent; seeds 2, collateral, 2.5–3 mm. long, the nucellus ellipsoid, about 1 mm. long, the wings subequal in length, the distal wing lanceolate, slightly narrower than nucellus, the basal wing subulate.

DISTRIBUTION: Endemic to Fiji, apparently infrequent, now known from Viti Levu and Kandavu at elevations of 870–1050 m. The species is reported as a shrub or tree, up to 6 m. in height, occurring in dense forest or in forest-clearings; the calyx and filaments are white and the anthers yellow. Recorded local names are *katakata* (Smith) and *kutakuta* (Gillespie). The type, collected by Graeffe on Kandavu, is cited below.

FIJI: VITI LEVU: Mba: Tholo-i-Nandarivatu ridge, *Gibbs 731* (BM); Naitasiri: Northern portion of Rairaimatuku Plateau, between Mt. Tomanivi and Nasonggo, *Smith 5800* (A, US); Namosi: Summit of Mt. Voma, *Gillespie 2728* (Bish, GH, K, NY, US). KANDAVU: Mt. Mbuke Levu, *Graeffe 16* in part (BM, K TYPE).

Spiraeanthemum graeffei and *S. serratum* are readily distinguished from *S. katakata* by their usually strictly glabrous branchlets and leaves, these parts bearing a long-persistent velutinous-puberulent indument in *S. katakata*. Characters pertaining to the indument seem much more reliable here than in the genus *Weinmannia*.

3. *Spiraeanthemum serratum* Gillespie in Bishop Mus. Bull. 83: 11. fig. 11. 1931.

Small tree, up to 4 m. high, dioecious, the branchlets slender, glabrous or distally strigose-puberulent (hairs pale, 0.1–0.2 mm. long); very young stipules ovate, obtuse, copiously sericeous dorsally, glabrate, the scars conspicuous, curved; leaves opposite, the petioles semiterete, 1–2 cm. long, glabrous or faintly puberulent like young branchlets, distally winged; leaf-blades subcoriaceous, lanceolate- or oblong-ovate, 4–8 cm. long, 1.3–3.8 cm. broad, attenuate or acute at base and long-decurrent on the petiole, gradually acuminate or obtusely cuspidate at apex, conspicuously serrate at margin (teeth callose-glandular, 3 or 4 per centimeter), glabrous on both surfaces or sparsely puberulent on costa, sometimes with axillary domatia on lower surface, the costa slightly elevated above and prominent beneath, the secondary nerves 6–10 per side, subascending or arcuate, plane above, slightly elevated beneath, the veinlet-reticulation intricate, prominulous on both surfaces or subimmersed above; inflorescence paniculate, solitary, axillary or pseudoterminal, ample, many-flowered, 6–12 cm. long and nearly as broad, the peduncle slender, glabrous or faintly puberulent, 2–4 cm. long, the branches opposite or subopposite, the distal portions strigose-puberulent with hairs 0.1–0.3 mm. long, the bracts papyraceous, oblong, about 2 mm. long, soon glabrate, the ultimate bracteoles about 0.5 mm. long; flowers scattered, not fasciculate, solitary at apices of short ultimate branchlets (up to 0.8 mm. long or essentially none), the pedicels (above articulation) 0.6–1 mm. long, glabrous at anthesis; calyx carnos, glabrous, 1.6–2 mm. long, deeply 4- (rarely 5-) lobed, the lobes oblong-ovate, $1.2\text{--}1.5 \times 0.8\text{--}1$ mm., obtuse or subacute; stamens 8 (rarely 10), the filaments glabrous, in ♂ flowers 1.2–1.6 mm. long, in ♀ flowers less than 1 mm. long, the anthers ellipsoid, in ♂ flowers 0.3–0.4 mm. long, in ♀ flowers minute and apparently sterile; disk-lobes in ♂ flowers 4–6, carnos, free or loosely connate within stamens, irregularly obovoid, 0.3–0.5 mm. long, truncate or emarginate at apex, glabrous; disk-lobes in ♀ flowers 8 (rarely 10), essentially similar, sometimes sparsely setulose at apex (hairs few, to 0.3 mm. long); carpels in ♀ flowers 4 (rarely 5), ovoid, copiously sericeous (hairs 0.1–0.2 mm. long), the style 0.5–0.7 mm. long, the ovules 2, collateral, falcate, narrowly winged at both ends; mature carpels narrowly ellipsoid, up to 3.5 mm. long and 0.8 mm. broad, sericeous, the style persistent; seeds paired or only 1 developing, lanceolate, 2.5–2.7 mm. long, 0.3–0.5 mm. broad, the nucellus ellipsoid, less than 1 mm. long, the distal and basal wings subequal, very narrow, subacute.

DISTRIBUTION: Fiji, apparently limited to the summits and upper slopes of a few high hills, at elevations of 1100–1323 m., on Viti Levu and Taveuni. The species is recorded as a small tree, up to 4 m. in height, occurring in the dense thickets of high ridges. It is noteworthy that the localities thus far known are the four highest mountains in Fiji. The type, *Gillespie 4107*, is cited below.

FIJI: VITI LEVU: Mba: Mt. Evans Range [presumably Mt. Mbotilamu], *Greenwood 364* (K), *457* (K); summit of Mt. Tomanivi [Mt. Victoria], *Gillespie 4107* (Bish TYPE, GH), *4122.1* (Bish, K, NY); Namosi: Summit ridge of Mt. Korombasambasanga, *B. E. Parham 2200* (A). TAVEUNI: Summit of Uluinalau, *Smith 891* (Bish, GH, K, NY, US).

On the basis of type collections, it would appear that *S. serratum* is very distinct from *S. graeffei*, but actually the suite of specimens now available shows that the two are closely related. Differences in the leaf-margin and the other points mentioned in my key seem to provide adequate grounds for the maintenance of Gillespie's species.

4. *Spiraeanthemum katakata* Seem. in *Bonplandia* 10: 36, nomen. 1862, Fl. Vit. 111. *pl. 17*. 1865; Pampan. in *Ann. di Bot.* 2: 51. 1905; Gibbs in *Jour. Linn. Soc. Bot.* 39: 145. 1909.

Spiraeanthemum samoense sensu Gibbs in *Jour. Linn. Soc. Bot.* 39: 145. 1909; non A. Gray.

Spiraeanthemum parksii Gillespie in *Bishop Mus. Bull.* 83: 10. *fig. 10*. 1931.

Shrub or tree up to 15 m. high, dioecious, the branchlets terete or distally flattened, copiously velutinous-puberulent toward apices with pale spreading hairs 0.1–0.15 mm. long, the older parts cinereous, glabrate; stipules oblong-ovate, rapidly enlarging in size, up to 15 mm. long and 10 mm. broad, obtuse, densely velutinous-puberulent on both surfaces or closely sericeous, soon caducous, the scars elongate, curved; leaves opposite, the petioles semiterete, 0.8–4 cm. long, narrowly winged distally, copiously puberulent like branchlets, tardily glabrate or not; leaf-blades papyraceous or subcoriaceous, ovate to lanceolate- or ovate-elliptic, 4–14 cm. long, 1.5–8.5 cm. broad, rounded to obtuse or rarely acute at base and abruptly decurrent on the petiole, obtusely cuspidate or short-acuminate at apex, narrowly revolute and entire at margins or undulate or inconspicuously denticulate (teeth if present minute, 1–3 per centimeter), obscurely puberulent on costa above, obviously puberulent on costa and secondaries beneath, otherwise glabrous on both surfaces, usually with obvious axillary domatia on lower surface, the costa nearly plane above and prominent beneath, the secondary nerves 5–11 per side, arcuate-spreading, usually plane above and sharply elevated beneath, the veinlet-reticulation intricate, usually slightly prominulous on both surfaces; inflorescence paniculate, solitary, axillary or pseudoterminal, ample, many-flowered, 5–13 cm. long, 4–8 cm. broad, the peduncle slender, 1–4 (–5) cm. long, copiously and persistently puberulent like young branchlets, the branches opposite or subopposite, persistently puberulent and sometimes also hispidulous with pale hairs to 0.5 mm. long, the bracts oblong, papyraceous, to 2.5 mm. long, rarely

larger and subfoliaceous, puberulent on both sides, the ultimate bracteoles about 0.5 mm. long; flowers solitary or in fascicles of 2–5, each actually terminal on a minute ultimate branchlet to 0.6 mm. long or insignificant, the pedicels (above articulation) 0.5–1.4 mm. long, copiously but minutely puberulent; calyx 1.3–1.8 mm. long and broad, sparsely puberulent or glabrate, deeply lobed, the lobes usually 4, rarely 3 or 5, ovate-oblong, $0.7\text{--}1.2 \times 0.6\text{--}1$ mm., subacute and minutely cucullate; stamens 8 (rarely 6 or 10), the filaments glabrous, in ♂ flowers 2–2.6 mm. long, in ♀ flowers 0.6–1.2 mm. long, the anthers ellipsoid, in ♂ flowers 0.3–0.4 mm. long, in ♀ flowers minute and apparently sterile; disk-lobes in ♂ flowers usually 4 or 5, rarely 3, free or loosely connate, carnose, obovoid-angled, 0.4–0.7 mm. long, irregularly truncate at apex and setulose or crispate-pilose with pale hairs 0.3–0.6 mm. long; disk-lobes in ♀ flowers 8 (rarely 6 or 10), essentially similar, the apical hairs shorter (0.2–0.3 mm. long) or sometimes lacking; carpels in ♀ flowers usually 4, rarely 3 or 5, ovoid, closely sericeous (hairs about 0.1 mm. long), the style 0.5–1 mm. long, the ovules 2, collateral, attached near middle, narrowed and winged at both ends; calyx and stamens persistent in fruit; mature carpels (1 or more sometimes aborted) falcate- or lanceolate-ellipsoid, 2.5–3 mm. long, persistently puberulent, the style persistent; seeds 2, collateral, 2.2–2.8 mm. long, the nucellus ellipsoid, about 0.8 mm. long, the wings subequal in length, the distal wing oblong, the basal wing subulate.

DISTRIBUTION: Fiji, where it appears to be the most abundant species of the genus, although it is known from only a few islands and is nowhere an obvious feature of the vegetation. A wide range has been recorded for altitudinal occurrence (100–1195 m.) and habitat (dense forest, dry forest, open places, forest-grassland transition, dense ridge thickets and forest, etc.). The species is a shrub or tree, sometimes attaining 15 m. in height; the calyx and filaments are white or greenish white, the styles are white often flushed with pink, and the mature carpels are dull pink. The most frequently recorded local name is *katakata*, but other names, some perhaps questionable, are *kutakuta*, *tandalo*, *vurewai*, *rure*, *singasinga*, and (on Vanua Levu) *wakathere*. The type collection is Seemann 196, of which the precise locality is in doubt; in the original description Seemann reports it as Kandavu, but one sheet at Kew with this number is indicated as being from Port Kinnaird (Ovalau) in part and from Namosi (Viti Levu) in part.

FIJI: VITI LEVU: *Milne* 69 (K); M b a : Mt. Evans Range, *Greenwood* 863A (A, Bish, US), 1220 (US); summit of Mt. Koroyanitu, Mt. Evans Range, *Smith* 4192 (A, US); Mt. Evans Range between Mt. Vatuyanitu and Mt. Natondra, *Smith* 4371 (A, US); Mt. Nairoso, Mt. Evans Range, *Smith* 4409 (A, US); Nandarivatu and vicinity, *Gibbs* 673 (BM), *Parks* 20676 (Bish), 20725 (Bish type of *S. parksii*), *Gillespie* 4021 (Bish, GH, K, NY, US), *Tothill* 777 (K), 778 (K), 778a (K), *Sykes* 27 (A), *Greenwood* 863 (A, K, NY, US), *Smith* 4904 (A, US), *Vaughan* 3260 (BM); western slopes of Mt. Nanggaranambuluta, *Smith* 4792 (A, US); valley of Nggaliwana Creek, *Smith* 5371 (A, US); western and southern slopes of Mt. Tomanivi, *Smith* 5222 (A, US); R a : Numbumakita (about 10 miles east of Mt. Tomanivi), *Gibbs* 880 (BM); N a n d r o n g a & N a v o s a : Northern portion of Rairaimatuku Plateau,

between Nandrau and Nanga, *Smith* 5429 (A, US); Namosi: Near Namosi, *Gillespie* 2589 (Bish, GH, NY); Naitasiri: Nakatia, Navuakethe District, *B. E. Parham* 2738 (A). OVALAU: *Milne* 52 (K), 267 (K). VANUA LEVU: Thakaundrove-Mathuata boundary: Crest of Korotini Range, *Smith* 553 (Bish, GH, K, NY, US); Thakaundrove: Natewa Peninsula, hills south of Natewa, *Smith* 1967 (Bish, GH, K, NY, US). Fiji, without definite locality: *Seemann* 196 (Kandavu, Ovalau, or Viti Levu?) (GH, K TYPE), *Horne* 845 (GH, K), 846 (GH, K), 1007 (GH, K).

The very close velutinous-puberulent indument of vegetative parts readily distinguishes *S. katakata*, from the essentially glabrous *S. graeffei* and *S. serratum* on the one hand, and from the hispidulous- or strigose-pubescent *S. samoense* on the other. Gillespie noted the close relationship of his *S. parksii* with *S. katakata*, suggesting as differentiating characters only the thicker, smaller, and more coriaceous leaves. Among the specimens cited above are many which show, on a single plant, variations in these characters covering the extremes of the two type specimens. As I cannot find any consequential points of difference, either in foliage or inflorescence, among the cited specimens, Gillespie's binomial is reduced to synonymy. The prominence and length of the hairs of the disk-lobes, or even their presence or absence, are not correlated with other characters and appear strictly individual in nature.

5. *Spiraeanthemum samoense* A. Gray, Bot. U. S. Expl. Exped. 1: 667. *pl.* 83, A. 1854, in Ann. Sci. Nat. IV. Bot. 4: 177. 1855, in Proc. Am. Acad. 3: 128. 1857; C. Muell. in Walp. Ann. Bot. Syst. 5: 23. 1858; Reinecke in Bot. Jahrb. 25: 633. 1898; Pampan. in Ann. di Bot. 2: 51. 1905; Rechinger in Denkschr. Akad. Wiss. Wien 85: 286. 1910; Setchell in Carnegie Inst. Publ. 341: 92. 1924; Christophersen in Bishop Mus. Bull. 128: 96. 1935.

Shrub or tree up to 8 m. high, dioecious (or possibly sometimes polygamodioecious), the branchlets distally copiously hispidulous with spreading pale brown hairs 0.3–1 mm. long, at length becoming subglabrate; stipules ovate when young, rapidly enlarging, at length lanceolate-oblong, up to 35 mm. long and 10 mm. broad, obtuse, densely or sparsely sericeous or hispidulous without, glabrous within, soon caducous, the scars elongate, curved; leaves opposite, the petioles semiterete, 1–4 cm. long, copiously hispidulous like branchlets, at length subglabrate; leaf-blades subcoriaceous or chartaceous, elliptic- or ovate-oblong, 5–14 (–15) cm. long, 2.5–7 (–7.5) cm. broad, broadly obtuse to acute at base and short-decurrent on the petiole, obtusely cuspidate or callose-apiculate at apex, conspicuously serrulate at margin with 2–4 callose-glandular teeth per centimeter, sparsely strigose-puberulent on both sides (hairs grayish, 0.2–0.7 mm. long), at length glabrate except indument persisting on costa and secondaries beneath, usually with small axillary domatia on lower surface, the costa plane above or elevated in a groove, prominent beneath, the secondary nerves 6–13 per side, arcuate-spreading, usually plane above and strongly elevated beneath, the veinlet-reticulation intricate, plane or immersed

above, prominulous beneath; inflorescence paniculate, solitary, axillary or pseudoterminal, ample, many-flowered, 7–17 cm. long, 3–10 cm. broad, the peduncle subterete or slightly flattened, 1.5–6 cm. long, hispidulous-puberulent with hairs 0.1–0.3 mm. long, the branches opposite, persistently hispidulous (hairs 0.2–0.5 mm. long), the bracts lanceolate, often subfoliaceous, to 15 mm. long, strigose-puberulent on both sides, the ultimate bracteoles about 0.5 mm. long; flowers solitary at apices of ultimate branchlets (these 0.7–2.5 mm. long), the pedicels (above articulation) 0.5–1.8 mm. long, strigose-puberulent, often glabrate; calyx 1.7–2.3 mm. long and broad, proximally puberulent, usually glabrate, the lobes 4 or 5, rarely 6, ovate-deltoid, $1-1.5 \times 0.7-1.1$ mm., acute; stamens 8 or 10 (or 12?), the filaments glabrous, in ♂ flowers 1.5–3 mm. long, in ♀ flowers 1–1.5 mm. long, the anthers broadly ellipsoid, in ♂ flowers 0.2–0.3 mm. long, in ♀ flowers minute and probably sterile; disk-lobes in ♂ flowers 4–6, carnose, loosely coherent or free, oblong, 0.6–1 mm. long, irregularly truncate at apex, ventrally and apically sparsely hispidulous with hairs 0.2–0.3 mm. long or glabrous; disk-lobes in ♀ flowers 8 or 10 (or 12?), similar but slightly shorter, 0.4–0.7 mm. long; carpels in ♀ flowers 4 or 5 (or 6?), ovoid, densely sericeous with stramineous hairs 0.2–0.4 mm. long, the style 0.5–0.7 mm. long, the ovules 2, collateral, pendulous from near middle; calyx and stamens persistent in fruit; mature carpels narrowly oblong-ellipsoid, up to 3 mm. long and 1 mm. broad, persistently sericeous, the style persistent; seeds 2 (1 often smaller or perhaps aborted), 1.5–2 mm. long, the nucellus ellipsoid, 0.8–1 mm. long, the wings subequal in length (0.3–0.5 mm. long), the distal wing oblong, obtuse, the basal wing subulate.

DISTRIBUTION: Endemic to Samoa, where it occurs on at least the larger islands at altitudes of 500–1700 m., being indicated by Christophersen as common at middle and high elevations. It is usually noted as a tree 2–8 m. high, occurring in various types of forest; the flowers are said to be white or yellowish white and fragrant. Recorded local names are *tauli*, *maota mea*, *saitamu*, and *lau matui*. The type is an Exploring Expedition collection, cited below, which Gray cited with a question as being from Tutuila.

SAMOA: SAVAI: Above Letui, *Christophersen* 780 (Bish, K); above Safune-Letui, *Christophersen* 819 (A, Bish, US); above Matavanu, *Christophersen & Hume* 1992 (A, Bish, US), 2069 (Bish, K, NY, US), 2131 (Bish, US). UPOLU: Laulii River basin, *Reinecke* 281 (US); above Utumapu, *Rechinger* 1518 (BM, K, US); Lanutoo, *Funk* 113 (BM), *Rechinger* 706 (BM), 1920 (BM, K, US); Malololelei-Lanutoo trail, *Christophersen* 373 (Bish, K, NY), 399 (Bish, US). TUTUILA: Matafao Ridge, *Collarino* (in *Setchell*) 549 (Bish), *Christophersen* 1048 (Bish, NY), 1067 (A, Bish, US); Le Pioa, *Christophersen* 3506 (Bish, K, NY), 3576 (Bish). Samoa, without definite locality: *U. S. Expl. Exped.* (probably from Tutuila) (GH, US 47619 and 47620 TYPE), *Whitmee* (BM, GH), 37 (K), 257 (BM), 957 (K), *Powell* (GH, K, NY), 121 (K).

The single representative of the genus from Samoa is well characterized by the comparatively long indument of its branchlets, lower surface of leaf-costa, etc., by its elongate stipules which are glabrous within, by its serrulate leaf-blades, and by the comparatively elongate ultimate inflorescence-

branchlets. In this, as in other species of the genus, the pedicels might be described as "jointed," but only the portion above the articulation is strictly pedicellary.

4. *PULLEA* Schlechter

The genus *Pullea*, described in 1914 (in Bot. Jahrb. 52: 164. fig. 9), is now composed of six species, all limited to New Guinea, as discussed by Perry (in Jour. Arnold Arb. 30: 163-165. 1949). The species here described as new indicates the occurrence as far east as Fiji of another Papuanian genus. That so many genera with this distribution have not yet been reported from the Solomons and the New Hebrides can only indicate the sparsely collected nature of those archipelagos.

Pullea perryana sp. nov.

Arbor ad 6 m. alta, ramulis teretibus vel superne leviter complanatis, glabris vel apices versus obscure strigillosis, inconspicue lenticellatis, nigrescentibus demum cinerascentibus; stipulis subcoriaceis obovato-suborbicularibus vel obovato-ellipticis, (8-) 10-12 mm. longis, (3-) 8-11 mm. latis, basi angustatis, apice rotundatis, margine valde revolutis, utrinque obscure strigoso-puberulis glabratibus, mox caducis, cicatricibus brevibus transverse ellipticis subrectis; foliis oppositis, petiolis crassis semiteretibus vel leviter canaliculatis superne alatis (7-) 10-25 mm. longis parce strigoso-puberulis mox glabratibus, laminis coriaceis in sicco brunnescentibus ellipticis vel lanceolato-ellipticis, (7-) 11-18 cm. longis, (3.5-) 4-9 cm. latis, basi attenuatis et in petiolum longe decurrentibus, apice obtuse cuspidatis (acumine ipso ad 1 cm. longo rotundato), margine grosse undulato-crenatis (dentibus circiter 1 per centimetrum) et anguste revolutis, utrinque glabris, costa valida supra plana vel leviter elevata subtus prominente, nervis secundariis utrinsecus 7-11 arcuato-adscendentibus supra subplanis subtus valde elevatis, rete venularum intricato supra subimmerso subtus prominulo vel plano; inflorescentiis axillaribus vel pseudoterminalibus ample paniculatis multifloris, binis vel ternatis superpositis, sub anthesi (3-) 6-11 cm. longis et (2-) 3-7 cm. latis, pedunculo gracili subcomplanato (1.5-) 4-7 cm. longo parce hispidulo (pilis pallidis 0.1-0.2 mm. longis) glabrato, ramulis primariis apice pedunculi 3-7 aggregatis, bracteis primariis subfoliaceis lineari-oblongis ad 9×2 mm. puberulis mox caducis, ramulis ut pedunculo minute hispidulo-puberulis; floribus hermaphroditis sessilibus confertis 1-bracteolatis, bracteolis obovatis 1-1.2 mm. longis apice rotundatis extus parce strigillosis intus glabris margine ciliolatis; calyce 2-2.5 mm. longo demum subrotato ad 4 mm. diametro, tubo minute obconico, limbo papyraceo profunde lobato, lobis 5 vel 6 anguste imbricatis oblongo-ellipticis $1.5-1.7 \times 1-1.2$ mm., inconspicue nervatis, extus parce strigilloso-puberulis vel glabratibus, intus dense puberulis, margine ciliolatis, apice rotundatis; petalis nullis; staminibus 10 vel 12 demum deciduis, filamentis gracilibus 2-2.3 mm. longis, antheris ellipsoideis circiter 0.4 mm. longis utroque rotundatis; disci lobis

10 vel 12 carnosis plerumque binatim cohaerentibus oblongo-obovoideis subquadratis 0.3–0.4 mm. longis glabris, apice complanatis vel rotundatis; ovario subsupero, basi in calycis tubo leviter immerso, crispato-tomentello (pilis 0.5–0.7 mm. longis), stylis subulatis curvatis glabris 1.5–2 mm. longis, ovulis in quoque loculo 4 biseriatim pendulis.

DISTRIBUTION: Fiji, known from only two collections, both obtained in southeastern Viti Levu; Parham notes his collection as a tree 6 m. high, growing in ridge forest, with cream-white flowers.

FIJI: VITI LEVU: Naitasiri: Tholo-i-Suva, *B. E. Parham 1646* (A); Rewa or Naitasiri: "Central Road, Suva," November, 1928, *B. H. Tothill 472* (Bish, K TYPE, US).

This remarkable species, so completely unlike anything yet described from Fiji, is most suggestive of the New Guinean *P. decipiens* Perry, from which it differs in its much larger leaves and inflorescences and in having the ovary nearly completely superior, immersed in the calyx-tube only at its base. The New Guinean species seem to have the ovary about half-inferior, but otherwise no basic characters are discerned for segregation of the Fijian plant.

It is a pleasure to name this species for Dr. Lily M. Perry, in recognition of her valuable work on the flora of Papuasias, and with particular reference to her review of the Cunoniaceae (in *Jour. Arnold Arb.* 30: 139–165. 1949). As Dr. Perry first suggested that the new species might be sought in *Pullea*, the epithet seems particularly fitting.

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