A REVISION OF SYZYGIUM (MYRTACEAE) IN SAMOA

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Syzygium is one of the largest genera in Polynesia and the third largest in Samoa. Of the 20 species recognized in Samoa (three herein described as new), 16 are native, and nine of these are endemic. All 20 are distinguished in a key, and complete descriptions are included. Local names and ethnobotanic information are noted for those species recognized and used by the Samoans.

Syzygium Gaertner is one of the largest genera in Polynesia and is represented by 28 native species in Fiji (Smith, 1985), seven in Tonga, four in Wallis and Futuna (St. John & Smith, 1971), two or three on Niue (Sykes, 1970), and four in Hawaii (St. John, 1973). Until now there has been no comprehensive study of *Syzygium* in Samoa, and the most recent publication on the Samoan flora (Christophersen, 1938) did not include a complete enumeration. In the present study 16 native species have been recognized, ranking the genus in size behind only *Cyrtandra* J. R. & G. Forster (Gesneriaceae), with 20 species, and *Psychotria* L. (Rubiaceae), also with 20 (Whistler, 1986). Nine of the species of *Syzygium* are endemic to Samoa; the other seven are also found in Fiji, Niue, Tonga, Wallis, Futuna, and/or Ponape.

In the entire Polynesian region including Fiji, there are 45 native species of *Syzygium*: in addition to the nine endemic to Samoa, there are 22 endemic to Fiji, four to Hawaii, and ten found in two or more islands or archipelagoes. Compared to species in large, widespread genera such as *Psychotria* and *Cyrtandra,* those of *Syzygium* apparently are not as easily dispersed (the genus is even absent from eastern Polynesia except for Hawaii). Speciation does not appear to have occurred as readily in *Syzygium* as in these two genera, which have higher rates of endemism and fewer wide-ranging indigenous species.

TAXONOMIC HISTORY OF THE GENUS IN SAMOA

Twenty-two species of *Syzygium* have been described from or attributed to Samoa since the first records of the Samoan Myrtaceae were published by Asa Gray in 1854. However, since no comprehensive study of the genus in Samoa has been made and no keys have been published, the genus has long been in need of revision.

The first specimens of *Syzygium* recorded from Samoa were collected by the United States Exploring Expedition in 1839. Subsequent collections were made in 1860–1875 by three amateur botanists, Graeffe, Powell, and Whitmee, but their work was never published. Professional botanists followed, and records

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Journal of the Arnold Arboretum **69**: 167–192. April, 1988.

of *Syzygium* specimens are found in Reinecke (1898), Rechinger (1910), Setchell (1924), Christophersen (1938), and Yuncker (1945). The most complete collection of the genus was made by Christophersen, who gathered all but one of the native species. A more detailed account of the botanical collectors in Samoa can be found in Whistler (1986).

During field work in Samoa between 1971 and the present, I have collected over 4500 specimens, including representatives of 13 of the 16 native *Syzygium* species, but no species was collected for the first time. Collections by Bristol in 1968 and Cox over the last several years have likewise failed to include any new species. It thus appears that the available specimens (over 300 collection numbers) represent a fairly complete sampling of the genus, and that very few new species can be expected to turn up in the future. Although the collections seem to be adequate, the study of the genus certainly is not. I have found it necessary to describe three new species and make major corrections in the work of previous botanists.

During my botanical study of Samoa, I visited a number of European and American institutions to study their collections and select specimens that were subsequently to be received on loan. Effort was made to examine and record every specimen gathered in the archipelago. Collections at the following institutions were utilized: Harvard University Herbaria (A and GH), Botanisches Museum of Berlin-Dahlem (B), Bernice P. Bishop Museum (BISH), British Museum (Natural History) (BM), Royal Botanic Garden, Edinburgh (E), Conservatoire Botanique, Geneva (G), Institut für Allgemeine Botanik, Hamburg (HBG), Royal Botanic Gardens, Kew (K), Botanische Staatssammlung, Munich (M), National Herbarium of Victoria (MEL), my own collection at the Pacific Tropical Botanical Garden (PTBG), University of California, Berkeley (UC), U. S. National Herbarium (US), Botanical Institute, Wroclaw (WRSL), and Naturhistorisches Museum, Vienna (W).

Syzygium Gaertner, Fruct. Sem. Pl. **1**: 166. 1788.

Trees up to 25 m tall, glabrous throughout. Stems terete or quadrangular and winged. Leaves opposite, petiolate or rarely sessile; blade chartaceous or coriaceous, glandular-punctate (but sometimes obscurely so), pinnate-nerved, with obvious, straight intramarginal collecting nerve (or this sometimes composed of looping distal ends of primary nerves) and often 1 or 2 outer collecting nerves. Inflorescences terminal or axillary (sometimes cauliflorous), several- to many-flowered panicles or thyrses, the axes with tiny caducous bracts and bracteoles (larger and persistent in 1 species). Flowers sessile or pedicellate, varying in size; hypanthium obovoid, campanulate, cuplike, or turbinate, sometimes tapering into distinct stipe, distally prolonged into rim; calyx lobes 4, sometimes obscure, borne on outer margin of hypanthium rim; petals 4, confluent and imbricate in bud to form fugacious calyptra (sometimes free, imbricate in bud, concave); stamens borne on inner hypanthium rim, numerous (ca. 35 to 450), strongly inflexed in bud, the filaments filamentous, free or proximally fused into many phalanges, the anthers oblong to subglobose, dorsifixed, 2-locular, longitudinally dehiscent; ovary usually 2-locular, placenta-

Distribution of the Samoan species of Syzygium.

Species	Island				
	Savaii	**Upolu**	**Tutuila**	**Manua**	**Other**
S. brevifolium	X	X	X		
S. carolinense	X	X	X	X	X
S. christophersenii	X				
S. clusiifolium	X	X	X	X	X
*S. corynocarpum**	X	X	X	X	X
S. curvistylum	X	X			X
S. dealatum	X		X	X	X
S. effusum	X				X
S. graeffei	X				
S. hebephyllum	X	X			
S. inophylloides	X	X	X	X	X
*S. jambos**	X	X	X?		X
*S. malaccense**	X	X	X	X	X
S. neurocalyx	X	X	X	X	X
S. oligadelphum		X			
S. patentinerve	X	X			
*S. samarangense**	X	X	X	X	X
S. samoense	X	X	X	X	
S. savaiiense	X	X			
S. vaupelii	X				
Total species	19	15	11	9	11
Native species	15	11	7	6	7

*Introduced species.

tion axile, ovules numerous, style slender to stout, stigma small. Fruit baccate, subglobose to ellipsoid, pericarp fleshy or thin, seed usually 1.

The genus in Samoa consists of 16 native species, nine of which are endemic. In addition, there are two aboriginally introduced species in cultivation (rarely escaping), one recent introduction that is thoroughly naturalized in native forests, and one recent introduction in cultivation. The distribution of the species in Samoa is shown in the TABLE. Savaii, the largest island in the archipelago, has all but one of the native species, Upolu has 11, Tutuila has seven, and Manua has six.

No sections of the genus have been recognized in the region, but in his treatment of *Syzygium* in Fiji, Smith (1985) divided the native species into three "groups" based on the flowers. His first group is distinguished by the presence of large, persistent bracts on the inflorescence and is represented in Samoa by a single species, *Syzygium samoense* (Burkill) Whistler. His second group mainly comprises small-flowered species with the petals fused into a fugacious calyptra; most of the Samoan and the Fijian species fit into this category. The third group consists of large-flowered species with the petals not calyptrate but fugacious singly and is represented in Samoa by only one native species, *S. neurocalyx* (A. Gray) Christoph.

All of the species here are well within the definition of *Syzygium,* and not

Eugenia L. as discussed by Schmid (1972) and Hyland (1983). A single native species of *Eugenia, E. reinwardtiana* (Bl.) DC., is found in Samoa.

Taxonomic Characters of Significance

Stems. Several of the species have distinctly quadrangular and winged stems, which can serve to distinguish them from otherwise similar species with terete stems.

Leaves. The size and shape of the leaves and the length of the petiole are usually sufficient to allow distinction among most of the Samoan species. Also of importance is the degree of glandular punctation on the lower leaf surface. In some species the glands are obscure, in others they are just barely evident, while in still others they are conspicuous. Two species that are very similar in nearly all respects, *Syzygium brevifolium* (A. Gray) C. Mueller and *S. hebephyllum* Melville, can be distinguished from each other by this character even when sterile. Another useful leaf character is venation. In four species the intramarginal collecting nerve is looping and made up from the distal ends of the primary nerves, rather than being distinct and straight.

Inflorescences. The inflorescences vary widely in position, flower number, and structure, and the differences are sometimes useful in distinguishing between otherwise similar species. In most species the inflorescences are axillary or terminal, but in two they are borne on the stem. Many-flowered panicles predominate, but some species have few-flowered panicles and one has nearly capitate inflorescences. The branches are generally terete, although in several species they are flattened or winged. Only one species has conspicuous, persistent bracts, a character that Smith (1985) used to distinguish a separate group of species in Fiji.

Flowers. The flowers differ greatly in size and can be very useful in distinguishing otherwise similar species. Flower size is also partially correlated with the number of stamens in the flowers, which in my counts varied from 35 to several hundred. Nearly all of the species have the petals fused into a calyptra, but the size and shape of the calyx is sometimes useful. The length of the staminal filaments and the style is also of some value in identification.

Fruits. The most important differences are in size and shape. Also significant is the size of the hypanthium (which can indicate flower size in the absence of flowers) and whether or not it is partially surrounded by the fruit.

Key to the Species of Syzygium in Samoa

1. Leaf blades mostly less than 4 cm long.
   2. Young stems terete; leaf blades obovate. ..... 1. *S. vaupelii.*
   2. Young stems quadrangular; leaf blades variously shaped.
      3. Leaf bases acute; hypanthia 2–3 mm long. ..... 2. *S. effusum.*
      3. Leaf bases rounded to subcordate; hypanthia 6–8 mm long.
         4. Lower leaf surfaces conspicuously glandular-punctate. .. 3. *S. brevifolium.*

4. Lower leaf surfaces obscurely (if at all) glandular-punctate. ..... 4. *S. hebephyllum.*

1. Leaf blades mostly 4–30 cm long.
   5. Young stems quadrangular.
      6. Leaves with petiole 1–3 mm long, blade 2–3.5 cm wide; stamens ca. 80, filament up to 12 mm long; montane forest. ..... 5. *S. graeffei.*
      6. Leaves with petiole 7–20 mm long, blade 3–11.5 cm wide; stamens ca. 300, filament up to 20 mm long; lowland and coastal forest. ... 6. *S. dealatum.*
   5. Young stems terete.
      7. Inflorescences on stem; coastal forest. ..... 7. *S. clusiifolium.*
      7. Inflorescences axillary or terminal; various habitats.
         8. Bracts persistent, up to 2.5 mm long. ..... 8. *S. samoense.*
         8. Bracts caducous at anthesis, mostly less than 1 mm long.
            9. Flowers large, hypanthium mostly 9–20 mm long.
               10. Leaves with looping intramarginal collecting nerve formed from distal ends of primary nerves.
                 11. Petioles usually 2–6 mm long; filaments white; forest. ..... 9. *S. samarangense.*
                 11. Petioles 8–20 mm long; filaments red; cultivated. ..... 10. *S. malaccense.*
               10. Leaves with straight, distinct intramarginal collecting nerve.
                 12. Leaves lanceolate to long-elliptic; flowers with calyx lobes 4–10 mm long, style over 3 cm long; mostly cultivated.
                   13. Flowers in capitate umbels, hypanthium strongly longitudinally ribbed; leaves 5–9 cm wide. ..... 11. *S. neurocalyx.*
                   13. Flowers in panicles, hypanthium not ribbed; leaves 2–6 cm wide. ..... 12. *S. jambos.*
                 12. Leaves oblong to elliptic; flowers with calyx lobes 1–4 mm long, style less than 3 cm long; forest.
                   14. Leaves with base subcordate to rounded, sessile or with petiole to 2 mm long. ..... 13. *S. patentinerve.*
                   14. Leaves with base acute to subcuneate, petiole 3–18 mm long.
                     15. Leaf blades 8–24 cm long; inflorescence branches flattened. ..... 14. *S. savaiiense.*
                     15. Leaf blades 5–10 cm long; inflorescence branches terete.
                       16. Lower leaf surfaces conspicuously glandular-punctate; Upolu. ..... 15. *S. oligadelphum.*
                       16. Lower leaf surfaces not conspicuously glandular-punctate; Savaii. ..... 16. *S. christophersenii.*
            9. Flowers small, hypanthium 2.5–8 mm long.
               17. Leaves with blade 2.5–12 cm long, caudate to acuminate at apex, coriaceous, finely pinnately nerved.
                 18. Leaf apexes caudate with blunt tip; fruits 2.5–4 cm long; common, lowlands and foothills. ..... 17. *S. inophylloides.*
                 18. Leaf apexes acuminate with sharp tip; fruits less than 1 cm long; uncommon, montane forest. ..... 18. *S. curvistylum.*
               17. Leaves with blade 6–20 cm long, acute to acuminate at apex, chartaceous, coarsely nerved.
                 19. Hypanthia 2.5–4 mm long; leaf blades 6–20 cm long, usually less than 2.5 times longer than wide, lower surface drying brown; forest. ..... 19. *S. carolinense.*

19. Hypanthia 5–8 mm long; leaf blades 7.5–13 cm long, usually more than 2.5 times longer than wide, lower surface drying light green; cultivated. ..... 20. *S. corynocarpum.*

1. **Syzygium vaupelii** Whistler, sp. nov. FIGURE 1.

Syzygium aff. *effusum* Christoph. Bernice P. Bishop Mus. Bull. **54:** 23. 1938; non C. Mueller.

Syzygio effuso affinis, a qua imprimis differt in foliis obovatis et caulibus teretibus.

Tree, height not recorded. Stems terete. Leaves with petiole 2–6 mm long; blade obovate, 20–35 by 10–18 mm, shortly acuminate at apex, cuneate at base, slightly revolute, coriaceous, glossy above, lighter and conspicuously glandular-punctate beneath, finely pinnate-nerved. Inflorescences terminal, paniculate, many flowered, 2–4 cm long. Flowers with pedicel 1–4 mm long; hypanthium cup shaped, 4–6 by 4–5 mm, irregularly and shallowly notched, without distinct calyx lobes; petals confluent, calyptrate; stamens ca. 100, filament up to 12 mm long, anther oblong, 0.5–1 mm long; style 2.5–4.5 mm long. Fruits not known.

TYPE. Samoa, Savaii, S Maugaloa, 1906, *Vaupel 408* (holotype, B!; isotypes, BISH!, K!, PTBG!, US!).

DISTRIBUTION. Endemic to Samoa; uncommon in cloud forest on Savaii, 900–1300 m alt.

PHENOLOGY. Flowering reported in August.

ADDITIONAL SPECIMENS EXAMINED. **Samoa.** SAVAII: above Matavanu, *Christophersen 1997* (A, BISH, K, US).

The measurements in the description are based on one flowering and one sterile specimen and must be considered tentative until more material of this rare species is collected and studied.

2. **Syzygium effusum** (A. Gray) C. Mueller, Ann. Bot. Syst. **4:** 838. 1858; A. C. Smith, Fl. Vit. Nova **3:** 334. 1985.

Eugenia effusa A. Gray, Bot. U. S. Expl. Exped., Phan. 524. 1854; Reinecke, Bot. Jahrb. Syst. **25:** 658. 1898. TYPE: Fiji, Mbua Province, near Sandalwood Bay, 1840, *U. S. Expl. Exped. s.n.* (holotype, US *47775*; isotypes, GH!, K!).

Tree, height not recorded. Young stems quadrangular, winged. Leaves with petiole 3–7 mm long; blade elliptic, 2.5–4(–6) by 1–2(–3.2) cm, broadly acute at apex, acute at base, not revolute, coriaceous, dark green above, lighter and obscurely glandular-punctate beneath, finely pinnate-nerved. Inflorescences terminal and from upper axils, paniculate, many flowered, 2–7 cm long, the axes quadrangular, winged, bearing deciduous bracts ca. 0.5 mm long. Flowers with pedicel 2–5 mm long; hypanthium 2–3 by 1.5–2 mm, shallowly notched into broadly rounded calyx lobes less than 0.5 mm long; petals confluent,

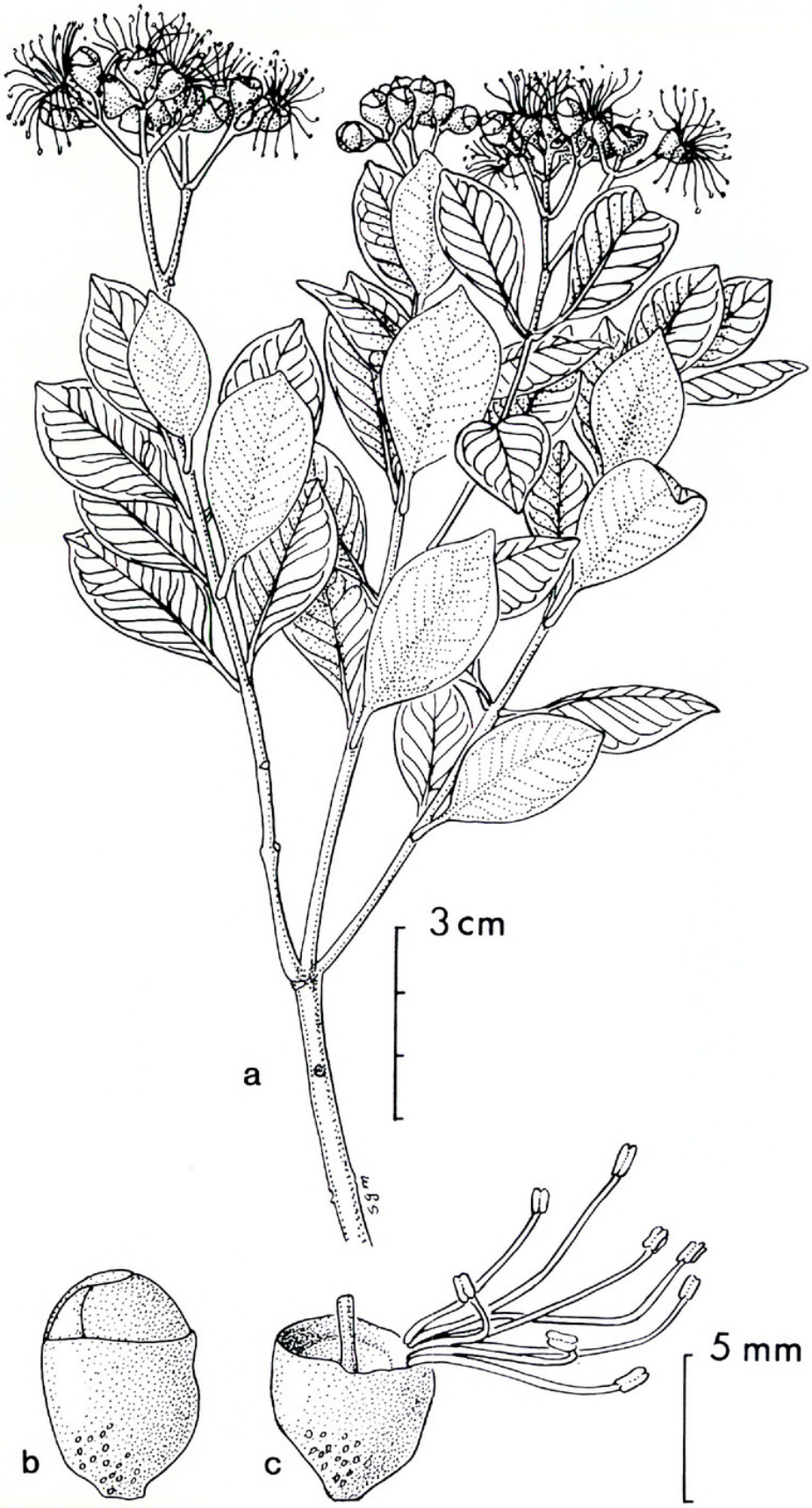

FIGURE 1. **Syzygium vaupelii:** a, flowering branchlets; b, flower bud; c, flower after anthesis.

calyptrate; stamens ca. 35, the filament up to 2 mm long, the anther subglobose, ca. 0.3 mm long; style 1–2 mm long. Fruits not known.

DISTRIBUTION. Indigenous to Samoa; rare in mountain region of Savaii, no altitude reported. Also found from New Guinea to Fiji.

PHENOLOGY. Flowering reported in September.

ADDITIONAL SPECIMENS EXAMINED. **Samoa.** SAVAII: mountain region, *Reinecke 485* (G), *487* (G, K). WITHOUT FURTHER LOCALITY: *Reinecke s.n.* (K, WRSL).

Based on specimens cited by Rechinger (1910) and Christophersen (1938), Smith (1985) concluded that this species does not occur in Samoa. However, *Reinecke 485* (cited by Reinecke, 1898) and *487* (not cited), which were not seen by Smith, do belong to this species, although they differ from those collected over the rest of the species' range in having pedicels 2–5 (vs. 0.5–2) mm long.

Two sterile specimens collected from Savaii (above Salailua, 750 m alt., *Christophersen 2900,* BISH; Siuvao-Auala, 600 m alt., *Christophersen 3366,* BISH) may also belong here. Although these specimens have the winged, quadrangular stems typical of *Syzygium effusum,* they differ in having leaf blades up to 10 cm long with the lower surface conspicuously glandular-punctate.

3. **Syzygium brevifolium** (A. Gray) C. Mueller, Ann. Bot. Syst. **4:** 839. 1858; Christoph. Bernice P. Bishop Mus. Bull. **154:** 21. 1938; Whistler, Allertonia **2:** 160. 1980.

Eugenia brevifolia A. Gray, Bot. U. S. Expl. Exped., Phan. 531. 1854; Reinecke, Bot. Jahrb. Syst. **25:** 659. 1898; Rech. Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl. **85:** 145. 1910. TYPE: Samoa, Tutuila, "on the mountains of Tutuila. . .at the elevation of 2,500 feet," 1839, *U. S. Expl. Exped. s.n.* (holotype, US *47772*!; isotype, GH [fragment]!).

Eugenia oreophila Rech. Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl. **85:** 145. 1910; non Diels. TYPE: Samoa, Upolu, mountain region of Lake Lanotoo, 1905, *Rechinger 1811* (lectotype, here designated, W!; isolectotypes, BISH!, BM!, K!, US!).

Tree up to 10 m tall. Stems quadrangular, winged. Leaves decussate and sometimes nearly imbricate on stem, sessile or with petiole up to 2 mm long; blade ovate to elliptic, 1.3–4.2 by 0.8–2.5 cm, acute to subacuminate at apex, rounded to subcordate at base, slightly revolute, coriaceous, glossy above, lighter and conspicuously glandular-punctate beneath, pinnately nerved. Inflorescences terminal and from upper axils, paniculate, many flowered, up to 4 cm long. Flowers sessile or with pedicel less than 1 mm long; hypanthium campanulate, 6–8 by 4.5–6 mm, shallowly notched into broadly rounded calyx lobes ca. 0.5 mm long; petals confluent, calyptrate; stamens ca. 200, the filament up to 15 mm long, probably white, the anther oblong to subglobose, ca. 0.5 mm long; style 5–7 mm long. Fruits ovoid, ca. 14 mm long.

DISTRIBUTION. Endemic to Samoa; in montane to cloud forest on Savaii, Upolu, and Tutuila, 500–1300 m alt.

PHENOLOGY. Flowering reported in August, fruiting in November.

ADDITIONAL SPECIMENS EXAMINED. **Samoa.** SAVAII: central mountain region, 1300 m alt., *Reinecke 431* (WRSL). UPOLU: rim of Lanotoo, *Christophersen 118* (A, BISH, K, UC); near Lanotoo, *Rechinger 710* (W), *750* (W), *1811* (BISH [fragment], BM, K, US, W); *sine loco, Rechinger 3346* (W); near Lanoataata, *Whistler 1493* (B, BISH, PTBG). TUTUILA: top of Matafao, *Christophersen 1025* (BISH); Matafao ridge, *Christophersen 1051* (BISH), *1071* (A, BISH); Matafao, *Whistler 3850* (BISH, PTBG). WITHOUT FURTHER LOCALITY (Savaii?): *Reinecke s.n.* (K).

Bristol 2165 (BISH, US), a sterile specimen collected far above Aopo, Savaii, has leaf blades (possibly juvenile) up to 6 cm long but probably belongs here. Another sterile specimen, *Whistler 3911* (PTBG), collected above Tonitoniga, Upolu, may belong to this species as well.

4. **Syzygium hebephyllum** Melville, Kew Bull. **2:** 293. 1955. TYPE: Samoa, Upolu, on lip of canyon at Afiamalu, 1954, *Irwin 5* (lectotype, here designated, K!; isolectotypes, A!, BISH!, K!).

Memecylon sp. Reinecke, Bot. Jahrb. Syst. **25:** 662. 1898.
Eugenia brevifolia sensu Rech. Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl. **85:** 145. 1910, *pro parte*; non A. Gray.

Tree up to 18 m tall. Young stems quadrangular, winged. Leaves decussate and often imbricate on stem, sessile or with petiole up to 2 mm long; blade orbicular to lanceolate, 0.6–4(–8 in juvenile leaves) by 0.5–2.5 cm, acuminate to subrounded at apex, round to subcordate at base, slightly revolute, coriaceous, dark green and glossy above, lighter and obscurely glandular-punctate beneath, pinnately nerved. Inflorescences terminal, paniculate, 3- to 11-flowered, 0.8–2 cm long. Flowers with pedicel ca. 1 mm long; hypanthium subglobose, 6–8 by 5–7 mm, shallowly notched into broadly rounded calyx lobes 1–2 mm long; petals confluent, calyptrate; stamens ca. 230, the filament up to 10 mm long, white, the anther oval, 0.5–1 mm long; style 6–8 mm long. Fruits subglobose, 15–24 mm long, hypanthium partially surrounded, pericarp red at maturity.

DISTRIBUTION. Endemic to Samoa; uncommon in cloud forest on Savaii and Upolu, 500–1500 m alt.

PHENOLOGY. Flowering reported in December, fruiting in April.

ADDITIONAL SPECIMENS EXAMINED. **Samoa.** SAVAII: above Patamea, *Bristol 2328* (BISH, K, US); Matavanu lava flow, *Christophersen 1968* (BISH); above Matavanu, *Christophersen 2082* (A, BISH, K, US); central region, 1500 m, *Reinecke 370* (K, US); "Matai," *Vaupel 563* (B, BISH, PTBG). UPOLU: Malololelei ridge, *Christophersen 274* (BISH, W); canyon lip at Afiamalu, *Irwin 1* (K), *2* (A, K), *3* (K), *4* (K); near Lanotoo, *Rechinger 726* (W), *1347* (W), *1954* (W).

The collections made by Irwin are numbered *1* to *5*, and two different dates are involved. Melville listed two type specimens, one with fruit and one with flowers. *Irwin 5*, the specimen in the type collection at Kew, is hereby designated as the lectotype.

5. **Syzygium graeffei** Whistler, sp. nov. FIGURE 2.

Syzygio dealato affinis, a qua imprimis in petiolis brevioribus, foliis angustioribus, filamentis brevioribus, et staminibus paucioribus differt.

FIGURE 2. **Syzygium graeffei:** a, vegetative and flowering branchlets; b, flower at anthesis; c, flower after anthesis.

Tree, height not recorded. Young stems quadrangular and winged, or sometimes terete. Leaves with petiole ca. 1–3 mm long; blade lanceolate, 8–13 by 2–3.5 cm, acuminate to subacuminate at apex, rounded at base, not revolute, chartaceous, dark above, lighter and sparingly glandular-punctate beneath, finely pinnate-nerved. Inflorescences terminal or in upper axils, paniculate, loose, many flowered (up to ca. 27), up to 11 cm long, narrow, the ultimate branches

17–24 mm long, bearing 3 flowers. Flowers subsessile or with pedicel to 3 mm long; hypanthium turbinate, 5–6 by 4–7 mm, divided into suborbicular calyx lobes 2–3 mm long; petals confluent, calyptrate; stamens ca. 80, the filament up to ca. 12 mm long, the anther oblong, 0.4–0.7 mm long; style ca. 4–6 mm long. Fruits not known.

TYPE. Samoa, Savaii, central volcanic region, 1905, *Rechinger 3736* (holotype, W!).

DISTRIBUTION. Endemic to Samoa; presumably rare at high altitudes on Savaii, altitude range not known.

PHENOLOGY. Flowering reported in August.

ADDITIONAL SPECIMEN EXAMINED. **Samoa.** SAVAII: *sine loco, Graeffe 213a* (HBG).

The species is named in honor of Eduard Graeffe, who made extensive collections in the South Pacific during the 1860's and 1870's. He was the first to collect this species, but the holotype is *Rechinger 3736,* a more complete specimen.

6. **Syzygium dealatum** (Burkill) A. C. Smith *in* Yuncker, Bernice P. Bishop Mus. Bull. **220:** 203. 1959; H. St. John & A. C. Smith, Pacific Sci. **25:** 335. 1971; Whistler, Allertonia **2:** 160. 1980.

Eugenia dealata Burkill, J. Linn. Soc., Bot. **35:** 37. 1901. TYPE: Tonga, Eua, 1889, *Lister s.n.* (holotype, K!).
Syzygium clusiifolium sensu Sykes, New Zealand Dept. Sci. & Industr. Res. Bull. **200:** 131. 1970; non C. Mueller.

Tree up to 8 m tall. Stems quadrangular, slightly winged. Leaves with petiole 7–20 mm long; blade oblong to elliptic, 7–16 by 3–11.5 cm, acute to caudate at apex with short somewhat twisted tip (occasionally retuse), rounded to abruptly cuneate at base, slightly revolute, coriaceous, often with 1 to several prominent insect galls, glossy above, dull and glandular-punctate beneath, pinnately nerved. Inflorescences terminal, paniculate, many flowered, 5–9 cm long, widely branching. Flowers sessile; hypanthium campanulate, 4–9 by 4–6 mm, not noticeably ridged when dry, notched into broadly triangular to rounded calyx lobes 1–2 mm long; petals confluent, calyptrate, white and red; stamens ca. 260 to 360, the filament up to 20 mm long, showy white, the anther oblong, ca. 0.5 mm long; style 4–7 mm long. Fruits ovoid to ellipsoid, 18–24 mm long, the hypanthium partially surrounded, the pericarp thin, purple at maturity.

DISTRIBUTION. Indigenous to Samoa; in coastal forest on all main islands except Upolu, near sea level to 150 m alt. Also found on Uvea, Alofi, Tonga (Eua, Tongatapu, Tafahi, Niuafoou, and Niuatoputapu), and Niue.

PHENOLOGY. Flowering reported September–November, fruiting December–January.

ADDITIONAL SPECIMENS EXAMINED. **Samoa.** SAVAII: Sataua-Papa on coastal bluffs, *Christophersen 3419* (BISH); coast NE of Asau, *Whistler 1015* (G, K, PTBG). TUTUILA: Mt. Tau,

Whistler 2886 (BISH, PTBG); E of Onenoa, *Whistler 3750* (BISH, PTBG). AUNUU: N ridge, *Whistler 3273* (B, BISH, G, K, PTBG, US). OFU: adjacent to air strip, *Whistler 3049* (B, PTBG); Nuutele Is., *Whistler 3780* (BISH, PTBG). TAU: SE side of island, *Whistler 3220* (PTBG); Auauli, *Whistler 3680* (BISH, PTBG). WITHOUT FURTHER LOCALITY: *Whitmee 212* (MEL).

Christophersen (1938) mentioned his specimens in the discussion of *Syzygium clusiifolium* but noted how they differed from this species. The populations outside of Samoa differ in having leaf apexes rounded to obtuse, petioles shorter (2–8 mm long), stems often neither quadrangular nor winged, and fruits with the hypanthium exserted 1.5–4 mm. The only non-Samoan specimen seen with flowers was the holotype; the flowers are 10–12 mm long with calyx lobes up to 2.5 mm long.

7. **Syzygium clusiifolium** (A. Gray) C. Mueller, Ann. Bot. Syst. **4:** 839. 1858; Yuncker, Bernice P. Bishop Mus. Bull. **220:** 202. 1959; Whistler, Allertonia **2:** 160. 1980.

Eugenia clusiaefolia A. Gray, Bot. U. S. Expl. Exped., Phan. 528. 1854; Reinecke, Bot. Jahrb. Syst. **25:** 659. 1898; Rech. Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl. **85:** 144. 1910. TYPE: Samoa, "Tutuila and Savaii: on rocks near the sea," 1839, *U. S. Expl. Exped. s.n.* (holotype, US *47773*!; isotypes, GH [fragment]!, K!).

Tree up to 15 m tall. Stems terete. Leaves with petiole 3–16 mm long; blade obovate to elliptic, 7–16 by 3–9.5 cm, broadly acute or occasionally rounded to retuse at apex, cuneate at base, not revolute, coriaceous, glossy above, dull and glandular-punctate beneath, finely pinnate-nerved. Inflorescences on stem, paniculate, many flowered, 12–30 cm long, widely branching. Flowers sessile; hypanthium campanulate, 5.5–9.5 by 4–6 mm, white at anthesis, longitudinally ridged when dry, shallowly notched into broad, rounded calyx lobes ca. 1 mm long; petals confluent, calyptrate, white; stamens ca. 100, the filament up to 12 mm long, showy white, the anther oblong, ca. 0.5 mm long; style 4–6 mm long. Fruits ovoid, 2–3.3 cm long, hypanthium partially surrounded, pericarp dull purple at maturity.

DISTRIBUTION. Indigenous to Samoa; common to abundant in coastal forest on all main islands, particularly on offshore tuff-cone islets, near sea level to over 100 m alt. Also found in Tonga, Uvea, and Futuna.

PHENOLOGY. Flowering reported August–January, fruiting August–March.

LOCAL NAMES AND USES. *Asi vao,* according to Powell (1868), who noted that he encountered it only on Manono. This name, however, also refers to a number of other species of this genus. The tree is called *asi* on Futuna and *fekika vao* in Tonga. It is sometimes used for timber.

ADDITIONAL SPECIMENS EXAMINED. **Samoa.** SAVAII: Asau-Aopo, *Christophersen 2546* (BISH); Falealupo, *Christophersen 2784* (BISH); Sataua-Papa, *Christophersen 3415* (A, BISH, K, US, W); near Paia, *Reinecke 376* (G); Paia Mtn., *Reinecke 377* (G, WRSL); Falealupo, *Vaupel 645a* (B); E of Asau, *Whistler 954* (B, BISH, PTBG). UPOLU: Mt. Vaea, *Rechinger 4499* (W); Nuutele Is., *Whistler 470* (B, BISH, PTBG); Fanuatapu Is., *Whistler 1813* (B, BISH, PTBG), *4680* (B, PTBG, US); Namua Is., *Whistler 1888a* (BISH, PTBG). TUTUILA: *sine loco, Long 3024a* (PTBG); Afono–Vatia trail, *Whistler 1280* (G, PTBG); Two-Dollar Beach, *Whistler*

3755 (BISH, PTBG). OFU: Nuutele Is., *Whistler 3779* (BISH, PTBG). OLOSEGA: Alei Ridge, *Whistler 3492* (BISH). TAU: Auauli, *Whistler 3679* (B, BISH, PTBG). WITHOUT FURTHER LOCALITY: *Powell 24* (K), *314* (K); *Whitmee s.n.* (GH, K).

This species is also found in Tonga (Vavau, Eua, Niuafoou, Tafahi, Tongatapu, Niuatoputapu, Kao), Futuna, and Uvea. The populations on Kao and Eua have oblanceolate leaves, and the one on Tongatapu appears to have shorter fruits.

8. **Syzygium samoense** (Burkill) Whistler, Phytologia **38:** 410. 1978, Allertonia **2:** 160. 1980.

Eugenia samoensis Burkill, J. Linn. Soc., Bot. **35:** 38. 1901. TYPE: Samoa, without further locality, ca. 1860's, *Powell 6* (lectotype, here designated, K!).
Eugenia "spec. I" Rech. Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl. **85:** 145. 1910.
Eugenia "spec. II" Rech. Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl. **85:** 146. 1910.
"?*Syzygium savaiiense*" sensu Christoph. Bernice P. Bishop Mus. Bull. **154:** 26. 1938, *pro parte*; non C. Mueller.
Syzygium clusiaefolium sensu Christoph. Bernice P. Bishop Mus. Bull. **154:** 22. 1938; non C. Mueller.

Tree up to 17 m tall. Stems terete. Leaves with petiole 7–20 mm long; blade oblanceolate to obovate, 7–23 by 3–11 cm, obtuse to rounded at apex, cuneate to nearly decurrent at base, revolute, coriaceous, dark green and glossy above, lighter and conspicuously glandular-punctate beneath, finely pinnate-nerved. Inflorescences terminal, paniculate, many flowered, 5–9 by 5–12 cm, bearing persistent, paired, oblong to triangular bracts 0.5–2.5 mm long. Flowers with pedicel 4–10 mm long, bearing persistent bracts; hypanthium campanulate to cup shaped, 7–10 by 6–8 mm, undulate into broadly rounded lobes ca. 1 mm long; petals confluent, calyptrate; stamens ca. 480, the filament up to 9–12 mm long, white, the anther oblong, ca. 0.8–1.3 mm long; style 5–7 mm long, often persistent on fruit. Fruits ovoid to urceolate, 15–19 mm including partially surrounded, concave hypanthium, pericarp red at maturity.

DISTRIBUTION. Endemic to Samoa; in lowland to cloud forest on all main islands, 100–1200 m alt.

PHENOLOGY. Flowering reported June–July, fruiting in February and July–September but probably year-round.

NATIVE NAMES. Possibly *fena vao,* due to its vague similarity to *fena,* another species of *Syzygium.* This name was not known by my informants, however.

ADDITIONAL SPECIMENS EXAMINED. **Samoa.** SAVAII: above Gataivai, *Bristol 2257* (BISH, GH), *2284* (BISH); above Vaipouli, *Christophersen 1918* (A, BISH, K, UC, US); Manase, *Christophersen 2373* (A, BISH, K); above Salailua, *Christophersen 2888* (BISH, UC, US), *3080* (BISH); Siuvao-Auala, *Christophersen 3368* (BISH); Auala, *Fasavalu 25* (BISH); S Maugaloa, *Vaupel 407* (B, BISH, K, PTBG, US, WRSL), *647* (B); above Asau, *Whistler 7* (BISH, PTBG, US). UPOLU: Mt. Fao, *Christophersen 557* (BISH), *570* (A, BISH, K, M); *sine loco, Graeffe 1315* (HBG); above Utumapu, *Rechinger 32* (W), *980* (W); rim of Lanotoo, *Whistler 1618* (B, BISH, K, PTBG); Mt. Vaea, *Whistler 3992* (PTBG). TUTUILA: Papatele Ridge,

Christophersen 1008 (BISH); top of South Pioa, *Christophersen 1199* (BISH, K, UC); top of Pioa, *Christophersen 3482* (BISH, US), *3498* (A, BISH); Aoloaufou, *Whistler 2688* (B, BISH, G, K, PTBG), *2749* (BISH, K, PTBG); N of Aoloaufou, *Whistler 2957* (B, BISH, PTBG). TAU: Mt. Lata, *Whistler 3731* (BISH, PTBG). WITHOUT FURTHER LOCALITY: *Powell 267* (K), *327* (K); *Whitmee 95* (BM, GH, K, MEL), *96* (MEL), *108* (MEL).

In his description of *Eugenia samoensis,* Burkill noted three specimens, one from Vavau and two from Samoa, as well as a fourth (*Whitmee 95,* from Samoa) that "may well be a form of this species." The specimen from Vavau is conspecific with *Syzygium brackenridgei* (A. Gray) C. Mueller (Smith, 1985), but the other three are distinct from that species, and a lectotype has to be designated from among them.

The persistent inflorescence bracts in *Syzygium samoense* and *S. brackenridgei* distinguish them from other species in the region. *Whistler 7,* collected above Asau, Savaii, probably belongs to *S. samoense* but has leaves with an acuminate apex. Two small-leaved sterile specimens (*Christophersen 2900* and *3366,* both at BISH) from above Salailua, Savaii, probably also belong here.

9. **Syzygium samarangense** (Blume) Merr. & Perry, J. Arnold Arbor. **19:** 115. 1938; Whistler, Allertonia **2:** 160. 1980.

Myrtus samarangensis Blume, Bijdr. Fl. Ned. Ind. 1084. 1826 or 1827.
Eugenia javanica Lam. Encycl. **3:** 200. 1789; non *Syzygium javanicum* Miq. (1855). TYPE: Indonesia, Java, without further locality, *Commerson s.n.* (P-LA).
Syzygium richii sensu Sykes, New Zealand Dept. Sci. & Industr. Res. Bull. **200:** 136. 1970; non Merr. & Perry.

Tree up to 12 m tall. Stems terete. Leaves with petiole 2–6(–10) mm long; blade usually elliptic, 6–21 by 2–10 cm, acute to acuminate (rarely rounded) at apex, rounded to acute at base, not revolute, chartaceous, dark green and glossy above, lighter and glandular-punctate beneath, coarsely nerved, intramarginal collecting nerve composed of looping distal ends of primary nerves. Inflorescences terminal, paniculate or thyrsoid, few- to several-flowered, 9–12 cm long, the apex flattened and bearing 3 flowers, with terminal one on extended rachis. Flowers sessile; hypanthium turbinate, 10–15 by 9–12 mm, notched into rounded calyx lobes 4–6 mm long, these pale yellow, reflexed at anthesis; petals suborbicular, 7–11 mm long, concave, white; stamens ca. 280, the filament up to 22 mm long, white, the anther 0.8–1.3 mm long; style 15–20 mm long. Fruits ovoid to obovoid, 2.5–4 cm long including persistent, inflexed calyx lobes, pericarp fleshy and red at maturity.

DISTRIBUTION. Introduced to Samoa before 1931, now naturalized in lowland to cloud forest on all main islands; 20–740 m alt. Also naturalized on Niue (incorrectly identified as *Syzygium richii*) and occurring in Tonga and Wallis and Futuna.

PHENOLOGY. Flowering reported in August and September, fruiting July–August and December–January.

NATIVE NAME AND USES. Possibly *nonu vao,* literally "Malay apple of the bush." The fruit is edible, according to Smith (1985), but there are no reports of its being eaten in Samoa.

SPECIMENS EXAMINED. **Samoa.** SAVAII: near Saumalaeulu, *Christophersen 2554* (BISH); Le To, above Salailua, *Christophersen 2921* (BISH); Siuvao-Auala, *Christophersen 3292* (BISH); Siuvao-Auala, *Christophersen 3374* (BISH); Papa-Fagatele, *Christophersen 3411* (BISH); near Aopo, *Whistler 1720* (PTBG); below Mata-o-le-Afi, *Whistler 2401* (BISH, PTBG). UPOLU: Tanumalala, *McKee 2998* (BISH); Lanoanea Farm, *Whistler 1078* (G, K, PTBG); W of Mt. Sigaele, *Whistler 2040* (G, PTBG); inside Sigaele crater, *Whistler 2061* (PTBG). TUTUILA: Vaisa Stream, *Kuruc 107* (BISH); Fagaalu Canyon, *Whistler 1461* (PTBG), *2871* (BISH, PTBG). OFU: NE side of island, *Whistler 3013* (PTBG). OLOSEGA: *sine loco, Whistler 3077* (PTBG); atop Piumafua, *Whistler 3824* (PTBG). TAU: N slope of island, *Whistler 3156* (BISH, PTBG), *3210* (B, BISH, K, PTBG).

A sterile specimen (*Vaupel 644,* B) collected in 1906 at "Puapua bush" on Savaii appears to belong to this species. If so, this is by far the earliest record of this species from Samoa, considerably antedating Christophersen's collection of it in 1931.

10. **Syzygium malaccense** (L.) Merr. & Perry, J. Arnold Arbor. **19:** 215. 1938.

Eugenia malaccensis L. Sp. Pl. 470. 1753; A. Gray, Bot. U. S. Expl. Exped., Phan. 510. 1854; Setch. Publ. Carnegie Inst. Wash. **341:** 64. 1924; Christoph. Bernice P. Bishop Mus. Bull. **154:** 19. 1938. TYPE: according to Smith (1985), four references were cited by Linnaeus, but no lectotypification was made.

Jambosa malaccensis (L.) DC. Prodr. **3:** 286. 1828; Reinecke, Bot. Jahrb. Syst. **25:** 658. 1898; Rech. Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl. **85:** 144. 1910.

Tree up to 25 m tall. Stems terete. Leaves with petiole 8–20 mm long; blade elliptic to ovate, 9–26 by 6–13 cm, acute to acuminate at apex, acute to rounded at base, not revolute, coriaceous, glossy above, dull, glandular-punctate, and often marked by large insect galls beneath, the intramarginal collecting nerve formed from looping distal ends of primary nerves. Inflorescences borne on old stems, thyrsoid, few flowered, up to 6 cm long. Flowers with pedicel 2–5 mm long; hypanthium turbinate, 12–18 by 8–12 mm, notched to form broadly rounded calyx lobes 2–4 mm long; petals obovate, 6–9 by 6–8 mm, concave, tuberculate on outside, red, singly fugacious; stamens many, the filament up to 2.5 cm long, red, the anthers oblong, 0.5–1 mm long; style up to 2.5 cm long. Fruits ovoid to obovoid, 3–7 cm long, the pericarp fleshy, red, white, or striped at maturity.

DISTRIBUTION. Aboriginally introduced, common in villages and plantations on all main islands, occasionally persisting in what appears to be primary forest but probably a remnant of past cultivation. Native to the Indo-Malesian region.

PHENOLOGY. Flowering in Samoa reported May–September, fruiting July–December.

NATIVE NAMES AND USES. Commonly *nonu fi'afi'a.* This name has cognates throughout Polynesia: *kavika* (Fiji), *fekika kai* (Tonga), *kafika* (Futuna), *fekakai* (Niue), *ka'ika* (Rarotonga), *'ahi'a* (Tahiti), *kehi'a* or *kehika inana* (the Marquesas), and *'ohi'a 'ai* (Hawaii). The English name is "Malay apple" or, less commonly, "mountain apple." The tree is widely cultivated for its edible fruit and was one of the few fruit trees available to the early Polynesians. Samoans

also use the grated inner bark to make a medicine for mouth and throat infections.

SPECIMENS EXAMINED. **Samoa.** SAVAII: Matautu, *Reinecke 460* (G); Safai, *Vaupel 362* (B, BISH). UPOLU: Savaia (Lefaga), *Bristol 2001* (BISH); above Eva, *Christophersen 529* (A, BISH, UC, US); *sine loco, Graeffe 3a* (HBG); Falefa Falls, *McKee 2867* (BISH, E); Mt. Vaea, *Rechinger 1234* (W); Apia, *Reinecke 403* (BM, BISH, E, G, K, US); near Lanoanea, *Whistler 1095* (PTBG); Nuutele Is., *Whistler 4482* (PTBG). TUTUILA: E side of Alava Ridge, *Christophersen 1120* (A, BISH, K); above Pago Pago, *Setchell 298a* (UC); Pago Pago, *Setchell 352* (UC); Alava Ridge, *Whistler 3635* (PTBG). WITHOUT FURTHER LOCALITY: *Guest 11* (BISH); *Powell 321* (K).

Two specimens listed by Rechinger (1910), *30* from Moamoa, Upolu, and *1749* from Mt. Vaea, Upolu, could not be located at Vienna. Likewise, an unnumbered specimen noted by Pickering (1876) as having been collected by the U. S. Exploring Expedition on Tutuila could not be located at either the U. S. National Herbarium or the Gray Herbarium.

11. **Syzygium neurocalyx** (A. Gray) Christoph. Bernice P. Bishop Mus. Bull. **154:** 27. 1938.

Eugenia neurocalyx A. Gray, Bot. U. S. Expl. Exped., Phan. 512. 1854, U. S. Expl. Exped., Atlas Phan. *pl. 59.* 1856; Reinecke, Bot. Jahrb. Syst. **25:** 658. 1898; Setch. Publ. Carnegie Inst. Wash. **341:** 65. 1924. TYPE: Fiji, Ovalau or Vanua Levu, without further locality, 1840, *U. S. Expl. Exped. s.n.* (holotype, US *47777*!; isotype, GH!).
Jambosa formosa sensu Rech. Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl. **85:** 144. 1910; non Niedenzu.

Shrub or small tree up to 4 m tall. Stems terete. Leaves with petiole 1–7 mm long; blade lanceolate to long-elliptic, 12–30 by 5–9 cm, rounded to acute at apex, rounded to subcordate at base, not revolute, chartaceous, often with prominent insect galls, glossy above, lighter, dull, and glandular-punctate beneath, pinnately nerved. Inflorescences terminal, capitate, several flowered. Flowers sessile; hypanthium campanulate to rotate, 15–20 by 15–22 mm, strongly 10- to 14-costate, notched into round to oblong calyx lobes up to 1 cm long, these red to green tinged with red; petals suborbicular, ca. 8–15 by 8–20 mm, white, singly deciduous, sometimes persisting past anthesis; stamens several hundred, the filament up to 2.5 cm long, yellow, the anther linear to oblong, 1–2.5 mm long; style 3–5 cm long. Fruits not seen, but subglobose with urceolate neck and persistent sepals and style, reported (Smith, 1985) to be up to 7.5 by 6 cm in Fiji, fleshy, fragrant.

DISTRIBUTION. Christophersen (1938) and Setchell (1924) believed that this species was aboriginally introduced to Samoa, where it is now rare in cultivation on Savaii, Upolu, and Tutuila. However, two specimens (*Whistler 1907* and *Reinecke 282*) from Upolu were collected in native forest at about 700 m altitude. Additionally, the flowers of the Samoan specimens are smaller than those in Fiji, which may support Smith's (1985) opinion that *Syzygium neurocalyx* is native to Samoa and was brought from the forest and cultivated. Also native to Fiji, and native or aboriginally introduced to Tonga, Rotuma, and Futuna.

PHENOLOGY. Flowering reported April–October, fruiting in April but probably year-round.

NATIVE NAMES AND USES. *Fena,* apparently a strictly Samoan name, and sometimes *'oli,* a cognate of the Tongan and Futunan (*koli*) and the Rotuman (*kori*) names for the plant. According to Powell (1868), it was used only as a perfume, suspended from the neck by a string, but Setchell (1924) noted its use for making an aromatic oil for the hair. It was employed similarly in Tonga (Yuncker, 1959) and Fiji (Smith, 1985).

ADDITIONAL SPECIMENS EXAMINED. **Samoa.** SAVAII: Aopo, *Christophersen 2541* (BISH). UPOLU: *sine loco, Graeffe 27a* (HBG); secondary forest by "Heniger," *Rechinger 490* (W), *492* (W), *1877* (W); above Letogo at 700 m, *Reinecke 282* (E, G); Taitoelau rim, *Whistler 1907* (B, BISH, K, PTBG). TUTUILA: *sine loco, Mitchell 562* (BISH); above Pago Pago, *Setchell 295* (UC), *298b* (UC), *514* (UC). WITHOUT FURTHER LOCALITY: *Powell s.n.* (K); *Whitmee 12* (K), *224* (K).

12. **Syzygium jambos** (L.) Alston *in* Trimen, Handb. Fl. Ceylon **6:** 115. 1931; Christoph. Bernice P. Bishop Mus. Bull. **154:** 27. 1938.

Eugenia jambos L. Sp. Pl. 470. 1753; Rech. Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl. **85:** 144. 1910. TYPE: four prior references were listed by Linnaeus, but apparently no lectotype has been selected (Smith, 1985).

Tree up to 5 m or more tall. Stems terete, sometimes quadrangular when young. Leaves with petiole 5–13 mm long; blade lanceolate, 9–26 by 2–6 cm, acuminate and sometimes curved at apex, acute at base, not revolute, coriaceous, dark green above, lighter and obscurely glandular-punctate beneath, finely pinnate-nerved. Inflorescences terminal or axillary, paniculate, several flowered (up to 10), 5–10 cm long. Flowers with pedicel 8–16 mm long; hypanthium turbinate, 12–17 by 8–13 mm, notched into rounded calyx lobes 4–7 mm long, these tuberculate outside; petals suborbicular, 15–18 mm long, concave, reflexed at anthesis, white, tuberculate outside; stamens 400+, the filament up to 4 cm long, pale yellow, the anther oblong, 1–1.5 mm long; style 3–4 cm long. Fruits globose to ovoid, 2.5–3.7 cm in diameter, the calyx lobes and style persistent, the pericarp fleshy, yellowish to pink.

DISTRIBUTION. Introduced prior to 1860, uncommonly cultivated in villages and plantations. Native to southeastern Asia.

PHENOLOGY. Flowering reported May–September.

NATIVE NAMES AND USES. *Seasea palagi,* literally "European *seasea*" (*Syzygium corynocarpum* (A. Gray) C. Mueller). The English name is "rose apple." The fruit is eaten, but it is not nearly as common or as esteemed as *nonu fi'afi'a,* the Malay apple.

SPECIMENS EXAMINED. **Samoa.** SAVAII: Safotu, *Christophersen 3596* (BISH, UC). UPOLU: Siusega, *Cox 168* (BISH, GH, UC); *sine loco, Graeffe 268* (HBG); near Malifa, *Rechinger 940* (W); near Motootua, *Rechinger 1767* (W); *sine loco, Tiuu s.n.* (PTBG). WITHOUT FURTHER LOCALITY (Tutuila?): *Guest 7* (BISH), *17* (BISH).

13. **Syzygium patentinerve** Christoph. Bernice P. Bishop Mus. Bull. **154:** 24. 1938. TYPE: Samoa, Savaii, forest above Matavanu Crater, 900 m alt., 1931, *Christophersen 2262* (holotype, BISH!).

"*Eugenia* spec. nova," Reinecke, Bot. Jahrb. Syst. **25:** 660. 1898.

Tree up to 10 m tall. Stems terete. Leaves sessile or with petiole to 2 mm long; blade oblong to elliptic, 4–10 (longer in saplings) by 3–7 cm, rounded to obtuse at apex, subcordate to rounded at base, somewhat revolute, coriaceous, glossy above, dull and conspicuously glandular-punctate beneath, pinnately nerved. Inflorescences terminal and in upper axils, paniculate, few- to several-flowered (up to 20), 2.5–6 cm long, broad, with axes and branches somewhat flattened between nodes. Flowers sessile; hypanthium campanulate, 13–18 mm by 8–12 mm, notched into broadly rounded calyx lobes 2–4 mm long; petals imbricate, suborbicular, 6–9 mm across, concave, white, fugacious singly; stamens ca. 300, the filament up to 20 mm long, showy white, the anther oblong, ca. 0.5 mm long; style ca. 18–24 mm long. Fruits ellipsoid to obovoid, 3–4 cm long including hypanthium exserted 2–4 mm or partially surrounded, the pericarp thin, dark purple and glossy at maturity.

DISTRIBUTION. Endemic to Samoa; in cloud forest on Savaii and Upolu, 900–1300 m alt.

PHENOLOGY. Flowering reported September–November, fruiting in May.

ADDITIONAL SPECIMENS EXAMINED. **Samoa.** SAVAII: above Letui, *Christophersen 792* (A, BISH, K); central region at 1200 m, *Reinecke 436* (G); above Asau, *Whistler 1766* (PTBG); below Mata-o-le-afi, *Whistler 2481* (PTBG); above Masamasa, *Whistler 4574a* (PTBG). UPOLU: rim of Mt. Fiamoe, *Whistler 1169* (B, PTBG).

14. **Syzygium savaiiense** (A. Gray) C. Mueller, Ann. Bot. Syst. **4:** 839. 1858.

Eugenia savaiiensis A. Gray, Bot. U. S. Expl. Exped., Phan. 530. 1854. TYPE: Samoa, Savaii?, without further locality, 1839, *U. S. Expl. Exped. s.n.* (lectotype, here designated, US *77359*!, *pro parte*; isolectotype, GH [fragment]!).

Syzygium tutuilense (A. Gray) C. Mueller, Ann. Bot. Syst. **4:** 839. 1858; Christoph. Bernice P. Bishop Mus. Bull. **154:** 26. 1938.

Eugenia tutuilensis A. Gray, Bot. U. S. Expl. Exped., Phan. 529. 1854. TYPE: Samoa, "Tutuila" (almost certainly Savaii or Upolu), without further locality, 1839, *U. S. Expl. Exped. s.n.* (lectotype, here designated, US *47782*!; isolectotype, GH!).

Eugenia richii sensu Reinecke, Bot. Jahrb. Syst. **25:** 659. 1898; Rech. Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl. **85:** 145. 1910; non A. Gray.

Tree up to 10 m tall. Stems terete. Leaves with petiole 3–12 mm long; blade oblong to elliptic, 8–24 by 4–9.5 cm, acute to acuminate at apex, acute at base, not revolute, coriaceous, glossy above, dull and obscurely glandular-punctate beneath, finely pinnate-nerved. Inflorescences terminal, paniculate, many flowered, 4–15 cm long, broad, with axes and branches flattened between nodes. Flowers sessile; hypanthium campanulate, 11–15 by 7–10 mm, shallowly notched into broadly rounded calyx lobes 1–2 mm long; petals confluent, calyptrate, white(?); stamens ca. 300, the filament up to 25 mm long, showy white, the anther oblong, ca. 0.5 mm long; style 18–30 mm long. Fruits ovoid to ellipsoid

or almost urceolate with distinct neck, 20–33 mm long, pericarp dark purple at maturity.

DISTRIBUTION. Endemic to Samoa; common in lowland to montane forest on Savaii and Upolu, 5–700 m alt.

PHENOLOGY. Flowering reported September–December, fruiting April–June.

NATIVE NAMES. Sometimes *asi* or *asi vai,* but these are not species specific (particularly the former, which is often used indiscriminately for several different species of the genus).

ADDITIONAL SPECIMENS EXAMINED. **Samoa.** SAVAII: near Salailua, *Christophersen 2483* (BISH); Salailua-Latatai, *Christophersen 2629* (A, BISH); near Taga, *Christophersen 2822* (BISH, K, UC, US); above Sili, *Christophersen 3232* (BISH), *3271* (BISH); near Patamea, *Rechinger 1180* (W); Puapua road, *Vaupel 595* (B); E of Asau, *Whistler 981* (B, BISH, PTBG); Puapua-Saumalaeulu, *Whistler 2195* (PTBG). UPOLU: above Lefaga, *Bristol 2457* (BISH), *2459* (BISH, GH, K, US); ridge above Malololelei, *Christophersen 165* (BISH); above Tafatafa, *Cox 366* (BISH, GH, UC); *sine loco, Graeffe 1559* (HBG, K); above Siumu, *Reinecke 203* (E, G, K, US, WRSL); near Utumapu, *Whistler 680* (PTBG); rim of Mt. Mariota, *Whistler 745* (B, G, PTBG), *816* (BISH, PTBG); rim of Mt. Taitoelau, *Whistler 1105* (PTBG); near coast at Saaga, *Whistler 1113* (PTBG); E rim of Lanotoo, *Whistler 1619* (B, BISH, PTBG); crater rim SE of Mt. Mariota, *Whistler 1899* (B, BISH, PTBG); Tanumalala, *Whistler 2034* (BISH, PTBG); E of Lake Lanotoo, *Whistler 3505* (PTBG); NW of Tonitoniga, *Whistler 3911* (PTBG); Mt. Fao, *Whistler 5710* (PTBG). WITHOUT FURTHER LOCALITY: *Whitmee 176* (K).

The type specimens of *Eugenia savaiiensis* and *E. tutuilensis* are conspecific. The former comprises an inflorescence of *E. savaiiensis* and a stem of *Antidesma sphaerocarpum* Muell.-Arg. (Euphorbiaceae) but is noted to have been collected on Savaii; the latter consists of fruits and stems but has the locality listed as "Tutuila," where the species is apparently not found. In order not to belie the distribution of this species, the type specimen of *E. savaiiense* was selected as the lectotype for this species.

15. **Syzygium oligadelphum** (Christoph.) Merr. & Perry, Sargentia **1:** 75. 1942.

Pareugenia oligadelphum Christoph. Bernice P. Bishop Mus. Bull. **154:** 20. 1938. TYPE: Samoa, Upolu, Maugatele Ridge above Saluafata, ca. 550 m alt., 1929, *Christophersen 523* (holotype, BISH!).

Tree up to 7 m tall. Stems terete. Leaves with petiole 3–12 mm long; blade elliptic to obovate, 5–10 by 2.5–4.5 cm, shortly acuminate to caudate at apex with narrow tip somewhat twisted, acute at base, slightly revolute, coriaceous, glossy above, lighter, dull, and finely glandular-punctate beneath, finely pinnate-nerved. Inflorescences terminal or in upper axils, paniculate, many flowered, 6–8 cm long, branches terete. Flowers with pedicel 1–2 mm long; hypanthium campanulate to cup shaped, 10–14 by 6–8 mm, shallowly notched into broadly rounded calyx lobes 1–2 mm long; petals confluent, calyptrate; stamens ca. 160, the filament up to 8 mm long, white, the anther oblong, 0.5–1 mm long; style ca. 6 mm long. Fruits subspherical to ovoid, ca. 17–23 mm long including hypanthium exserted 1–2 mm or partially surrounded, the pericarp thin, black and shiny at maturity.

DISTRIBUTION. Endemic to Samoa; in montane to cloud forest on Upolu and possibly Savaii, 400–550 m alt.

PHENOLOGY. Flowering and fruiting reported in September.

ADDITIONAL SPECIMENS EXAMINED. **Samoa.** UPOLU: above Utumapu, *Rechinger 1522* (W), *1691* (W); Togitogiga Farm, *Whistler 726* (B, BISH, PTBG).

The only flowering specimen of this species has immature flowers. In addition to the two cited specimens, three other sterile specimens collected above Utumapu, Upolu, and held at W may belong here: *Rechinger 1522* (cited by Rechinger as "*Apocynacea*"), *1543* (incorrectly identified as *Eugenia effusa* A. Gray), and *1691* (cited as *Eugenia* spec. I).

16. **Syzygium christophersenii** Whistler, sp. nov. FIGURE 3.

Syzygio oligadelpho affinis, a qua imprimis differt in foliis infra non conspicuo glandulosis punctatis.

Tall tree. Stems terete. Leaves with petiole 5–18 mm long; blade elliptic to ovate, 5.5–9 by 1.5–4 cm, acuminate to caudate at apex with twisted tip, acute to subcuneate at base, slightly revolute, coriaceous, dull above, lighter, dull, and not appearing glandular-punctate beneath, finely pinnate-nerved. Inflorescences terminal, paniculate, many flowered, 4–8 cm long, branches terete. Flowers subsessile; hypanthium campanulate, 7–11 by 7–9 mm, shallowly notched into broadly rounded calyx lobes 1–2 mm long; petals confluent, calyptrate, white; stamens ca. 275, the filament up to 16 mm long, showy white, the anther oblong, ca. 0.8 mm long; style up to 10 mm long. Fruits not known.

TYPE. Samoa, Savaii, above Asau at 450 m, 1974, *Whistler 1671* (holotype, PTBG!; isotypes, B!, BISH!).

DISTRIBUTION: Endemic to Samoa; in montane forest of Savaii, 450–600 m alt.

PHENOLOGY. Flowering reported in March.

ADDITIONAL SPECIMEN EXAMINED. **Samoa.** SAVAII: Siuvao-Auala, *Christophersen 3386* (BISH).

This endemic species from Savaii is superficially very similar to *Syzygium oligadelphum* (endemic to Upolu) but unlike that species lacks obvious glandular punctation on the lower leaf surfaces. The type is the only fertile specimen known, but *Christophersen 3386,* which is sterile, agrees with it vegetatively. Another sterile specimen, *Rechinger 1611* (W), collected at Maugaafi, Savaii, probably belongs here as well. *Whistler 574a,* comprising immature fruits found on the forest floor above Ologogo, Savaii, may belong to this species.

Syzygium christophersenii is named in honor of Erling Christophersen, whose excellent work on Samoan botany is still unequaled.

17. **Syzygium inophylloides** (A. Gray) C. Mueller, Ann. Bot. Syst. **4:** 838. 1858; Christoph. Bernice P. Bishop Mus. Bull. **154:** 24. 1938; Whistler, Allertonia **2:** 160. 1980.

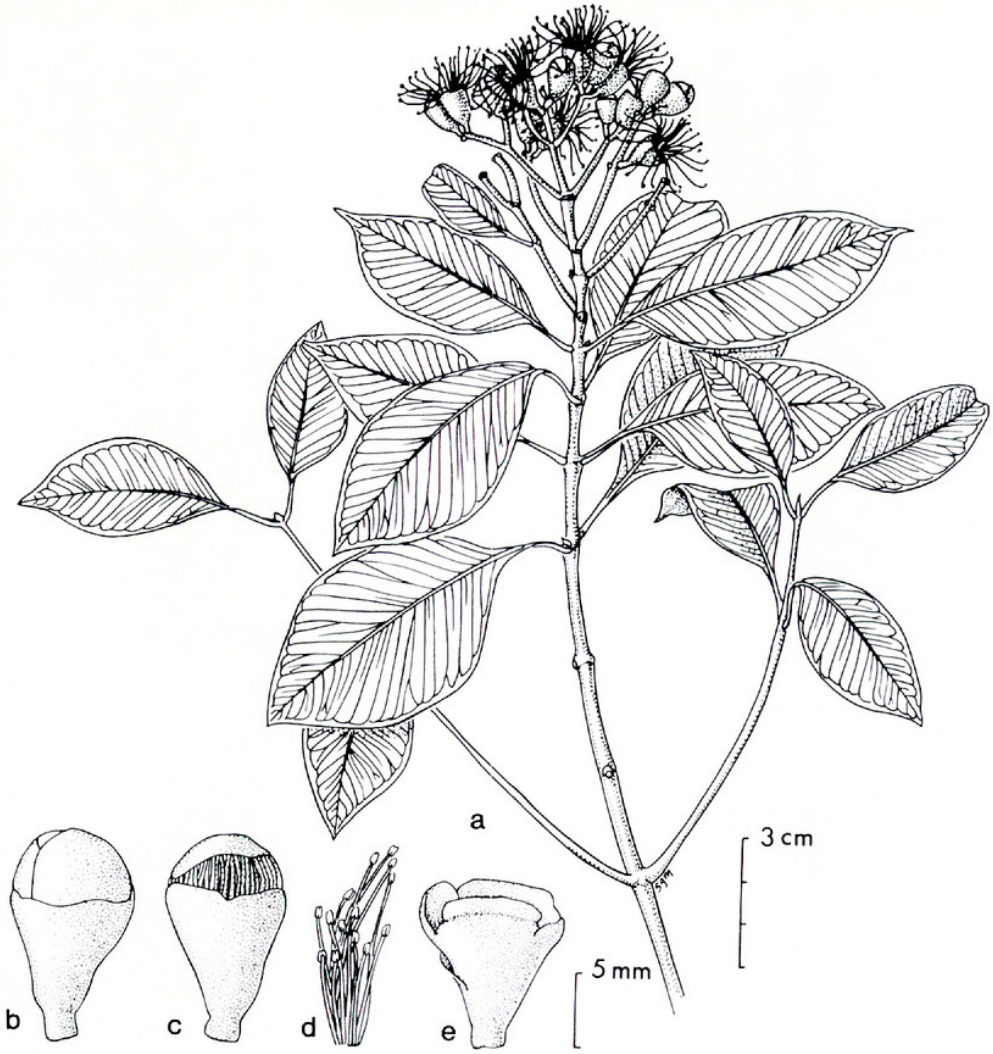

FIGURE 3. **Syzygium christophersenii:** a, vegetative and flowering branchlets; b, flower bud; c, flower at anthesis; d, stamens; e, flower after anthesis.

Eugenia inophylloides A. Gray, Bot. U. S. Expl. Exped., Phan. 521. 1854; Setch. Publ. Carnegie Inst. Wash. **341:** 65. 1924; Yuncker, Bernice P. Bishop Mus. Bull. **184:** 54. 1945. TYPE: Samoa, Tutuila, "common on a wooded ridge, at the elevation of 500 feet," 1839, *U. S. Expl. Exped. s.n.* (holotype, US *47776*!; isotypes, GH!, K!).

Eugenia amicorum sensu Rech. Denkschr. Kaiserl. Akad. Wiss. Math.-Naturwiss. Kl. **85:** 145. 1910, *pro parte*; non A. Gray.

?*Eugenia crosbyi* Burkill, J. Linn. Soc., Bot. **35:** 38. 1901. TYPE: Tonga, Vavau, 1891, *Crosby 61* (holotype, K!).

Tree up to 20 m or more tall. Stems terete. Leaves with petiole 3–10 mm long; blade usually elliptic (ovate to obovate), 2.5–8 (longer in saplings) by 1.5–4.5 cm, caudate at apex with narrow, blunt, somewhat twisted tip 3–12 mm long, acute to rounded at base, slightly revolute, coriaceous, glossy above, dull and usually obscurely glandular-punctate beneath, finely pinnate-nerved. Inflorescences terminal and in upper axils, paniculate, many flowered, 2.5–10 cm long. Flowers with pedicel usually less than 1 mm long; hypanthium narrowly campanulate, 5–7 mm by 2–3 mm, shallowly notched into broadly triangular

calyx lobes ca. 0.5 mm long; petals confluent, calyptrate, white; stamens ca. 80–120, the filament up to 7 mm long, white and showy, the anther oblong, ca. 0.5 mm long; style 5–7 mm long. Fruits obovoid to ellipsoid, 2.5–4 cm long, including hypanthium exserted 0.5–1.5 mm, the pericarp thin, yellowish when mature, longitudinally many-ribbed when dry.

DISTRIBUTION. Indigenous to Samoa; common in lowland to montane forest on all main islands, 10–750 m alt. Also indigenous to Alofi (Horne Islands), Tonga, and Niue.

PHENOLOGY. Flowering reported August–December, fruiting February–September so perhaps year-round.

NATIVE NAMES AND USES. Commonly *asi* (on Alofi, as well as in Samoa), which can refer to other species of the genus. It is also called *asi toa, asi vao,* and possibly *asi malo* to distinguish it from most or all of the other species known as *asi.* The tree is one of the major commercial timber trees of Samoa (Whistler, 1984) and is used locally in construction and for house posts.

ADDITIONAL SPECIMENS EXAMINED. **Samoa.** SAVAII: above Vaipouli, *Christophersen 1909* (BISH); near Matavanu, *Christophersen 1956* (A, BISH, M, US); Olo, *Christophersen 2292* (A, BISH, W); above Sili, *Christophersen 3225* (BISH); Siuvao-Auala, *Christophersen 3362* (BISH); Papa-Fagatele, *Christophersen 3408* (BISH, K, UC, US); Tapueleele, *Christophersen 3463* (BISH); Auala, *Fasavalu 23* (BISH); Aopo, *Fasavalu 34* (BISH); Aopo-Asau lava flow, *Rechinger 66* (W); above Vaipouli, *Rechinger 4490* (W); above Ologogo, *Vaupel 428* (B, BISH, K, PTBG, US, W, WRSL), *428a* (B); Puapua bush, *Vaupel 594* (B); above Ologogo, *Whistler 519* (BISH, PTBG), *588* (PTBG); above Asau, *Whistler 980* (B, BISH, G, PTBG); NW of Aopo, *Whistler 1712* (B, BISH, K, PTBG). UPOLU: Togitogiga, *Fasavalu 7* (BISH); *sine loco, Funk 208* (WRSL), *Graeffe 36* (HBG); above Luatuanuu, *Whistler 1540* (B, BISH, K, PTBG), *1611* (B, BISH, PTBG). TUTUILA: *sine loco, Bayliss s.n.* (BISH); ridge W of Pago Pago, *Christophersen 1255* (A, BISH, K, US); Pago Pago Harbor, *Diefenderfer 14* (BISH); trail down to Vatia, *Setchell 337* (BISH, UC); above Pago Pago, *Setchell 570* (UC); W of Aoloaufou, *Whistler 2802* (B, BISH, G, K, PTBG); *sine loco, Wilder 93* (BISH). OLOSEGA: Alei Ridge, *Whistler 3493* (PTBG). TAU: Amouli trail, *Garber 637* (A, BISH, K). WITHOUT FURTHER LOCALITY: *Powell 313* (K); *Whitmee 27, pro parte* (K), *50* (K), *212* (K), *s.n., pro parte* (GH), *s.n.* (BM).

Christophersen 2901 (BISH), collected above Salailua, Savaii, is a sterile sapling with long-attenuate leaves and probably belongs here.

The type of *Eugenia crosbyi* Burkill was examined and appears to be conspecific with *Syzygium inophylloides.* It lacks fruits, as does the only other specimen I have seen, *Whistler 6006,* also collected on Vavau, and consequently the reduction to synonymy of *E. crosbyi* is considered to be tentative.

18. **Syzygium curvistylum** (Gillespie) Merr. & Perry, Sargentia **1:** 75. 1942; A. C. Smith, Fl. Viti. Nova **3:** 337. 1985.

Eugenia curvistyla Gillespie, Bernice P. Bishop Mus. Bull. **83:** 21. 1931. TYPE: Fiji, Viti Levu, Mba Province, near Vatuthere, 1927, *Gillespie 4269* (holotype, BISH!; isotypes, BISH!, US).

Tree at least 7 m tall. Stems terete. Leaves with petiole 2–8 mm long; blade lanceolate to elliptic, 4–12 by 1.5–5.5 cm, acuminate (rarely acute) at apex,

acute at base, not revolute, coriaceous, glossy above, lighter, duller, and conspicuously glandular-punctate beneath, finely pinnate-nerved. Inflorescences terminal or rarely axillary, paniculate, several flowered, up to 6 cm long. Flowers with pedicel 1–3 mm long; hypanthium campanulate, 4–6 by 3–4 mm, notched into rounded calyx lobes up to 1.5 mm long; petals confluent, calyptrate; stamens ca. 108, the filament ca. 10 mm long, white, the anther subglobose, ca. 0.5 mm long; style ca. 8 mm long, persistent in fruit. Fruits subspherical, ca. 6 mm long including persistent sepals, pericarp purple at maturity.

DISTRIBUTION. Indigenous to Samoa; uncommon in foothill to cloud forest on Savaii and Upolu, 200–900 m alt. Also found in Fiji.

PHENOLOGY. Flowering reported in June, fruiting in December, both possibly year-round.

ADDITIONAL SPECIMENS EXAMINED. **Samoa.** SAVAII: far above Aopo, *Bristol 2139* (BISH, GH, US). UPOLU: swamp near Tiavi, *Christophersen 171* (BISH); rim of Mt. Fiamoe, *Whistler 2010* (BISH, PTBG); above Saagafou, *Whistler 3921* (PTBG). WITHOUT FURTHER LOCALITY: *Powell 336* (K).

19. **Syzygium carolinense** (Koidz.) Hosok. J. Jap. Bot. **16:** 542. 1940; Whistler, Allertonia **2:** 160. 1980.

Eugenia carolinensis Koidz. Bot. Mag. Tokyo **30:** 402. 1916. TYPE: Ponape, without further locality, 1915, *Koidzumi s.n.* (holotype, TI).
Eugenia ponapensis Merr. ex Kaneh. Trans. Nat. Hist. Soc. Taiwan **6:** 43. 1916.
Syzygium ponapense (Merr.) Diels, Bot. Jahrb. Syst. **56:** 533. 1921; Christoph. Bernice P. Bishop Mus. Bull. **154:** 25. 1938.
Eugenia rubescens sensu Reinecke, Bot. Jahrb. Syst. **25:** 659. 1898; sensu Rech. Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl. **85:** 145. 1910; non A. Gray.
Eugenia richii sensu Yuncker, Bernice P. Bishop Mus. Bull. **185:** 54. 1945; non A. Gray.

Tree up to 10 m tall. Stems terete. Leaves with petiole 3–12 mm long; blade elliptic, 6–20 by 2.5–8.5 cm, acute to acuminate and sometimes twisted at apex, obtuse to acute at base, slightly revolute, coriaceous, dark green and glossy above, lighter and obscurely glandular-punctate beneath, coarsely nerved, intramarginal collecting nerve formed from looping distal ends of primary veins. Inflorescences terminal and in upper axils, paniculate, many flowered, 8–20 cm long, widely branching. Flowers sessile; hypanthium cup shaped to turbinate, 2.5–4 by 2–3 mm including distinct stipe, subentire, lacking distinct calyx lobes; petals confluent, calyptrate, pale green; stamens ca. 100, the filament up to 6 mm long, white, the anther oval, ca. 0.3 mm long; style 2.5–4 mm long. Fruits ellipsoid, 15–25 mm long including exserted necklike hypanthium, sometimes somewhat curved, pericarp red to purple at maturity.

DISTRIBUTION. Indigenous to Samoa; in lowland to cloud forest on all main islands, 100–750 m alt. Also found on Ponape.

PHENOLOGY. Flowering reported June–July and November–January, fruiting March–September so perhaps year-round.

SPECIMENS EXAMINED. **Samoa.** SAVAII: far above Aopo, *Bristol 2163* (BISH); above Gataivai, *Bristol 2251* (BISH); near Matavanu, *Christophersen 1953* (A, BISH, K, UC, US, W); Olo, above Safotu, *Christophersen 2265* (A, BISH, K, US); Salailua, *Christophersen 2614* (BISH); behind Safai, *Vaupel 290* (B, BISH, K, US, WRSL); *sine loco, Vaupel 646* (B, BISH, PTBG). UPOLU: Savaia above Lefaga, *Bristol 2074* (BISH, GH), *2112* (BISH, GH, K, US); Matautu (Lefaga), *Bristol 2475* (BISH, GH, US); ridge to Mt. Vaitou, *Christophersen 272* (BISH); near Lanotoo, *Rechinger 1817* (BM); Lanotoo, *Reinecke 336* (E, G, US, WRSL); E of Lanotoo, *Whistler 2018* (B, BISH, PTBG); ridge W of Lemafa Farm, *Whistler 5138* (PTBG, US); Apia (cult.), *Wilder 415* (A, BISH). TUTUILA: Alava Ridge, *Spence 472* (BISH), *Whistler 2773* (PTBG), *3651* (BISH, PTBG); Aoloaufou, *Whistler 2780* (BISH, G, PTBG), *2796a* (BISH, PTBG); ridge N of Matafao, *Whistler 3543* (BISH, K, PTBG); Aua–Afono trail, *Yuncker 9428* (A, BISH, K). OLOSEGA: top of Piumafua, *Garber 1028* (BISH); Olosegauta-Piumafua Ridge, *Garber 1030* (A, BISH). WITHOUT FURTHER LOCALITY: *Powell 349* (K).

Four specimens (near Lanotoo, *Rechinger 156, 1818, 1850*; near Patamea, *Rechinger 1134*) that probably belong here could not be located. They should be at Vienna but were not found during my visit there in 1974.

20. **Syzygium corynocarpum** (A. Gray) C. Mueller, Ann. Bot. Syst. **4:** 839. 1858; Christoph. Bernice P. Bishop Mus. Bull. **154:** 23. 1938.

Eugenia corynocarpa A. Gray, Bot. U. S. Expl. Exped., Phan. 526. 1854, U. S. Expl. Exped., Atlas Phan. *pl. 64.* 1856; Reinecke, Bot. Jahrb. Syst. **25:** 659. 1898; Setch. Publ. Carnegie Inst. Wash. **341:** 65. 1924; Yuncker, Bernice P. Bishop Mus. Bull. **184:** 54. 1945. TYPE: Samoa or Fiji, without further locality, 1839 or 1840, *U. S. Expl. Exped. s.n.* (holotype, US *62251*!; isotypes, GH!, K!).

Eugenia amicorum sensu Reinecke, Bot. Jahrb. Syst. **25:** 659. 1898; Rech. Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl. **85:** 145. 1910; non A. Gray.

Tree up to 5 m tall. Stems terete. Leaves with petiole 2–9 mm long; blade lanceolate, elliptic, or oblanceolate, 7.5–13 by 2.5–4.5 cm, acute to acuminate at apex, acute to cuneate at base, not revolute, chartaceous, dark green above, light green and conspicuously glandular-punctate beneath, coarsely nerved, intramarginal collecting nerve composed of looping distal ends of primary nerves. Inflorescences terminal, paniculate, many flowered, 8–16 cm long, widely branching, primary branches perpendicular to rachis. Flowers sessile; hypanthium turbinate, 5–8 by 2–3 mm, entire or shallowly notched into broadly triangular calyx lobes ca. 0.5 mm long; petals confluent, calyptrate, white; stamens ca. 110, the filament up to 5 mm long, white, the anther ovoid to oblong, ca. 0.5 mm long; style 3–6 mm long, persistent on fruit. Fruits fusiform to cylindrical, 2.5–3.5 cm long including necklike hypanthium 4–6 mm in length, the pericarp fibrous inside, fleshy, red, fragrant at maturity.

DISTRIBUTION. Aboriginally introduced to Samoa; uncommon on all main islands in plantations and secondary forest, occasionally cultivated; 25–425 m alt. Probably native to Fiji, aboriginally introduced throughout western Polynesia (Tonga, Uvea, Futuna, and Niue).

PHENOLOGY. Flowering reported in September and November, fruiting in December.

LOCAL NAMES AND USES. *Seasea* (same name used on Futuna; a cognate of *hehea,* its Tongan name). The ripe fruits are suspended with string to form a

fragrant necklace, a use also reported from Fiji (Smith, 1985) and Futuna (St. John & Smith, 1971).

ADDITIONAL SPECIMENS EXAMINED. **Samoa.** SAVAII: behind Safune, *Christophersen 2392* (BISH); Matautu, *Reinecke 396* (BISH, E, G); Vaipouli, *Reinecke 397* (E, G); Safai, *Vaupel 257* (B, BISH, K, US, WRSL). UPOLU: near Vailele, *Christophersen 355* (A, BISH); Sauago, *Christophersen 546* (BISH, US); Vailima, *Eames 82* (BISH); *sine loco, Graeffe 11a* (HBG), *31* (HBG), *558* (HBG); above Moamoa, *Rechinger 38* (W); above Utumapu, *Rechinger 929* (W); Mt. Vaea, *Rechinger 1358* (W); Papaseea Waterfall, *Rechinger 1856* (BM, US, W); "Le Pua," *Reinecke 629* (E, G, WRSL); Faatoia (Apia), *Whistler 2064* (PTBG); Mt. Vaea, *Whistler 4002* (BISH, PTBG). TUTUILA: Aua–Afono trail, *Garber 837* (BISH); *sine loco, Graeffe 274* (HBG); Pago Pago, *Meebold 26574* (BISH); behind Pago Pago, *Setchell 364* (UC); *sine loco, Setchell 451* (UC), *452* (UC). OLOSEGA: SE side of island, *Kuruc 88* (BISH); behind Olosega Village, *Whistler 3828* (PTBG). TAU: plateau behind Luma, *Garber 652* (BISH, K, UC), *658* (A, BISH, UC). WITHOUT FURTHER LOCALITY: *Powell 201* (K), *s.n.* (K); *Reinecke s.n.* (K); *Whitmee 41* (MEL).

Some of the material collected by the U. S. Exploring Expedition has Tahiti given as the locality, but this is almost certainly in error because the natural range of the genus in Polynesia does not extend east of Niue (except for Hawaii). Errors in labeling the specimens from the Expedition are not infrequent.

Two specimens collected on Savaii (Lealatele, *Reinecke 391*; Matautu, *Reinecke 402*) could not be located. These were probably unicates that were destroyed in Berlin during World War II.

ADDITIONAL SPECIES

Two other species of *Syzygium* have been collected in Samoa. *Syzygium cumini* (L.) Skeels, from the government research station at Nafanua, Apia, is represented by *Whistler 2112* (BISH, PTBG) and *2120* (BISH, PTBG). An unidentified species collected in Apia is represented by *Whistler 2065* (PTBG). It has sessile leaves and small, campanulate, edible fruits and was reportedly introduced from Papua New Guinea.

ACKNOWLEDGMENTS

I am greatly indebted to the faculty and staff of the herbaria that I visited and from which I borrowed specimens during the course of my work. I also wish to thank Sue Nakamura for her excellent drawings of the new species.

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