

NOTES ON SOME MYRTACEAE OF FIJI

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OF THE GENERA of the Myrtaceae which occur in the Fiji Islands, the genus *Syzygium* Gaertner is by far the largest. In it twenty-seven species had already been reported in various publications when Dr. A. C. Smith's excellent collection of some sixty Myrtaceae and twenty other miscellaneous collections came to hand for determination. These contained one species of *Cleistocalyx*, the usual forms of *Metrosideros* (and two collections which have fascicled inflorescences or inflorescences branched very close to the base; however, the flower-buds are so young that I have not attempted to name these beyond the genus), *Decaspermum*, *Psidium guajava*, and the New Caledonian genus *Piliocalyx* which, as far as I know, is here reported outside of New Caledonia for the first time. Of course the bulk of the collections belong to *Syzygium*. With so much material to be named, the time seemed opportune for presenting a summary of the species of *Syzygium*. Of all the species of this genus which I have studied, those of the Fiji Islands have been the most difficult to define. When one considers the variations which occur, it seems as though the species must be in a state of flux. There is a wide range in the size of the leaves, the length of the petiole, and sometimes in the shape of the leaf-base. There has been a tendency to use the subcordate leaf-base as a distinguishing character as opposed to the rounded leaf-base, and I must confess that in some cases it appears like a good character, but, with a large series of specimens at hand, both have occasionally been found on the same specimen. Another character which has been considered reliable is the shape of the branchlets, but here again one may find angled and compressed branchlets in the same collection. As always it is difficult to be sure that flowers and fruiting material have been matched correctly unless belonging to the same collection. All too often supplementary descriptive field notes are lacking.

In this study I have had the privilege of examining material from the following herbaria: Gray Herbarium (G), U. S. National Museum (US), the Bernice P. Bishop Museum (Bish), the New York Botanical Garden (NY), the University of California (Cal — type-collection), and the Arnold Arboretum (A).

KEY TO THE SPECIES OF SYZYGIUM

Bracts of the inflorescence persistent.

Leaves sessile.....*S. Wolfii*.

Leaves petiolate.

Flowers with calyx 4–7 mm. long, at the apex 4–6 mm. broad.

Disk lining the calyx-tube deeply cupulate....*S. Brackenridgei*.

Disk lining the calyx-tube very shallow.....*S. oblongifolium*.

- Flowers smaller, with calyx 3–4 mm. long, at the apex 2–2.5 mm. broad.....*S. confertiflorum*.
- Bracts of the inflorescence caducous.
- Flowers small; calyx (including pseudostalk) not more than 1 cm. long at anthesis.
- Inflorescences usually found on the twigs below the leaves, or on the trunk, or on the slender branches growing from the trunk or the old growth.
- Persistent calyx-limb crowning the fruit 3–5 mm. diameter; cotyledons lying side by side, the inner faces folded, the long radicle (extending to the outer margin of the cotyledons) lying within the folds.
- Fruit elongate, fusiform (i.e., tapering at both base and apex); flower-buds subclavate.....*S. corynocarpum*.
- Fruit ellipsoid or obovoid-ellipsoid, rounded at the apex; flower-buds pyriform.....*S. diffusum*.
- Persistent calyx-limb crowning the fruit 2–3 mm. diameter; cotyledons superposed, the inner faces flat or concave, not folded, the radicle short; fruit oblong to oblong-ellipsoid....
.....*S. Cumini*.
- Inflorescences axillary and terminal.
- Calyx about 1 cm. long, 5–7 mm. broad at the apex; flowers crowded at the apices of the branchlets of the inflorescence (i.e., inflorescence compact).
- Branchlets terete; leaves somewhat abruptly long-acuminate, veins more easily seen on the lower surface.....
.....*S. nidic*.
- Branchlets 4-angled; leaves shortly and obtusely acuminate, veins more easily seen on the upper surface.....
.....*S. leucanthum*.
- Calyx 3–8 mm. long, usually around 3 mm. broad at the apex, or, if as broad as in the above species, the flowers not crowded at the apices of the branches of the inflorescence (i.e., inflorescence open).
- Leaves rounded, or subcordate, or cordate at base.
- Leaves rounded or subcordate at base, subsessile or short (to 1.2 cm. long) petiolate, secondary veins easily seen on the lower surface; inflorescence fairly large (7–15 cm. long), and many-flowered.....
.....*S. Grayi*.
- Leaves cordate at base, sessile, secondary veins obscure on the lower surface; inflorescence small (2–2.5 cm. long), and few-flowered.....*S. simillimum*.
- Leaves cuneate at base, or, if rounded, narrowed into the petiole.
- Calyx pyriform; leaves with two intramarginal veins, the outer one finer than the inner...*S. phacophyllum*.
- Calyx turbinate; leaves with usually only one intramarginal vein.
- Calyx gradually narrowed below the limb, near the base contracted into a short pseudostalk.

Calyx definitely lobed, the lobes 2-3 mm. wide, 1-1.5 mm. high; leaves obviously closely veined and acuminate.....*S. curvistylum*.

Calyx repandly lobed; leaves obscurely veined, obovate or elliptic, rounded, or obtuse, or retuse, but sometimes acutish at the apex.....*S. effusum*.

Calyx somewhat abruptly narrowed below the limb (i.e., above or near the middle), the tapering base with pseudostalk longer than, or almost as long as the upper part.

Branchlets sharply 4-angled. Small tree apparently common on the banks of streams..

.....*S. Seemannianum*.

Branchlets terete. Trees of the forest and open rolling country.

Secondary nerves and reticulations easily seen with the naked eye on the upper surface of the leaves, less prominent on the lower surface; calyx-tube abruptly contracted into a pseudostalk only a little shorter than the narrowly campanulate upper part.....*S. fijiense*.

Secondary nerves and reticulations obscure on the upper surface of the leaves, usually manifest or inconspicuous on the lower surface; calyx-tube somewhat abruptly contracted into a pseudostalk longer than the narrowly campanulate upper part.

Inflorescence usually longer than the subtending leaves, with widely spreading branches, profusely flowering; leaves acuminate, secondary venation usually inconspicuous.....*S. rubescens*.

Inflorescence usually not longer than the subtending leaves and smaller than in *S. rubescens*; leaves subacuminate or obtusely acuminate, secondary venation easily seen...

.....*S. amicorum*.

Flowers large; calyx (including pseudostalk) at least 1.3 cm. long and 1 cm. broad (at apex) at anthesis.

Inflorescence on branches below the leaves.

Leaves cuneate at base.....*S. malaccense*.

Leaves rounded or subcordate at base.....*S. Richii*.

Inflorescence axillary and/or terminal.

Inflorescence on a very short axis; flowers sessile in heads or sometimes solitary.

Calyx-tube ribbed; leaves comparatively narrow (to 8.5 cm.).....*S. neurocalyx*.

- Calyx-tube not ribbed; leaves very broad (to 17 cm.)
 *S. amplifolium*.
 Inflorescence with an obvious axis and branches.
 Inflorescence dense; axis with very short branches
 *S. quadrangulatum*.
 Inflorescence open.
 Base of the leaves rounded or subcordate or cordate.
 Inflorescence axis and branchlets somewhat robust; flowers numerous (15-50).
 Flowers pyriform, with practically no pseudostalk *S. Richii*.
 Flowers infundibular, tapering to a very slender base or pseudostalk . . . *S. nandarivatense*.
 Inflorescence axis and branchlets (if present) slender; flowers 1-3(-7) *S. gracilipes*.
 Base of the leaves cuneate (or if rounded then shortly cuneate or shortly decurrent on the petiole).
 Leaves long acuminate; petioles not more than 1.5 cm. long *S. Jambos*.
 Leaves blunt or acute, not acuminate; petioles usually more than 1.5 cm. long.
 Fruit obovoid; petioles 3.5 cm. long
 *S. Gillespiei*.
 Fruit globose; petioles 1-2.5 cm.
 *S. tetrapleurum*.

Syzygium Wolfi (Gillespie) Merrill & Perry in Sargentia 1: 75. 1942.

Eugenia Wolfi Gillespie in Bishop Mus. Bull. 83: 22, fig. 28. 1931.—
 A. C. Smith in Bishop Mus. Bull. 141: 106. 1938.

VANUA LEVU: Mathuata, Wainunu-Ndreketi Divide, in dense forest, alt. 200-300 m., *A. C. Smith* 1854 (G), May 1934 (slender tree 20 m. high); Seanggangga Plateau, in drainage of Korovuli River, vicinity of Natua, patches of forest in open rolling country, alt. 100-200 m., *A. C. Smith* 6877 (A), Nov.-Dec. 1947 (tree 10 m. high, locally frequent but rarely fertile; young fruit pink to deep purple). FIJI: without further locality, *J. Horne* 1100 (G).

I have been unable to locate the type of this species, but from the specimens cited above, it would appear that the species is readily distinguished by the large sessile or subsessile leaves.

Syzygium Brackenridgei (A. Gray) C. Mueller in Walpers Ann. 4: 838. 1857. — Merrill & Perry in Sargentia 1: 75. 1942.

Eugenia Brackenridgei A. Gray, Bot. U. S. Expl. Exped. 1: 521. 1854; Atlas pl. 61 A. 1857.

Jambosa Brackenridgei Brongn. & Gris in Bull. Soc. Bot. Fr. 12: 181. 1865.

Pareugenia Imthurnii Turrill in Jour. Linn. Soc. Bot. 43: 21. 1915; in Hook. Icon. 31: pl. 3004. 1915.

Pareugenia Brackenridgei (A. Gray) A. C. Smith in Bishop Mus. Bull. 141: 109. 1936.

Syzygium Imthurnii (Turrill) Merrill & Perry in Sargentia 1: 75. 1942.

VANUA LEVU: Mathuata: Seanggangga Plateau, in drainage of Korovuli River, vicinity of Natua, patches of forest in open rolling country, alt. 100–200 m., *A. C. Smith* 6738 (A), Nov.-Dec. 1947 (tree 7 m. high; old calyces pink-tinged, at length rich purple).

OVALAU: without further locality, *U. S. Expl. Exped. 1838–1842* (type-collection, G).

VITI LEVU: Lautoka: mountains near Lautoka, *W. Greenwood* 36 (A), Aug. 1920. Nandronga & Navosa: northern portion of Rai-raimatuku Plateau, between Nandrau and Rewasau, dense forest, alt. 725–825 m., *A. C. Smith* 5443 (A). Tholo North: Nandarivatu, valley of the Singatoka, alt. 850 m., *J. W. Gillespie* 3834 (Bish), Nov. 1927; Nandarivatu, 2 miles up the Mba trail, alt. 1000 m., *J. W. Gillespie* 4042 (Bish), Nov. 1927; vicinity of Nandarivatu, alt. 900 m., *J. W. Gillespie* 4193 (Bish), Dec. 1927; Nandarivatu, margin of thick bush on ridge, alt. 1300 m., *H. E. Parks* 20682 (Bish), July 1927. Namosi: trail up Voma Mountain from Namosi, alt. 600 m., *J. W. Gillespie* 2904 (Bish), Sept. 1927; trail between Nangarawai and Sele ni ndrau villages, *J. W. Gillespie* 3225 (Bish), Sept. 1927; vicinity of Namosi, near stream, alt. 400 m., *J. W. Gillespie* 2657 (Bish), Sept. 1927; Namosi, *B. Seemann* 155 (G).

KANDAVU: Mt. Mbuke Levu, alt. 200–500 m., *A. C. Smith* 239 (G), Oct. 1933.

This species shows considerable variation in the size of the leaves. In *Gillespie* 3834 only the upper leaves are shown, the largest of these being 6.5×3.5 cm. In the type-collection of *S. Brackenridgei* (A. Gray) C. Mueller the small leaves (11×4 cm.) are narrowly cuneate at base, but the one large leaf (21×10 cm.) in the Gray Herbarium specimen is broadly cuneate or acute at the base. Most of the other collections have leaves intermediate in size between the extremes given above. I have not seen the type-specimen of *S. Imthurnii* (*Pareugenia Imthurnii* Turrill), but I have at hand four collections (*Gillespie* 3834, 4042, 4193, and *Parks* 20682) gathered in the vicinity of Nandarivatu, the type-locality of Turrill's species. According to the size of the leaves given in the description these specimens would belong to *S. Imthurnii*. However, other specimens show a complete transition to typical *S. Brackenridgei*, and at present I can see no character sufficient to distinguish two species.

Syzygium Brackenridgei (A. Gray) C. Mueller var. *dubium*, var. nov.

A forma typica differt foliis oblongis utrinque angustatis; inflorescentiis similibus.

VANUA LEVU: Mathuata: Lower Wainunu River Valley, thin forest, alt. 0–200 m., *A. C. Smith* 1723 (A), May 1934 (tree 8 m. high; calyx and petals pink to red; filaments rich pink; anthers yellow); summit ridge of Mt. Numbuiloa, east of Lambasa, dense forest, alt. 500–590 m., *A. C. Smith* 6524 (Arnold Arboretum, TYPE of var.), Oct.-Nov. 1947 (tree 4 m. high; calyces pink to purple).

These two specimens have oblong leaves; apart from that I do not at present observe any other variation from the species unless it might be that the flowers are slightly larger. In our representation of *S. Brackenridgei* (A. Gray) C. Muell. not too many mature flowers are present.

Syzygium oblongifolium (Gillespie) Merrill & Perry in Sargentia 1: 75. 1942.

Pareugenia oblongifolia Gillespie in Bishop Mus. Bull. 83: 23, fig. 29. 1931.

VITI LEVU: Namosi: near summit of Vakarongasiu Mt., alt. 850 m., J. W. Gillespie 3268 (type-collection, Cal), Oct. 1927. Naitasiri: Waidanda, B. E. Parham 782 (A). Mba: hills between Nggaliwana and Tumbeindreketi Creeks, east of sawmill at Navai, alt. 725–800 m., A. C. Smith 5897 (A), Sept. 1947 (tree 10 m. high; petals and filaments greenish white, becoming pure white; anthers pale yellow; disk and style white). Nandronga & Navosa: northern portion of Rairaimatuku Plateau, between Nandrau and Rewasau, in dense forest, alt. 725–825 m., A. C. Smith 5420 (A), Aug. 1947. FIJI: without further locality, J. Horne 936 (G).

Syzygium oblongifolium and *S. Brackenridgei* closely resemble each other. In the former, the limb of the calyx is very short, so that the disk lining it is only slightly concave; the leaves are usually oblong-elliptic or elliptic with a short-acuminate apex. In the latter, the limb of the calyx is longer, consequently the disk is deeply cup-shaped; the leaves are usually oblanceolate or obovate-elliptic, but occasionally elliptic, and at the apex rounded or slightly retuse, or sometimes short-acuminate. In most of the leaves with round or retuse apex the growing tip appears to have been stunted.

Syzygium confertiflorum (A. Gray) C. Mueller in Walpers Ann. 4: 838. 1857.

Eugenia confertiflora A. Gray, Bot. U. S. Expl. Exped. 1: 523. 1854; Atlas pl. 64B. 1857. — A. C. Smith in Bishop Mus. Bull. 141: 105. 1936.

VANUA LEVU: Yanawai River region, Mount Kasi, dense bush, alt. 300–430 m., A. C. Smith 1757 (G), 1797 (G). FIJI: without further locality, J. Horne 702 (G), 1056 (G).

OVALAU: U. S. Expl. Exped. 1838–1842 (type-collection, G).

Syzygium corynocarpum (A. Gray) C. Mueller in Walpers Ann. 4: 839. 1857. — E. Christophersen in Bishop Mus. Bull. 154: 23. 1938.

Eugenia corynocarpa A. Gray, U. S. Expl. Exped. 1: 536. 1854; Atlas t. 64. 1857.

VANUA LEVU: Mathuata: Mathuata Coast, W. Greenwood 649 (A) (small tree 15 ft. high, with spreading branches; young buds often purplish; flowers white, strong-scented; petals pushed off in one piece; flowers often borne on short branches on old wood near centre of tree). Thakaundrove: Maravu, near Salt Lake, in very dark woods, O. Degener & E. Ordonez 14219 (A), Jan. 1941 (tree to 3 m. high; fruit dark red or pure yellow, partly cauliflorous, sometimes produced so low on the trunk as to lie on the ground); near Urata, Savu Savu Bay region, in forest near the shore, O. Degener & E. Ordonez 13927 (A), Dec.-Jan. 1941. FIJI: without further locality, U. S. Expl. Exped. 1838–1842 (G, type-collection), B. Seemann 153 (G), B. E. Parham 1045 (A).

VITI LEVU: Tholo North: Mt. Matomba, Nandala, vicinity of Nandarivatu, in rich dark forest, alt. 750–900 m., O. Degener 14453 (A), Feb. 1941 (tree 4–5 m. high; fruits very dark red); Nauwanga, near Nan-

darivatu, alt. 750–900 m., *O. Degener 14676* (A), Feb.-Mar. 1941 (tree 3 m. high; fruit dark red). Namosi: hills between Navua River and Suva, alt. 200–300 m., *W. Greenwood 1017* (A), May 1943 (weak tree about 15 ft. high, with leaves only at the ends of the twigs; inflorescence on the main stem 3–4 ft. from the ground — on another tree an inflorescence was 6 inches from the ground). Rewa: Korobamba, *A. Meebold 16691* (Bish), July 1932; southeast slope of Korobamba Mountain, alt. 200 and 300 m., *J. W. Gillespie 2239* (Bish), *2441* (Bish), Aug. 1927.

Christophersen (Bishop Mus. Bull. 154: 23. 1938) noted that this species is characterized by the elongated beaked fruits and the distinctly bicolored leaves. It should also be pointed out that the flowers are sessile or subsessile, and the space occupied by the locules of the ovary is much longer than broad, whereas in the other species this space is as broad as long. *Rechinger 1856* (US), and *Vaupel 257* (US), from Samoa belong to this species. Rechinger's collection was published as *E. amicorum* A. Gray.

Syzygium diffusum (Turrill) Merrill & Perry in *Sargentia* 1: 76. 1942.

Eugenia diffusa Turrill in Jour. Linn. Soc. Bot. 43: 20. 1915. — A. C.

Smith in Bishop Mus. Bull. 141: 107. 1936.

Syzygium aneityense Guillaumin in Jour. Arnold Arb. 12: 256. 1931.

TAVEUNI: western slope, between Somosomo and Wairiki, alt. 500–900 m., *A. C. Smith 755* (G), *769* (G), *797* (G).

KORO: eastern slope of main ridge, *A. C. Smith 994* (G).

VITI LEVU: Lautoka: Mt. Evans, near summit, alt. 1200 m., *W. Greenwood 948* (A), Oct. 1942 (tree about 20 ft. high; fruit in big bunches on the stem about 1–2 ft. below the terminal leaves; fruit at first red but deep purple when ripe, about 1.5 cm. diameter and 2 cm. long, orifice 3 mm. wide); Mt. Evans, alt. 1090 m., *W. Greenwood 965* (A), Dec. 1942 (tree 15–20 ft. high; inflorescences on short branches with leaves behind the ends of shoots, or on the main trunk without any leaves). Nandronga & Navosa: northern portion of Rairaimatuku Plateau, between Nandrau and Rewasau, dense forest, alt. 725–825 m., *A. C. Smith 5612* (A), July-Aug. 1947 (tree 12 m. high; inflorescence from the trunk; calyx dull green, pink-tinged distally; young petals pinkish on exposed areas, otherwise with filaments and style pale yellow); southern slopes of Nausori Highlands, in drainage of Namosi Creek above Tumbenasolo, dense forest, alt. 300–450 m., *A. C. Smith 4714* (A), May-June 1947. Naitasiri: Viria, in rain forests, alt. 400 m., *H. E. Parks 20434* (Bish).

KANDAVU: Mt. Mbuke Levu, alt. 200–500 m., *A. C. Smith 224* (G). FIJI: without further locality, *J. Horne 443* (G).

I am indebted to Dr. H. Emery Moore, Jr. of Ithaca, N. Y., for a photograph of the type (two sheets) of this species in the Kew Herbarium. I believe our material to be a good match for it. In general our specimens are more profusely flowering and the leaves are 8–13 cm. long, 2.5–5 cm. broad, but these are variations to be expected.

Syzygium diffusum (Turrill) Merrill & Perry var. *purpureum* var. nov.

A forma typica differt foliis usque 7 cm. longis, 3 cm. latis, plerumque 6×2.5 cm.

VANUA LEVU: Mathuata: summit ridge of Mt. Numbuiloa, east of Lambasa, dense forest, alt. 500–590 m., *A. C. Smith 6413* (Arnold Arboretum, TYPE of var.), Oct.–Nov. 1947 (slender tree 6–10 m. high; inflorescence arising from trunk or sometimes on leafy branches; inflorescence-branches and young flowers [buds] rich purple; filaments and style white); Seanggangga Plateau, in drainage of Korovuli River, vicinity of Natua, patches of forest in open rolling country, alt. 100–200 m., *A. C. Smith 6681* (A), Nov.–Dec. 1947 (tree 15 m. high; inflorescence branches and flowers [buds] rich purple).

VITI LEVU: Korubalevu, dense jungle, alt. 450 m., *H. E. Parks 20318* (Bish), June 1927. Rewa: southeast slopes of Korobamba Mountain, alt. 300 m., *J. W. Gillespie 2219* (Bish), Aug. 1927; near summit of Korobamba Mountain, alt. 500 m., *J. W. Gillespie 2313* (Bish), Aug. 1927. Tholo North: Nandarivatu, thick forests, alt. 1400 m., *H. E. Parks 20778* in part (Bish), July 1927. Mba: northern portion of Mt. Evans Range, between Vatuyanitu and Mt. Natondra, dense forest, alt. 700–900 m., *A. C. Smith 4351* (A), May 1947 (tree 15 m. high; fruit dependent from slender branches; fructescence freely branched, about 1 m. long).

These collections seem to differ from *S. diffusum* only in the smaller leaves, those in the species usually being around 10 cm. long and 4–5 cm. broad. None of the specimens cited have either flowers at anthesis or mature fruits.

Syzygium Cumini (L.) Skeels in U. S. Dept. Agric. Bur. Pl. Ind. Bull. 248: 25. 1912. — Alston, Handb. Fl. Ceylon 6(Suppl.): 116. 1931. — Merrill & Perry in Jour. Arnold Arb. 19: 108, 230. 1938.

Myrtus Cumini Linn. Sp. Pl. 471. 1753.

Eugenia Jambolana Lam. Encycl. 3: 198. 1789.

Eugenia Cumini Druce in Rept. Bot. Exch. Club Brit. Isles 3: 418. 1914. — M. R. Henderson in Gardens Bull. Singapore 12: 182, fig. 35. 1949.

FIJI: without further locality, *M. Scott 1060* (A), March 1938 (tree 15–20 ft. high).

Probably introduced for cultivation. So far as I know the species has not been reported previously from Fiji.

Syzygium nidie Guillaumin in Jour. Arnold Arb. 12: 257. 1931. — Merrill & Perry in Sargentia 1: 77. 1942.

Type-collection from Aneityum. Previously reported from Fiji on the basis of *Degener 14550* (A), *14665* (A).

Syzygium leucanthum, sp. nov.

Arbor 10 m. alta glabra; ramulis quadrangularibus; foliis in sicco tenuiter coriaceis ellipticis vel interdum subrhombicis, olivaceis subtus pallidioribus et glandulosis (glandulis minutis parce adspersis), 2.5–6 cm. longis, 1–2.8 cm. latis, apice abrupte et breviter acuminatis (acumine 3–5 mm. longo, 2–4 mm. lato obtuso), basi obtusis deinde fere ad basim petioli decurrentibus, costa utrinque brunnescente, nervis primariis numerosis tenuibus fere transversis supra paululo elevatis subtus manifestis, vena intramarginali a margine recurvo 0.5 mm. remota conjunctis, rete venu-

larum subobscuro; petiolo (cum basi decurrente folii) 5–9 mm. longo (sine basi decurrente 3 mm. longo) planiusculo; inflorescentiis terminalibus, trichotomis usque 4 cm. longis, axi et ramulis quadrangularibus; floribus sessilibus vel subsessilibus 3 in apice ramulorum dispositis; bracteis ovatis, 4 mm. longis, caducis; alabastris 1–1.2 cm. longis; calyce sub anthesin obconico vel subturbinato, 9 mm. longo, apice 7 mm. lato, lobis 4 circiter 3 mm. latis et 1.3 mm. longis, probabiliter persistentibus; petalis calyptratis caducis; staminibus numerosis, filamentis ca. 8 mm. longis, antheris ellipticis ca. 0.4 mm. longis; stylo 6–7 mm. longo; fructibus non visis.

VITI LEVU: Naitasiri: northern portion of Rairaimatuku Plateau between Mt. Tomanivi and Nasonggo, dense forest, alt. 870–970 m., *A. C. Smith 6088* (Arnold Arboretum, TYPE), Aug.-Sept. 1947 (tree 10 m. high, with bushy crown; calyx green, pink-tinged; petals white, faintly pink-tinged, soon caducous; filaments pure white, anthers pale yellow).

This species is most like *S. nidie* (Guillaumin) Merrill & Perry. The latter, however, has leaves which are chartaceous, becoming brittle when dry, the veins are more easily seen on the lower surface, the acumen is long and narrow, the base is only very shortly decurrent on a rugose petiole (channeled on the upper side), and the branchlets are terete. In *S. leucanthum* the leaves are somewhat leathery in texture, the veins are more obvious on the upper surface, the acumen is short and broad, the base is relatively long-decurrent so that the petiole appears very short, and the branchlets are quadrangular. In this species too the flowers taper a little more toward the base, i.e., tend to be turbinate, and are perhaps a little more crowded at the apices of the branchlets.

Syzygium Grayi (Seemann) Merrill & Perry in *Sargentia* 1: 76. 1942.

Eugenia Grayi Seeman, *Fl. Vit.* 79, pl. 16. 1865.

VANUA LEVU: Thakaundrove: Maravu, near Salt Lake, in forest, alt. 0–450 m., *O. Degener & E. Ordonez 14161* (A), Jan. 1941 (tree 8 m. high; petals whitish); Savu Savu Bay region, between Mbalanga and Valethi, in open forest, alt. 0–400 m., *O. Degener & E. Ordonez 14039* (A), Dec.-Jan. 1941 (tree 5 m. high; flowers white).

VITI LEVU: Nandronga & Navosa: southern slopes of Nausori Highlands, in drainage of Namosi Creek above Tumbenasolo, dense forest, alt. 300–450 m., *A. C. Smith 4597* (A), May-June 1947 (tree 15 m. high; inflorescence sometimes associated with foliage, sometimes pendent on long leafless branchlets; young petals pink-tinged; filaments pure white); northern portion of Rairaimatuku Plateau, between Nandrau and Rewasau, dense forest, alt. 725–825 m., *A. C. Smith 5643* (A), July-Aug. 1947 (tree 8 m. high; calyx yellow, pink-tinged distally; filaments and style pale yellow). Namosi: trail from Namosi up Voma Mountain, alt. 450 m., *J. W. Gillespie 2516* (Bish); bank of stream above waterfall near Namuamua, alt. 400 m., *J. W. Gillespie 2985* (Bish). Naitasiri: Waindina River, Nawangambena, *F. Raiqiso 746* (A); Viria, *A. Meebold 16888* (Bish). Tholo North: Natuku, Navai, alt. 750–900 m., *O. Degener 15028* (A), Feb.-Mar. 1941 (tree 3 m. high); Mataivisai, Navai, *O. Degener 15029a* (A), Feb.-Mar. 1941 (tree 3 m. high). Mba: hills between Nggaliwana and Tum-

beindreketi Creeks, east of sawmill at Navai, dense forest, alt. 725–800 m., *A. C. Smith* 5871 (A), Sept. 1947 (tree 8 m. high; inflorescence on branchlets below leaves; young bracts and flower-buds greenish yellow). *Lautoka*: mountains near Lautoka, alt. about 360 m., *W. Greenwood* 906 (A), Oct. 1941 (upright tree 6 m. high).

KANDAVU: without further locality, *B. Seemann* 163 (G). FIJI: without further locality, *J. Horne* 742, 758 (G).

The collections above cited are reasonably uniform with leaves 10–28 cm. long, 5–9 cm. broad. In addition to these there are at hand five specimens, *O. Degener* 14455 (A), 14902 (A), *J. W. Gillespie* 3218 (Bish), 3917 (Bish), and *W. Greenwood* 881 (A), from the vicinity of Nandari-vatu, Viti Levu, which have leaves only 5–12.5 cm. long and 3–5.5 cm. broad. The field labels do not indicate whether these trees have larger leaves or not. In spite of the difference in the size of the leaves, all appear to belong to the species. Then again there are two collections from Vanua Levu, *A. C. Smith* 1803 (A), 6582 (A), which, although most like *S. Grayi*, differ each in a single obvious character. In the first the base of the leaves is not rounded or subcordate as is to be expected in this species, but cuneate with the lamina decurrent along the petiole; in the second the apex of the leaves differs in being obtuse rather than acute or acuminate.

Syzygium simillimum Merrill & Perry in *Sargentia* 1: 76. 1942.

Type-collection (*O. Degener & E. Ordonez* 14093) from Vanua Levu. I have seen no further material of this species.

Syzygium phaeophyllum Merrill & Perry in *Jour. Arnold Arb.* 26: 103. 1945.

Eugenia durifolia A. C. Smith in *Bishop Mus. Bull.* 141: 105, fig. 56. 1936.
Syzygium durifolium Merrill & Perry in *Sargentia* 1: 76. 1942, non in *Mem. Acad. Arts & Sci.* 18: 176. 1939.

Type-collection (*A. C. Smith* 919) from the island of Taveuni. I have seen no other collections which match this. It seems best characterized by long-acuminate leaves with two intramarginal veins, the outer one (2 mm. within the margin) finer than the inner (4–5 mm. within the margin), flower-buds with calyx tapering evenly from the apex to the base, and pale brown branchlets.

Syzygium curvistylum (Gillespie) Merrill & Perry in *Sargentia* 1: 75. 1942.

Eugenia curvistyla Gillespie in *Bishop Mus. Bull.* 83: 21, fig. 26. 1931.

VANUA LEVU: Mathuata: southern slopes of Mt. Numbuiloa, east of Lambasa, in open forest, alt. 100–350 m., *A. C. Smith* 6394 (A), Oct.-Nov. 1947 (tree 25 m. high; trunk about 60 cm. diameter; calyx rich purple distally); Seanggangga Plateau, in drainage of Korovuli River, vicinity of Natua, patches of forest in open rolling country, alt. 100–200 m., *A. C. Smith* 6900 (A), Nov.-Dec. 1947 (spreading tree 15 m. high; fruit deep red to deep purple).

VITI LEVU: without further locality, *B. Seemann* 152 (G). THOLO North: trail near Vatu There, alt. 900 m., *J. W. Gillespie* 4269 (Bish, type-collection), Nov. 1927.

This species is probably best characterized by the acuminate closely veined leaves and the persistent calyx lobes. Seemann's collection is a perfect match for the type-collection, although previous to receiving the loan of the co-type it had seemed to be an aberrant form of the species both in the shape of the leaves and the size of the flowers. The other specimens earlier designated as this species have been placed in that varying, puzzling, and collective species *S. amicum* (A. Gray) C. Mueller.

Syzygium curvistylum (Gillespie) Merrill & Perry var. *parvifolium*, var. nov.

Foliis usque 6 cm. longis, 2.5 cm. latis, aliter formae typicae speciei simile.

VANUA LEVU: Mbua: southern portion of Seatovo Range, forest, common on ridges, alt. 100–350 m., *A. C. Smith 1556* (Arnold Arboretum, type of var.).

VITI LEVU: Tholo North: vicinity of Nandarivatu, valley of the Singatoka, *J. W. Gillespie 3723* (Bish), Nov. 1927; Nandarivatu, summit ridge of Loma laga, alt. 1200 m., *J. W. Gillespie 3875* (Bish), Nov. 1927; vicinity of Nandarivatu, alt. 900 m., *J. W. Gillespie 4266* (Bish), Dec. 1927.

The relation between the collections cited above and *S. curvistylum* (Gillespie) Merrill & Perry became obvious in the working out of a key for the group. Although the leaves of the latter are larger, their shape and the pattern of the venation are similar in both instances. Likewise the flowers are about the same size, the calyx in both having apparently persistent lobes. The flowers of *Smith 1556* appear to be softer or less spongy in texture than those of the type of the species. Whether this is a difference owing to environmental conditions, or age, or a valid difference, I do not know. At present it seems best to consider the differences only varietal.

Syzygium effusum (A. Gray) C. Mueller in Walpers Ann. 4: 838. 1857.

— E. Christophersen in Bishop Mus. Bull. 154: 23. 1938.

Eugenia effusa A. Gray, Bot. U. S. Expl. Exped. 1: 524. 1854.

VANUA LEVU: Thakaundrove: Yanawai River region, Mount Kasi, dense forest, alt. 300–430 m., *A. C. Smith 1821* (G), May 1934 (tree 12 m. high; fruit white). Bua: Bua Bay, *U. S. Expl. Exped. 1838–1842* (type-collection, G).

OVALAU: without further locality, *B. Seemann 151* (G).

VITI LEVU: Tholo West: vicinity of Mbalo, near Vatukarasa, alt. 120–300 m., *O. Degener 15271* (A), (*A. Tabualewa*) 15624 (A); Mbuyombuyo, near Namboutini, in forest, *O. Degener (A. Tabualewa) 15595* (A).

MOALA: forest above Maluku, alt. 400 m., *A. C. Smith 1346* (A), May 1934 (tree 15 m. high; young fruit pink); wind-swept ridge, edge of bare area and rain forest, alt. near 350 m., *E. H. Bryan, Jr. 308* (A, Bish), July 1924 (small tree 4–5 m. high, up to 12 cm. diameter; bark gray-brown, moderately smooth; sapwood thin, red-brown; heartwood hard, yellow-brown; fruit white). FIJI: without further data, *Forest Dept. 122* (*Dept. Agriculture 1427*) (A); *J. Horne 431* (G).

This species has been confused with *S. confertiflorum* (A. Gray) C. Muell. The latter, however, has an inflorescence with apparently persistent bracts, and the glands of the leaves are more evenly distributed, although at a glance the leaves seem much alike. In *S. effusum* (A. Gray) C. Mueller the bracts of the inflorescence apparently fall long before the flowers bloom.

Syzygium Seemannianum Merrill & Perry in *Sargentia* 1: 76. 1942.

Eugenia rivularis Seemann Fl. Vit. 80. 1865; non *Syzygium rivulare* Vieill. ex Guillaumin in Bull. Soc. Bot. Fr. 85: 645. 1938.

VITI LEVU: Navua River, *B. Seemann* 162 (type-collection, G). Namosi: vicinity of Namosi, alt. 450 m., *J. W. Gillespie* 2936 (Bish, NY); trail in vicinity of Nangarawai village, alt. 500 m., *J. W. Gillespie* 3204 (Bish, US). Naitasiri: Waindina River, *B. E. Parham* 903 (A); Waindina River Basin, alt. 50 m., *L. H. McDaniels* 1032 (Bish). Tholo North: near Wainibuka River at Nasukamai, alt. 400 and 450 m., *J. W. Gillespie* 3394.5 (Bish), 4691.3 (Bish); vicinity of Nandarivatu, along stream, alt. 750–900 m., *O. Degener* 14272A (A), *J. W. Gillespie* 3394.5 (Bish), 3961 (Bish); Nandarivatu, 2 miles down the Nandrau trail, at stream, alt. 800 m., *J. W. Gillespie* 4221 (Bish, NY). Mba (formerly Tholo North): valley of Nandala Creek, about 3 miles south of Nandarivatu, thickets along creek, alt. about 780 m., *A. C. Smith* 6255 (A), Sept. 1947 (tree 2–4 m. high, the branches drooping on water and doubtless submerged in floods; petals pink-tinged; filaments white; calyx purplish). Ra: vicinity of Rewasa, near Vaileka, along stream, *O. Degener* 15466 (A, NY), June 1941 (small to medium tree characteristic of stream banks).

KANDAVU: region of Namalata Isthmus, *A. C. Smith* 28 (G, NY, US).

Syzygium fijiense, sp. nov.

Arbor 18–25 m. alta, glabra; ramulis teretibus vel apicem versus compressis, cortice pallide fusco; foliis chartaceis vel tenuiter coriaceis ellipticis, 4.5–9.5 cm. longis, 1.8–4.5 cm. latis, apice abrupte et longiuscule acuminatis (acumine 0.7–1.7 cm. longo et basi 5 mm. lato) basi obtusis deinde ad petiolum sensim angustatis, nervis primariis crebris et tenuibus paullo ascendentibus, vena intramarginali a margine 1–2 mm. remota conjunctis, nervis et rete venularum utrinque tenuiter elevatis praecipue supra distincte manifestis; petiolo 0.5–1.5 cm. longo gracile; paniculis terminalibus vel in ramulis brevibus lateralibus dispositis, 7–15 cm. longis latisque, ramulis late patentibus subteretibus; floribus in apice ramulorum 3 vel 2 vel 1 sessilibus vel brevissime pedicellatis; alabastro turbinato; calycis tubo in sicco basi 2 mm. stipitato deinde subabrupte 2 mm. campanulato-obconico, minute lobato; petalis calyptratim caducis; staminibus numerosis, filamentis vix 5 mm. longis, antheris 0.5 mm. latis, 0.3 mm. longis; stylo ca. 4.5 mm. longo; fructibus obovoideis, 1 cm. longis et 0.6 cm. diam., apice calycis tubo (vix 3 mm. lato) coronatis; cotyledonibus superpositis, radícula brevi.

VANUA LEVU: Mathuata: summit ridge of Mt. Numbuiloa, east of Lambasa, dense forest, alt. 500–590 m., *A. C. Smith* 6464 (A), Oct.–Nov. 1947 (tree 18 m. high; trunk about 30 cm. diam.; petals and filaments white);

Seanggangga Plateau, in drainage of Korovuli River, vicinity of Natua; patches of forest in open rolling country, alt. 100–200 m., *A. C. Smith 6722* (Arnold Arboretum, TYPE), Nov.-Dec. 1947 (tree 25 m. high; calyx reddish-tinged; filaments white, anthers pale yellow).

OVALAU: without further locality, *B. Seemann 154* (G).

VITI LEVU: Tholo North: Nandarivatu, 2 miles down the Mba trail, alt. 950 m., *J. W. Gillespie 4043* (Bish, NY), Nov. 1927.

In addition to the above cited specimens there are at hand two sterile ones, *J. W. Gillespie 4813* and *J. Horne 1106*, which appear to be more like this species than any other; however, knowing the difficulty of determining sterile specimens in this genus with any degree of accuracy, I mention these with some hesitancy. In the past this species has been called *S. rubescens* (A. Gray) C. Mueller, and in the Gray Herbarium a fragment of Gray's type and *Seemann 154* (both from Ovalau) are mounted on the same sheet. Both dried approximately the same color, but the leaves of Seemann's collection are shorter and broader, and the reticulate venation (particularly on the upper surface) is obvious to the naked eye. In the other specimen the leaves have a smooth surface, the primary veins for the most part being obscure on the upper surface and at times inconspicuous below; the flowers also are a little longer and more clavate. Without further material these variations might well be regarded as intraspecific. Fortunately the new collection under study contains a specimen (*Smith 6722*) with both flowers and fruit, and the differences in the fruits of the two are at once apparent. In *S. fijiense* the fruits are oblong-obovoid, the seed has superposed cotyledons with concave inner faces and a very short radicle. In *S. rubescens*, on the other hand, the fruit is subglobose, the cotyledons lie side by side with the inner faces folding over a radicle long enough to reach to the margin of the cotyledons.

Syzygium rubescens (A. Gray) C. Mueller in Walpers Ann. 4: 839. 1857.

Eugenia rubescens A. Gray, U. S. Expl. Exped. 1: 525. 1854.

OVALAU: vicinity of Levuka, hills overlooking the town, alt. 500 m., *J. W. Gillespie 4558* (Bish, US), Jan. 1928 (common small tree); without further locality, *U. S. Expl. Exped. 1838–42* (G, US, TYPE).

VITI LEVU: Namosi: narrow exposed ridge on Vakarongasiu mountain, *J. W. Gillespie 3275* (Bish), Oct. 1927. Rewa: Suva, Princes Road, *A. Meebold 16692* (Bish), Aug. 1932; slopes of Korobamba mountain, alt. 300 m., *J. W. Gillespie 2258* (Bish, NY), Aug. 1927. Naitasiri: Tamavua woods, 7 miles from Suva, alt. 150 m., *J. W. Gillespie 2149* (Bish), Aug. 1927; Tamavua woods, 7½ miles from Suva, alt. 150 m., *J. W. Gillespie 2448* (Bish), Aug. 1927; vicinity of Nasinu, 9 miles from Suva, *J. W. Gillespie 3481* (Bish, US), Oct. 1927; same locality, *J. W. Gillespie 3627* (Bish, NY), Oct. 1927 (slim tree 8 m. tall); vicinity of Nasinu, 10 miles from Suva, alt. 150 m., *J. W. Gillespie 3667.1* (Bish), Nov. 1927. Tholo North: Nandarivatu, alt. about 830 m., *W. Greenwood 843* (A), May 1941 (tree about 3 m. high; flower-buds white). VITI LEVU: without further locality, *H. E. Parks 20918* (Bish), May-July 1927. FIJI: without further locality, *U. S. Expl. Exped. 1838–42* (*S. amicorum* in part, G).

I am not sure that *S. rubescens* and *S. amicorum* (A. Gray) C. Muell., as interpreted from Fiji, are separable into two species. The specimen in the Gray Herbarium which Dr. Gray designated as *E. amicorum* consists of two parts: (1) a flowering fragment from the Tongatabu collection with a leaf, and (2) a sterile shoot which was probably a portion of the fruiting specimen included in the description of that species. After assembling the material on loan from the Bishop Museum and the U. S. National Herbarium, I believe that most of the Fijian material determined as *S. amicorum* is *S. rubescens*. In the latter the specimens are usually reddish brown when dry, and the venation of the leaves is mostly inconspicuous.

***Syzygium rubescens* (A. Gray) C. Mueller var. *koroense*, var. nov.**

A forma typica differt cortice pallidiore, venulis foliorum utrinque distincte manifestis, inflorescentiis plerumque quam foliis brevioribus, floribus clavatis, paulo congestis.

KORO: main ridge in forest, alt. 300–500 m., *A. C. Smith 1049* (G, NY, US), *1056* (TYPE of var., Gray Herbarium; NY, US), Feb. 1934 (trees 23 and 25 m. high, 5 dm. diameter; filaments white).

The above cited specimens probably represent a new species. However, I should like to see the fruits before describing it. In general appearance the plants suggest *S. rubescens* (A. Gray) C. Muell. But it must be noted that in these the venation of the leaves is more obvious, the inflorescences are shorter than the subtending leaves and not lax, in fact, the axis and branches are stouter, the flowers tend to be crowded, and the calyx is clavate rather than clavate-turbinate.

***Syzygium ?amicorum* (A. Gray) C. Mueller in Walpers Ann. 4: 839. 1857.**

Eugenia amicorum A. Gray, Bot. U. S. Expl. Exped. 1: 524. 1854, as to flowering specimen; Atlas, pl. 62. 1857.

VANUA LEVU: Mbua: upper Ndama River Valley, dense forest, alt. 100–300 m., *A. C. Smith 1598* (G), April 1934 (tree 10 m. high; flower buds pale green). Mathuata: southern slopes of Mt. Numbuiloa, east of Lambasa, open forest, alt. 100–350 m., *A. C. Smith 6405* (A), Oct.–Nov. 1947 (tree 20 m. high). Thakaundrove: hills between Vatukawa and Wainio Rivers, Ndrekeniwai Valley, forest, alt. 200–500 m., *A. C. Smith 592* (G), Nov. 1933 (tree 5 m. high); southwestern slope of Mt. Mbatini, dense forest, alt. 300–700 m., *A. C. Smith 609* (G), Nov. 1933 (tree 18 m. high).

TAVEUNI: western slope, between Somosomo and Wairiki, woods along stream, alt. 300 m., *A. C. Smith 839* (G), Dec. 1933–Jan. 1934 (tree 9 m. high; flowers white; fruit deep purple).

VITI LEVU: Mba: southern slopes of Ndelainathovu, on the escarpment west of Nandarivatu, dense forest, alt. 870–970 m., *A. C. Smith 4938* (A), June 1947 (slender tree 4 m. high; Nandarivatu, alt. about 830 m., *W. Greenwood 844* (A), May 1941 (shrub about 3 m. high; buds pink-tinged); Nandarivatu, valley of the Singatoka, alt. 950 m., *J. W. Gillespie 4028* (Bish), Nov. 1927. Lautoka: mountains near Lautoka, in bed of dry creek on open mountain-side, alt. about 550 m., *W. Greenwood 934* (A),

Oct. 1941 and June 1942 (upright tree about 7 m. high; buds white, second collection in young fruit).

This species needs to be examined, not from the point of view of the type, but with mature specimens from the type locality so that its limits of variation can be estimated. It may not even occur in Fiji. Nevertheless, here I have brought together, as an aggregate, most of the specimens which I have been unable to place elsewhere at present. The collections from Vanua Levu (except *A. C. Smith* 592) and Taveuni were previously determined as *S. curvistylum*, but they differ from that species in that the leaves lack the gradual elongate acumination, the primary veins are more distant from each other, and the calyx-lobes are thinner. It should be noted, however, that they differ from the type-specimen of *S. amicorum* in that the calyx below the globose upper part is very short, not long and slender.

***Syzygium malaccense* (L.) Merrill & Perry** in Jour. Arnold Arb. 19: 215. 1938; in Sargentia 1: 78. 1942.

Eugenia malaccensis L. Sp. Pl. 470. 1753.

VANUA, LEVU: Mathuata: Mt. Uluimbau ("The Three Sisters"), south of Lambasa, open forest, alt. 150–369 m., *A. C. Smith* 6597 (A), Nov. 1947 (tree up to 25 m. high; fruit red at maturity, edible). Thakau-drove: Savu Savu Bay region, Vatunivumonde Mt., in forest, alt. 0–400 m., *O. Degener & E. Ordonez* 14030 (A), Dec.-Jan. 1941.

VITI LEVU: Ra: vicinity of Rewasa, near Vaileka, in forest, alt. 50–200 m., *O. Degener* 15501 (A), May-June 1941 (tree 3 m. high). Mba: slopes of escarpment north of Nandarivatu, hillside thickets, alt. 550–800 m., *A. C. Smith* 6051 (A), Sept. 1947 (tree 4 m. high; inflorescence on branchlets below leaves; young petals red); same locality, woods along stream, alt. 550–800 m., *A. C. Smith* 6293 (A), Sept. 1947 (tree 18 m. high; petals and filaments bright pink; anthers yellow; style white); northern portion of Mt. Evans Range, between Mt. Vatuyanitu and Mt. Natondra, dense forest, alt. 700–900 m., *A. C. Smith* 4303 (A), May 1947 (tree 15 m. high; flowers on branchlets below leaves and sometimes associated with leaves; petals, filaments, and carpels rich pink). Lautoka: mountains near Lautoka, in thick bush by creek, alt. about 550 m., *W. Greenwood* 356A (A), Dec. 1944 (young fruit white).

KANDAVU: western end of island, near Cape Washington, open woods, alt. 0–20 m., *A. C. Smith* 305 (A), Oct. 1933 (tree 23 m. high; fruit red at maturity, edible).

TUVUTHA: on edge of forested limestone slopes, alt. about 100 m., *E. H. Bryan Jr.* 543 (A), Sept. 1924 (tree 5–7 m. high, 20–30 cm. diameter; bark nearly smooth, gray ashy brown; sapwood thick, light brown; heartwood yellow-brown, moderately hard; flowers not seen; fruit green with pink and white, from old wood). FIJI: without further locality, *B. Seemann* 161 (G); *U. S. Expl. Exped.* 1838–42 (G).

***Syzygium neurocalyx* (A. Gray) Christophersen** in Bishop Mus. Bull. 154: 27. 1938.

Eugenia neurocalyx A. Gray, Bot. U. S. Expl. Exped. 1: 512. 1854; Atlas, pl. 59. 1857.

KORO: eastern slope of main ridge, in forest, alt. 200–300 m., *A. C. Smith 1008* (A), Jan.-Feb. 1934 (tree 9 m. high; fruit oil used as skin lotion).

VITI LEVU: Rewa: Korumbamba, *A. Meebold 17067* (Bish). Ra: vicinity of Rewasa, near Vaileka, in dense wet forest, alt. 50–200 m., *O. Degener 15520* (A); Rewasa, Mataimeravula, in dark forest, alt. 50–200 m., *O. Degener 15344* (A), May-June 1941 (flowers white; fruit usually red, used as a dye for bark necklaces; leaves and buds used for lung trouble). FIJI: without further locality, *U. S. Expl. Exped. 1838–42* (G, type-collection); *B. Seemann 159* (G); *J. Horne 287* (G).

In the collections above cited the leaves vary considerably in size; some are fairly slender and narrow, as 10.5–32.5 cm. \times 2–5 cm., others are wider in proportion to the length, as 16–24 cm. \times 5–8.5 cm. All, however, have the same type of flowers. This species is very easily recognized on account of the ribbed calyx.

Syzygium amplifolium, sp. nov.

Frutex vel arbor parva glabra; ramulis teretibus cortice brunnescente, internodiis summis 7–9 cm. longis; foliis coriaceis circiter 45 cm. longis, 17 cm. latis, apice obtusis, basi cordatis, nervis primariis utrinsecus costa circiter 32 supra impressis subtus perspicuis inter se 1–1.5 cm. distantibus, vena intramarginali a margine 5–7 mm. remota conjunctis, rete venularum laxo; petiolo vix 1 cm. longo crasso; tantum uno flore post anthesin viso, terminale, subsessile, axi inflorescentiae vix 5 mm. longo, minute bracteolato; calycis tubo anguste campanulato vel obtuse elongato-obconico, 3.5 cm. longo, basi fere 1 cm., apice 2 cm. diametro, disco crassiusculo, lobis 4, 1–1.4 cm. longis, 2–2.3 cm. latis obtuse rotundatis; staminibus non visis; stylo 5.5 cm. longo basi crassiusculo.

VITI LEVU: Namosi: hills east of Navua River, alt. 200–300 m., *W. Greenwood 981* (Arnold Arboretum, TYPE), May 1943 (scrambly shrub or small tree 15–20 ft. high; leaves in pairs at ends of branches — four pairs biggest number seen; flowers in the fork of the upper pair of leaves; stamens yellow, about 1.5 inches long; style as long as stamens; calyx of four rounded lobes, yellow inside, purple outside; old fruit 1.5 inches across, with three seeds). Rewa: near summit of Korobamba Mountain, alt. 450 m., *J. W. Gillespie 2316* (Bish, sterile specimen).

No other Fijian species has such large leaves. At first the dried flower looked as if it were ribbed something like that of *S. neurocalyx* (A. Gray) Christophersen, but on closer examination the calyx-lobes seemed to be perfectly smooth, and after boiling the flower was smooth; whereas in *S. neurocalyx* the ribs extend up into the lobes and join near the apex.

The type-specimen has only one flower, but a scar indicates that at least one has fallen off.

Syzygium quadrangulatum (A. Gray) Merrill & Perry in *Sargentia* 1: 77. 1942.

Eugenia quadrangulata A. Gray, Bot. U. S. Expl. Exped. 1: 511. 1854. — Seemann, Fl. Vit. 78. 1865.

Jambosa quadrangulata (A. Gray) C. Mueller in Walpers Ann. 4: 849. 1857.

OVALAU: common in woods, *U. S. Expl. Exped. 1838-42* (G, US, type-collection).

VITI LEVU: Ra: vicinity of Rewasa, near Vaileka, dense forest, alt. 50-200 m., *O. Degener 15382* (A), May-June 1941. Mba: southern slopes of Mt. Ndelainathovu, on escarpment west of Nandarivatu, dense forest, alt. 870-970 m., *A. C. Smith 4939* (A), June 1947 (slender tree 4 m. high; fruit red, about 4 cm. \times 2 cm. when fresh). FIJI: without further locality, *Horne 340* (G).

In the original description of this species the cotyledons are described as "thickened, corneous, united." As a matter of fact the two cotyledons of a seed in the pocket on the specimen at the Gray Herbarium have separated. Only one other mature fruit is in the pocket and that I hesitate to open. From the contour of the matching faces it looks as if the seed might have had a long radicle.

Syzygium Richii (A. Gray) Merrill & Perry in *Sargentia* 1: 77. 1942.

Eugenia Richii A. Gray, Bot. U. S. Expl. Exped. 1: 510. 1854; Atlas, pl. 58. 1857. — Seemann, Fl. Vit. 77. 1865.

Jambosa Richii C. Muell. in Walpers Ann. 4: 849. 1857.

VITI LEVU: without further locality, sea beach, *B. Seemann 165* (G). Nandronga & Navosa: beach at Thuvu, Singatoka, *W. Greenwood 785A* (A), May 1947 (usually very spreading shrub 6-8 ft. high, but does grow into tree 20 ft. high with spreading top when out of wind; flowers large, yellow, on older branches in large clusters). FIJI: without further locality, *U. S. Expl. Exped. 1838-42* (G, US, type-collection), *J. Horne 1081* (G).

When Dr. A. Gray described this species he noted that he had some specimens with large ovate leaves and others with more commonly oblong acutish smaller leaves. Dr. B. Seemann indicated that here was a species and a small-leaved variety, unless these should later turn out to be two species. I believe that this is a problem still to be solved by someone who is in the field and can observe the habit of these trees in their native habitat. Possibly some character, veiled or lacking in the dried specimens, can be found in the growing trees. More knowledge of the color of the flowers and fruits might help. The specimens cited above are only those with coriaceous broadly ovate acutish leaves. It is to be noted that only one (from the beach at Thuvu) is a comparatively recent collection. Seemann commented "common on the sea-beach. . . ." But are these confined to the sea-beach?

The other collections cited below are those with chartaceous (or thinly coriaceous) oblong-elliptic and often acute leaves. The field notes do not suggest that these are beach plants. But, could it be that these are two forms of one species responding to different environments, or are two species involved?

VANUA LEVU: Mathuata: southern slopes of Mt. Numbuiloa,

east of Lambasa, in open forest, alt. 100–350 m., *A. C. Smith* 6360 (A), Oct.-Nov. 1947 (tree 18 m. high; old calyx-lobes pink-tinged). Mbuu: Upper Ndama River Valley, in dense forest near streams, alt. 100–300 m., *A. C. Smith* 1693 (G, US), April 1934 (tree 10–15 m. high; calyx white, pink-tinged; petals and filaments white). Thakaundero: Savu Savu Bay region, along stream in pasture, alt. 0–150 m., *O. Degener & E. Ordonez* 13884 (A, US), Dec. 1940 (tree 25 ft. high; fruit red).

VANUA MBALAVU: northern limestone section, forest, alt. 0–200 m., *A. C. Smith* 1498 (G, US), April 1934 (tree 9 m. high; petals cream-white; filaments yellow).

VITI LEVU: Nandronga & Navosa: northern portion of Rairaimatuku Plateau, between Nandrau and Rewasau, dense forest, alt. 725–825 m., *A. C. Smith* 5619 (A), July-Aug. 1947 (tree 20 m. high; fruit on branchlets below leaves, pink-tinged). Tholo West: vicinity of Mbalo, near Vatukarasa, *O. Degener (Aloisio Tabualewa)* 15641 (A), May 1941 (tree 2 m. high). Namosi: between Namosi and Navua River, *B. Seemann* 164 (G). Ra: vicinity of Rewasa, near Vaileka, in dense forest, alt. 50–200 m., *O. Degener* 15490 (A, US), May-June 1941. Lautoka: mountains near Lautoka, alt. about 600 m., *W. Greenwood* 959 (A), Sept. 1942 (tree 8 m. high; flower-buds white); Mt. Evans, by edge of creek, alt. about 750 m., *W. Greenwood* 1158 (A), Sept. 1945 (spreading tree 5 m. high; flower-buds white).

MOALA: forest near Maloku, *A. C. Smith* 1380 (G), Mar. 1941 (tree 10 m. high; petals white; filaments bright yellow).

KAMBARA: limestone formation, in forest, alt. 0–100 m., *A. C. Smith* 1255 (G, US), Mar. 1941 (tree 17 m. high; petals and filaments cream-white). FIJI: without further locality, *U. S. Expl. Exped.* 1838–42 (G).

In *A. C. Smith* 5619 and *O. Degener* 15490 the leaves tend to be narrowed in the lower part, but for the present it seems as if they might belong with this complex.

***Syzygium nandarivatense* (Gillespie), comb. nov.**

Eugenia nandarivatensis Gillespie in Bishop Mus. Bull. 83: 22, fig. 27. 1931.

VITI LEVU: Tholo North: vicinity of Nandarivatu, escarpment north of the Government Station, alt. 400 m., *J. W. Gillespie* 3972 (Bish, type-collection); slopes of the escarpment north of Nandarivatu, hillside thickets, alt. 550–800 m., *A. C. Smith* 6065 (A), Sept. 1947 (tree 4–6 m. high; inflorescence terminal on short leafy branches arising from branchlets below leafy shoots; flower-buds greenish yellow).

KANDAVU: Mt. Mbuke Levu, dense forest, *A. C. Smith* 236 (G, US), Oct. 1933 (tree 4 m. high; fruit red).

The compound branching of the inflorescence (branches of the third order) suggests *S. Richii* (A. Gray) Merrill & Perry, but the flower (post anthesis) is slender and much more like that of *S. gracilipes* (A. Gray) Merrill & Perry. *Smith* 236 was collected from Mt. Mbuke Levu, surely very close to the type-locality of *Eugenia vitiensis* Turrill, i. e., *S. gracilipes*. It might possibly be that this is an intermediate form between *S. gracilipes* and *S. Richii*.

Syzygium gracilipes (A. Gray) Merrill & Perry in *Sargentia* 1: 78. 1942.

Eugenia gracilipes A. Gray, Bot. U. S. Expl. Exped. 1: 513. 1854. — Seemann, Fl. Vit. 78, pl. 15. 1865.

Jambosa gracilipes C. Mueller in Walpers Ann. 4: 849. 1857.

Eugenia vitiensis Turrill in Jour. Linn. Soc. Bot. 43: 21. 1915.

Syzygium vitiense (Turrill) Merrill & Perry in *Sargentia* 1: 78. 1942.

TAVEUNI: banks of streams in coconut plantation, vicinity of Waiyevo, *J. W. Gillespie* 4791 (Bish).

OVALAU: mountains behind Levuka, alt. 400 m., *J. W. Gillespie* 4450 (Bish), Jan. 1928 (fruit red).

VITI LEVU: Tholo West: Mbuyombuyo, near Namboutini, *O. Degener* (*A. Tabualeva*) 15591 (A, US), 15606 (A, US), June 1941 (tree 1 m. high; fruit bright red). Serua: vicinity of Ngaloa, Vatuvilakia, in dense forest, alt. 0–150 m., *O. Degener* 15142 (A), Apr.-May 1941 (tree 3 m. high; fruit pendent). Namosi: Naitaradamu Mountain, alt. 800 m., *J. W. Gillespie* 3087 (Bish); narrow exposed ridge on Vakarongasiu Mountain, alt. 800 m., *J. W. Gillespie* 3274 (Bish). Rewa: southeast slope of Korombamba Mountain, alt. 350 m., *J. W. Gillespie* 2244 (Bish); limestone hills near the quarry beyond Lami village, *J. W. Gillespie* 4608 (Bish). Naitasiri: vicinity of Nasinu, 9 miles from Suva, alt. 150 m., *J. W. Gillespie* 3476.5 (Bish, US). Tailevu: forest above Waimaro Road, *B. E. Parham* 3031 (A). Mba: Lomalangi, in dense bush, alt. 1400 m., *H. E. Parks* 20751 (Bish), July 1927 (shrub 3 m. high; flowers few, yellow, pendulous); slopes of Mt. Nairosa, eastern flank of Mt. Evans Range, dense forest, alt. 700–1050 m., *A. C. Smith* 4078 (A), April-May 1947 (slender tree 2 m. high; calyx pink; petals white; filaments yellow); eastern slopes of Mt. Koroyanitu, Mt. Evans Range, alt. 950–1050 m., dense low forest, alt. 950–1050 m., *A. C. Smith* 4148 (A), May 1947 (slender tree to 5 m. high, sparsely flowering; calyx dull pink; petals white, at length pink-tinged; filaments pale yellow); northern portion of Mt. Evans Range, between Mt. Vatuyanitu and Mt. Natondra, dense forest, alt. 700–900 m., *A. C. Smith* 4305 (A), May 1947 (slender tree 10 m. high; fruit deep purple); western slopes of Mt. Nanggaranambuluta [Lomalangi], east of Nandarivatu, dense forest, alt. 1000–1100 m., *A. C. Smith* 5670 (A), June-Aug. 1947 (slender tree 5 m. high; old calyx distally reddish; style red); slopes of the escarpment north of Nandarivatu, woods along stream, alt. 550–800 m., *A. C. Smith* 6057 (A), Sept. 1947 (tree 5 m. high; calyx and petals yellowish with pink tinge; filaments pale yellow; style pale green); Nauwanga, vicinity of Nandarivatu, dense forest, alt. 750–900 m., *O. Degener* 14808 (A), Feb.-Mar. 1941 (tree about 2 m. high; fruit red, globose-pyriform, about 4 cm. diameter and 3- or 4-seeded; seeds about 1.5 cm. diam.); Mt. Matomba, Nandala, vicinity of Nandarivatu, in dense rich forest, alt. 750–900 m., *O. Degener* 14433 (A), Feb. 1941 (spreading tree 3 m. high). Lautoka: Mt. Evans, alt. about 820 m., *W. Greenwood* 82A (A), Oct. 1942 (tree 4 m. high; flowers yellow); Mt. Evans, on edge of creek, alt. about 750 m., *W. Greenwood* 82B (A, Bish), Sept. 1945 (tree 5 m. high; flowers bright yellow); north of Lomolomo, dense forest, alt. 0–150 m., *O. Degener* & *E. Ordonez* 13638 (A, US), Dec. 1940 (shrub 2 ft. high, spreading; fruit pink). FIJI: without further locality, *Seemann* 158 (G); *U. S. Expl. Exped.* 1838–42 (US, not in G); *W. H. Harvey* (G).

Among the specimens cited, so much variation in the diagnostic characters has been found that I am convinced that only one species is represented. Through the courtesy of Dr. H. Emory Moore, Jr., of Ithaca, N. Y., I have received a photograph of *Eugenia vitiensis* Turrill. Turrill compared his species with *S. gracilipes* (A. Gray) Merrill & Perry, noting three differences: the rounded, not slightly cordate, leaf-base, the shorter and more robust pedicels, and the size of the flower. In comparing the descriptions of the flowers I cannot see much difference in the size. As for the other two differences, they are not always correlative; further, the specimen *Smith 4305* has leaves on one branchlet which are slightly cordate and some on another branchlet with a rounded base, which leads me to think the character cannot stand very well alone. As for the slender or robust pedicels, these vary so greatly that it would be difficult to say where one begins and the other ends.

Mostly, the inflorescence consists of an axis and branches, each terminated by a single flower. In some instances it consists of a single flower at the end of a long slender axis.

Syzygium Jambos (L.) Alston, Handbk. Fl. Ceylon 6 (Suppl.): 115. 1931.

— E. Christophersen in Bishop Mus. Bull. 154: 27. 1938.

Eugenia Jambos L. Sp. Pl. 470. 1753. — F. Brown in Bishop Mus. Bull. 130: 202. 1935.

VITI LEVU: Mba: western and southern slopes of Mt. Tomanivi [Mt. Victoria], thickets, near sawmill at Navai, alt. about 750 m., *A. C. Smith 5141* (A), July-Sept. 1947 (tree 10 m. high; petals and filaments pale yellow; calyx dull red).

Native name: kavika ni vavalangi. According to Dr. Smith's note this is the "foreigner's Kavika," the name suggesting a recent introduction. In 1938 Dr. Christophersen reported it in cultivation in Samoa, and in 1935 Dr. Brown indicated that it was relatively new in the Marquesas.

Syzygium Gillespiei Merrill & Perry in Sargentia 1: 78. 1942.

No further material of this species has been found in the collections at hand.

Syzygium tetrapleurum, sp. nov.

Frutex 3 m. vel arbor 6 m. alta, glabra; ramulis quadrangularibus marginatis deinde interdum subteretibus; cortice cinereo novello pallide brunnescente; foliis chartaceis oblongis, 11–14 cm. longis, 3–4.5 cm. latis, in frutice 5.5×1.5 cm., 7×3.5 cm., 10×3.5 cm., apice obtusis vel interdum acutiusculis, basi cuneatis et decurrentibus, nervis primariis utrinsecus 8–10 patenti-ascendentibus prope marginem arcuatim conjunctis, supra manifestis, subtus prominulis, venulis et rete venularum inconspicuis; petiolo 1–2.5 cm. longo, dorso rotundato, supra plano; paniculis terminalibus anthesi circiter 12 cm. longis latisque, axi et ramulis quadrangularibus vel valde compressis; floribus in apice ramulorum 3 vel 1, sessilibus vel subsessilibus; alabastro turbinato; calyce in sicco 1.8–2 cm. (basi 3 mm. stipitato incluso) longo, apice vix 1 cm. lato, lobis 6 mm. latis,

3 mm. longis, rotundatis, persistentibus; petalis singulatim caducis; staminibus fere 3 cm. longis, antheris 1.5 mm. longis, 0.5 mm. latis; stylo 2.5 cm. longo; fructibus subglobosis in sicco 2 cm. diametro, apice calycis tubo (circiter 8 mm. lato) et lobis coronatis; seminibus 2, radicula longa.

VITI LEVU: Mba: immediate vicinity of Nandarivatu, dense forest along stream, alt. 800–900 m., *A. C. Smith 5044* (A), June–Oct. 1947 (slender tree 6 m. high; petals and filaments pale yellow); same locality, thickets, *A. C. Smith 5741* (Arnold Arboretum, TYPE), June–Oct. 1947 (shrub 3 m. high; fruit becoming red).

The obvious characters of this species are the very pale (when dry) oblong obtuse leaves, the subglobose fruits, and the sharply angled grayish branchlets. I have chosen the fruiting specimen as the type, as it shows three years' growth; the oldest growth is barely 4-angled, last year's branchlets are sharply margined and grayish in color, while those of the new growth are brownish and very narrowly winged. It is to be noted, however, that the branchlet of the flowering specimen (30 cm. long attached to one trimmed to 4 cm.) is only inconspicuously angled.

Syzygium tetrapleurum has in common with *S. Gillespiei* Merrill & Perry the long petiole of the leaves. But the two are readily distinguished by the shape of the fruit. In the latter it is obovoid, the apex constricted around the disk and the calyx-lobes spreading, and the base somewhat pointed. In *S. tetrapleurum*, on the other hand, the constriction around the disk at the apex of the fruit is less marked and the calyx-lobes smaller and often incurving; the base is rounded.

Two other specimens in this collection have a close affinity here. *A. C. Smith 4201*, collected in the dense ridge forest and thickets on the summit of Mt. Koroyanitu, high point of Mt. Evans Range, alt. 1165–1195 m., has a sharply angled and margined branchlet similar to that of the type of *S. tetrapleurum*, but the leaves are acute and broadest near the base which tends to be rounded. The flowers are sessile and not stipitate. The other specimen, *A. C. Smith 4858*, has compressed branchlets, oblong-elliptic leaves, the margins equally incurving towards the apex and the base, with the base subrounded and the apex very shortly acuminate. This specimen has two fruits which, in the pressing, look as if the calyx were accrescent, but on dissection the latter appears to be a long disk with the calyx-lobes not unduly large. In species which vary as widely as those of this genus appear to do in Fiji, more material is necessary to place these specimens.

Piliocalyx wagapensis Brongniart & Gris in Bull. Soc. Bot. France 13: 471. 1866; in Ann. Sci. Nat. sér. 5, 6: 263. 1866.

VITI LEVU: Nandronga & Navosa: northern portion of Rairaimatuku Plateau, between Nandrau and Nanga, dense forest, alt. 725–825 m., *A. C. Smith 5467* (A), Aug. 1947 (tree 15 m. high; fruit pink). Mba: northern portion of Mt. Evans Range, between Mt. Vatuyanitu and Mt. Natondra, dense forest, alt. 700–900 m., *A. C. Smith 4373* (A), May 1947 (tree 20 m. high; fruit becoming dull pink); western and southern slopes

of Mt. Tomanivi [Mt. Victoria], dense forest, alt. 850–1150 m., *A. C. Smith* 5118 (A), July–Sept. 1947 (tree 25 m. high; fruit dull pink); hills between Nandala and Nukunuku Creeks, along trail from Nandarivatu toward Lewa, edge of forest, alt. 750–850 m., *A. C. Smith* 6155 (A), Sept. 1947 (tree 5 m. high, with dense foliage; flower-buds white); vicinity of Nandarivatu, dense forest, alt. 750–900 m., *O. Degener* 14532 (A, NY), Feb.–Mar. 1941 (tree; fruit greenish white, pinkish at apex).

These collections are very much like the material we have of this New Caledonian species. The fruits certainly suggest the genus *Acmena* in appearance and in the structure of the seed; however, *Smith* 6155, which is the only specimen with flower-buds, furnishes the clue to the New Caledonian genus *Piliocalyx*. The buds are closed, the apex being apparently circumscissile, the stamens seem to have didymous anthers, and the ovules on the axile placentae are pendent from the apex of the locules. I have not found any previous record of the occurrence of this genus in Fiji.

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Perry, Lily M. 1950. "Notes on some Myrtaceae of Fiji." *Journal of the Arnold Arboretum* 31(4), 350–371. <https://doi.org/10.5962/p.333932>.

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