

MATERIALS TOWARD A MONOGRAPH OF THE GENUS VITEX. X

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VITEX SECUNDIFLORA H. Hallier

Stamens exerted about 4 mm. from the corolla-mouth; filaments villous at the base; style about 1 cm. long; stigma shortly bifid; ovary glabrous; fruiting-calyx enlarged, to 3 mm. long and 5 mm. wide; fruit drupaceous, about 4 mm. long (possibly not ripe).

The type of this species was collected by Pieter Willem Korthals at Gunung Pamatton, in southeastern Borneo. A common name is "halaban tandoek". Hallier refers to the scales on the calyx and corolla as glands. It has been collected at 100 meters altitude.

Citations: BORNEO: Dachlan 37 [Z. O. B. 3513; Boschproefst. BB.10715] (Bz--25143, Bz--25144); Endert 2617 (Bz--72387); Obi 98 [Z. O. B. 3444; Boschproefst. BB.10530] (Bz--25142, Bz--25669, Er, N, Ut--93575), 100 [Z. O. B. 3446; Boschproefst. BB.10582] (Bz--25140, Bz--25141, Bz--25670, N--photo, Z--photo); Verhoef I/2 [Boschproefst. BB.13038] (Bz--25138, Bz--25139).

VITEX SEINERI Gürke ex Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 47, 60, & 84. 1928; Fedde, Repert. 26: 164. 1929.

Literature: Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 47, 60, & 84. 1928; Pieper in Fedde, Repert. 26: 164. 1929; Hill, Ind. Kew. Suppl. 8: 249. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 51 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 82. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 119 & 202. 1949.

Shrub; branches obtusely angular, pubescent; leaves often ternate, 5- or 7-foliolate; petioles 10 cm. long, cinereous-pubescent; petiolules about 1 cm. long; leaflet-blades chartaceous, obovate-cuneate, short-apiculate at the apex, scabrous above, incanous-hirtous beneath, many-nerved, the central one about 10 cm. long and 4 cm. wide; inflorescence axillary, contracted, few-flowered, shorter than the subtending petiole, incanous-pubescent; peduncles 4--6 cm. long; cymes about 1.5 cm. long and 3 cm. wide; bracts to 1 cm. long, linear-lanceolate; bractlets linear, about 4 mm. long; calyx campanulate, sericeous-pilose on the outside, its rim deeply split into 5 equal teeth; immature corolla subcurvate, glandulose outside on the upper part, the lobes incanous-pilose; ovary globose, sparsely glandulose at the apex; fruiting-calyx and fruit not known.

The type of this species was collected by Franz Seiner (no. 123) -- in whose honor it is named -- at Livingstone, Northern Rhodesia, and is deposited in the herbarium of the Botanisches Museum at Berlin. It is known thus far only from the original collection.

VITEX SELLOWIANA Cham., Linnaea 7: 108--109. 1832.

Synonymy: Vitex sellowiana var. grandiflora Schau. in Mart., Fl. Bras. 9: 299. 1851.

Literature: Cham., Linnaea 7: 108--109. 1832; Schau. in A. DC., Prodr. 11: 689. 1847; Schau. in Mart., Fl. Bras. 9: 298--299. 1851; Navarro de Andrade & Vecchi, Bois Indig. São Paulo 280. 1916; Moldenke, Alph. List Common Names 21 & 29. 1939; Moldenke, Geogr. Distrib. Avicenn. 27 & 40. 1939; Moldenke, Prelim. Alph. List Invalid Names 52. 1940; Worsdell, Ind. Lond. Suppl. 2: 501. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39, 75, & 104. 1942; Moldenke, Alph. List Invalid Names 55. 1942; Moldenke, Phytologia 2: 122. 1944; H. N. & A. L. Moldenke, Pl. Life 2: 82. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95, 166, & 202. 1949.

Illustrations: Navarro de Andrade & Vecchi, Bois Indig. São Paulo 280. 1916.

Small shrub or tree, to 6 m. tall; branchlets rather stoutish and irregular, gray, obtusely tetragonal, minutely puberulent, soon becoming glabrous, flattened and ampliate at the nodes, woody; twigs slender, brown, tetragonal, usually decidedly compressed and flattened, densely puberulent with brownish hairs, becoming more sparsely so in age; nodes mostly flattened and ampliate on older wood, not annulate; principal internodes 0.5--5 cm. long, usually abbreviated; leaf-scars very large and extremely corky, very conspicuously elevated; leaves decussate-opposite, 5-7-foliolate; petioles slender, 2.5--7.5 cm. long, convex beneath, flattened above, densely short-pubescent or puberulent with brown or brownish hairs, slightly ampliate at the base, somewhat club-shaped at the apex; leaflets mostly quite unequal in size, the lowermost ones much smaller than the central ones, all petiolulate on densely short-pubescent canaliculate and very slender petiolules 1--10 mm. long, the petiolules on the lowermost leaflets usually much shorter than those of the central ones or even obsolete; leaflet-blades chartaceous, becoming rather firm when mature, dark-green above, much lighter beneath, the central one oblong or narrow-elliptic to lanceolate or oblanceolate, 4--10.5 cm. long, 1.4--4.5 cm. wide, acute or short-acuminate at the apex, entire, acute or acuminate at the base, often somewhat attenuate into the petiolules, very minutely and obscurely pulverulent-puberulent above when young, soon becoming glabrous, densely short-pubescent beneath, the lateral ones similar in all respects but smaller and shorter-stipitate and usually less acuminate (or even obtuse) at the apex; midrib slender, impressed above, sharply prominent beneath; secondaries slender, 9--15 per side, arcuate-ascending, flat or subimpressed above, prominulent beneath, arcuately joined at the margins beneath; vein and veinlet reticulation abundant, very fine, subprominulent above, usually obscured by the pubescence beneath or the largest portions prominulent; inflorescence axillary, cymose, capitate or subumbelloid, 7--9 cm. long, 1.5--5 cm. wide, sometimes 2-branched and each branch subcapitate or umbelloid, densely many-flowered, canescent- or cinereous-short-pubescent or -puberulent throughout; peduncles slen-

der, 5--6 cm. long, mostly flattened, brown, puberulent or short-pubescent; pedicels mostly obsolete, rarely to 1 mm. long and densely canescent; bracts none; bractlets and prophylla linear, 1--3 mm. long, canescent, or rarely the bractlets oblong or lanceolate and to 12 mm. long and 2 mm. wide; flowers subsessile; calyx short-cyathiform, 2--3 mm. long, about 2 mm. wide, puberulent or short-pubescent with appressed antrorse hairs, subbilabiate, the teeth short and exiguous, acute, the 3 upper ones slightly larger, the 2 lower ones smaller; corolla hypocrateriform, varying from pale-blue to violet or red, the tube slightly ampliate at the apex, 5--6 mm. long, densely pubescent on the outer surface, often glandular, the limb about as long as the tube, pulverulent-pubescent, the upper lip erect, obtusely 2-lobed, the lower lip 3-lobed, the middle lobe elongate, rounded, undulate along the margins and at the base, conspicuously bearded, the lateral ones oblong, obtuse, spreading; stamens bearded at the base, shortly exserted from the corolla-tube; anthers blue, nodding, the thecae divergent at the base; style filiform, as long as the stamens, glabrous; stigma shortly bifid; ovary glabrous; fruit drupaceous, obovoid-globose, about as large as a small cherry (Prunus avium).

This species was based by Chamisso on an unspecified Sellow collection which is apparently his no. 1437 from Villa Rica, Rio Grande do Sul, Brazil, and is deposited in the herbarium of the Botanisches Museum at Berlin. The unnumbered Sellow specimens in other herbaria are probably part of this same collection. The species inhabits woods, thickets, and mountaintops, ascending to 1600 meters altitude. It has been collected in anthesis in April and from August to November, and in fruit in January. Common names are "Maria preta" and "taruman". Glaziou also records the names "ipé branco" and "maminha de cadella" for this species, but if these names apply to the collections he cites then they refer to V. mexiae Moldenke and V. schaueriana Moldenke.

Schauer also cites two Riedel collections from near Santa Lucia and from near Sabara [both localities in Minas Gerais] and two Martius collections from Villa de Campanha [Minas Gerais] and from near Tacasava [Rio de Janeiro] -- the first two are probably in the Leningrad herbarium and the two latter are at Munich. I have not seen the former, but the latter are cited by me under V. mexiae. The Vitex sellowiana var. parviflora Schau. and the V. brasiliensis Mart., cited by Schauer, are now regarded as being V. mexiae.

The McFadyen collection cited below as having been cultivated on Jamaica does not actually bear any indication on its label that it represents cultivated material. However, it seems obvious that it must have originated from cultivated material. It was misidentified as V. umbrosa Sw.

Citations: BRAZIL: Minas Gerais: Ackermann s.n. [Catingas] (Br); Barbosa s.n. (Ja--5891); P. Clausen 10 (Cb, Cb, Dc--889, F--876860), 53 (Bm), 379 (B, Bm, Cb, Cb, G, V, X), 436 (Bm), 1459 (P, P, P), s.n. [August--April 1840] (B, Bm, Br, Br, Br, Br, Br, F--

600402, K, N); Gaudichaud s.n. [Herb. Imp. Brésil. 40] (P); Mello Barreto 3271 [Herb. Jard. Bot. Belo Horiz. 4731 & 4732] (F--933057, N), 8114 [Herb. Jard. Bot. Belo Horiz. 23293] (F--933060); Mendes Magalhães 1384 [Herb. Jard. Bot. Belo Horiz. 40083] (N); Saint-Hilaire B'. 783 (P, P); Schwacke 7496 (B), 8701 (B), 9597 (Cb), 12646 (Cb); Warming s.n. [Lagoa Santa] (Cp, V), s.n. [Serra da Piedade] (Bm). Rio de Janeiro: Campos Porto s.n. [Itatiaia; Herb. Rio de Janeiro 22585] (B, N--photo, S, Ut, Z--photo); Luetzelburg 6945 (Mu). São Paulo: F. C. Hoehne s.n. (Sp--3047). Rio Grande do Sul: Sellow 1437 [Macbride photos 17567] (B--isotype, B--isotype, F--663046--photo of type, Kr--photo of type, N--photo of type), s.n. [Villa Rica] (Bm--isotype, K--isotype, P--isotype, Vt--isotype). State undetermined: Collector undesignated s.n. (Bm); Herb. Rio de Janeiro 5981 (Ja); Hort. Douville s.n. (Cb); Schüch s.n. (E--photo, N, N--photo, V, V, Z--photo); Sellow 1264 [Canara] (B). CULTIVATED: Jamaica: McFadyen s.n. [Herb. Hance 9325] (Bm).

VITEX SERETI DeWild., Fl. Bas- & Moyen-Congo 3: 130--131. 1909.

Literature: DeWild., Fl. Bas- & Moyen-Congo 3: 130--131. 1909; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 45, 59, & 84. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 49 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 83. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 115 & 202. 1949.

Tree, 10--15 m. tall; branches more or less tomentose with dense yellow-ferruginous hairs; leaves 5-foliolate; petioles 8--12.5 cm. long, tomentose with brown-ferruginous hairs; petiolules about 5 mm. long, densely ferruginous-tomentose; leaflet-blades obovate-oblong, 6.5--14 cm. long, 2.5--6 cm. wide, more or less abruptly acuminate at the apex, entire, long-cuneate at the base, sparsely pilose beneath; secondaries 6--10 per side, prominulous beneath; inflorescence axillary, opposite, about 12 cm. long, lax; peduncles velutinous; pedicels 2--4 mm. long, bracteolate; calyx 2.5--4 mm. long, tomentose, its teeth triangular-acute; corolla whitish, short-tubular, the tube about 5 mm. long or twice as long as the calyx, pubescent on the outside, the anterior lobe blue.

The type of this species was collected by Féçox Seret (no. 847 -- in whose honor it is named -- at Nala, Belgian Congo, in March, 1907. It is known thus far only from the original collection.

VITEX SIAMICA F. N. Will., Bull. Herb. Boiss., sér. 2, 5: 431. 1905.

Literature: F. N. Will., Bull. Herb. Boiss., sér. 2, 5: 431. 1905; King & Gamble, Journ. Asiat. Soc. Beng. 74: 847. 1909; H. J. Lam, Verbenac. Malay. Arch. 167, 197--198, & 370. 1919; H. J. Lam, Bull. Jard. Bot. Buitenz., sér. 3, 5: 178. 1922; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 60, 61, & 104. (1942) and [ed. 2], 138, 139, & 202. 1949.

Tree, to 13 m. tall; branchlets glabrous; leaves 1--3-foliate; petioles 2.5--5 cm. long, glabrous; leaflet-blades coriaceous, ovate or ovate-lanceolate, acuminate or blunt at the apex, entire, rounded or cuneate at the base, glabrous, the central one 6--12.5 cm. long and 1.8--4.3 cm. wide, on petiolules about 1.2 cm. long, the lateral ones sometimes slightly asymmetric, usually about 1/3 smaller, on petiolules about 1.2 cm. long; secondaries 12--24 per side, only slightly curving toward the margins; inflorescence paniculate, terminal, with sometimes additional branches arising from the axils of the upper leaves, to 30 cm. long, many-flowered, minutely puberulous; bracts many, persistent, linear-lanceolate, 0.6--1.8 cm. long; bractlets 2 on each pedicel; pedicels slender or sometimes obsolete; flowers small; calyx campanulate, pubescent and glandulose outside, the tube about 1.2 mm. long, its rim 5-toothed, the teeth about 0.5 mm. long, acute; corolla blue or white, with the base of the tube mauve and the throat yellowish, the tube about 2.5 mm. long, pubescent on both surfaces except at the base, and with many yellow glands, the upper lip with 2 short obtuse lobes, the lower lip 3-lobed, the middle lobe longer than the lateral ones and villous on the inner surface; stamens included or nearly so; filaments thickened, villous; style rather thick, as long as the stamens; stigma shortly bifid; ovary depressed, sparsely glandulose; fruiting-calyx much enlarged, cupuliform; fruit drupaceous, globose, about 3.5 mm. in diameter, glandulose, obscurely 4-lobed.

The type of this species was collected by Charles Curtis (no. 1633) at Teruto in 1888 and at Coah in 1892, in the Langkawi Archipelago of Malaya. The species inhabits open limestone hilltops and is said by Henderson to be a common tree on limestone. It has been collected at altitudes of 100 to 1600 feet, flowering in August. A common name is "lankawi". Its inflorescence reminds one greatly of that seen in the genus Garrettia Fletcher. The Holttum 15095 collection cited below shows leaves that are 1- and 2-foliate.

Citations: MALAYA: Kedah: Walter Fox 12720 (Bz--25151); Haniff & Nur 7079 (Bz--25152); Holttum 15095 (Bz--25150). Kelantan: M. R. Henderson 29696 (Bz--25147). Langkawi Islands: M. R. Henderson 21385 (Bz--25143). Pahang: M. R. Henderson 22269 (N), 22464 (N), 25053 (N). Rabana: M. R. Henderson 23094 (Bz--25149). State undetermined: Kiah 35309 [Kaki Bukit] (Bz--25145).

VITEX SIMPLICIFOLIA Oliv., Trans. Linn. Soc. Lond. Bot. 29: 133, pl. 130. 1875 [not V. simplicifolia C. B. Clarke, 1885].

Synonymy: Vitex diversifolia J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 323. 1900 [not V. diversifolia Kurz, 1870]. Vitex schweinfurthii J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 322. 1900 [not V. schweinfurthii Gürke, 1894]. Vitex bakeri B. L. Robinson, Proc. Amer. Acad. 51: 531. 1916.

Literature: Kurz, Rep. Veget. Andaman Isls. App. A.45 [& B. 14]. 1870; Oliv., Trans. Linn. Soc. Lond. Bot. 29: 133, pl. 130.

1875; C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 586. 1885; Gürke in Engl., Bot. Jahrb. 18: 170. 1893; J. G. Baker in Thiselet.-Dyer, Fl. Trop. Afr. 5: 320, 322, & 323. 1900; B. L. Robinson, Proc. Amer. Acad. 51: 531. 1916; A. Chev., Expl. Bot. Afr. Occid. Franç. 1: 506. 1920; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 49, 64--65, 81, 82, & 84. 1928; Stapf, Ind. Lond. 6: 479. 1931; Moldenke, Alph. List Common Names 25. 1939; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 45, 47--49, & 104. 1942; Moldenke, Alph. List Invalid Names 52, 53, & 55. 1942; Moldenke, Phytologia 2: 122. 1944; H. N. & A. L. Moldenke, Pl. Life 2: 82. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 109, 110, 112--114, 116, & 202. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 15. 1949.

Illustrations: Oliv., Trans. Linn. Soc. Lond. Bot. 29: pl. 130. 1875; Lely, Useful Trees N. Nigeria 116. 1925.

Small tree; branchlets stout or rather stoutish, woody, obtusely tetragonal or subterete, densely short-pubescent on the youngest parts with white or drab-colored hairs, becoming glabrate (especially on the internodes) in age, gray or buff; nodes somewhat enlarged, usually annulate; principal internodes 3.5--10 cm. long; leaves decussate-opposite, subopposite, or ternate, 1--3-foliolate; petioles rather stout, 5.5--7.5 cm. long, more or less densely puberulent or glabrous, amplexate at the base, not noticeably jointed; leaflet-blades subcoriaceous, rather uniformly yellow-green or dark-green on both surfaces, shiny above, oblong or broadly elliptic, varying to obovate-cuneate or (on 1-foliolate leaves) suborbicular, from 1 1/2 to 2 times as long as wide, 8--16 cm. long, 7.7--11.5 cm. wide, varying from obtuse or abruptly short-acuminate to short-cuspidate or mucronate at the apex, irregularly sinuate-dentate or repand or even entire along the margins, obtuse or rounded at the base, often deeply divided on one side at the base into a small secondary leaflet, obscurely pubescent or glabrous above when mature, densely pubescent or puberulent with brownish hairs beneath, often matted-pubescent when young, less so when mature, the central one (on 3-foliolate leaves) short-petiolulate; midrib stout, wide and flat above, rounded-prominent and nigrescent in drying beneath; secondaries slender, 8--11 per side, flat above, prominent beneath, arcuate-ascending, arcuately joined in many loops at the margins; tertiaries very slender, mostly obscure or indiscernible above, prominulent beneath; vein and veinlet reticulation abundant, obscure or indiscernible above, prominulent beneath; inflorescence axillary, long-pedunculate, apparently only one cyme per node even on ternate-leaved specimens, 6.5--12 cm. long, lax, few-flowered, the branches densely pubescent or villous; pedicels very short; bractlets large, linear; calyx campanulate, about 3 mm. long, densely pubescent or villous, its rim 5-toothed, the teeth minute, distinct, ovate; corolla small, very hairy or villous on the outside; fruiting-calyx patelliform, 8--15 mm. wide, minutely puberulent, its rim obscurely toothed or irregularly scalloped; fruit oblong or oblong-elliptic, or even glob-

ose, about 2 cm. long and 1.5 cm. wide, fleshy, not apiculate.

The species is based on Speke & Grant 701/5, collected by D. K. S. Grant at Madi, Uganda, on his expedition to the sources of the Nile. V. schweinfurthii J. G. Baker is based on Schweinfurth 1303 from the Lao district, Dinka Territory, 1519 from Bongo, Bahr-el-Ghazal, Anglo-Egyptian Sudan, and 1953 from Djur [Jur], Seriba-Ghattas. V. diversifolia J. G. Baker is based on Barter 1096 from Lagos, Southern Nigeria, and 1644 from Nupe, Northern Nigeria. The V. schweinfurthii Gürke is a synonym of V. madiensis var. schweinfurthii (Gürke) Pieper, while V. simplicifolia C. B. Clarke is a synonym of Teijsmanniodendron hollrungii (Warb.) Kosterm.

Pieper also cites Chevalier 7535 from Ndellé, Ubangi-chari, French Equatorial Africa, and Chevalier 2767 from Sansanding, French Soudan, French West Africa, Döring 217, Kersting 36a and 555, and Schroeder 13 from Togo, and Ledermann 2911, 3273, 4070, and 4648 from Cameroons. He says that the species is closely related to the very variable V. madiensis Oliv. and that the number of leaflets and their form cannot be used to differentiate the two species. Oliver reduced to V. simplicifolia several specimens originally identified by Baker as V. vogelii, and, indeed, the leaf-form of V. vogelii is practically identical to that of V. simplicifolia as is well shown by Ledermann 4648. It is best, therefore, to regard V. vogelii as a mere variety. Baker says "An allied plant gathered by Welwitsch in Angola in the province of Golungo Alto, has occasionally two small accessory leaflets on the lower leaves of the branch. It is a shrub 6--8 feet high."

Common names recorded for V. simplicifolia are "buji", "bummehi", "bummeji", "bummere", "dinyar biri", "dunyar biri", "idjoli", "kourou", "kuru", "nambalerri", "panyeró buda", and "plum-tree". It has also been recorded from Gold Coast (Ghana) and Chad Territory.

Citations: ANGLO-EGYPTIAN SUDAN: Bahr-el-Ghazal: Schweinfurth 1519 (N, N--photo, S, Z--photo), 1953 (S). CAMEROONS: Mildbraed 9635 (K, N). UGANDA: Grant s.n. [Speke & Grant 701/5] (K--type, N--photo of type, Z--photo of type).

VITEX SIMPLICIFOLIA var. VOGELII (J. G. Baker) Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 65. 1928.

Synonymy: Vitex vogelii J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 319. 1900.

Literature: J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 319. 1900; A. Chev., Etud. Fl. Afr. Cent. Franç. 1: 244. 1913; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 65, 84, & 35. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 47, 48, & 104. 1942; Moldenke, Alph. List Invalid Names 56. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 88. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 113, 114, & 202. 1949.

The variety differs from the typical form of the species in having always 1-foliolate leaves, with narrower leaflet-blades

which are only twice as long as wide.

It is said to be a small tree, about 15 feet tall, the branchlets short-pubescent with whitish hairs, the leaves ternate, petioles 5 cm. long, leaflet-blades subcoriaceous, green, oblong, 10--12.5 cm. long, 5--6.3 cm. wide, acute at the apex, entire, subcuneate or rather rounded at the base, green and finally glabrous above, matted-pubescent beneath with persistent whitish hairs, cymes axillary, pedunculate, few-flowered, fruiting-calyx about 8 mm. in diameter, its rim obscurely lobed, and the drupe globose, about the size of a cherry (*Prunus avium*).

The type of the variety was collected by the ill-starred Julius Rudolph Theodor Vogel (no. 97) at Musgu, in southern Bornu, Northern Nigeria. Chevalier cites his nos. 8918 and 8921 from the region of Lake Iro, in the country of the Kabas-Maras, Ubangi-chari, French Equatorial Africa. It has also been recorded from Chad Territory.

VITEX SNETHLAGIANA Huber ex Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104 (1942) and [ed. 2], 95 & 202, nom. nud. 1949; H. N. & A. L. Moldenke, Pl. Life 2: 84, nom. nud. 1948; sp. nov.

Arbor; ramis gracilibus griseis; sarmentis brunnescentibus; foliis 1-foliolatis; petiolis gracillimis 2--2.7 cm. longis minute obscureque puberulis vel glabratis non ampliatis; petiolulis obsoletis vel usque ad 2 mm. longis marginatis; laminis tenuiter membranaceis anguste ellipticis 8--11.5 cm. longis, 2--3.3 cm. latis, obtusis integris vel subsinuatis, ad basin acutis vel subacuminatis, utrinque glabratis brunnescentibus; inflorescentiis axillaribus cymosis divaricatis laxe multifloris; pedunculis gracilibus 2 cm. longis glabratis vel obscure minuteque puberulis; pedicellis gracilibus 2--7 mm. longis subglabratis vel obscure puberulis; calyce campanulato 3 mm. longo, 4 mm. lato, subglabrato, margine subtruncato minutissime 5-dentato.

Tree; branchlets slender, gray; young twigs brunnescent in drying; leaves 1-foliolate; petioles very slender, 2--2.7 cm. long, minutely and obscurely puberulent or glabrate, not amplate at the base; petiolules obsolete or to 2 mm. long, continuous with the petiole, margined; leaflet-blades uniformly dark-green on both surfaces, thin-membranous, narrow-elliptic, 8--11.5 cm. long, 2--3.3 cm. wide, blunt at the apex, entire or subsinuate along the margins, acute or subacuminate at the base, glabrate on both surfaces, brunnescent in drying; midrib slender, plane or subimpressed above, rounded-prominent beneath; secondaries very slender, short, 10--14 per side, arcuate-ascending, subprominulous on both surfaces, not anastomosing; vein and veinlet reticulation abundant, subprominulous on both surfaces; inflorescence axillary, cymose, divaricate, loosely many-flowered; peduncles slender, about 2 cm. long, glabrate or obscurely and minutely puberulent; cyme-branches divaricate-ascending; pedicels slender, 2--7 mm. long, subglabrate or obscurely scattered-puberulent; calyx campanulate, about 3 mm. long and 4 mm. wide, subglabrate, its rim subtruncate, very minutely 5-toothed; corolla hypocrateriform,

its tube broadly cylindric, about 6 mm. long, minutely puberulent on the outer surface, its limb bilabiate, the smaller lobes 4--5 mm. long, 2--3 mm. wide, entire, obtuse, the large lower lip about 1 cm. long and 7 mm. wide, undulate-crisped along the margins, rounded, minutely puberulent on both surfaces; stamens and style exerted about 5 mm. from the corolla-mouth.

The type of this species was collected by Emil Heinrich Snethlage (Herb. Amaz. Mus. Para. 10413) -- in whose honor it is named -- somewhere in Pará, Brazil, and is deposited in the Goeldi Museum at Belém. Unfortunately, only two fragments of the type and three photographs of this interesting species have been available to me, and my description is, therefore, of necessity very incomplete. It is hoped that certain institutions that are loathe to lend their material to specialists for study and that even ignore correspondence may soon come to realize that the best interests of botanical science are not best served by such a policy of non-cooperation and isolationism which smacks strongly of provincialism.

Citations: BRAZIL: Pará: Snethlage s.n. [Herb. Amaz. Mus. Paraensis 10418; Macbride photos 10418] (F--601898--fragment & photo of type, N--fragment of isotype, N--photo of fragment of type & of phototype, Z--photo of fragment of type & of phototype).

VITEX SPRUCEI Briq., Bull. Herb. Boiss., sér. 1, 4: 346--347. 1896.

Synonymy: Vitex parviflora Spruce ex Briq., Bull. Herb. Boiss., sér. 1, 4: 347, in syn. [as "parviflorae"]. 1896; Moldenke, Prelim. Alph. List Invalid Names 52, in syn. 1940 [not V. parviflora A. L. Juss., 1806]. Vitex spongiocarpa Ducke, Trop. Woods 31: 20-21. 1932.

Literature: A. L. Juss., Ann. Mus. Hist. Nat. Paris 7: 76. 1806; Briq., Bull. Herb. Boiss., sér. 1, 4: 346--347. 1896; Hertner, Florula 105. 1930; Ducke, Trop. Woods 31: 20--21. 1932; Record, Trop. Woods 31: 28--29. 1932; Ducke, Arquiv. Jard. Bot. Rio Janeiro 6: 88--89. 1933; Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Prelim. Alph. List Invalid Names 52. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104. 1942; Moldenke, Alph. List Invalid Names 54. 1942; Ragonese & Martínez Crovetto, Revist. Invest. Agric. 1: 202. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 84. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 202. 1949; Occhioni, Lilloa 17: 485. 1949; Ducke & Black, Bol. Téc. Inst. Agron. Norte 29: 24--25. 1954.

Medium-sized or large tree, to 30 m. tall; trunk to 1.3 m. in diameter; bark thin, 3--4 mm. thick, smooth; sapwood gray, merging into pale-olive heartwood; branchlets and twigs stout or the latter more slender, rather acutely or obtusely tetragonal, conspicuously flattened and sulcate between the angles, somewhat lenticellate with greatly elongate linear lenticels, medullose, varying from minutely puberulent to pulverulent or glabrate, dark-brown or brownish in drying; nodes annulate, flattened and ampliate; buds sharp-pointed; principal internodes 2--12.5 cm.

long, usually elongate; leaf-scars large, corky, with prominently raised margins; leaves decussate-opposite, 5-foliolate, aromatic; petioles slender or very stout and woody, 4--10.7 cm. long, conspicuously flattened and often sulcate above, convex beneath, obscurely and very minutely puberulent or pulverulent or even glabrate, often ampliate at the base, not disciform at the apex; leaflets usually unequal, the lowermost much smaller than the central ones, all petiolulate; petiolules stout, incrassate, 3--27 mm. long, nigrescent, flattened and canaliculate-margined above, minutely pulverulent or glabrate; leaflet-blades very firmly thick-chartaceous or subcoriaceous, tough, uniformly bright-green or dark-green on both surfaces or slightly lighter beneath, shiny on both surfaces, mostly brunnescent in drying, the central one elliptic or broadly elliptic, 6--25 cm. long, 2--8.5 cm. wide, rather long-acuminate or caudate at the apex, entire, acute or short-acuminate at the base, obscurely pulverulent or glabrous and nitidulous on both surfaces, the lateral ones similar but somewhat smaller, 1 or 2 of the basal ones much reduced; midrib slender, flat or subimpressed above, very much rounded-prominent beneath; secondaries very slender, usually distant, 6--13 per side, arcuate-ascending, flat above, sharply prominent beneath, arcuately joined near the margins beneath; vein and veinlet reticulation rather sparse or abundant, mostly obscure or indiscernible above, the larger portions often subprominulous beneath, the rest obscure or indiscernible; inflorescence terminal (and axillary in the uppermost leaf-axils), thyrsoid, very massive, to 40 cm. long and 32 cm. wide, composed of 1--5 pairs of lateral and opposite compound and long-stipitate panicles, each panicle composed of 2--5 pairs of rather small, opposite, long-stipitate, many-flowered cymes; peduncles, rachis, and inflorescence-branches rather stoutish, dark-brown, minutely puberulent, annulate at the nodes, the ultimate parts compressed; main sympodia greatly elongate, 3--7 cm. long; secondary sympodia also elongate, minutely pulverulent-puberulent or subglabrate, brunnescent in drying; pedicels very slender, about 1 mm. long; bracts not seen, perhaps caducous; bractlets and prophylla linear, 1--3 mm. long, puberulent, caducous; calyx campanulate, 1.5--2 mm. long, ferruginous- or white-tomentellous, its rim shortly but distinctly 5-dentate, the teeth ovate, equal, 0.5--1 mm. long, acute; corolla white with a yellow spot in the center or violet and spotted or striped with yellow, 4--6 mm. long, white-sericeous on the outer surface, the tube slightly dilated toward the apex, the limb shortly bilabiate, the inferior lip larger than the other, much shorter than the tube, short-barbellate; fruiting-calyx finally split; fruit drupaceous, very large, black or reddish-black when mature, 1.5--2.5 cm. broad, not quite as long, slightly 4-tuberculate, depressed at the apex, glabrous, shiny, fleshy, the epicarp very thin, the mesocarp thick, spongy, white, the endocarp slightly crustaceous, fragile, the placental column thick and spongy.

The type of this very distinctive species was collected by Richard Spruce (no. 2767) -- in whose honor it is named -- near

Panuri, on the banks of the Rio Uaupes, Amazonas, Brazil, in December, 1852, and is deposited in the Delessert Herbarium at Geneva. The type of V. spongiocarpa was collected by Adolfo Ducke (Herb. Rio de Janeiro 22577) in swampy woods near the town of Manáos, also in Amazonas, Brazil, on October 15, 1929. The species has been collected in anthesis in March, April, June, and from October through December, and in fruit in October, December, and February. The Ducke 42a distributed as V. spongiocarpa by the Yale School of Forestry, at least insofar as the sheet 657655 in the herbarium of the Chicago Natural History Museum is concerned, is not this species nor even anything verbenaceous. The packet on the sheet contains only euphorbiaceous fruit.

Ducke states that V. sprucei is frequent in the environs of Manáos, where it was actually overlooked by previous collectors. He states that it reaches greater dimensions as a tree than any other Brazilian species of the genus with which he is familiar. It is, however, apparently surpassed in size by V. excelsa Moldenke, a species with which Ducke was not acquainted. V. sprucei is remarkable because its cymes of small, white, yellow-throated flowers are disposed in great terminal panicles, and especially on account of the voluminous spongy mesocarp of the fruits, which, during the rainy season, float in the swamps of the upland forests sometimes in considerable abundance. The blossoming trees, crowned with their wide upwardly-raised inflorescences, suggest teak (Tectona grandis L. f.) more than they do any other Brazilian species of Vitex. A detailed description of the wood anatomy is given by Record in the reference cited above. A vernacular name is "tarumá". A wood specimen of Ducke 41 is said to be Yale Mus. no. 20722, but has not as yet been seen by me. It has been collected also in wet non-inundated forests, on high ground along rivulets, and in high forests of the caatinga type.

Citations: BRAZIL: Amazonas: Ducke 41 [Herb. Yale Mus. 20721 & 20772] (A, F--657687, F--672240, Y), 41a (F--657686, N, Y), 41b (Y), 51 (F--901720, N, S), 1160 (N), s.n. [Herb. Rio de Janeiro 22577; Macbride photos 24705] (B, E, E--photo, K, K, N--photo, N--photo, P, S, Ut, W--1517711, W--1517712, Z--photo, Z--photo), s.n. [Herb. Rio de Janeiro 22578] (B, W--1499318, W--1517713); Fróes 20510 (N), 22264 (Be--23809); Spruce 2767 [Macbride photos 24705] (Bm--isotype, Br--isotype, Cb--type, Cb--isotype, Cp--isotype, Ed--isotype, F--869136--fragment of type, F--770968--photo of type, G--isotype, K--isotype, K--isotype, K--isotype, Kr--photo of type, Lu--isotype, Mi--photo of isotype, N--isotype, N--photo of isotype, N--photo of type, N--photo of type, P--isotype, X--isotype, Z--photo of type, Z--photo of isotype).

VITEX SPRUCEI var. LONGIDENTATA (Moldenke) Moldenke, Phytologia 2: 477. 1948.

Synonymy: Vitex spongiocarpa var. longidentata Moldenke, Phytologia 2: 31. 1941.

Literature: Moldenke, Phytologia 2: 31. 1941; Moldenke, Known

Geogr. Distrib. Verbenac., [ed. 1], 39 & 104. 1942; Moldenke, Phytologia 2: 477. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 202. 1949.

This variety differs from the typical form of the species in its calyx-teeth being 1.5--2 mm. long and its bractlets and prophylla being persistent.

The type of the variety was collected by Adolfo Ducke (Herb. Rio de Janeiro 23763) in caatinga woods at Igarapé Jurupary, on an affluent of the lower Rio Uaupés, Amazonas, Brazil, on November 2, 1932, and is deposited in the Britton Herbarium at the New York Botanical Garden. It is said to be a shrub or small tree, 2-12 m. tall, with a trunk diameter of 5--20 cm., white or rose-colored flowers, and "folhas quebradiças". It has been collected in anthesis only in November.

Citations: BRAZIL: Amazonas: Ducke s.n. [Herb. Rio de Janeiro 23763] (N--type); Fróes 21398 (Be--16845, N); Murça Pires 781 (N).

VITEX STAHELII Moldenke, Alph. List Common Names 14, hyponym. 1939; Pulle, Fl. Suriname 4 (2): 310--311. 1940.

Synonymy: *Vitex staheli* Moldenke, Alph. List Invalid Names Suppl. 1: 29, in syn. 1947.

Literature: Pittier, Contrib. U. S. Nat. Herb. 20: 487. 1922; Moldenke, Geogr. Distrib. Avicenn. 20--21. 1939; Moldenke, Alph. List Common Names 14. 1939; Moldenke in Pulle, Fl. Suriname 4 (2): 310--311. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 32, 33, & 104. 1942; Moldenke, Phytologia 2: 122. 1944; Moldenke, Alph. List Invalid Names Suppl. 1: 29. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 84. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 65, 67, 68, & 202. 1949.

Spreading tree, to 40 m. tall; trunk to 60 cm. in diameter, to 72.5 cm. in girth at 1.5 m. from the base, not buttressed; bark smooth, very pale gray or grayish-white, flakey, peeling off in thin thread-like strips; branches and branchlets decussate-opposite, stout or rather slender, medullose, gray or buff, becoming brownish in drying, very obtusely tetragonal or subterete, often somewhat ampliate at the nodes, minutely and rather sparsely puberulent, becoming glabrous in age; twigs stout or slender, more densely puberulent, mostly compressed and flattened when young; nodes not annulate; principal internodes 1--12 cm. long; leaf-scars large, often elevated on the ampliate nodes; leaves decussate-opposite or subopposite, 5-foliolate, very immature or absent at time of anthesis; petioles slender or stout, 5--16 cm. long, convex or keeled beneath, canaliculate above, often sulcate in drying, lightly puberulent with very minute grayish hairs, slightly ampliate at the base, slightly club-shaped (but not disciform) at the apex; leaflets mostly very unequal in size or subequal when very immature, all subsessile or short-petiolulate on petiolules that are stout, lightly and minutely puberulent, margined, and 1--6 mm. long; leaflet-blades chartaceous, uniformly dark-green on both surfaces or lighter beneath, the central one oblong or elliptic to subobovate, 9--23

cm. long, 2--9.5 cm. wide, long-acuminate or caudate at the apex, entire, acute or cuneate at the base, very minutely pulverulent-puberulent on both surfaces (especially beneath) when immature, becoming glabrous on both surfaces in age, lateral ones similar in color, texture, and puberulence, but usually much smaller and narrower; midrib slender, impressed above (on mature leaves), prominent beneath; secondaries slender, 12--21 per side, arcuate-ascending, flat or obscurely subimpressed above, prominent beneath, arcuately joined near the apex beneath; vein and veinlet reticulation rather abundant, flat or subprominent above, the larger portions often subprominent beneath; inflorescence axillary, cymose, 2--5 cm. long, 0.8--2.5 cm. wide, several times branched in a subcapitate or umbelloid fashion, each branch several times dichotomous with very short branches and rather densely few- to many-flowered, lightly canescent-puberulent throughout; peduncles slender, 0.7--4 cm. long, compressed, lightly puberulent, often slightly ampliate at the apex; cyme-branches very short, flattened, marked with a denser annulation of pubescence at every node; pedicels slender, obsolete or to 1.5 mm. long, canescent-puberulent; flower-buds gray-mauve, pubescent; calyx broadly campanulate, gray-green, 2 mm. long or less, densely appressed-puberulent, the rim sinuate or indistinctly 5-dentate; corolla varying from purple, purplish-blue, or bluish-mauve to lilac or heliotrope, the throat pale-yellow or yellow, hairy, the tube curvate, about 7.5 mm. long, the exerted portion puberulent on the outside, villous within at the insertion of the stamens, the limb patent, 2-lipped, the lower lip slightly cup-shaped, the lobes ovate or oblong, obtuse, more or less puberulent externally, glabrescent within, the inferior median lobe about 9.5 mm. long, the remaining lobes about 5 mm. long; stamens erect, exerted; filaments lilac; style exerted; fruiting-calyx accrescent, patelliform; fruit drupaceous, about 7 mm. long, glabrous, glossy purple-black, 1-stoned, the flesh greenish.

The type of this species was collected at Brownsberg, Surinam (B.W., Bureau of Forestry 2480), and is deposited in the herbarium of the Botanisch Museum at Utrecht. It is named in honor of Gerold Stahel, who has done so much to advance our knowledge of the botany of Dutch Guiana. Martyn states that the species regularly bears only a few young terminal leaves at time of flowering and that the flowers are in clusters at the end of the peduncles which are regularly 1 cm. long. Davis reports that it grows to 120 feet tall, with a trunk 2 feet in diameter, very smooth grayish-white bark, and deciduous leaves. On another collection the height is given as 115 feet and the girth 34 inches at 4 1/2 feet above the base, the first branch is said to be 65 feet up, the trunk not buttressed, and the bark very pale, peeling off in thread-like strips. He says that a blaze shows up lines like annual rings. Pittier, in the reference cited above, identifies the Rusby & Squires collections as V. capitata Vahl. It has also been confused with V. cymosa Bert. and misidentified as Bignoniaceae.

It has been collected in low ropey bush, at the edge of cof-

fee plantations, along railroad tracks, on hillslopes, in brown sand or in ochraceous clay mixed with sand, in miscellaneous forests, and growing in full exposure to the sun, at altitudes of 100 to 1650 meters, in anthesis from January to April and in September and November, and in fruit in April. Common names are "alasaobo", "hackiaballi" (in the Arawak dialect), "hakuyaballi", "panda", and "totumillo". It is of interest to note that most of these common names apply also to *V. compressa* Turcz.

Citations: COLOMBIA: Meta: Philipson, Idrobo, & Jaramillo 2105 (Bm, N, W--2026236); Sandeman 5788 (K). VENEZUELA: Bolívar: Cardona 2119 (N). Delta Amacuro: Rusby & Squires 84 (B, Bm, Cb, D, E--116203, Ed, F--160821, K, Mi, Mu--3704, N, Vu, W--325541, X, X), 257, in part (A, A, B, Bm, Cb, D, E--116202, Ed, F--160945, K, Mu--3705, N, N, V, Vu, W--325624, X). BRITISH GUIANA: British Guiana Forest Dept. 914 (K), 3013 [F.277] (K), 3228 [F.492] (N), 7789 [field no. JB.105] (N); T. A. W. Davis D.46 [British Guiana Forest Dept. 1048] (K, K, N); De la Cruz 3822 (N, N--photo, S--photo, Z--photo), 3822a (F--544466); Jenman 3623 (Bm, K, N, U, U); Martyn 34 (K, U); Record 914 (S). SURINAM: B.W., Bureau of Forestry 2454 [tree no. 1152] (N--photo, Ut, Ut, Z--photo), 2480 [tree no. 1152] (N--isotype, N--photo of type, Ut--type, Z--photo of type), 6804 [tree no. 1152] (N--photo, Ut, Z--photo); Stockdale 3821 (K).

VITEX STELLATA Moldenke, Phytologia 3: 448. 1951.

Small tree; branchlets stout, medullose, obtusely tetragonal, canaliculate, glaucous-gray, densely tomentellous with glaucous-stellate tips on the hairs; nodes not annulate; principal internodes 1.5--4 cm. long or longer; leaf-scars large but not especially prominent; terminal buds very densely flavescent-tomentellous; leaves decussate-opposite, 5-foliolate; petioles stout, 12-13 cm. long, densely tomentellous with the hairs conspicuously glaucous-stellate at their tips, giving the petioles a decidedly bluish cast; petiolules stout, 2--14 mm. long, the central one longest, all densely tomentellous with glaucous-stellate hairs, canaliculate above; leaflet-blades subcoriaceous, bright-green above, cinereous beneath, obovate, very densely pubescent on both surfaces, the pubescence cinereous beneath, the central ones 16--18 cm. long and 7.5--8 cm. wide, the lateral and lower ones smaller, rounded at the apex, entire and somewhat revolute along the margins, long-attenuate at the base; midrib stout, flat above, rounded-prominent beneath; secondaries slender, regular, 15--17 per side, ascending, slightly arcuate toward the margins, not anastomosing, flat above, sharply prominent beneath; veinlet reticulation abundant, mostly rather obscure above, prominulent beneath; inflorescence not known.

The species is apparently endemic to Madagascar. Lacking inflorescence, it is very possible that it is not here correctly placed, in spite of the collector's original determination of "*Vitex* sp." Its pubescence very strongly suggests Bignoniaceae.

The type was collected by Raymond Decary (no. 14549) at Massif de l'Ankara, Madagascar, on July 25, 1939, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

Citations: MADAGASCAR: Decary 14549 (N--isotype, N--photo of type, P--type, Z--photo of type).

VITEX STRICKERI Vatke & Hildbr., Linnaea 43: 532--533. 1882.

Synonymy: Vitex strickeri Vatke ex Moldenke, Known Geogr.

Distrib. Verbenac., [ed. 1], 50 & 104, sphalm. 1942.

Literature: Vatke & Hildbr., Linnaea 43: 532--533. 1882; Gürke in Engl., Pflanzenw. Ost-Afr. C: 340. 1895; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 318. 1900; Gürke in Engl., Bot. Jahrb. 28: 463. 1900; Fries, Notizbl. Bot. Gart. Berlin 8: 702. 1924; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 42, 55, & 84. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 50 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 84. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 117, 118, & 202. 1949.

A shrub, to 2 m. tall; branchlets densely brown-pubescent with short hairs; leaves 3-foliolate; petioles about 2.5 cm. long, densely pubescent; leaflet-blades subcoriaceous, ovate, 4--5 cm. long, acute at the apex, scabrous and more or less rugose above through the impressed venation, entire or slightly dentate along the margins, densely pubescent beneath, the central one short-petiolulate; midrib and secondaries prominent beneath, impressed above; inflorescence cymose, forming a thyrsoid terminal panicle 5--10 cm. long, its branches very pubescent; pedicels very short; calyx campanulate, about 2 mm. long, pubescent, its rim minutely toothed; corolla about 6 mm. long, pubescent, its tube infundibular, the lobes very small; fruiting-calyx and fruit not known.

The type of this very variable species was collected by Johann Maria Hildebrandt (no. 1303) at Bagamovo, Tanganyika Territory. Pieper notes that the leaves vary greatly in respect to their margins and the wrinkled character of the upper surface, and that the calyx shows a decided tendency toward being two-lipped. He states that it is closely related to V. lamiana Pieper and that numerous specimens previously determined as V. strickeri are actually V. lamiana. For V. strickeri he cites Busse 2163, Conrad 186, Engler 3328, Hildebrandt 1250, Kassner 206, Kirk s.n., Kranzlin 2996, and Stuhlmann 275, 6559, 6947, 7999, and 8719 from Tanganyika Territory, and Wakefield s.n. from Kenya. It has been collected at an altitude of 3300 feet in Tanganyika. Lynes 9, not seen by me, is said to be conspecific with the Burt 3923 cited below.

Citations: TANGANYIKA TERRITORY: Burt 3923 (Br, N); Schlieben 5623 (N, S). KENYA: R. M. Graham 2328 (N--photo, S, Z--photo).

VITEX STYLOSA Dop, Bull. Soc. Hist. Nat. Toulouse 57: 201--202. 1928.

Literature: Dop, Bull. Soc. Hist. Nat. Toulouse 57: 210—202. 1928; Hill, Ind. Kew. Suppl. 9: 298. 1938; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 59 & 104 (1942) and [ed. 2], 137 & 203. 1949.

Small shrub; branchlets subtetragonal, glabrous; leaves 3-foliate; petioles black in drying, about 3 cm. long, glabrous; leaflet-blades chartaceous, elliptic or obovate, 6--7 cm. long, 3--4 cm. wide, short-acuminate at the apex, acute or obtuse and often inequilateral at the base, glabrous, black and shiny above in drying, red-brown and glandulose beneath in drying, entire; secondaries small, 12--14, recurved at the margins; vein and veinlet reticulation conspicuous on both surfaces; central petiole 1.5--2 cm. long, the lateral ones smaller; inflorescence paniculate, terminal, pyramidal, very leafy, slightly puberulent, the cymules in the form of glomerules, many-flowered, short-stipitate; bracts none or very small and caducous; pedicels obsolete or to 2 mm. long; flowers about 8 mm. long; calyx campanulate, about 3.5 mm. long, slightly puberulent, its lobes 5, small, broadly triangular; corolla puberulent externally except at the base, its tube about 5 mm. long, glabrous inside, the upper lip 2-lobed, the lobes about 2 mm. long, acute at the apex, glabrous within, the lower lip 3-lobed, the lobes acute and glabrous within, the median one about 3 mm. long; stamens exserted; filaments flattened, glabrous; anthers with recurved thecae; ovary ovoid, glabrous; style thick, about 11 mm. long, exserted; stigma 2-lobed; fruiting-calyx and fruit not known.

The type of this species was collected by Henri François Bon (no. 3898) at Kien Khé, in the Dong Hâm hills, Tonkin, Indochina. Dop points out that this species is easily distinguished by its corollas being glabrous within and by its long and thick style which surpasses the corolla in length.

VITEX SUMATRANA Miq., Fl. Ind. Bat. Suppl. 1: 567--568. 1860.

Synonymy: *Vitex sumatrana* var. *typica* H. J. Lam, Verbenac. Malay. Arch. 136--137. 1919.

Literature: Miq., Fl. Ind. Bat. Suppl. 1: 567--568. 1860; H. J. Lam, Verbenac. Malay. Arch. 167, 136--137, & 370. 1919; Moldenke, Alph. List Invalid Names 55. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 56, 64, & 104 (1942) and [ed. 2], 129, 143, 145, & 203. 1949.

A tree; branchlets tetragonal, somewhat pubescent, becoming glabrescent in age; leaves 3--5-foliate; petioles 5--8 cm. long, glabrous; leaflet-blades chartaceous, obovate, abruptly acuminate at the apex (the acumination 9--12 mm. long), entire, acute or cuneate at the base, glabrous or subglabrous above on the lamina, but pubescent on the venation, with small white scales, sparsely pubescent and glandular beneath, the central one 6.5--14 cm. long, 4--7 cm. wide, on a petiolule [0.5?]-1.5--3 cm. long, the lateral ones 4.5--12 cm. long, 2.5--6.5 cm. wide, on petiolules 0.8--1.8 cm. long, the basal ones, when present, about 7 cm. long and 3 cm. wide, on petiolules about 0.5 cm. long; secondaries 6--10

per side; inflorescence terminal and paniculate or the lower ones axillary in the uppermost leaf-axils, narrow, 8--12 cm. long, 1.5 to 2.5 cm. wide, minutely and sparsely ferruginous-pubescent; calyx campanulate, about 3 mm. long and 2.5 mm. wide, pubescent and glandular externally, glabrous within, its rim 5-toothed, the teeth deltoid, small, with a small pimple-like swelling at the base of each; corolla about 7 mm. long in all, curvate in bud, pubescent and glandular outside, except on the lower part, entirely glabrous within or with some hairs at the base of the lip only, its tube about 4 mm. long, the lip about 2 mm. long, the lobes small, about 1 mm. long, all glabrous within; stamens didynamous, slightly exserted, inserted in the upper half of the corolla-tube; filaments stout, red, glabrous; anther-cells divaricate; style equaling the stamens; stigma shortly bifid; ovary pyriform, glabrous or somewhat glandulose at the top; fruiting-calyx enlarged, to 1.3 cm. in diameter; fruit globose, depressed, 1--1.2 cm. long, 9--10 mm. wide, somewhat beaked at the apex.

This species is based on Teijsmann 4302 H.B., 4333 H.B., and 4454 H.B. from near Natar, in the province of Lampongs, Sumatra, and probably an unnumbered collection from the same locality which is sheet no. 908267-471 in the Leiden herbarium. These are also the cotypes of Dr. Lam's var. typica. Actually only the unnumbered collection is cited by Miquel in his original description of the species, but it seems obvious that the numbered collections are part of the same gathering. The species has been collected in fruit in December, and has been misidentified in the past as V. heterophylla Roxb., V. pubescens Vahl, and V. sumatrana var. urceolata (C. B. Clarke) King & Gamble. According to Lam this species differs only in minor points from V. urceolata C. B. Clarke. In V. sumatrana the leaves are 3--5-foliolate, the leaflets are sparsely pubescent beneath, with the acumination 9--12 mm. long, the calyx is campanulate, about 3 mm. long and 2.5 mm. wide, with the teeth bullate at the base, and the corolla is 7 mm. long in all, recurved in bud, the tube 4 mm. long. In V. urceolata the leaves are always 3-foliolate, the leaflets are glabrous beneath, with an acumination absent or only to 3 mm. long, the calyx is urceolate, about 4 mm. long and 2--2.5 mm. wide, with the teeth ribbed but not bullate, and the corolla is 8--9 mm. long, not at all or but slightly curvate in bud, the tube 7 mm. long.

Citations: SUMATRA: Arsad 12 [Boschproefst. BB.9219] (Bz--24919); Bokhorst 40 [Boschproefst. BB.7723] (Bz--25160, Bz--25161, Ut--80701); Docters van Leeuwen 503 (Bz--25154); Endert El.1326 (Bz--25163, Bz--25164); Teijsmann 4302 H.B. [no. 2] (Bz--25155--cotype, Bz--25156--cotype, Ut--11559--cotype), 4333 H.B. (Bz--25157--cotype, Bz--25158--cotype, N--photo of cotype, Z--photo of cotype), 4454 H.B. (Bz--25159--cotype, Ut--11560--cotype).

169. 1911.

Literature: S. Moore, Journ. Linn. Soc. Lond. Bot. 40: 168--169. 1911; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 50, 70, & 84. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 85. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 121 & 203. 1949.

Large tree; branches "often prostrate"; branchlets leafy toward their tips, fulvous-pubescent when young, finally glabrescent; leaves opposite, mostly 5-foliolate; petioles slender, to 6.5 cm. long, often much shorter; petiolule on the central leaflet about 7 mm. long, on lateral ones about 2 mm. long; leaflet-blades thin-membranous, narrowly ovate-oblong or oblong-obovate, 2.5--6 cm. long, 1--3 cm. wide, rounded or obtuse at the apex and there pulvinate or barbate, entire or slightly undulate, narrowly cuneate into the petiolule at the base, glabrous above and olivaceous-castaneous in drying, pubescent beneath and gray-brown when dry; secondaries about 10, plainly visible; inflorescence axillary, the cymes about 1.5 cm. long, 1.5--2 cm. wide, few-flowered, fulvous-sericeous; peduncles 1 cm. long or less; bracts linear or linear-oblong, about 4 mm. long, surpassing the pedicels, pubescent; pedicels 1--2 mm. long; calyx campanulate, about 3 mm. long, densely fulvous-sericeous, its teeth deltoid, scarcely 1 mm. long, shorter than the tube, acute or obtuse at the apex; corolla white, its tube about 6 mm. long, about 2.2 mm. wide at the base and 4.2 mm. wide at the apex, twice as long as the calyx-tube, incurved and somewhat ampliate above, externally pubescent, the posterior lobe abbreviated, ovate, about 2.5 mm. long, obtuse at the apex, the lateral ones very broadly ovate-oblong, about 4 mm. long, very obtuse, somewhat shorter than the anterior one, hardly 5 mm. long; upper stamens exserted about 2.5 mm. from the corolla-mouth; anthers about 0.8 mm. long, short-exserted, with subparallel thecae; style about 6.5 mm. long, glabrous; ovary attenuate and setose toward the apex, about 2.5 mm. long; fruiting-calyx and fruit not known.

The type of this species was collected by Charles Francis Massey Swynnerton (no. 1054) -- in whose honor it is named -- in the forests at Madanda, at an altitude of about 400 feet, Gazaland, Portuguese East Africa, flowering in December. It is said to be closely related to *V. welwitschii* Gürke, from which it may be distinguished easily by its differently shaped leaflets and longer petiolules.

VITEX TANGENSIS Gürke in Engl., Pflanzenw. Ost-Afr. C: 339. 1895.

Synonymy: *Vitex polyantha* J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 321. 1900.

Literature: Gürke in Engl., Pflanzenw. Ost-Afr. C: 339. 1895; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 321--322. 1900; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 50, 68--69, & 84. 1928; Chiov., Fl. Somalia 2: 365. 1932; Worsdell, Ind. Lond. Suppl. 2: 501. 1941; Moldenke, Alph. List Invalid Names 54. 1942;

Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 50, 52, & 104 (1942) and [ed. 2], 117, 118, 121, & 203. 1949.

Illustrations: Chiov., Fl. Somalia 2: 365. 1932.

Shrub or small tree, to 7 m. tall; branchlets short, short-pubescent with yellowish or drab hairs; leaves 3-foliolate; petioles slender, 2.5--5 cm. long; leaflets sessile when immature, distinctly petiolulate when mature; leaflet-blades moderately firm, oblong or oblong-lanceolate, 2.5--7.5 cm. long, acute or acuminate at the apex, entire, dark-green and glabrous above when mature, paler beneath, pubescent and dotted beneath; inflorescence cymose, axillary, very numerous, short-pedunculate, densely congested; pedicels very short, densely pubescent; bracts lanceolate; calyx campanulate, about 2 mm. long, densely yellowish-pubescent, its rim minutely toothed, the teeth broad, acute; corolla-tube about twice the length of the calyx when mature, very pubescent; stamens exserted; fruit globose, 2.5 cm. or more in diameter, glabrous.

The type of this species was collected by Georg Ludwig August Volken (no. 92) at Tanga, Usambara, Tanganyika Territory, while that of V. polyantha was collected by Thomas Wakefield at Mombasa, Kenya. Pieper points out that Baker distinguishes his V. polyantha from V. tangensis only by its sessile leaflets, but his type collection bears only immature leaves, and the immature leaves of V. tangensis also exhibit sessile leaflets. He cites an additional Companhia de Moçambique 359 from Portuguese East Africa.

VITEX TELORAVINA J. G. Baker, Journ. Linn. Soc. Lond. Bot. 25: 340--341. 1890.

Synonymy: Vitex teleravina Baker apud Durand, Ind. Kew. Suppl. 1: 457, sphalm. 1906. Vitex telorovina Baker, in herb.

Literature: J. G. Baker, Journ. Linn. Soc. Lond. Bot. 25: 340-341. 1890; Durand, Ind. Kew. Suppl. 1: 457. 1906; Pieper in Engl. Bot. Jahrb. 62, Beibl. 141 ["142"]: 76, 79, & 84. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 104. 1942; Moldenke, Alph. List Invalid Names Suppl. 1: 29. 1947; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 15. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 123 & 203. 1949.

An erect shrub or tree, 10--15 m. tall; branches rather stout; branchlets and twigs medium-sledder or slender, obtusely tetragonal, medullose, densely tomentose with ferruginous or pale-brown tomentum on the younger parts, glabrescent in age; nodes not annulate; principal internodes 1--3 cm. long, mostly abbreviated, elongated to 11 or more cm. on sprouts; leaf-scars rather large, sunken, not conspicuously prominent; leaves decussate-opposite, 3--5-foliolate, the central leaflet much more conspicuously petiolulate than the lateral ones, giving the 3-foliolate leaves a pinnately trifoliolate aspect; petioles rather stout, 5--8.5 cm. long, densely sordid-tomentose or canescent-tomentellous, flattened above; petiolules very unequal, the lateral ones 1--18 mm. long, the central one 7--30 mm. long, all densely sordid-tomentellous; leaflet-blades thick-chartaceous or subcoriaceous, gray-

green on both surfaces, the lateral ones often very asymmetric at the base, the central ones mostly obovate, sometimes elliptic, 4.5--15 cm. long, 2--6 cm. wide, mostly rounded (rarely mucronulate) at the apex, entire, acute or cuneate-acuminate at the base, conspicuously bullate and rugulose above, rather densely but obscurely short-pubescent above, densely brown-tomentose beneath when young, brown-pubescent and resinous-granular beneath when mature; midrib slender, deeply impressed above, very prominent and densely brown-tomentose beneath; secondaries slender, 9--12 per side, rather close, deeply impressed above, sharply prominent beneath on mature leaves, ascending, rather straight, not arcuate, not anastomosing; veinlet reticulation very abundant, deeply impressed above, sharply prominent to the finest parts beneath on mature leaves; inflorescence axillary, loose, rather few-flowered or many-flowered, shorter than the subtending petioles; flowers not known; peduncles stoutish, 1.5--3 cm. long, densely fulvous-tomentellous; cyme-branches widely divergent in fruit, 9--15 mm. long, densely sordid-tomentellous; fruiting-pedicels stout, 4--10 mm. long, densely sordid-tomentellous; fruiting-calyx turbinate, 5--10 mm. long, 8--12 mm. wide, incrassate, densely fulvous-tomentellous, its rim shortly 5-dentate, the teeth deltoid, about 2 mm. long, broad at the base, erect or spreading or even reflexed, acute at the apex; fruit drupaceous, brown, subglobose, 7--12 mm. long and wide, wrinkled in drying, very shiny, closely invested at the base by the fruiting-calyx when mature or completely invested by it when immature.

The type of this species was collected by Richard Baron (no. 5384) in the northwestern part of central Madagascar. The species has been collected in fruit from March to May, growing at altitudes of 800--900 meters. Common names are "belohalika", "malainaretina", "tatorialahy", "teloravina", and "voandskia". It has been confused in the past by herbarium workers with V. lanigera Schau.

Citations: MADAGASCAR: d'Alleizette 164m (P); Baron 3381 (P), 5384 (K--type, N--photo of type, N--isotype, P--isotype, Z--photo of type), s.n. (K); Basse s.n. [28 mai 1931] (P); Herb. Jard. Bot. Tananarive 4985 (P); Humbert 14430 (P); G. W. Parker s.n. (K).

VITEX THOMASI DeWild., Contrib. Etud. Fl. Katanga Suppl. 2: 106--108. 1929.

Literature: DeWild., Contrib. Etud. Fl. Katanga Suppl. 2: 106--108. 1929; Hill, Ind. Kew. Suppl. 8: 249. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 49 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 86. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 115 & 203. 1949.

Shrub or tree, to 15 m. tall, with a dense crown; trunk 5--6 m. tall, 40--50 cm. in diameter; bark yellowish, more or less deeply fissured in rectangles; branches subtetragonal, ferruginous-tomentose or velutinous-hirsute on the younger parts, eventually glabrescent; buds globose, 7--10 mm. wide; leaves 5-foliolate, the central leaflet usually larger than the others; petio-

les 5--13 cm. long, more or less plainly canaliculate above, very hirsute; petiolules 2--4 mm. long, very velutinous; leaflet-blades coriaceous, obovate-lanceolate, 5.5--17 cm. long, 2--6 cm. wide, more or less acuminate or obtuse at the apex, entire, velutinous-pubescent above, especially on the veins, densely tomentose beneath; secondaries 8--12 per side, arising at an angle of about 45° from the midrib; inflorescence axillary, to 19 cm. wide, more or less branched, very many-flowered; cymes dichotomous, lax, many-flowered, the branches to 3 cm. long; peduncles 11--13.5 cm. long, densely velutinous or ferruginous-tomentose; bractlets velutinous or ferruginous-tomentose, the lower ones lanceolate and to 5 cm. long, with the limb to 8 mm. wide, the upper filiform, soon caducous; pedicels 1--7 mm. long, velutinous with divergent hairs; calyx campanulate, about 3 mm. long, velutinous or ferruginous-tomentose outside, its rim obscurely 5-toothed, the teeth triangular-acute or deltoid, about 1 mm. long, acute at the apex; corolla short-tubular, the tube about 2.5 mm. long, velutinous on the outside, the limb 5-lobed, the anterior lobe cuneate, about 3 mm. long and 2.5 mm. wide; fruiting-calyx accrescent, cupuliform, about 5 mm. long, 7--9 mm. wide, its rim plainly but not conspicuously 5-toothed, densely hirsute externally, glabrous within; fruit ovoid-elliptic, about 10 mm. long, 5--6 mm. wide, black, shiny, glabrous.

The species is based on Thomas 1324 from Kalonda, Belgian Congo, collected on August 20, 1923, and on Delevoy 337, collected in the forest at Benzee, at km. 136, Belgian Congo, on October 2, 1921. Vernacular names recorded by the collectors are "kishiamafu", "luseki", and "mufutu" -- the last-mentioned of these is applied to various, often totally different, species of the genus. The plant is said to be related to V. buchneri Gürke, differing from it particularly in the smaller size of the calyx. It is named in honor of René León Xavier Thomas, a Belgian forester and agriculturist.

VITEX THOMASI f. KASAIENSIS DeWild., Contrib. Etud. Fl. Katanga Suppl. 2: 108--109. 1929.

This form differs from the typical form of the species in having its leaflet-blades obovate-elliptic, abruptly acuminate at the apex (the acumen to 1 cm. long), shortly velutinous-scabrous above and ferruginous-tomentose beneath.

DeWildeman describes the plant as a tree 10--12 m. tall; branches cylindric or subtetragonal, brownish-velutinous when young, glabrous and grayish when mature; leaves 5-foliolate, the central leaflet usually larger than the others; petioles 2--10 cm. long, velutinous-hirsute, more or less plainly canaliculate above; petiolules 1--3 mm. long, velutinous; leaflet-blades obovate-elliptic, 0.9--11.5 cm. long, 0.5--6 cm. wide, more or less abruptly acuminate at the apex (the acumen to 1 cm. long), entire, cuneiform at the base and narrowed into the petiolule, shortly velutinous-scabrous above, velutinous or ferruginous-tomentose beneath, the hairs brownish, not very dense nor long; secondaries 11--14 per side; inflorescence axillary, more or less branched,

loose, many-flowered; peduncles 10--14 cm. long, velutinous or ferruginous-tomentose; cyme-branches dichotomous, to 2 cm. long; lower bractlets lanceolate, to 3.5 cm. long and 7 mm. wide (the blade to 2 cm. long), velutinous or ferruginous-tomentose, borne on filiform stalks, the upper bractlets filiform; fruiting-calyx accrescent, sessile or pedicellate, 4--5 mm. long, velutinous or ferruginous-tomentose on the outside, its rim with 5 large triangular teeth not very conspicuous; fruit ovoid-ellipsoid, to 12 mm. long and 8 mm. wide.

The type of this form was collected by Edouard Piere Luja (no. 259) in the forest at Bene-Dibele, Kasai, Belgian Congo.

VITEX THONNERI DeWild., Étud. Fl. Bangala & Ubangi 246--248, pl. 12. 1911.

Literature: DeWild., Étud. Fl. Bangala & Ubangi 246--248, pl. 12. 1911; DeWild., Fl. Bas- & Moyen-Congo 467. 1912; Hill, Ind. Kew. Suppl. 6: 219. 1926; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 45, 59, & 84. 1928; DeWild., Pl. Bequaert. 5: 16. 1929; Stapf, Ind. Lond. 6: 479. 1931; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 49 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 36. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 115 & 203. 1949.

Illustrations: DeWild., Étud. Fl. Bangala & Ubangi pl. 12. 1911.

Tree, to 5 m. tall; young branchlets more or less tetragonal, flattened, tomentose with spreading hairs, yellow-ferruginous; petioles to 13 cm. long, more or less compressed, ferruginous-tomentose, ciliate on the margins; leaves 5-foliolate; petiolules densely ferruginous-tomentose, 5--10 mm. long; leaflet-blades paler beneath, oboval or elliptic, cuneiform at the base, more or less abruptly acuminate at the apex (the acumen itself acute and apiculate), entire, densely pilose on the veins beneath, less so above; secondaries about 10 per side, the lateral ones more or less asymmetric at the base, 4--8.5 cm. long, 2.5--5 cm. wide, the central ones symmetric and about 13 cm. long and 7 cm. wide; inflorescence axillary, opposite, lax, to 15 cm. long; peduncles compressed, about 9 cm. long, dichotomous at the summit, bracteate; bracts linear, velutinous, to 7 mm. long; pedicels at the center of the dichotomy 5 mm. long, those elsewhere only 1 mm. long, densely velutinous like the branches; calyx 2--4 mm. long, 5-dentate, densely velutinous-ferruginous; corolla white or whitish-violet, 6--7 mm. long, 2-labiate, externally densely velutinous, the lip pale-violet.

The type of this species was collected by Franz Thonner (no. 263) -- in whose honor it is named -- at 450 meters altitude, Banayville, on the Ubangi, Belgian Congo, on March 8, 1909. The collector found the plant in shrubbery among rocks and says it was isolated and very rare. DeWildeman cites also Bequaert 6936 from the edge of river woods at Stanleyville, Belgian Congo, collected on February 13, 1915. Pieper cites also Malchair 73 from near Likimi, Bangala, Belgian Congo.

VITEX THONNERI var. TIBATENSIS (Engl.) Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 59. 1928.

Synonymy: Vitex tibatensis Engl. ex Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 59, in syn. 1928.

Literature: Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 59 & 84. 1928; Moldenke, Alph. List Invalid Names 55. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 104 (1942) and [ed. 2], 114 & 203. 1949.

This variety differs from the typical form of the species in being more densely pubescent, the leaf-margins being occasionally irregularly dentate, and the calyx-teeth sometimes as many as 7.

The type of the variety was collected by Carl Ludwig Ledermann (no. 2471) at Tibati, Cameroons, and is deposited in the herbarium of the Botanisches Museum at Berlin. It is known thus far only from the original collection.

VITEX THORELII Dop, Bull. Soc. Hist. Nat. Toulouse 57: 206--207. 1928.

Literature: Dop, Bull. Soc. Hist. Nat. Toulouse 57: 206--207. 1928; Hill, Ind. Kew. Suppl. 9: 298. 1938; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 59 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 86. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 137 & 203. 1949.

Shrub or tree; branchlets tetragonal, ferruginous-pubescent when young, later glabrescent; bark gray; leaves 3-foliolate; petioles slender, tetragonal, about 4 cm. long, ferruginous-pubescent; leaflet-blades chartaceous, brunnescent in drying, elliptic or elliptic-lanceolate, 8--9 cm. long, 1.5--3 cm. wide, entire, acuminate at the apex, acute or obtuse and often inequilateral at the base, glabrous above and scabrous except for the venation, glandulose, pubescent beneath; secondaries slender, 16 to 20, recurved; vein and veinlet reticulation conspicuous; central petiolules about 1.5 mm. long, the lateral ones subobsolete; inflorescence paniculate, terminal, pyramidal, lax, pubescent; peduncles elongate, opposite; cymes dichotomous, divaricate, 3-flowered; bracts firm, very small; pedicels 2--3 mm. long, 2-bracteolate at the apex; flowers about 8 mm. long; calyx campanulate, about 2.5 mm. long, slightly bilabiate, pubescent on the outside, the 5 lobes acute and about 1.5 mm. long, the 2 lower ones smaller; corolla very pubescent on the outside except for the base of the tube, the tube glabrous inside except at the insertion of the stamens and at the throat, about 4 mm. long, the upper lip 2-lobed with rounded lobes about 2 mm. long and glabrous inside, the lower lip 3-lobed, the middle lobe about 4 mm. long and villous at the base within; stamens not exerted; filaments villous at the base; anther thecae recurved; style equaling the stamens; stigma 2-lobed; ovary glabrous; fruiting-calyx 2-lipped; fruit drupaceous.

The type of this species was collected by Clovis Thorel (no. 2422) -- in whose honor it is named -- between 1866 and 1868 at Lacone, Cambodia, Indochina. No number is given by Dop in his or-

iginal description, but it appears fairly certain that no. 2422 is the type collection, although it was misidentified and distributed as V. leptobotrys H. Hallier in at least the Stockholm herbarium. It is inscribed on its label "Expedition du Me-Kong. Lacone". The species is said by Dop to be characterized by the subbilabiate calyx, a character more noticeable at time of fruiting.

Citations: INDOCHINA: Cambodia: Thorel 2422 (F--photo of isotype, N--isotype, N--photo of isotype, S--isotype, Sg--photo of isotype, Z--photo of isotype).

VITEX THYRSIFLORA J. G. Baker, Kew Bull. 1895: 152. 1895.

Synonymy: Vitex staudtii Gürke in Engl., Bot. Jahrb. 33: 299--300. 1904. Vitex agraria A. Chev., Expl. Bot. Afr. Occid. Franc. 1: 505, hyponym. 1920.

Literature: J. G. Baker, Kew Bull. 1895: 152. 1895; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 319. 1900; Gürke in Engl., Bot. Jahrb. 33: 299--300. 1904; Sim, For. Fl. & Res. Port. East Afr. 94. 1909; A. Chev., Expl. Bot. Afr. Occid. Franç. 1: 505. 1920; Wheeler, Bull. Am. Mus. Nat. Hist. 45: 444--452 & 585, fig. 88. 1922; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 42, 54, 80, & 85, pl. 10. 1923; Worsdell, Ind. Lond. Suppl. 2: 501. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 46--48, 52, & 104. 1942; Moldenke, Alph. List Invalid Names 52, 54, & 55. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 46 & 84. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 111--114, 121, & 203. 1949.

Illustrations: Wheeler, Bull. Am. Mus. Nat. Hist. 45: 449, fig. 88. 1922; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: pl. 10. 1923.

Much-branched shrub, tree to 4 m. tall, or liana; trunk to 10 cm. in diameter; branchlets glabrous, usually with an ant-home entrance at each node, sometimes a second hole in the internode; leaves 5-foliolate, long-petiolate; leaflets distinctly petiolulate, the blades submembranous, obovate-oblong, cuspidate at the apex, green and glabrous on the upper surface, pale and slightly pubescent beneath, the central one 15--20 cm. long and 7.5--9 mm. wide at the middle; inflorescence terminal, paniculate, ample, thrysoid; pedicels short, pubescent; bractlets small, linear; calyx campanulate, about 3 mm. long, its rim dentate, the teeth small, deltoid; corolla white or whitish, its tube twice the length of the calyx, the lobes oblong, the upper ones dirty-yellow, the lower ones violet; stamens included; fruit hard, dry, pale orange-yellow.

The species is based on Harrison 5 from Abeokuta, western Lagos, and on Rowland s.n. from the interior of Southern Nigeria, collected in 1863. The type of V. staudtii was collected by Georg August Zenker and Alois Staudt -- in whose honor it is named -- their collection no. 13, from an open forest at Yaúnde Station, Cameroons. Chevalier's V. agraria, is based, without formal description, on several of his collections from French

Guinea (nos. 13199 and 13267), Ivory Coast (nos. 17055, 17140, 19340, and 19805), and Southern Nigeria (no. 14122). Pieper gives V. myrmecophila Mildbr. in the synonymy of this species, but he cites the numbers which Mildbraed's species is based upon under var. laxiflora, so the name actually belongs in the synonymy of that variety.

Gürke was acquainted with Baker's V. thyrsiflora only from the description when he proposed his V. staudtii. The characters which he gives as distinguishing the two do not hold. The character of myrmecophily which he emphasizes for V. staudtii is also very noteworthy in V. thyrsiflora, although it was not mentioned by Baker in his original diagnosis. Gürke appears actually to have based his species on Baumann 564, "not uncommon in high forest", Togo, May 1895, Zenker 1412a from Yaunde Station, Zenker & Staudt 18, in open jungle on an old plantation at Yaunde Station, altitude 800 meters, September 1893, and Zenker & Staudt 355, from sunny open places on laterite at Yaunde Station, May 1895.

According to Wheeler the ants involved in the myrmecophily of this species is Viticicola tessmanni (Stitz). It is a very vicious species, and very alert. If the host plant is disturbed ever so slightly, the ants rush out of the hollow stems in great numbers and explore the entire plant. Their sting is extremely painful, sometimes causing vesicles to rise on the skin.

It is worthy of note that Pieper cites for V. thyrsiflora the following collections: Baumann 564 from Togo, Harrison 5 and Rowland s.n. from Southern Nigeria, Zenker 1412a and Zenker & Staudt 18 from Cameroons, and Sim 6046 from Zambezia, Portuguese East Africa.

The species inhabits forests along riverbanks, high forests, open jungles, and sunny open places on laterite, blooming in April, May, and July. It has been collected in fruit in January and June. A common name is "ngunge-di". Specimens have been misidentified as Scrophulariaceae in some herbaria. The leaves are boiled and used in native medicines to alleviate the pains of ulcers. It has been found growing at an altitude of 165 to 800 meters.

Citations: SIERRA LEONE: N. W. Thomas 1164 (Br, N). BELGIAN CONGO: Bequaert 2216 (Br, Br); Bredo 6 bis (Br), 1178 (Br), 1184 (Br); De Graer 866 (Br); De Wulf 11 (Br); Lebrun 2575 (Br, Br, N), 2911 (Br, Br, N--photo, Z--photo); Pittery 28 (Br, Br); Steyaert 587 (Br), 604 (Br).

VITEX THYRSIFLORA var. LAXIFLORA Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 54 & 85. 1928.

Synonymy: Vitex myrmecophila Mildbr., Wiss. Ergebn. Deutsch. Zentral-Afr. Exped. 1910/11, 2: 34 & 80, hyponym. 1922.

Literature: Mildbr., Wiss. Ergebn. Deutsch. Zentral-Afr. Exped. 1910/11, 2: 34 & 80. 1922; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 54 & 85. 1928; Moldenke, Alph. List Invalid

Names 54. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 104 (1942) and [ed. 2], 114 & 203. 1949.

This variety differs from the typical form of the species only in its more lax inflorescences.

The variety is based on three collections from Cameroons, all deposited in the herbarium of the Botanisches Museum at Berlin: Zenker & Staudt 355, from sunny open places on laterite at Yaunde Station, May 1895, Mildbraed 3896 from Molundu on the Dscha (Ngoko), and Mildbraed 5097 from between Assobam on the Bumba and Lomie Station, in the south Cameroons forest region. The last two of these were cited by Mildbraed in his original publication of V. myrmecophila, but without description to validate the name. He merely stated that the twigs are inhabited by ants. Pieper places the binomial in the synonymy of the typical form of V. thyrsoiflora, but cites both cotype collections as cotypes of his var. laxiflora, so Mildbraed's binomial obviously belongs in the synonymy of the variety. Zenker & Staudt 355 is one of the collections on which Gürke based his V. staudtii.

VITEX TOMENTULOSA Moldenke, Bull. Torrey Bot. Club 60: 58--59. 1932.

Literature: Moldenke, Bull. Torrey Bot. Club 60: 58--59. 1932; Moldenke, Geogr. Distrib. Avicenn. 6. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 25 & 104 (1942) and [ed. 2], 45 & 203. 1949; Roig, Dicc. Bot. 2: 1115. 1953; Alain in León & Alain, Fl. Cuba 4: 317--318. 1957.

Shrub or tree; branches and branchlets slender, obtusely tetragonal or subterete, grayish, more or less pulverulent-puberulent with cinereous or flavescent puberulence on the younger parts and nodes, becoming glabrate in age; twigs short, slender, obtusely tetragonal or subterete, densely pulverulent-puberulent with decidedly flavescent puberulence; nodes obscurely or not at all annulate; principal internodes mostly much abbreviated, 2--10 mm. long; leaf-scars very small, usually not at all prominent, inconspicuous; leaves decussate-opposite, 3-foliate; petioles very slender, 1.5--3.2 cm. long, convex beneath, flattened and canaliculate above, densely tomentulose with very short sordid or flavescent hairs or densely cinereous-puberulent, not noticeably ampliate at the base nor disciform at the apex; leaflets subequal or the 2 lateral ones somewhat smaller, all subsessile or short-petiolulate on canescent-puberulent, canaliculate, and margined petiolules 1--2 mm. long, the central petiolule usually longer than the lateral ones; leaflet-blades firmly chartaceous or subcoriaceous, very dark-green above, whitish or flavescent beneath, the central one narrowly elliptic or oblanceolate, 1.5--6 cm. long, 5--11 mm. wide, sharply acute or attenuate-acuminate (rarely emarginate) at the apex, entire and with the margins occasionally subrevolute, acute or subcuneate at the base, densely pulverulent and often granular above, densely tomentulose with matted and cinereous or sordid to flavescent tomentum beneath; midrib very slender, impressed above, prominent beneath; second-

aries slender, very short, 8--15 per side, ascending, rather straight except at the margins where they are rather conspicuously arcuate-joined, obscure or subimpressed above, very prominent beneath; vein and veinlet reticulation comparatively abundant, obscure or subimpressed above, prominent beneath; inflorescence axillary, cymose or subpaniculate, 2--3 cm. long, 1--2 cm. wide, composed usually of one pair of rather long-stipitate lateral cymes and a terminal one, each cyme 3--7-flowered; peduncles very slender, 1--1.5 cm. long, densely puberulent like the petioles; rachis and inflorescence-branches approximately equal in length, 3--7 mm. long, densely puberulent like the peduncles; pedicels obsolete or to 1 mm. long and densely puberulent; calyx obconic-campanulate, about 2.8 mm. long and 2.6 mm. wide, somewhat 4- or 5-angled, its rim subtruncate, scarcely or very slightly 4- or 5-toothed on the angles, very densely granulose-pulverulent; corolla infundibular or hypocateriform, its tube broadly cylindric, about 2.3 mm. long, very much ampliate above, more or less densely pilose within, its limb 4-parted, slightly irregular, its lobes broadly oblong-lingulate, 1--1.3 mm. long and wide, very broadly rounded at the apex, puberulent, slightly granulose-pulverulent on the back; stamens 4, inserted near the mouth of the corolla-tube; filaments filiform, about 1.3 mm. long, pilose; anthers oblong, about 0.6 mm. long and 0.3 mm. wide; style capillary, 2--3 mm. long, glabrous; stigma bifid, its branches about 0.5 mm. long, erect, somewhat divergent; ovary subglobose, about 0.7 mm. long and wide, somewhat tetragonal, granulose-pulverulent at the tip; fruit black.

The type of this species was collected by Alberto Fors y Reyes (Roig 5831) at Los Fagales, Las Martinas, Rematu de Guane, Pinar del Río, Cuba, on March 25, 1929, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species inhabits limestone terraces facing the sea, and has been collected in fruit in January. Fors reports that the wood is useful and that a common name is "roble guiro", "robleguiro", or "roble gñiro". It has been confused in the past by herbarium workers with V. clementis Britton & P. Wils.

Citations: CUBA: Oriente: Bucher s.n. [León 18552] (Ha); Ekman 16170 (B, E--photo, N, N, N--photo, S, S, Z--photo); León 16336 (Ha, N); Sagra 229 & 909 (N). Pinar del Río: Acuña 19936 (Z); Fors s.n. [Roig 5831] (Es--isotype, N--type).

VITEX TRICHANTHA J. G. Baker, Journ. Linn. Soc. Lond. Bot. 21: 434--435. 1885.

Synonymy: Chrysomallum trichantha Baker, in herb. Rhamnotiphus ferrugineus Baker, in herb.

Literature: J. G. Baker, Journ. Linn. Soc. Lond. Bot. 21: 434--435. 1885; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 76, 79, & 85. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 104 (1942) and [ed. 2], 123 & 203. 1949; Moldenke in Humbert, Fl. Madag. 174:120--122. 1956.

Illustrations: Moldenke in Humbert, Fl. Madag. 174: fig. 18,

4--6. 1956.

A much-branched erect shrub; branches, branchlets, and twigs very slender, obtusely tetragonal, grayish-brown, densely fulvous villous on the younger parts with long spreading or slightly antorse hairs, glabrescent in age; nodes not annulate; principal internodes abbreviated, 5--25 mm. long; leaves decussate-opposite and 1-foliolate; petioles slender, 5--14 mm. long or sometimes more abbreviated, very densely fulvous-villous with long spreading hairs; leaf-blades chartaceous (not subcoriaceous as stated by Baker), firm-textured, rather uniformly bright-green on both surfaces, oblong or elliptic, 4--12 cm. long, 2--5 cm. wide, acute or slightly mucronate at the apex, entire or irregularly short-dentate near the middle, often slightly subrevolute along the margins, rounded at the base, villous on both surfaces when young, glabrescent above and loosely villous beneath when mature, more densely villous on the larger venation; inflorescence axillary, 1- or 2-flowered, shorter than the subtending leaves; peduncles very slender or filiform, 5--15 mm. long, very densely fulvous-villous; bractlets lanceolate, 3--5 mm. long, more than twice as long as wide, densely spreading-villous with fulvous hairs on both surfaces, attenuate at the apex; pedicels filiform and to 10 mm. long and densely fulvous-villous, or obsolete; calyx campanulate, 7--8 mm. long, densely shaggy-villous with fulvous hairs, the rim 5-lobed, the lobes lanceolate, about as long as the tube; corolla purple or red, cylindric, incurved, or infundibular-elongate, 2--2.5 cm. long, 5--6 mm. wide at the apex, densely fulvous-villous with long spreading or subappressed hairs on the outside, the lobes small, orbicular; stamens and style exerted beyond the corolla-lobes; anthers minute, globose; stigma bifid; ovary densely hairy; fruiting-calyx and fruit not known.

The type of this species was collected by Richard Baron (no. 2316) in central Madagascar, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. The species inhabits forests, at altitudes of 1000--1400 meters, flowering in November.

Citations: MADAGASCAR: Baron 2316 (K--type, N--isotype, N--photo of type, P--isotype, Z--photo of type); Catat 1758 (P); Decary 5080 (P), 5082 (P); Humbert 3518 (P).

VITEX TRIFLORA Vahl, Eclog. Amer. 2: 49. 1798.

Synonymy: Pyrostoma ternata G. F. W. Mey., Prim. Fl. Esseq. 220. 1818. Vitex ferruginea Vahl ex H.B.K., Nov. Gen. & Sp. Pl. 2: 246 [ed. pict. 200]. 1818 [not V. ferruginea Schum. & Thonn., 1827, nor Bojer, 1847, nor Baker, 1928, nor H. & B., 1955, nor Schum., 1955]. Casarettoa diversifolia Walp., Repert. 4: 92. 1844. Ruellia macrocalyx Ruiz ex Nees in A. DC., Prodr. 11: 218, in syn. 1847. Macrostegia ruiziana Nees in A. DC., Prodr. 11: 218, in syn. 1847. Vitex triflora var. temuifolia Huber, Bol. Mus. Goeldi 5: 214--215. 1909. Clerodendrum ternatum Hoffm. ex Moldenke, Prelim. Alph. List Invalid Names 23, in syn. 1940

[not C. ternatum Schinz, 1890]. Pyrostoma latifolia G. F. W. Mey. ex Moldenke, Prelim. Alph. List Invalid Names 39, in syn. 1940. Pyrostoma 3-foliolata G. F. W. Mey. ex Moldenke, Prelim. Alph. List Invalid Names 39, in syn. 1940. Vitex paraensis Mart. (in part) ex Moldenke, Prelim. Alph. List Invalid Names 51, in syn. 1940 [not V. paraensis Moldenke, 1940]. Vitex sericea Poepp. (in part) ex Moldenke, Prelim. Alph. List Invalid Names 52, in syn. 1940. Vitex triphylla Vahl ex Moldenke, Prelim. Alph. List Invalid Names 52, in syn. 1940 [not V. triphylla Royle, 1839, nor L., 1947]. Vitex trifolia Vahl ex Moldenke, Suppl. List Invalid Names 11, in syn. 1941 [not V. trifolia L., 1781, nor Moon, 1895, nor L. f., 1933, nor Sessé & Moc., 1940, nor Hemsl., 1949]. Calymega trifoliata Poit., in herb. Pyrostoma trifoliata Mey., in herb. Pseudobasleria Von Rohr, in herb. Vitex argentea Hort., in herb. Vitex triflora Schau., in herb.

Literature: L., Suppl. Pl. 293. 1781; Vahl, Eclog. Amer. 2: 49. 1798; G. F. W. Mey., Prim. Fl. Esseq. 220. 1818; H.B.K., Nov. Gen. & Sp. Pl. 2: 246 [ed. pict. 200]. 1813; Schum. & Thonn. in Schum., Beskr. Guin. Pl. 288--289. 1827; Royle, Illustr. Bot. Himal. 299. 1839; Walp., Repert. 4: 92. 1844; Nees in A. DC., Prodr. 11: 213. 1847; Schau. in A. DC., Prodr. 11: 694. 1847; Schau. in Mart., Fl. Bras. 9: 300--302 & 307, pl. 49. 1851; Ettingsh., Blatt-Skelet. Dikot. 79, pl. 32, fig. 6. 1861; Ettingsh., K. Akad. Wiss. Wien Denkschr. 28: 219 [Fossile Flora Bilin 2: 32]. 1868; Schinz, Verhändl. Bot. Ver. Brand. 31: 206. 1890; Huber, Bol. Mus. Goeldi 5: 212--215, pl. 1. 1909; Glaz., Bull. Soc. Bot. France Mém. 3: 547. 1911; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 91, pl. 11, fig. 3. 1928; Stapf, Ind. Lond. 6: 479. 1931; LeCointe, A Amaz. Brasil. III Arv. & Pl. Uteis 430. 1934; Moldenke, Alph. List Common Names 20 & 29. 1939; Moldenke, Geogr. Distrib. Avicenn. 21, 22, 24, 27, & 28. 1939; Moldenke, Prelim. Alph. List Invalid Names 14, 23, 32, 39, 51, & 52. 1940; Worsdell, Ind. Lond. Suppl. 2: 501. 1941; Moldenke, Suppl. List Invalid Names 11. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 33, 35, 39, 40, & 104. 1942; Moldenke, Alph. List Invalid Names 12, 21, 33, 39, 54, & 55. 1942; Moldenke, Phytologia 2: 122. 1944; LeCointe, O Est. do Para 292. 1945; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 65, 67--69, 74, 95, 98, & 203. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 15. 1949; Angely, Gazeta do Povo, Curitiba, 37, no. 10698, p. 5. Dec. 8, 1955.

Illustrations: Schau. in Mart., Fl. Bras. 9: pl. 49. 1851; Ettingsh., Blatt-Skelet. Dikot. 79, pl. 32, fig. 6. 1861; Huber, Bol. Mus. Goeldi [Mus. Para.] 5: pl. 1. 1909; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: pl. 11, fig. 3. 1928.

Shrub or small tree, to 13 m. tall: trunk to 20 cm. in diameter at breast height; branches rather stout, obtusely tetragonal or subterete, gray, medullose, glabrate, not plainly lenticellate; branchlets more slender, more acutely tetragonal, often brownish or purplish in drying, glabrate; twigs slender, often flattened and sulcate in drying, more or less puberulent (especially at the

nodes) with brownish or flavescent and very minute hairs; nodes not annulate; principal internodes 1—9 cm. long (or sometimes elongate to 17 cm. on older wood); leaf-scars large, slightly elevated on older wood; buds obconic, hairy with golden-brown hairs; leaves decussate-opposite, 3-foliolate; petioles slender, 1.2—6 cm. long, densely or sparsely puberulent with appressed flavescent hairs or becoming glabrous, not noticeably ampliate at the base, convex beneath, flattened and canaliculate above; leaflets subequal in size or the 2 lateral ones slightly smaller, all very shortly petiolulate or subsessile; petiolules 1—3 mm. long and sparsely strigillose-puberulent, mostly margined; leaflet-blades thin-chartaceous or papery, rather uniformly light-green on both surfaces, the central one elliptic or subobovate, 5.5—22 cm. long, 2.4—9.4 cm. wide, acute or short-acuminate (rarely obtuse) at the apex, entire, acute or acuminate at the base, glabrous or subglabrate above (except for the pilose midrib), more or less puberulent or flavescent-pilose along the midrib and larger venation (or glabrous) beneath, the lateral ones similar in all respects but sometimes slightly smaller; midrib slender, flat or subimpressed above and usually more or less pilose, prominent beneath; secondaries slender, 8—15 per side, arcuate-ascending, arcuately joined near the margins, flat or subimpressed above, prominent beneath; vein and veinlet reticulation fine, subprominent on both surfaces; inflorescence axillary, cymose, usually 3-flowered or bifurcate and 7-flowered, rarely 1-flowered, 3.5 to 11 cm. long, 1—3 cm. wide; peduncles very slender, 1.5—7.5 cm. long, densely or sparsely puberulent, flattened; pedicels slender, 1—7 mm. long, puberulent with incanous or flavescent hairs; bracts none; bractlets and prophylla linear, 2—4 mm. long (or rarely elongate to 2.5 cm. and 3 mm. wide); calyx papery, tubular-infundibular, green, to 2 cm. long, 2-lipped, deeply 5-fid, rather densely appressed-pubescent with flavescent hairs, the lobes foliaceous, lanceolate, sharply acute, often spreading or recurved, more sparsely appressed-puberulent; corolla hypocrateriform or personate, varying from blue, pale-blue, or sky-blue to pale-purple, purple, pale-lavender, lilac, or violet, the upper lip lighter, the larger lobe darker or purple, its tube cylindric, incrassate, palest-lilac, to 2.3 cm. long, very densely appressed-villous with flavescent antrorse hairs on the portion exerted from the calyx-tube, its limb 2-lipped, lilac-purple, 5-lobed, the lobes comparatively small, densely villous like the tube externally, glabrous within, the upper lip erect and bifid, the lower lip with the middle lobe rounded at the apex, crenulate, barbate on the yellowish eye-spot at the base, and deepest purple; stamens slightly exerted, barbate at the base; filaments bluish; style subequaling the stamens; stigma very shortly bifid; ovary oblong, more or less tomentose; fruiting-calyx accrescent, its lobes often much enlarged and very foliaceous; fruit drupaceous, gray, fleshy or dry, about 1.5 cm. long and 1 cm. wide, densely appressed-pubescent with cinereous or flavescent hairs, edible, the thin mesocarp smelling strongly of Eau de Cologne, especially in drying, turning purplish, 4-celled, 1 or more seeds

often aborted.

The type of this widespread and well-known species is a specimen from the Vahl herbarium [Herb. Willdenow 11701; Macbride photos 22779] inscribed "Ex India" on the label. The type of Macrostegia ruiziana and of Ruellia macrocalyx was collected by Hipólito Ruiz [Macbride photos 5885] in Peru.

The species grows from Amazonian Venezuela, British Guiana, Surinam, and French Guiana, through Amazonian Brazil, to Peru and Bolivia. It has been cultivated in Brazil and France. One specimen in the Brussels herbarium is inscribed "Insulae Bahamenses", but whether this Amazonian tree is or was actually cultivated in the Bahamas is doubtful. The Vitex ferruginea accredited to Vahl by Kunth is probably V. triflora. Vahl described only V. capitata and V. triflora. Ettingshausen refers to this species as "V. sericea of Chile", but it is not known from that country.

Spruce reports that the entire tree is aromatic in every part. It inhabits terra firma, mata virgem, campos, forests, thickets, lowlands, swamps, and streamsides, from 70 to 300 meters altitude. Cowan reports it as infrequent in lowland forests. It has been collected in anthesis from March to December, and in fruit from September to December and in February. A Poiteau specimen from French Guiana in the Delessert Herbarium at Geneva is remarkable in having the leaflets glabrous on both surfaces and very shiny, and the Leprieur 266, also from French Guiana, in the Delessert and Leiden herbaria agrees with it in these respects, although it has much smaller leaflets, but a duplicate at Kew shows the usual puberulence on the lower leaf-surface. The Delessert Herbarium specimen of Poeppig 2555b is inscribed, apparently erroneously, "Perou". A wood sample of Ginzberger 818 is deposited in the Chicago Natural History Museum. Glaziou, in the reference cited above, lists a no. "15165a", but this seems to be a typographic error for no. 14165a.

The species is called "mama cachorra", "mama de cachoirra", "tarumã", "tarumá", and "tarumá de terra-firma" in Brazil, "tahuari" in Peru, "pantã" in Surinam, "guarataro" in Venezuela, and "hakiaballi" in British Guiana. It has been confused in herbaria with V. gigantea H.B.K., V. trifoliolata Lam., Hosta odorata Poepp., Clerodendrum ternifolium H.B.K., and the genus Duranta L. Specimens have also been misidentified as Petrea Houst. and even Ruellia L. LeCointe, in his 1934 publication cited above, lists the common names "tarumã de matta" and "tarumá silvestre". In his 1945 work he gives the name "tarumá da matta" and says that the leaves are used in the treatment of cystitis and urethritis, the root as a tonic and febrifuge, and the fruit as an emmenagogue and diuretic. Schauer, in his 1851 work, states that the name "taruma" is used for the tree throughout Pará and the Rio Negro region. Actually that name, in one or another of its variant spellings, is applied to most species of Vitex in the Amazonian area; "hakiaballi" is also applied to V. guianensis Moldenke.

Citations: VENEZUELA: Amazonas: Ll. Williams 15688 (W--

1876360). BRITISH GUIANA: A. Anderson s.n. (K); De la Cruz 3554 (Ca--299211, E--917737, G, K, N, W--1282788); N. G. L. Guppy 222 [Herb. Forest Dept. Br. Guian. 7198] (K); Herb. Forest Dept. Br. Guian. 4028 [F.1292] (N); Herb. Rudge s.n. (S); ImThurn s.n. [Oct. '79] (K, P); Jenman 476 (P, U), 2036 (C, U); W. H. F. Talbot s.n. [1840] (K). SURINAM: Hulk 235 (Ut); Kappler 67 (Le), 2093 (B, Gt, Le, V, V), s.n. [1861] (Ut), s.n. [1862] (Ut); B. Maguire 24837 (N, S); Tresling 379 (Ut). FRENCH GUIANA: Collector undesignated 352 (P, P, Us), s.n. [Cayenne] (Dc, Dc, Dc, Dc, Dc, Dc, Le), s.n. (Dc); Cowan 38829 (S); DeCandolle & L'Héritier s.n. (Cb, Cb); Gabriel s.n. (Cb, Cb, Cb, F--870960); Herb. Barbier s.n. (P); Herb. Harvey s.n. [Cayenne, 1842] (Du--166533); Leprieur 266 (Cb, Le, P), s.n. [1838] (P), s.n. [1839] (Cb, Cb); J. Martin s.n. [Herb. Rudge] (Bm, Bm), s.n. (Bm, Bm, Bm, Bm, Br, K); Perrottet s.n. [1821] (P), s.n. (Cb, Cb, N); Poiteau s.n. (B, B, Cb, Cb, K, P, P, P, P); Rech 17 (P); L. C. Richard s.n. (P, P, P); Ryan s.n. [Cayenne] (Cp); Sagot s.n. [Karouany, 1857] (P), s.n. [Karouany, 1859] (V). PERU: Loreto: Ducke 7561 (Cb); Klug 1254 (F--627556, N, W--1456261), 1492 (F--627495, N, W--1456410), 2791, in part (B, F--690207, S); Poeppig 2362, in part (Cb, F--876715, P, P, V, V, V, V, X), s.n. (Le); Ll. Williams 4195 (F--627017, N). Depart-ment undetermined: Ruiz s.n. [Macbride photos 5885] (N--photo); Ruiz & Pavon s.n. (F--843612). BRAZIL: Amapá: Cowan 38398 (N); Fróes 26651 (N). Amazonas: Ducke 6759 (Cb); Fróes 22495 (Be--32283, N); Krukoff 4704 (A, B, B, Ca--606320, Cb, F--810958, It, K, N, S, Sp--35046, Ug, Ut), 6034 (F--874477, Mi, N, S), 6869 (F--874070, Mi, N, S); Murça Pires 105 (Be--19996, N); Poeppig 2555b (B, Cb, Cb, P, V), s.n. [prope Ega] (B, Bm, V); Schwacke 3636 (Cb); Spruce 2130 (B, B, Bm, Br, Cb, Cb, Ed, G, K, K, Lu, N, P, V, V, X). Maranhão: Fróes 13 (W--1617858), 1972 (A, B, Bm, Cb, E-1042170, K, Mi, N, P, S, Ut). Pará: Black 47-1794 (Be--30003, N), 48-3223 (Be--37758); Derby s.n. [near Santarem, 1871] (C); Ducke 1980 (Cb), 2950b (Bm, Cb, Cb, P, W--1040309); Fróes 20381 (Be--15917, N), 30403 (Z); Ginzberger 818 (F--934795), 819 (F--934797); Goeldi 7786 (Cb, Cb); Killip & Smith 30598 (F--929265, N); Martius 2590 (Br); A. M. Moss s.n. [1926] (Em); Murça Pires & Black 416 (Ca--743872); Murça Pires, Fróes, & Silva 5966 (Z); A. J. de Sampaio 5014 [Herb. Mus. Nac. Rio de Janeiro 18917] (B); Schomburgk 227 (K); Sieber s.n. [Hoffmannsegg; Rio Negro] (Br); Spruce s.n. [prope Santarem, August 1850] (B, Cb, Cp, F--876587, G, P, X); Zerny 817 (F--935097). State undetermined: L. Riedel 1259 (N). BOLIVIA: El Beni: H. H. Rusby 1027 (C, D, F--162471, G, Pa, Pr, W--58261). CULTIVATED: Brazil: Glaziou 14165a (K, P). France: Hort. Celsianus s.n. (Cb); Hort. Paris s.n. (Cb, Cb, Cb, Cb). LOCALITY OF COLLECTION UNDETERMINED: Herb. Expos. Coloniale s.n.

(P); Herb. Vahl s.n. [Ex India; Macbride photos 22779] (B--photo of type, F--687354--photo of type, Kr--photo of type, N--photo of type); Moll s.n. [1834; Insulae Bahamenses] (Br); Von Rohr s.n. (Cp). MOUNTED ILLUSTRATIONS: Martius, Fl. Bras. 9: pl. 49. 1851 (B).

VITEX TRIFLORA var. ANGUSTILOBA Huber, Bol. Mus. Goeldi 5: 215, pl. 3, figs. 14--18. 1909.

Literature: Huber, Bol. Mus. Goeldi [Mus. Para] 5: 215, pl. 3, figs. 14--18. 1909; Stapf, Ind. Lond. 6: 479. 1931; Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104 (1942) and [ed. 2], 95 & 203. 1949.

Illustrations: Huber, Bol. Mus. Goeldi 5: 215, pl. 3, figs. 14--18. 1909.

This variety differs from the typical form of the species in its leaflets being membranous in texture, glabrous above and ferrugineous-puberulent on the veins beneath or else puberulent or short-pubescent throughout on both surfaces, the inflorescences rather lax and rather many-flowered, the calyx decidedly irregular and usually 2-lipped, its tube narrow-cylindric, the attenuate lobes shorter than the tube, narrowly lanceolate-triangular, and very acute at the apex.

The variety was based by Huber on his no. 254, collected in the Matta de Jupatitube, Belém, in July, 1896, and no. 524 from Marco da Legua, Belém, Pará, Brazil, collected in November, 1896, and Siqueira 6886 (in part) from the matta at São Salvador, Marajo Island, Brazil, collected in November, 1904. He comments that "Esta variedade, que se distingue principalmente pelo calyce bastante delgado dividido em lobulos muito estreitos e pontudos, tem-se achado ate aqui so na regioa costeira." The variety is said to inhabit forests and clearings and has been collected in anthesis in July and November.

A key for distinguishing this and the other varieties of V. triflora from the typical form of the species follows:

1. Leaflets thin-chartaceous or membranous.

2. Leaves uniformly 3-foliolate.

3. Leaflets distinctly downy above to touch; cymes usually more than 3-flowered.....V. triflora var. angustiloba.

3a. Leaflets glabrous, subglabrate, or only obscurely strigillose above; cymes mostly 3-flowered.....V. triflora.

2a. Leaves 3--5-foliolate....V. triflora var. quinquefoliolata.

1a. Leaflets thicker in texture, usually subcoriaceous or coriaceous.

4. Cymes mostly many-flowered; calyx-tube as long as the lobes.

5. Leaves 1--5-foliolate; leaflets usually very densely velutinous-tomentose on both surfaces; calyx densely hirsute-tomentose.....V. triflora var. kraatzii.

5a. Leaves 3-foliolate; leaflets only puberulent or softly short-pubescent on both surfaces; calyx appressed-pubescent.....V. triflora var. floribunda.

4a. Cymes few-flowered; calyx-tube often twice as long as the lobes.....V. triflora var. coriacea.

Citations: BRAZIL: Pará: Huber 254 (Bm--cotype, Cb--cotype, Cb--cotype, N--cotype, N--photo of cotype, Z--photo of cotype). MARAJÓ ISLAND: Siqueira 6886, in part (Cb--cotype).

VITEX TRIFLORA var. CORIACEA Huber, Bol. Mus. Goeldi 5: 215--216, pl. 1, figs. 1--4. 1909.

Literature: Huber, Bol. Mus. Goeldi [Mus. Para.] 5: 215--216, pl. 1, figs. 1--4. 1909; Stapf, Ind. Lond. 6: 479. 1931; Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Alph. List Common Names 29. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104. 1942; Moldenke, Phytologia 2: 122. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 203. 1949.

Illustrations: Huber, Bol. Mus. Goeldi [Mus. Para.] 5: pl. 1, figs. 1--4. 1909.

This variety differs from the typical form of the species in its leaflets being coriaceous or subcoriaceous in texture, and densely and softly velutinous-pubescent throughout on both surfaces. The inflorescence is contracted and the calyx-tube is elongate-cylindric, often twice as long as the very narrow lobes.

The type of the variety was collected by Adolfo Ducke (no. 1997) on the road from Belém to Pinheiro, Pará, Brazil, on December 31, 1900. Huber notes that "Pelos flores, esta especie aproxima-se principalmente da variedade angustiloba, mas ella distingue-se pelas folhas coriáceas o mais avelludadas". It has been collected in anthesis in June, August, November, and December. The Herb. Rio de Janeiro 35668 specimen cited below is described as a small tree with blue-violet flowers. Its leaves are apparently immature and are thin-membranous, but a single loose mature leaflet is decidedly coriaceous. It is, however, not at all certain that this loose leaflet actually belongs with the rest of the specimen. If it doesn't, then this collection may not represent this variety, but may be V. triflora in its typical form. Ducke records the common name "tarumã" for this collection. Silva describes the plant from which his collection, cited below, was taken as a large tree. The variety has been collected in secondary non-inundated forests and along roadsides.

Citations: BRAZIL: Amazonas: Ducke s.n. [Manáos, June 1937; Herb. Rio de Janeiro 35668] (N). Pará: Ducke 1997 (Cb--isotype, E--photo of isotype, N--photo of isotype, Z--photo of isotype); A. M. Moss s.n. [1916] (Bm, Bm), s.n. [1926] (Bm); Murça Pires & Black 126 (Be--17038); M. B. da Silva 155 (Be--13631).

VITEX TRIFLORA var. FLORIBUNDA Huber, Bol. Mus. Goeldi 5: 215, pl. 2, figs. 9--11, & pl. 3, fig. 21. 1909.

Synonymy: Vitex paraensis Mart. (in part) ex Moldenke, Prelim. Alph. List Invalid Names 51, in syn. 1940.

Literature: Huber, Bol. Mus. Goeldi [Mus. Para.] 5: 215, pl. 2, figs. 9--11, & pl. 3, fig. 21. 1909; Stapf, Ind. Lond. 6: 479. 1931; Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Pre-

lim. Alph. List Invalid Names 51. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104. 1942; Moldenke, Alph. List Invalid Names 54. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 203. 1949.

Illustrations: Huber, Bol. Mus. Goeldi [Mus. Para.] 5: pl. 2, figs. 9--11, & pl. 3, fig. 21. 1909.

This variety differs from the typical form of the species in its leaflet-blades being subcoriaceous and more or less puberulent or softly short-pubescent on both surfaces, its inflorescences many- and densely flowered, the calyx-tube campanulate, shorter than in var. angustiloba, the lobes ovate-lanceolate or narrowly triangular, equaling the tube, rather obtuse or shortly acute at the apex, and the corolla showy, twice as long as the calyx.

The type of the variety was collected by Manoel Guedes (no. 2133) in the matta of the Bosque Municipal at Belém, Pará, Brazil, on July 20, 1901. Huber notes that "Se aproxima da variedade precedente [var. angustiloba], com a qual cresce junto". It has been collected in anthesis from May to August and in October, and in fruit in July. The amount of pubescence on the leaflets varies greatly, but the blades are mostly ciliate along the margins. The corolla is described as light-blue, bluish, or violet. The variety is said to be a small tree or shrub, 3 m. tall, inhabiting woods on terra firma. The Ule collection cited below is anomalous in its few-flowered cymes and very sparsely puberulent leaflet-blades -- it may actually represent a different variety, and is placed here only tentatively.

Citations: BRAZIL: Acre Territory: Ule 9727 (B, Cb, K, Le). Pará: Burchell 9514 (K, K, K, Le, N, P, V); Ducke 971 (N); 3029 (Bm, W--1040313); Fröes 24318 (Be--43254); Guedes 2133 (Bm--isotype, Cb--isotype, Cb--isotype, Mi--photo of isotype, N--photo of isotype, P--isotype, W--1040260--isotype, Z--photo of isotype); Herb. Lusit. s.n. [Pará] (P); Martius 2590, in part (Mu--686), s. n. (Mu--687, Mu--688); Siqueira 3668 (Bm, Cb); Spruce 492 (Mu--689), s. n. [In vicinibus Para, Jul.-Aug. 1849] (K, N, V). State undetermined: Burchell 9633 (K, K, P).

VITEX TRIFLORA var. KRAATZII Huber, Bol. Mus. Goeldi 5: 216, pl. 2, figs. 12 & 13. 1909.

Synonymy: Vitex flavens x triflora Ducke ex Moldenke, Prelim. Alph. List Invalid Names 50, in syn. 1940.

Literature: Huber, Bol. Mus. Goeldi [Mus. Para.] 5: 216, pl. 2, figs. 12 & 13. 1909; Stapf, Ind. Lond. 6: 479. 1931; Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Alph. List Common Names 20. 1939; Moldenke, Prelim. Alph. List Invalid Names 50. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104. 1942; Moldenke, Alph. List Invalid Names 53. 1942; Moldenke, Phytologia 2: 122. 1944; H. N. & A. L. Moldenke, Pl. Life 2: 67. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 203. 1949.

Illustrations: Huber, Bol. Mus. Goeldi [Mus. Para.] 5: 216,

pl. 2, figs. 12 & 13. 1909.

This variety differs from the typical form of the species in its leaflets being thicker or even subcoriaceous in texture, smaller in size, 2--11 cm. long, 1--5.3 cm. wide, varying from 1 to 5 in number, regularly obtuse or emarginate at the apex or rarely abruptly short-acuminate, and usually densely velutinous-pubescent or subvillous on both surfaces (rarely sparsely short-pubescent), often subbullate and rubiginous, rarely only pubescent along the nerves beneath. The pubescence is more dense on the twigs, peduncles, and petioles, the hairs being rufous or flavescent in color. The secondaries are impressed above; the veinlet reticulation obscure or indiscernible on both surfaces. The inflorescence is short-pedunculate, contracted or more usually many-flowered. The calyx-tube is subinfundibular. The corolla is red and slightly surpasses the calyx.

The variety -- named in honor of Karl Alexander von Kraatz-Koschlau, head of the department of geology and mineralogy at the Museu Paraense, where he died of yellow fever in 1900 -- was based by Huber on Ducke 2873, collected on campos at Monte Alegre, Pará, Brazil, on July 16, 1902, and on Huber 1729, collected on the seashore at Braganca, Pará, Brazil, in December, 1899. Huber describes it as a small shrub, and Silva as a tree. The flowers are said by Traill to be "personate". It has been collected in anthesis and in fruit in July and December. A common name is "mammi-cachorri". The Huber cotype collection is actually anomalous in its sparsely short-pubescent leaflet-blades, while Traill 672 is unusual because of its abruptly short-acuminate leaflets. The Silva collection has long-villous "fruits", which are probably galled by insects and therefore abnormal.

Citations: BRAZIL: Maranhão: Lisbôa 2488 (Bm, Cb, N). Pará: Ducke 2873 (Bm--cotype, Cb--cotype, N--photo of cotype, P--cotype, W--1040308--cotype, Z--photo of cotype), 9921 (Cb, E--photo, N--photo, Z--photo); Huber 1729 (Cb--cotype, N--photo of cotype, Z--photo of cotype); N. T. da Silva 2 (Be--36033, N); Siqueira 6886, in part (Cb); Traill 672 (K).

VITEX TRIFLORA var. QUINQUEFOLIOLATA Moldenke, Phytologia 1: 104. 1934.

Synonymy: Vitex triflora var. quinquefoliata Moldenke, in herb.

Literature: Moldenke, Phytologia 1: 104. 1934; Moldenke, Geogr. Distrib. Avicenn. 24 & 27. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 35, 39, & 104 (1942) and [ed. 2], 74, 95, & 203. 1949.

This variety differs from the typical form of the species in having its leaflets 3 or 5 in number, mostly 5, and in its inflorescences being often many-flowered.

The type of the variety was collected by Boris Alexander Krukov (no. 5765) on terra firma near the mouth of the Rio Macauhan (a tributary of the Rio Yaco) at latitude 9°20' S., longi-

tude 69° W., Acre Territory, Brazil, on September 3, 1933, and is deposited in the Britton Herbarium at the New York Botanical Garden. It is described as a slender tree, 15--45 feet tall, with a stem diameter of 3 inches and with its fresh foliage and other parts aromatic with the scent of sweetbrier (Rosa rubiginosa), especially when rubbed. In glabrescence its leaflets resemble those of the typical form of the species. The corolla is said by collectors to be sky-blue. A common name recorded is "tahuari", the same name as applied to the typical form. It ascends to 140 meters altitude in Peru, and Spruce describes it as rare. It inhabits forests, terra firma, and the gravelly shores of rivers. In anthesis it has been collected in August and December, and in fruit in September. Klug 2791 exhibits 5 leaflets on the Geneva, St. Louis, and Washington herbarium specimens, but only 3 leaflets on the Arnold Arboretum, Kew, and New York specimens. The Krukoff collection shows 5 leaflets on the Arnold Arboretum, Kew, New York, Stockholm, and Utrecht specimens, but only 3 on the rest.

Citations: BRAZIL: Acre Territory: Krukoff 5765 (A--isotype, B--isotype, Ca--605833--isotype, Cb--isotype, Cb--isotype, F--811835--isotype, F--811844--isotype, It--isotype, K--isotype, K--isotype, N--type, S--isotype, Ut--isotype). Pará: Spruce 1039 (K, K, N), s.n. [in vicinibus Santarem, Aug. 1850] (B, Bm, Ed, Lu). PERU: Loreto: Klug 2791 (A, Cb, E--1065360, K, N, W--1457177).

VITEX TRIFOLIA L., Sp. Pl., ed. 1, 638 [as "trifoliis"]. 1753.

Synonymy: Piperi similis fructus striatus, femina C. Bauh., Pinax Theatr. Bot. 412. 1671. Vitex latiore folio C. Bauh., Pinax Theatr. Bot. 475. 1671. Caranosi Rheede, Hort. Ind. Malab. 2: 13, pl. 2. 1679. Vitex trifolia minor indica Breyn. ex Pluk., Alm. Bot. 390, pl. 206, fig. 5. 1696. Vitex trifolia floribus per ramos sparsis Burm., Thes. Zeyl. 229, pl. 109. 1737. Lagondium vulgare Rumph., Herb. Amboin. 4: 48, pl. 18. 1743. Vitex trifolia minor indica Pluk. ex L., Sp. Pl., ed. 1, 638, in syn. 1753. Vitex integerrimis Mill., Gard. Dict., ed. 8, no. 3. 1768. Vitex indica Mill., Gard. Dict., ed. 8, in errat. 1768. Vitex variifolia Salisb., Prodr. Stirp. Hort. Allert. 107. 1796. Vitex trifolia var. trifoliata Cham., Linnaea 7: 107. 1832. Vitex triphylla Royle, Illustr. Bot. Himal. 299. 1839. Vitex trifolia var. trifoliolata Schau. in A. DC., Prodr. 11: 683. 1847. Vitex agnus castus var. trifolia (L.) Kurz, For. Fl. Brit. Burma 270. 1877. Vitex agnus-castus var. subtrisecta Kuntze, Rev. Gen. Pl. 2: 510 & 511. 1891. Vitex agnus-castus β trifolia (L.) Kurz ex Kuntze, Rev. Gen. Pl. 2: 510 & 511. 1891. Vitex agnus-castus Kurz apud Jacks., Ind. Kew. 2: 1213, in syn. 1895 [not V. agnus-castus L., 1753]. Vitex incisa Wall. apud Jacks., Ind. Kew. 2: 1213, in syn. 1895 [not V. incisa Lam., 1788, nor Bunge, 1927, nor Thunb., 1947]. Vitex integerrima Mill. apud Jacks., Ind.

Kew. 2: 1213, in syn. 1895. Vitex trifoliata L. f. ex E. D. Merr., Bur. Govt. Labs. 6: 17--18, sphalm. 1904. Vitex langundi Ridl., Journ. Roy. As. Soc. Straits 45: 50, hyponym. 1906. Vitex trifoliata P. Henderson, Handb. Pl., new ed., 482. 1910. Vitex trifoliolata Schau. apud P'ei, Verbenac. China 99, in syn. 1932. Vitex trifolia L. f. apud Benthall, Trees Calcutta 356, sphalm. 1933. Piper similis fructus striatus, femina Banks ex Moldenke, Prelim. Alph. List Invalid Names 36, in syn. 1940. Vitex agnus-castus var. trifolia (L.) Kurz ex Moldenke, Alph. List Invalid Names 52, in syn. 1942. Vitex trifoliata Lam. ex Moldenke, Alph. List Invalid Names Suppl. 1: 29, in syn. 1947 [not V. trifoliata Pav., 1940]. Vitex triphylla L. ex Moldenke, Alph. List Invalid Names Suppl. 1: 29, in syn. 1947. Vitex trifoliata L., in herb. Vitis trifoliata L. f., in herb. [not V. trifoliata Baker, 1871, nor Thunb., 1825].

Literature: C. Bauhin, Pinax Theatr. Bot. 412 & 475. 1671; Rheede, Hort. Ind. Malab. 2: 13, pl. 11. 1679; Ray, Hist. Pl. 3: 1575. 1688; Plukenet, Alm. Bot. 390, pl. 206, fig. 5. 1696; Burm., Thes. Zeyl. 229, pl. 109. 1737; Rumph., Herb. Amboin. 4: 48, pl. 18. 1743; L., Sp. Pl., ed. 1, 2: 638. 1753; N. L. Burman, Fl. Ind. 137. 1768; Mill., Gard. Dict., ed. 8, no. 3 & in errat. 1768; West., Univ. Bot. 1: 312. 1770; Lour., Fl. Cochinch., ed. 1, 2: 390. 1790; Poir. in Lam., Tabl. Encycl. pl. 541, fig. 2. 1794; Salisb., Prodr. Stirp. Hort. Allert. 107. 1796; Willd., Sp. Pl., 3: 392. 1801; Pers., Syn. Pl. 2: 144. 1806; R. Br., Prodr. Fl. Nov. Holl., ed. 1, 1: 511. 1810; Ait., Hort. Kew., ed. 2, 4: 67. 1812; Curtis, Bot. Mag. 47: pl. 2187. 1820; Roxb., Fl. Ind., ed. 1, 481. 1820; Thunb., Fl. Javan. 11. 1825; Cham., Linnaea 7: 107. 1832; Bojer, Hort. Maurit. 258. 1837; Royle, Illustr. Bot. Himal. 299. 1839; O'Shaughnessy, Beng. Dispens. 484. 1841; Schau. in A. DC., Prodr. 11: 683. 1847; Irvine, Short Acct. Mat. Med. Patna 118. 1848; Lindl., Med. & Oeconom. Bot. 223. 1849; Drury, Useful Pl. India 443. 1858; W. Elliot, Fl. Andhr. 180 & 190. 1859; F. Muell., Fragm. 3: 59. 1862; Van Tjandjoer, Geneeskundig Tijdsch. 1: 690. 1862; Birdwood, Cat. Veg. Prod. Bomb. 66. 1865; Benth. & Muell., Fl. Austr. 5: 66. 1870; Baker in Mart., Fl. Bras. 14 (2): 212. 1871; Brandis, For. Fl. NW. & Cent. India 3: 370. 1874; F. Muell., Fragm. 9: 5. 1875; J. G. Baker, Fl. Maurit. & Seych. 256. 1877; Kurz, For. Fl. Brit. Burma 270. 1877; Blanco, Fl. Filip., ed. 3, 2: pl. 226. 1878; F. Muell., First Census 103. 1882; F. M. Bailey, Syn. Queensl. Fl. 379. 1883; Dymock, Veg. Mat. Med. W. Ind., ed. 2, 600. 1885; C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 583. 1885; Ind. Forester 12: app. 19. 1886; F. Muell., Second Census 173. 1889; F. M. Bailey, Cat. Pl. Queensl. 35. 1890; Kuntze, Rev. Gen. Pl. 2: 510-511. 1891; Lubbock, Seedlings 2: 372. 1892; Moore, Handb. Fl. New South Wales 357. 1893; Watt, Dict. Econom. Prod. Ind. 6 (4): 201 & 251. 1893; Jacks., Ind. Kew. 2: 1213. 1895; Matsum., Bot. Mag. Tokyo 13: 121. 1899; Koord. & Val., Bijdr. Booms. Java 7: 200. 1900; A. DC., Bull. Herb. Boiss., sér. 2, 1: 581. 1901; F. M.

Bailey, Queensl. Fl. 4: 1179. 1901; Ridl., Journ. Roy. As. Soc. Straits 45: 50. 1906; Kloppenburg-Versteegh, Pl. Atlas pl. 15. 1907; P. Henderson, Handb. Pl., new ed., 482. 1910; Matsum., Ind. 2 (2): 534. 1912; F. M. Bailey, Compreh. Catal. 386. 1913; Publicaties Ned. Ind. Landb. Syndicaat 1914: 172. 1914; Koord. & Val., Atlas Baumart. Java pl. 292. 1914; E. D. Merr., Interpret. Rumph. Herb. Amboin. 453. 1917; Heyne, Nutt. Plant. Nederl. Ind., ed. 1, 4: 116. 1917; L  veill  , Cat. Pl. Yun-Nan 278. 1917; Basu, Ind. Medic. Pl. 3: 3, pl. 740b. 1918; H. J. Lam, Verbenac. Malay. Arch. 166, 180--183, & 370. 1919; Bakh. & Lam, Bull. Jard. Bot. Buitenz., s  r. 3, 4 (2): 285. 1922; H. J. Lam, Bull. Jard. Bot. Buitenz., s  r. 3, 5 (2): 178. 1922; Ridl., Fl. Malay Penins. 2: 630-636 & 671. 1923; E. D. Merr., Enum. Philip. Pl. 3: 397. 1923; H. J. Lam in Engl., Bot. Jahrb. 59: 92. 1925; Heyne, Nutt. Pl. Nederl. Ind., ed. 2, 1319. 1925; Meager, Ann. Mus. Col. Marseille, s  r. 4, 4: pl. 60. 1926; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 75, 77, & 85. 1928; Domin, Bibl. Bot. 22 (89-6): 1114. 1928; Hill, Ind. Kew. Suppl. 7: 252. 1929; Stapf, Ind. Lond. 6: 479. 1931; P'ei, Mem. Sci. Soc. China 1 (3): [Verbenac. China] 99. 1932; Kanehira, Fl. Micrones. 343. 1933; Benthall, Trees Calcutta 356. 1933; Crevost & P  telot, Bull. Econom. Indo-chine 37: 1294. 1934; Junell, Symb. Bot. Upsal. 4: 93. 1934; Dop, Fl. G  n. Indo-chin. 4: 834. 1935; Blumea 2: 262. 1937; Basu, Ind. Medic. Pl. 3: fig. 2499. 1938; Corner, Gard. Bull. Straits Settl. 10: 257. 1939; Moldenke, Alph. List Common Names 10, 14, 15, 18, 19, 28, 30, & 33. 1939; Moldenke, Geogr. Distrib. Avicenn. 41. 1939; Moldenke, Suppl. List Common Names 1--3, 7, 8, 10--13, & 16--24. 1940; Moldenke, Prelim. Alph. List Invalid Names 14, 29, 36, 49, 51, & 52. 1940; Moldenke, Suppl. List Invalid Names 11. 1941; Worsdell, Ind. Lond. Suppl. 2: 501. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52, 53, 55--58, 60, 61, 63--70, 75, 103, & 104. 1942; Moldenke, Alph. List Invalid Names 12, 27, 36, 51--53, & 55. 1942; Moldenke, Phytologia 2: 122. 1944; E. D. Merr., Pl. Life Pacific World 33, 37, 39, 42, 46, 274, & 282. 1945; Van Steenis, Science & Scientists Neth. Ind. 339. 1945; Darlington & Janaki Ammal, Chromosome Atlas 271. 1945; Menninger, 1947 Cat. Flow. Trees 24--25. 1946; E. D. Merr., Chron. Bot. 10: 311. 1946; Menninger, Introd. Offer Flower. Trees Coll. [1]. 1946; Razi, Journ. Mysore Univ. 7 (4): 64. 1946; Benthall, Trees Calcutta 356--357. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 29. 1947; Terrac., Trav. Lab. Mat. Med. 33 (3): 101. 1947; Hara, Enum. Sperm. Jap. 1: 191. 1948; W. L. Phillips, Cat. Pl. Fairchild Trop. Gard. 41. 1949; Guillaumin, Bull. Mus. Hist. Nat. Paris, s  r. 2, 21: 261. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 122--125, 128--130, 133--135, 138--140, 142, 143, 145--152, 155, 166, 201, & 203. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 15. 1949; Fosberg, Pacific Sci. 3: 339. 1949; Menninger, Winter 1950 Seed List n.p. 1950; Menninger, 1950-1951 Offer. 300 Diff. Flow. Trop. Trees [4]. 1950; E. H. Walker, Import. Trees Ryukyo Isls. 285--286, fig. 185. 1954; Menninger, 1955 Price List n.p. 1954; Menninger, 1956 Price List [9]. 1955; St. John, Pacific Sci. 10: 101. 1956.

Illustrations: Rheede, Hort. Ind. Malab. 2: pl. 11. 1679; Pluk., Alm. Bot. pl. 206, fig. 5. 1696; Burm., Thes. Zeyl. pl. 109. 1737; Rumph., Herb. Amboin. 4: pl. 18. 1743; Poir. in Lam., Tabl. Encycl. pl. 541, fig. 2. 1794; Curtis, Bot. Mag. 47: pl. 2187 (colored). 1820; Blanco, Fl. Filip., ed. 3, 2: pl. 226 (colored). 1878; Lubbock, Seedlings 2: 372. 1892; Kloppenburg-Versteegh, Pl. Atlas pl. 15 (colored). 1907; Koord. & Val., Atlas Baumart. Java pl. 292. 1914; Basu, Ind. Medic. Pl. 3: pl. 740b. 1918; Mezger, Ann. Mus. Col. Marseille, sér. 4, 4: pl. 60. 1926; Basu, Ind. Medic. Pl. fig. 2499. 1938; E. H. Walker, Import. Trees Ryukyu Isls. fig. 185. 1954.

Slender bush, shrub, or shrubby tree, to 6.5 m. tall; stems to 15 cm. in diameter, freely branched from near the base; wood soft, whitish or yellowish or light-yellow except for the murky-brown center, moderately hard to very hard, often brittle, of fine to moderately fine texture, odorless and tasteless; bark smooth or (when old) finely checked, brown or light-brown; branches numerous, lax; branchlets and twigs slender, brownish, acutely or obtusely tetragonal or subterete, densely puberulent with sordid or cinereous hairs most conspicuous on the youngest parts; nodes annulate; principal internodes 1.5--5 cm. long; leaves decussate-opposite, mostly horizontal, resinous-aromatic when crushed, normally 3-foliolate, occasionally 1-foliolate; petioles slender, 0.6--3.3 cm. long, convex beneath, flattened and somewhat canaliculate above, densely appressed-puberulent with sordid or whitish hairs, not noticeably ampliate at the base nor disciform at the apex; leaflets subequal in size or the two lateral ones much smaller, the central one usually petiolulate on petiolules 1--6 mm. long, puberulent, and decidedly margined, the lateral ones usually sessile or subsessile; leaflet-blades thin-membranous, rich deep- or dark-green above, usually brunnescent or nigrescent in drying, white or grayish beneath, nearly flat or curved and subnitid on the upper surface, the central one varying from oblong-elliptic to oblanceolate or obovate, 2.5--7 cm. long, 1--4 cm. wide, acute or short-acuminate at the apex (varying to obtuse, rounded, or emarginate), entire, varying from acute or acuminate to cuneate-attenuate at the base, pulverulent-puberulent and more or less resinous-dotted above (especially when young), becoming glabrescent, sometimes more densely puberulent above and white-tomentose on the margins, densely tomentulose-puberulent with white or grayish matted hairs beneath, the lateral ones similar but usually smaller and sessile or subsessile and less attenuate at the base; midrib very slender, flat and usually more or less canescent above, prominulent beneath; secondaries very slender, 7--12 per side, arcuate-ascending, often branched, flat or subprominulent above, prominulent or hidden by the dense tomentum beneath, not anastomosing; vein and veinlet reticulation sparse, obscure or indiscernible on both surfaces; inflorescence terminal and axillary in the uppermost leaf-axils, paniculate, erect or suberect, 3--23 cm. long, 2--4 cm. wide, composed of many opposite stipitate and usually several times branched rather many-flowered cymes, cinereous- or sordid-puberulent

throughout, often much abbreviated; peduncles (1--5 cm. long) and rachis slender, usually acutely tetragonal, similar to the adjacent twigs in color, texture, and puberulence; sympodia sometimes few and abbreviated, often numerous and 1--1.5 cm. long; pedicels very slender, about 1 mm. long or less, densely white-puberulent; bracts often present in the larger panicles, simple or 2- or 3-foliolate, foliaceous, resembling the leaves in texture, color, and puberulence, but much smaller, usually subtending only the lowest (or two lowest) pairs of cymes; bractlets and prophylla linear, 1--3 mm. long, densely white-puberulent; flowers odorless or with the fragrance of sage (Salvia officinalis), about 12 mm. long; calyx cyathiform, 4--5 mm. long, 2.5--3.5 mm. wide, 5-nerved, very densely white-tomentulose externally, its rim shortly and acutely repand-dentate or the teeth blunt; corolla hypocrateriform, varying from blue, pale-blue, or bright-blue to lavender, bluish, purplish, purple, or violet, 2-lipped, pulverulent or puberulent externally, its tube infundibular, 10--13 mm. long, the lower lip expanded into a villous tongue about 6 mm. long, the remaining lobes smaller; stamens 4, exserted; filaments hairy at the base; pistil exserted; fruiting-calyx cupuliform, herbaceous, about 5 mm. long and wide, densely cinereous-puberulent on the outside, its rim regularly 5-dentate; fruit drupaceous, at first green, then yellow or reddish, finally turning blue or black, globose or ovoid, 5--6 mm. long, about 5 mm. wide.

The species is widely distributed in its typical form from Afghanistan and Pakistan through all of tropical Asia north to southern China, Hainan, Japan, and the Liukiu Islands, westward to Mauritius, Madagascar, and Natal, and eastward through the Philippines and Indonesia to New Guinea, New Caledonia, Fiji, Samoa, Hawaii, and Australia. Watt describes it as a shrub or small tree found scattered throughout India in the tropical and subtropical regions from the foot of the Himalayas to Ceylon and Malacca, "nowhere common". Razi calls it a microphanerophyte in Raunkiaer's classification of life-forms, and records it from Mysore. Watt says "It is occasionally found in thickets and village shrubberies near Calcutta".

The wood is useful and the plant is employed extensively for making hedges in Sumatra. Degener says that it is used as a hedge in the Hawaiian Islands, while Clemens reports it as ubiquitous as a hedge in Queensland "as goats do not eat it" (but he admits that they ate a couple of branches of it when it was offered to them). It has been introduced in Madagascar on sand dunes to hold them in place, and it is probable that all the Madagascar and Mauritius records are based on introduced material. The leaves are a powerful discutient; in decoctions and infusions and as a cataplasm they are applied to enlarged spleens. Drury says that a clear sweet oil of a greenish color is extracted from the root and that the seeds are also supposed to yield a fatty oil. Watt states that the medicinal uses for V. trifolia are about the same as those enumerated in these notes for V. negundo L. It is cultivated for medicine in Thailand. Lindley reports that the leaves are employed by the Malays to remove "the boss". Marie-Louis Ter-

rac says "On emploie, en médecine locale les feuilles et les fruits qui contiennent un alcaloïde mal connu (Boorsma). Les feuilles renferment une essence dont les principaux constituants sont le pinène, le camphène, l'acétate de terpényle. Elles sont utilisées en cataplasmes résolutifs sur les rhumatismes, les ulcères de mauvaise nature. Elles présentent encore des vertus antiseptiques, dépuratives, emménagogues, et stimulantes."

Walker says that the wood is "used for excellent fuel but too small for other uses. The tree is a valuable shore protector and windbreak and the source of many drugs used for medicinal purposes. It is also a useful ornamental shrub because of its light appearance, blue flowers, and fragrance." He continues, "This small tree ranges in form down to a mere shrub creeping over the beach sand, this low variation usually called variety ovata and having predominantly simple leaves. The flowers are hardly distinguishable." We discuss this form under var. simplicifolia Cham.

Menninger describes the species thus: "This dainty Malayan shrub or small tree to 8 feet, has drooping, sprawly branches, attractive gray-green foliage and pretty blue flowers with the fragrance of sage. The leaves are resinous aromatic when crushed, and the under sides of the leaflets are hoary white felted. The pale blue flowers, about half inch long, are in rather narrow clusters to 5 inches long, 1--2 inches wide, and they come in great profusion and last several weeks.....blooming twice a year!" He offers 8--15-inch seedlings for \$1 each and 4-foot seedlings for \$3 each, or 3--6-foot seedlings at 50 cents per foot, in Florida. He adds that "this plant looks like V. divaricata but blooms much more prolifically and is a much better plant." Fosberg records it as cultivated on Johnson Island in the central Pacific, while Bojer found it in cultivation in gardens at Port Louis and in the Royal Botanic Garden at Pamplemousse, Mauritius. Benthall says that the flowers are produced in the hot season at Calcutta. Perrier de la Bâthie says that in Madagascar the leaves are "persistent". Kienholz describes the fruit (erroneously) as a "capsule" and says that the leaves are "5-parted" (actually they are compound and 3-foliolate, the 5-foliolate form being var. bicolor) and show anisophylly very well. Kajewski says for his no. 84 that the leaves are "variegated with white", but actually the variegation which he seems to have observed is not the true discoloration as seen in var. variegata, but is caused mainly by the dense white tomentum of the lower surface continued on the leaf-edges. The conspicuously bicolored aspect of the leaflets on many herbarium specimens reminds one very strongly of var. bicolor, but the mostly 3 leaflets and their uniformly short petiolules well characterize the typical form of the species.

The original seeds from which the N. Taylor specimen, cited below, was grown were obtained from the Royal Botanic Gardens at Kew, England. The Herb. Lugd.-Bat. 908267-479 and 91313-124 and Ordets 15349, cited below, do not actually have indications on their labels that they came from cultivated material, but I as-

sume that they did. The Natal specimen is from material said to have escaped from cultivation. The species has been recorded from the Salajar Islands in *Blumea* 2: 262 (1937).

Vernacular names for the plant include "ai toeban", "asla", "banj-angashte-abí", "danglá", "dinsaw", "doenoeko", "galoemi", "gëndarasi", "hand of Mary", "hogagii", "Indian privet", "Indian wild pepper", "India three-leaved vitex", "jala-nirgundi", "kiyoubhán-bin", "konti saw", "lagoendi", "lagondi", "lagundi", "lagúndi", "lagundian", "lagundíng-dágat", "langghoendi", "langgoendi", "langkandi", "lanra", "lawarani", "lëgoendi", "legoendi olie", "lëgundi", "lënggundi", "lilëgoendi", "liñgei", "lipuk", "man kinh", "mitsuba-hamago", "ndrala", "nira-lakki-gidá", "nir-noch-chi", "nir-noch-chi", "niru-vávili", "pani ka sanbhalu", "pánf-kí-sanbhálú", "pánf-kí-shanbálí", "páni-samálú", "pani sanbhaki", "panj-angushta-ábí", "quan âm", "que-ábi", "sagarai", "salah gundi", "sangari", "shiru-noch-chi", "shiru-varíli", "silagundi", "sisua noi", "sufed sanbhalu", "suféd-sanbhálú", "sunrasa-vrikshasha", "surasa-vrikshasha", "tella-vavíli", "thúóc kinh", "thúóc ðn", "tigau", "uljí-shabáli", "uljí-shanbáli", "vaturu-nikka", "wild pepper", and "yé-kiyouban-bin". It is to be noted that "ai toeban" is applied also to V. negundo, and so does "lënggundi", while "danglá" applies also to V. trifolia var. bicolor and "sagarai" applies both to V. trifolia var. bicolor and Avicennia marina (Forsk.) Vierh. According to many writers the vernacular names applies to V. trifolia and V. negundo are the same. Moodeen Sheriff, however, states that the adjectives for "white" and for "water" which enter into so many of the names are properly applied only to V. trifolia.

In the Linnean Herbarium, preserved at the Linnean Society in London, under genus 790 [811], Vitex, sheet number 7 is inscribed "trifolia" and "India" and "413" in the handwriting of Linnaeus. There is a long description on the reverse side of the sheet. The leaves are 3-foliolate and the inflorescence-branches are divaricate. It is undoubtedly what we now know as Vitex trifolia L. Sheet no. 6 is also inscribed "trifolia", but is what we now call V. trifolia var. bicolor (Willd.) Moldenke. Sheet no. 10 is inscribed "pinnata" and there is the notation "Fl. Zeyl. 415" and "India D." [=Dalman]. Smith has struck out the epithet "pinnata" and has written in "minime; nil nisi V. trifoliata J. Sm. vera V. pinnata in H. B." [=Banks]. The leaves are 3-foliolate and very white beneath. It is plainly what we now call V. trifolia.

The Vitex langundi of Ridley, published as a hyponym in Journ. Roy. As. Soc. Straits 45: 50 (1906), was never really validly described. Ridlet merely says that it is an aromatic shrub with blue flowers, very commonly used in native medicines, called "langkandi" in the Mantra Gajah of the Malays. It is not listed by him in his Flora of the Malay Peninsula 2: 630--636 & 671 (1923). It is listed by Hill in Ind. Kew. Suppl. 7: 252 (1929), where it is referred to as a "nomen" only, and in my own Known

Geogr. Distrib. Verbenac., [ed. 1], 61 & 103 (1942) and [ed. 2], 139 & 201 (1949). It seems obvious, from the similarity of the specific epithet to vernacular names applied to V. trifolia, the brief descriptive phrase, the statement about medicinal uses, and other evidence, that the name belongs in the synonymy of V. trifolia.

Kuntze 5817 is apparently the type of V. agnus-castus var. subtrisecta Kuntze. It is labeled as from the Willisgebirge, Java, and Kuntze cites this as the type locality of the variety. The specimen seems to be typical V. trifolia. Another Kuntze specimen in the Britton Herbarium at New York, however, and numbered "4448" (or 4445?), bears Kuntze's diagnosis of the variety in his own handwriting. It was taken from material cultivated at Sindangbaja ("cult. Sindangbaja") and this locality is not mentioned by him in his original publication. It is a mixture of V. trifolia and its var. simplicifolia. His diagnosis of var. subtrisecta implies the characters of what we now call var. heterophylla, but what I regard as his type specimen (no. 5817) is typical V. trifolia L., so I am reducing his trinomial to the synonymy of the typical form of the species. The type was collected at 2000 feet altitude on August 28, 1875, while no. 4448 came from 3500 feet and was collected on May 25, 1875.

Specimens of Vitex trifolia have been confused with and misidentified in herbaria as V. agnus-castus L., V. litoralis L., V. negundo L., V. trifolia var. obovata Benth., and even Vitis trifoliata L. f. It has been collected at altitudes from sea-level to 1165 meters, blooming in every month of the year, in fruit in February, March, May, and from July to December. Collectors have found it in woods in sandy soil along the coast, in shrubbery of gulches, along seashores and beaches, in back of sandy beaches near habitations, in coastal thickets, on dunes, at the edges of lagoons, on slopes, in rocky pasture land, and in the littoral in general, but it is said to be common in the rainforests in New Hebrides. Guillaumin cites Buchholz 1536 from New Caledonia, and Lam cites Neuhaus 2 from Northeastern New Guinea, but the Toxopeus 631 cited by the latter authority from Buru is actually var. bicolor. Darlington & Janaki Ammal report the specues to have 32 chromosomes.

Citations: UNION OF SOUTH AFRICA: Natal: Collector undesigned s.n. (Na--14450). MADAGASCAR: Afzelius s.n. [Tamatave, 2.8.1912] (K, N); Baron 2232 (K, P), 2755 (K, P); d'Alleizette 1340m (P); Decary s.n. (P); Herb. Desvaux 519 (N, P); Humbert 3950 ter (P); Lindley s.n. [Madagascaria, 1826] (Br); Perrier de la Bâthie 10257 (P), 10270 (P), 18774 (P); Richard 321 (P); Viguier & Humbert 439 bis (P). MASCARENE ISLANDS: Mauritius: Richard s.n. [Ile de France] (P); Sieber 283 (P); Telfair s.n. (K). REUNION: l'Isle 478 (P). AFGHANISTAN: Herb. W. Griffith 6057 (Cm). INDIA: West Bengal: R. L. Heinig s.n. [Sunderabunds] (Na--4856). State undetermined:

Collector undesignated 413 [Herb. Linnaeus G.811, S.7] (Ls--type, N--photo of type, S--photo of type, Z--photo of type), s.n. (S); Dalman s.n. [Herb. Linnaeus G.811, S.10] (Ls, Mi--photo, N--photo, Z--photo); Herb. Mus. Bot. Stockholm 16 (S); Roxburgh s.n. (Br, Br); Wallich s.n. (Cp, Cp, Cp, Cp, N). PORTUGUESE INDIA: Goa: J. Correa 142.10 H (Xa); Santapau 142-1 H (Xa). BURMA: Tenasserim: Helfer 6057 (S). CEYLON: Thwaites 1955 (Br). CHINA: Yunnan: Forrest 9226 (S). HAINAN ISLAND: Henry 8568 (K); Wu 1086 (Du--250159). MALAYA: Penang: Haniff 29 (La). PHILIPPINE ISLANDS: Lubang: E. D. Merrill 957 (N). Luzon: De la Rosa s.n. [Gates 8494] (Ka--64771); A. D. E. Elmer 7877 (N, Vt); Kienholz 188 (Ur); Vanoverbergh 321 (Br, Go, Lu); Whitford 674 (N). Mindoro: M. T. Cruz 53 (Ur). Palawan: Merrill Sp. Blanc. 302 (Bz--25290). Polillo: R. C. McGregor s.n. [Herb. Philip. Bur. Sci. 10270] (Br). Island undetermined: Collector undesignated 88 (Q); Kienholz 84 [Herb. Philip. Bur. Sci. 15225] (Ur); Née 34 (Q), 52 (Q). SUMATRA: Bangham & Bangham 806 (K); Boeea 551 (Kr); Bunnemeijer 4439 (Bz--25313, Bz--25314); Galoengi 22 (Bz--25306); Iboet 248 (Bz--25311, Ut--82001); Jacobson 2078 (Bz--25201); Leefmans 68 (Bz--25209, Bz--25210); Lörzing 4161 (Bz--25207), 4946 (Bz--25206), 5776 (Bz--25309), 11144 (Bz--25312); Lutjeharms 4655 (N); Ouwehand 69 (Bz--25200); Posthumus 972 (Ut--97183); Pringgo Atmodjo 223 (Bz--25199); Toroes 910 (S). JAVA: Backer 4550 (Bz--25262), 4771 (Bz--25250), 15230 (Bz--25239), 33174 (Bz--25247), 33176 (Bz--25246); Bakhuizen van den Brink 1557 (Bz--25177), 6500 (Br); Edeling s.n. [Dec. 1862] (Bz--25178); Jensen s.n. (Cp); Kuntze 5817 (N, N); Selinek s.n. [Java] (Br); Vorderman s.n. (Bz--25252). SARAWAK: Native collector 278 (Ph). BORNEO: Amdjah 1226 (Bz--25228, Bz--25229); Labohm 1962 (Bz--25230); Posthumus 2072 (Bz--25166). CELEBES: Bunnemeijer 10828 (Bz--25293), 11153 (Bz--25294); Kjellberg 3888 (Bz--25191, S, S); Rachmat 983 [Vuuren 983] (Bz--25297), s.n. [Vuuren 108] (Bz--25302). LESSER SUNDA ISLANDS: Buton: Collector undesignated 345 (Bz--25319). Sumbawa: Rensch 901 (Bz--25187). Timor: Grijp 19 [Boschproefst. BB.20267] (Bz--25188). MOLUCCA ISLANDS: Amboina: C. B. Robinson 305 (N). NEW GUINEA: Northeastern New Guinea: Schlechter 14253 (Bz--25284). HAWAIIAN ISLANDS: Oahu: N. J. Andersson s.n. [Honolulu, 1852] (S, S, S). NEW HEBRIDES: Aneityum: Kajewski 801 (La). Tanna: Kajewski 66 (La), 84 (La). Island undetermined: Herb. Mus. Bot. Stockholm s.n. (S). NEW CALEDONIA: Eloin s.n. [Port de France?] (Br); Franc 56 (La); Germaine s.n. [1874--1876] (Br, N). FIJI ISLANDS: Vanua Levu: A. C. Smith 1075 (N), 4559 (N), 6078 (N), 6610 (N). AUSTRALIA: New South Wales: Herb. Mus. Nac. Hist. Nat. Chile 16030 (Sg). Queensland: F. M. Bailey s.n. [Moreton Bay] (Du--9526); Collector undesignated s.n. [Rockingham Bay] (Bz--25326); J. Dall s.n. [Rockingham Bay] (Na--

129); Stephen Johnson s.n. (Na--5890); F. Mueller s.n. [Fort Denison] (Br). CULTIVATED: Australia: M. K. Clemens s.n. [Charleville, Oct.-Nov. 1945] (Or--53351, Or--53352). Belgium: M. Martens s.n. (Br). California: Andersson s.n. [Californien, 1852] (S). China: McClure 58, in part (Ar--11240). Cuba: Acuffa 18321 (Es). Florida: Crevasse s.n. [Simmons Park, 7/31/40] (Fl--33356); Menninger s.n. [Stuart, April 17, 1945] (N); Ordets 15349 (Es); Pearson s.n. [June, 1940] (Bu). Hawaiian Islands: Degener 9505 (N). India: Herb. Hort. Bot. Calcuttensis s.n. (Le, Le, Mu--682, X); Wallich 182 (Cp), 1743 (K), 1743g (B), 1746 (K). Java: Backer 22575 (Bz--25234); Herb. Lugd.-Bat. 908267-479 (Le); Kuntze 4448 (N). Kenya: R. M. Graham s.n. [MacNaughlan 171] (K). Mauritius: Bojer II.44 (V). Netherlands: Herb. Lugd.-Bat. 91313-124 (Le). New Hebrides: Kajewski 84 (K). New York: N. Taylor s.n. [N. Y. Bot. Gard. Cult. Pl. 13550] (N). Réunion: Richard s.n. [Bourbon] (P). Sumatra: Herb. Hort. Sibolangit 135 (Bz--26514). Thailand: Vanpruk 448 (K). Union of South Africa: Herb. Capetown Bot. Gard. s.n. (S). LOCALITY OF COLLECTION UNDETERMINED: T. Cooke s.n. (Mi); Herb. Shelton s.n. (Ka). MOUNTED ILLUSTRATIONS: Curtis, Bot. Mag. pl. 2187 (N).

VITEX TRIFOLIA var. BICOLOR (Willd.) Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 79. 1942.

Synonymy: Vitex bicolor Willd., Enum. Hort. Berol. 660. 1809. ? Vitex agnus-castus f. negundodes Kuntze, Rev. Gen. Pl. 2: 510 & 511. 1891. ? Vitex agnus-castus f. negundodes f. albiflora Kuntze, Rev. Gen. Pl. 2: 510. 1891. ? Vitex agnus-castus f. javanica Kuntze, Rev. Gen. Pl. 2: 510 & 511. 1891. Vitex negundo var. bicolor (Willd.) H. J. Lam, Verbenac. Malay. Arch. 191. 1919. Vitex petiolaris Domin, Bibl. Bot. 22 (89-6): 1115. 1928. Vitex iriomotensis Ohwi, Acta Phytotax. & Geobot. Kyoto 7: 29. 1938. Vitex ternifolia Hort., in herb.

Literature: Willd., Enum. Hort. Berol. 660. 1809; Schau. in A. DC., Prodr. 11: 683. 1847; Miq., Fl. Ind. Bat. 2: 860. 1856; Miq., Fl. Ind. Bat. Suppl. 1: 242 & 567. 1860; Benth. & Muell., Fl. Austral. 5: 67. 1870; Kuntze, Rev. Gen. Pl. 2: 510--511. 1891; H. Hallier, Meded. Rijks Herb. Leid. 37: 42. 1918; H. J. Lam, Verbenac. Malay. Arch. 191--193 & 369. 1919; H. J. Lam, Bull. Jard. Bot. Buitenz., sér. 3, 3: 56. 1921; Bakh. & Lam, Bull. Jard. Bot. Buitenz., sér. 3, 4 (2): 285. 1922; H. J. Lam, Bull. Jard. Bot. Buitenz., sér. 3, 5 (2): 178. 1922; E. D. Merr., Enum. Philip. Pl. 3: 394. 1923; H. J. Lam, Nova Guin. 14: 169. 1924; H. J. Lam in Engl., Bot. Jahrb. 59: 27--28 & 93. 1925; Domin, Bibl. Bot. 22 (89-6): 1114--1115 & 1117, fig. 182. 1928; Wilder, Bishop Mus. Bull. 86: 93. 1931; Crevost & Pételot, Bull. Econom. Indo-chine 37: 1292--1293. 1934; Christoph., Bishop Mus. Bull. 128: 192. 1935; Ohwi, Acta Phytotax. & Geobot. Kyoto 7: 29. 1938; Moldenke,

Alph. List Common Names 10, 18, 19, & 26. 1939; Moldenke, Prelim. Alph. List Invalid Names 50. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53, 55, 56, 58, 61, 63--66, 68, 69, 75, 79, & 104. 1942; Moldenke in A. C. Sm., Sargentia 1: 115. 1942; Moldenke, Alph. List Invalid Names 52. 1942; Kanehira & Hatusima, Bot. Mag. Tokyo 56: 116. 1942; Yuncker, Bishop Mus. Bull. 178: 102. 1943; Parham, Fiji Native Pl. 22. 1943; Moldenke, Phytologia 2: 122. 1944; Moldenke, Alph. List Invalid Names Suppl. 1: 29. 1947; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 15. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 123, 128, 130, 135, 139, 142, 143, 145--152, 155, 166, & 203. 1949; Ciferri, Mycopath. & Mycol. Appl. 6: 19--27. 1951; Biol. Abstr. 26: 882 & 3851. 1952.

Illustrations: Domin, Bibl. Bot. 22 (89-6): fig. 182. 1928.

This variety differs from the typical form of the species in having its leaves mostly 5-foliolate, decidedly silvery and white-tomentose beneath, the upper surface always nigrescent in drying, imparting to the leaves a decided black-and-white bicolored appearance.

It is a straggling shrub or small spreading tree, 1--10 m. tall; trunk often 4 cm. in diameter; bark rough; young branches and petioles densely tomentose; leaflets mostly 5, sometimes 3 or 4, rarely 1, conspicuously bicolored, elliptic-lanceolate, the two lowest on each of the 5-foliolate leaves smaller and sessile or subsessile, the 3 central ones on petiolules to 2 cm. long; flowers slightly aromatic, the corollas varying from blue or bluish-purple to lavender, lilac, or pink, often deeper blue inside, 5--8 mm. long, borne in large branching axillary or terminal clusters; fruit small, green, turning brown [or yellow?], eventually brownish-black, blue-black, or black when ripe, round.

The variety is found from Madagascar and the Comoro Islands eastward along the coasts of India, Ceylon, and Malaya, north to Hainan, thence through Oceania from the Philippines and Indonesia to New Guinea, Fiji, New Caledonia, Hawaii, the Solomon Islands, and Samoa, south to the coasts of Australia. Among its recorded vernacular names are "agalonte", "dablan", "dabtan", "danflá", "danglá", "daon lagondi", "dauhon lagondie", "drala-kaka", "dralasala", "dralawa", "gamulega", "kaju labundèn", "kakawkaw", "klesechedui", "klschochodúi", "klsegathui", "lagondi", "lagundí", "lala", "lala taki", "lala tea", "legoendi", "lifgei", "líŋgei", "molokaka", "muzu", "namulega", "namulenga", "ndrala", "rara", "sagarai", "shaehl", "similotch mananeraba", and "tjimèjong". It is worthy of note that some of these names, or variants of them, such as "danglá" and "lifgei", apply also to the typical form of V. trifolia; "sagarai" is applied also to Avicennia marina (Forsk.) Vierh., while "drala-kaka" is a name for Erythrina ovalifolia Roxb.

The variety is usually described as common along the edge of the sea, on sandy coasts, in thickets near the beach, on the beach at the edge of light rainforests, and common in low wet sections and swampy land, but on Lele Island it is said to be

"uncommon along the strand". It has been found from sea-level to altitudes of 665 meters in the Himalayas. Herbarium material has been confused with and misidentified as V. negundo L., V. paniculata Lam., V. triphylla L., V. trifolia L., V. trifolia var. trifoliolata Schau., and V. trifoliolata L. It has been collected in anthesis from August to June, and in fruit from September to February and in May and June.

I cannot agree with Dr. Lam that this plant's affinity is closest to the Indian V. negundo. It always grows in a similar habitat as V. trifolia and, indeed, often in close association with the typical form of the species (3 leaflets), with var. heterophylla (1--3 leaflets), and with var. simplicifolia (1 leaflet). Its inflorescence characters all point unmistakably to a very close affinity with V. trifolia, rather than with V. negundo. The confusion doubtless arose through the fact that so many Asiatic specimens of V. trifolia and its varieties have in the past been misidentified as V. negundo in herbaria throughout the world. Kajewski says "fruit yellow when ripe", but this is highly questionable. In Samoa the leaves are rubbed on the head and body of patients in the treatment of fevers. They are also made into poultices to place on abrasions. In Fiji they are used to treat abscesses of the ear, while in the Solomons the macerated bark and sap are placed against the teeth in cases of toothache according to Kajewski. Mrs. Parham states that "The Fijians value the leaves of this pretty plant for the medicinal properties, especially for abscess in the ear -- and for this purpose they chew the leaves together with the soft inner stem of the gasau grass (Eulalia japonica), and put the pulp thus obtained into the orifice of the ear. They then take a young shoot of the gasau and use it as a probe wherewith to break the abscess. In Vanua Levu, especially in the dry zone, this shrubby plant grows as a rule close to the ground, in a thick mass of scented leaves. In Viti Levu it is often found growing as a small tree."

In the Linnean Herbarium, preserved at the Linnean Society in London, sheet no. 6 under the genus Vitex is inscribed "trifolia" and "cagendi laut" in Linnaeus' own handwriting. The leaves are 5-foliolate, although the 2 basal leaflets are very small. It is certainly what we now call var. bicolor.

The Jarvis Island specimen cited below is said to be from "a single introduced plant growing near the house". Ciferri describes the hyperparasitic fungus Arthrobotryum gorgoneum Ciferri, which he found to grow parasitically on Irenina vilis (Sydow) Stevens [Meliola vilis Sydow], which, in turn, is parasitic on Callicarpa and on Vitex trifolia var. bicolor.

The Walker & Tawada 6749 cited below is actually a merotype of Vitex iriomotensis Ohwi. It was collected at the upper edge of the beach in the village, Yaetama Gunto, F. Bay -- "the only place known" on Iriomote Island. The "varieties" negundodes and javanica, published by Kuntze under V. agnus-castus in 1891 --

the former from Deccan, India, and the latter from Java -- may possibly prove to be the same as what I am calling var. bicolor. If so, then his names have priority over the epithet "bicolor", provided that the Greek letters which he uses to separate the specific from the subspecific part of the names are regarded as equivalent to what we now call "variety". He differentiates the two by saying that in negundodes the leaflets are 5--8 times as long as wide, in javanica as long as wide to twice as long as wide, while in V. negundo they are two and a half to 4 times as long as wide. Not having seen his types of these particular taxa, I am not certain that they are correctly placed here. Kuntze also proposed a Vitex agnus-castus f. negundodes f. albiflora for a white-flowered form. As yet I have not seen any record or specimen of a white-flowered form of var. bicolor.

If Bentham's V. trifolia var. parviflora, published in his Fl. Austral. 5: 67 (1870) -- on which V. benthamiana Domin is based -- really proves to be the same entity as what I am calling var. bicolor, as seems very likely from the description and figure, then Bentham's varietal epithet will have to be the one adopted for the taxon [Bibl. Bot. 22 (89-6): 1114 & 1117, fig. 182. 1928].

Dr. Lam in Verbenac. Malay. Arch. 193 (1919) regards Volkens 425 from the island of Yap as a hybrid between "Vitex negundo var. bicolor" and "Vitex trifolia var. trifoliolata". He notes that it has often 1-foliolate leaves, the terminal one usually petiolulate, corollas 8--9 mm. long, and calyx 2--2.5 mm. long, and that it appears to be quite fertile. To me it seems to be only V. trifolia var. bicolor, nothing more. He cites, in addition to specimens cited by me (below), the following specimens: -- from Banka: Herb. Utrecht 44165; from Java: Kuhl & Hasselt s.n. (Le--918210-52), Junghuhn s.n. (Le--908267-566, Le--918210-52), Ploem s.n. (Le--90927-151), Blume s.n. (Le--908267-47, Le--908267-93), Waitz s.n. (Le--908267-51), De Vriese & Teijsmann s.n. (Le--908267-270), and Herb. Hasskarl s.n. (Le--908267-81); from Sumbawa: Elbert 3729, 3927, and 4118; from Timor: Zippel s.n. (Le--908267-464); from Flores: Weber s.n. (Le--908267-83); from Kalao-Toa: Docters van Leeuwen-Reijnvaan 1513; from Celebes: Elbert 2986 and Forsten s.n. (Le--908267-718, Le--908267-720); from Moena Island: Elbert 2873; from Kabaena Island: Elbert 3337; from Banda: Herb. Leiden 908267-474; from the Molucca Islands: Reinwardt s.n. (Le--908267-363); from Amboina: Forsten s.n. (Le--908266-1214); from Basilan: Tarrosa 19553; from Luzon: Rosenbluth & Tamesis 12708; from New Britain: Lauterbach 166 and Dahl 149; from the Pelew Islands: Kraemer s.n.; from Korrör: Raymundus 178 and Ledermann 14122; from Truk: Kraemer s.n.; from Ponape: Ledermann 13631; and from Saipan: Höfer 25 and Haenke s.n. He also cites Schlechter 14253 from New Guinea, but I regard this collection as typical V. trifolia. He cites the Wight s.n. (Ut--49906) specimen

as from "Malaya", instead of from India. He also reports that the specimen of Lewandowsky 48 which he examined exhibits one 1-foliolate leaf. Actually 1-foliolate leaf-like bracts are normally found in both V. trifolia and var. bicolor, but these are in or immediately subtending the inflorescences. In var. heterophylla the 1-foliolate leaves are scattered all through the foliage on all parts of the twigs, branchlets, and branches.

Meeuse, in a letter to me dated December 9, 1953, states that "Dr. Backer who has always been an extremely keen observer in the field, convinced me of the differences between Vitex bicolor and the species to which it is often referred (e.g., by Lam and Bakhuizen v. d. Brink). The differences in the florescence, etc., also coincide with ecological differences. I see that you reduce it to V. trifolia L. var. bicolor (Willd.) Moldenke, but the differences are constant and indicate a specific rather than varietal rank."

Citations: COMORO ISLANDS: Anjouan: Lavanchie s.n. (P). Mayotte: Boivin 3224 (P); Humblot 218 [Herb. Reichenbach f. 35381] (P, V). NOSY-BE: Boivin 2082 (P). MADAGASCAR: Baron 6546 (P), 6623 (P); Bernier 85 (P); Boivin 1795 (P, P), s.n. [1847-1852] (P); Commerson s.n. [Madagascar] (P); Forbes 2 (K); Herb. Mus. Paris 87 (P); Richard s.n. [1837] (P), s.n. (P). MASCARENE ISLANDS: Mauritius: Sieber Fl. Maurit. II.161 (M). INDIA: Bombay: Hohenacker 703 (S). United Provinces: Strachey & Winterbottom s.n. (Os). State undetermined: Osbeck s.n. (S, S); Roxburgh 2619 (Br); Voigt s.n. [Ind. orient.] (Cp, Cp, Cp, Cp); Wight s.n. (Ut--49906). CEYLON: Collector undesignated 34 (Le), 69 (Le). LIUKIU ISLANDS: Iriomote: Walker & Tawada 6749 (N). PHILIPPINE ISLANDS: Luzon: Ahern 166Q (Bz--24417), 223Q (Bz--24422), 255 (N), 255Q (Bz--24421); Borden s.n. [Herb. Philip. Forest Bur. 2035] (Bz--24315, N); A. D. E. Elmer 15236 (Ut--67401), s.n. [Los Banos, Apr. 1906] (Bz--24416); Haenke 567 (N), s.n. [1792] (N); Herb. Swartz s.n. (S); E. D. Merrill 1106 (N), Sp. Blanc. 440 (Bz--24410); R. Meyer s.n. [Herb. Philip. Forest Bur. 2276] (Bz--24419, N); Née 44 (Q); M. Ramos s.n. [Herb. Philip. Bur. Sci. 27118] (Bz--25287); E. M. Weiss 3564 (Bz--24423); R. S. Williams 185 (N, N). Masbate: W. W. Clark s.n. [Herb. Philip. Forest Bur. 2527] (Bz--24420, N). Mindanao: Ahern 671 (N), 671Q (Bz--24418); A. D. E. Elmer 11999 (Bz--24413, N); D. P. Miranda s.n. [Herb. Philip. Forest Bur. 17976] (Cm); R. S. Williams 2978 (N, N), 3026 (N, N). Island undetermined: Collector undesignated 27 (Q); Cuming 1866 (V); Née 26 (Q). MARIANNA ISLANDS: Guam: P. Nelson 522 (Bz--25220), 535 (Bz--25218); J. B. Thompson 439 (Bz--25327). Saipan: Kanehira 1025 (N). Island undetermined: Haenke 772 (N), s.n. [1792] (Gg--267593). CAROLINE ISLANDS: Lele: Glassman 2716 (W). Yap: Volkens 425 (Bz--24435). SUMATRA: Lütjeharms 4655 (Bz--

24317). VERLATEN ISLAND: Backer s.n. [April 1906] (Bz--24429); Leeuwen-Reijnvaan 3834 (Bz--25214). MADURA ISLAND: Backer 19352 (Bz--24377, Bz--24378), 19623 (Bz--24381), 20825 (Bz--24379, Bz--24380). KRAKATOA: Beumee A.210 (Bz--24318); Docters van Leeuwen-Reijnvaan 11740 (Bz--25213). JAVA: Backer 1448 (Bz--24343, Bz--24344), 8159 (Bz--24360, Bz--24361, Bz--24362), 9445 (Bz--24353), 15621 (Bz--24358, Bz--24359), 17574 (Bz--24382, Bz--24383, Bz--24384, Bz--24385), 24659 (Bz--24341, Bz--24342), s.n. [Aug. 1903] (Bz--24352, Bz--24355, Bz--24356), s.n. [Feb. 1904] (Bz--24354), s.n. [April 1906] (Bz--24357); Bakhuizen van den Brink 1479 (Ut--24873a), 6580 (Ut--80700); Boschma 10 (Bz--24340); Clason C.90 (Bz--24261); Clason-Laarman 970 (Bz--24263); Endert s.n. [Boschproefst. E.1134] (Bz--24262); H. Hallier s.n. [15.6.96] (Bz--24345, Bz--24346); Hoed 26 (Bz--25175); Hoogerwerf 2 (Bz--24267), 4 (Bz--24266); Karta 279 (Bz--24308), 331 (Bz--24307), 412 (Bz--24309); Koorders 103 (Bz--24376), 199 (Bz--24275), 11853b (Bz--24364), 22488b [2320*] (Bz--24366), 27615b [436*] (Bz--24368, Bz--24369), 29118b [1145*] (Bz--24373), 29994b [1823*] (Bz--24374, Bz--24375), 34349b [2742*] (Bz--24365), 37132b [1423*] (Bz--24367); E. M. Meyer s.n. [1842] (M); Ploem s.n. [Java] (Bz--24363); Scheffer s.n. [Batavia] (Bz--24460); Slooten 2679 (Bz--24277); Van Steenis 4468 (Bz--25173). MAS BESAR: Valeton s.n. [2/3/05] (Bz--24274). BOKOR: Backer 31099 (Bz--24271, Bz--24272). NOORDWACHTER: Backer 35080 (Bz--24269, Bz--24270); Boschma 54 (Bz--24264, Bz--24265). BATAVIA BAY ISLANDS: Edam: Backer 31021 (Bz--24273); Pulle s.n. [24/IV/1906] (Ut--49907). BORNEO: Rutten 61 (Ut--16968, Ut--16969); Wilkes 40 (T), s.n. [U. S. Explor. Exped.] (C). CELEBES: Kjellberg 130 (Bz--24316, S); Koorders 19555b [299] (Bz--24424), 19557b [2177] (Bz--24425, Bz--24426); L. Riedel 5836 (Bz--24430, Ut--11558). KANGAEAN ARCHIPELAGO: Kangean: Backer 26801 (Bz--24297, Bz--24298), 27185 (Bz--24295), 27568 (Bz--24289, Bz--24290, Bz--24291), 28047 (Bz--24296); Dommers 256 (Bz--24301). Paliat: Backer 29377 (Bz--24292). Saboenting: Backer 29779 (Bz--24302). Saoebi: Backer 28321 (Bz--24299, Bz--24300, Bz--25662). Saseel: Backer 28737 (Bz--24303, Bz--24304). Sepandjang: Backer 28963 (Bz--24305, Bz--24306). Sepapan: Backer 28487 (Bz--24293, Bz--24294). LESSER SUNDA ISLANDS: Bali: Paardt 49 (Bz--24310). Banka: Amand 466 (Ut--44165); Bünneimeijer 1533 (Bz--24427); Collector undesignated 21 (Ut--44163); Kurz s.n. [Banka] (Bz--24428). Pinie: Raup 509 (Bz--25320). Sumbawa: Bloembergen 3076 (Bz--72653). Timor: Collector undetermined 800 (Bz--24312). MOLUCCA ISLANDS: Amboina: Boerlage 145 (Bz--24394), 319 (Bz--24395); Boesveld s.n. [Sept. 1921] (Bz--24390); C. B. Robinson 305 (Bz--24391); Treub 366 (Bz--24392, Bz--24393). Bisa: Link 45 (Bz--24386). Buru: Teijs-

mann s.n. (Bz--24401, Bz--24402); Toxopeus 631 (Bz--24396). Ceram: Kornassi 926 (Bz--24400, N, Ut--80724); Rutten 111 (Bz--24399, Ut--80735), 1774 (Bz--24397, Bz--24398). Morotai: Main & Aden 740 (Bz--72882). Obi: Atasrip 92 (Bz--24387, Bz--24388, Bz--24389). Sula: Atje s.n. [Hulstijn 107] (Bz--24403, Bz--24404). Taliaboe: Bloembergen 4788 (Bz--24313). Tanimber Islands: Buwalda 4411 (Bz--72599). NEW GUINEA: Dutch New Guinea: Janowski 518 (Bz--24407, Bz--24408); Kostermans 2916 (Bz--72834); Pleyte 487 (Bz--72881). Japen Island: Aet & Idjan 348 (Bz--72974). Northeastern New Guinea: Hollrung 486 (Bz--24406, Mb, Mb); Lewandowsky 48 (Bz--24405, S, S); Nyman 210 (S). Papua: Brass 859 (Bz--24314); J. B. Chalmers s.n. [South Cape] (Mb); W. V. Fitzgerald 13 (Mb). Schouten Island: Feuilletau de Bruyn 4441 (Bz--24409). LOUISIADE ARCHIPELAGO: Rossell: W. MacGregor s.n. [1889] (Mb). HAWAIIAN ISLANDS: Oahu: Gemzell s.n. [Juni 1927] (S). BISMARCK ARCHIPELAGO: New Britain: R. Parkinson s.n. [1901] (Vt). SOLOMON ISLANDS: Guadalcanal: Kajewski 2417 (Bz--25219, S). NEW HEBRIDES: Aneityum: Kajewski 801 (V). NEW CALEDONIA: Eloin s.n. (Br); C. Skottsberg 9 (S). TONGAN ISLANDS: Nomuka: Yuncker 15801 (Yu, Z). Tongatapu: Banks & Solander 1769 (S); Setchell & Parks 15296 (S); Yuncker 15011 (Ss, Yu). FIJI ISLANDS: Fulanga: A. C. Smith 1200 (N). Kandavu: A. C. Smith 314 (G, N). Makondronga: Degener & Ordenez 13815 (A). Vanua Levu: Degener & Ordenez 14058 (A, N); A. C. Smith 6622 (N). Viti Levu: Degener & Ordenez 13620 (A, N), 13691 (A, N). SAMOAN ISLANDS: Ofu: Yuncker 9566 (Dp--29051). Tau: D. W. Garber 611 (Bz--24432, N); Yuncker 9104 (Dp--29052). Upalu: A. J. Eames 36 (N); Graeffe 1581 (Pa). NIUE: Yuncker 10041 (Dp--29050). AUSTRALIA: New South Wales: Herb. Prager 18675 (Gg--31486). Queensland: M. K. Clemens s.n. [Jericho, March-April 1946] (Or--56349); F. Mueller s.n. [Rockingham Bay, 1869] (Bz--25328), s.n. [Endeavour River] (Bz--25330). BRIBIE ISLAND: M. K. Clemens s.n. [April 20-30, 1944] (Or--49643, Or--49644). HAYMAN ISLAND: C. T. White 10167 (N). LINE ISLANDS: Jarvis: A. C. Browne s.n. (Du--270471). CULTIVATED: Java: Bakhuizen van den Brink 6580 (Bz--24347, Bz--24348, Bz--24349, Bz--24350, Bz--24351); Herb. Hort. Bot. Bogor. II.Q.C.24 (Bz--25756), XV.F.52a (Bz--26353, Bz), XV.J.A.(XXXV).6 (Bz--2433, Bz--24334, Bz--24335), XV.J.A.XXXV.7 (Bz--26420, Bz--26421, Bz, N), s.n. (Bz--24336, Bz--24337, Bz--24338); Herb. Lugd.-Bat. 908267-49 (Le, N--photo, N, Z--photo). LOCALITY OF COLLECTION UNDETERMINED: Collector undesignated 467 (Ut--44164).

VITEX TRIFOLIA var. HETEROPHYLLA (Mak.) Moldenke, Phytologia 3: 178. 1949.

Synonymy: Vitex rotundifolia var. heterophylla Mak., Ill. Fl.

Nipp. 186. 1940.

Literature: Kuntze, Rev. Gen. Pl. 2: 510--511. 1891; Mak., Ill. Fl. Nipp. 186. 1940; Hara, Enum. Sperm. Jap. 1: 191. 1948; Moldenke, Phytologia 3: 178 (1949), 295 & 381 (1950), and 461--463 & 468. 1951; Moldenke in Humbert, Fl. Madag. 174: 82--83 & 273. 1956.

This variety differs from the typical form of the species in being a dwarf or prostrate shrub with both 1-foliolate and 3-foliolate leaves regularly interspersed on the branchlets. It is said to be woody or semi-woody, to 3 m. tall, the stem to 4 cm. in diameter. The entire plant has the fragrance of desert sagebrush (Artemisia tridentata Nutt.), the leaves being especially fragrant. The leaflets on 1-foliolate leaves are usually broader, more oblong in shape, and more obtuse at both ends than those on 3-foliolate leaves. The corollas are blue, reddish-purple, or white (Tsui 286).

The variety is found chiefly along seashores from Madagascar and Mauritius through India, the Andaman Islands, Indochina, and Malaya, north to Hainan, Kwangtung, and Japan, and eastward through Indonesia to the Lesser Sunda Islands, Moluccas, New Caledonia, Fiji, and Queensland. It is sometimes cultivated in Europe and Indonesia. On Hainan it is found along roadsides, in village commons, and is said to be fairly common on dry or moist gentle slopes in sand of seashores, ascending to 750 meters altitude. It is regarded as a medicinal plant in Mauritius, while in Sumatra, according to Hayes, all parts of the plant are used in treating fevers. It has been collected in anthesis in February to April, June to August, October, and December. It has been confused by herbarium workers with and misidentified as V. negro-undo L.

The Skottsberg 5 cited below consists of mostly 1-foliolate leaves and only a few 3-foliolate ones. The Bijoux collection from Mauritius bears a label stating that it is "a medicinal plant" growing at low levels. The Riedel collection from Gorontalo is a mixture with a species of Acacia. Our plant is called "vone lang" on Hainan Island.

Kuntze's description of his V. agnus-castus s. subtrisecta, collected in Java at 2000 feet altitude, implies var. heterophylla, but his type specimen seems to be V. trifolia in its typical form. I am therefore placing his trinomial in the synonymy of the typical form of V. trifolia.

Citations: MADAGASCAR: Afzelius s.n. [Tamatave, 2.8.1912] (S); Kaudern s.n. [Tamatave, 10.2.1912] (S). MASCARENE ISLANDS: Mauritius: Bijoux s.n. (Bz--25331). INDIA: West Bengal: C. E. Parkinson 4335 (N). ANDAMAN ISLANDS: South Andaman: Prain s.n. [15/11/1889] (Br). CHINA: Kwangtung: Chun 7625 (Bz--25221). Yunnan: Henry 12302a (N). Province undetermined: Hooker s.n. [China] (C). HONAM ISLAND: Hom A.387 [Herb. Lingnan Univ. 18794] (N). HAINAN ISLAND: Fung 20300 (Bz--25227, N); Gressitt 1131 (I); Lau 270 (M1, N). HONGKONG: Tsui 286 (N). INDOCHINA: Annam: Herb. Torrey

s.n. [Turou, Note B.5.19] (T). COCHINCHINA: Harmand s.n. [Ba Yoe prés Ha Tien, 1875] (Bz--72859). THAILAND: Haniff & Nur 3584 (Bz--25215); Kerr 1248 (Bz--25325). MALAYA: Trengganu: Corner 33492 (Bz--25225). LIUKIU ISLANDS: Iriomote: Walker & Tawada 6601 (N), 6602 (N). Okinawa: Carow 5 (W--1991962). Yaeyama: Lehmboden 96 (N). PHILIPPINE ISLANDS: Luzon: H. M. Curran s.n. [Herb. Philip. Forest Bur. 5295] (Br); A. D. E. Elmer 7877 (Bz--25288), 15236 (Bz--25286, N, S); Merritt & Darling s.n. [Herb. Philip. Forest Bur. 14079] (Bz--25289); Vanoverbergh 321 (S). Palawan: E. D. Merrill Sp. Blanc. 302 (N). Panay: Edaffo s.n. [Herb. Philip. Bur. Sci. 46232] (S); Ramos & Edaffo s.n. [Herb. Philip. Bur. Sci. 31523] (Bz--25285). SIMALUR ISLAND: Achmad 45 (Bz--25321). SUM-
 ATRA: Ajoeb 7 (Bz--25202); Bünnemeijer 2517 (Bz--25315), 2975 (Bz--25316), 5649 (Bz--25317), 7995 (Bz--25204, Ut--58760); Grashoff 963 (Bz--25194); Gusdorf 30 (Bz--25195); Hayes s.n. (Bz--25203); Herb. Jard. Bot. Brux. s.n. [Sumatra] (Br); Lürzing 3797 (Bz--25208), 6268 (Bz--25308), 8006 (Bz--25205), 8974 (Bz--25307), 10066 (Bz--25212); Van Steenis 3345 (Bz--25196, Bz--25197), 5875 (Bz--25198); Voogd 1355 (Bz--25192, Bz--25193, Bz--25671); R. Wind 26 [Boschproefst. BB.9843] (Bz--25211). MADURA ISLAND: Backer 19416 (Bz--25277), 19895 (Bz--25275, Bz--25276), 21149 (Bz--25278). BAWEAN ISLAND: Buwalda 3055 (Bz--73022); Dor-
 gelo 4 (Bz--25180), 53 (Bz--25181). JAVA: Backer 2541 (Bz--25258), 4550 (Bz--25261), 4771 (Bz--25251), 6828 (Bz--25259), 9554 (Bz--25265), 11962 (Bz--25253, Bz--25254), 15230 (Bz--25238, Bz--25240), 16394 (Bz--25241, Bz--25242), 16615 (Bz--25255, Bz--25256), 22860 (Bz--25245, Bz--25673), 23189 (Bz--25232), 24283 (Bz--25263, Bz--25264), 26430 (Bz--25235, Bz--25236), 33174 (Bz--25248), 33175 (Bz--25249), 33177 (Bz--25244); Brascamp 12 (Bz--25169); Brinkman 551 (Bz--25168); Buysman 252 (Ut--53408); Col-
 lector undesignated 654b (Bz--25170); Grutterink 3112 (Bz--25260); Hoffmannsegg s.n. [Java] (Br); Jeswiet s.n. [1916] (Ut--71063); Karta 56 (Bz--25179); Kobus 264 (Bz--25269); Koorders 15559b (Bz--25270), 25043b [2209*] (Bz--25272, Bz--25674), 28038 [923*] (Bz--25273), 36203b [1902*] (Bz--25271), 38790b [1480*] (Bz--25274); Mousset 1118 (Bz--25268); Reinwardt s.n. (S); Slooten 2649 (Bz--25243), 2697 (Bz--24276); Ultee 25 (Bz--25266); Westendorp s.n. [Batavia] (Br); Winckel 1140b (Bz--25176); Zoll-
 inger 2559 (Bz--25267). BATAVIA BAY ISLANDS: Klein Kombius: H. J. Lam 2173 (Bz--25231). JAMBONGAN ISLAND: Cabiling 3691 (Bz--25167). CELEBES: Bünnemeijer 10633 (Bz--25291, Ut--80733), 10828 (Bz--25292), 11234 (Bz--25295), 12305 (Bz--25296); Noerkas 36 [Vuuren 36] (Bz--25298); Rachmat 35 (Bz--25301), 108 (Bz--25303); J. G. F. Riedel s.n. [Gorontalo] (Bz--25303, in part); Saimoendt 61 [Posthumus 972] (Bz--25310); Teijsmann 12706 (Bz--25304); Vuuren

s.n. [30.III.12] (Bz--25299, Bz--25300). LESSER SUNDA ISLANDS: Banka: Btinnemeijer 1467 (Bz--25318). Flores: Horst 44 (Bz--25182); Posthumus 3426 (Bz--25183); Rensch 1053 (Bz--25184); Veeartsenijk. Dienst. 55 (Bz--24311). Lombok: Harreveld s.n. [4 Oct. 1920] (Bz--25186); Rensch 43 (Bz--25185). Sumbawa: Bloembergen 3074 (Bz--72652). Timor: Forbes 3726 (Bz--25279, Bz--25280), 3730 (Bz--25281); M. E. Walsh 134 (Bz--25189, Bz--25190). MOLUCCA ISLANDS: Amboina: Rant 278 (Bz--25282); C. B. Robinson 304 (Bz--25283). NEW CALEDONIA: Schlechter 15548 [Herb. Hort. Then. I.5998] (Br, S); C. Skottsberg 5 (S). FIJI ISLANDS: Viti Levu: Gillespie 4380 (Bz--25217); A. C. Smith 7088 (Z). AUSTRALIA: Northern Territory: Landsborough s.n. [Gulf of Carpentaria] (Pa). Queensland: Collector undesignated s.n. (Bz--25329). CULTIVATED: Belgium: Lejeune s.n. (Br). Java: Backer 22575 (Bz--25233); Herb. Hort. Bogor. XV.F.50 (Bz--25352), XV.JA.XXXV.1a (Bz--26415), XV.JA.XXXV.2 (Bz--26417, Bz--26418, Bz), XV.JA.XXXV.2a (Bz--26419); Wit s.n. [Herb. Hort. Bogor. XV.JA.XXXV.1] (Bz--26414). New York: New York Bot. Gard. Cult. Pl. 13350 (Ur). Sumatra: Herb. Hort. Bot. Sibolangit 135 (Bz--26515). LOCALITY OF COLLECTION UNDETERMINED: Beumee A.92 (Bz--25257); Collector undesignated s.n. [Archip. Ind.] (Bz--25323, Bz--25324); De V. S. s.n. [Juni 1919] (Bz--25172); Doctors van Leeuwen-Reijnvaan s.n. [Saliatiga, 21 Maart 1909] (Bz--25237); Rand s.n. [July 1919] (Bz--25171).

VITEX TRIFOLIA var. *SIMPLICIFOLIA* Cham., *Linnaea* 7: 107 [as "f"]. 1832; H. J. Lam, *Verbenac. Malay. Arch.* 182. 1919.

Synonymy: *Vitex rotundifolia* L. f., *Suppl. Pl.* 294. 1781. *Vitex ovata* Thunb., *Fl. Jap.* 257. 1784. *Vitex repens* Blanco, *Fl. Filip.*, ed. 1, 513. 1837. *Vitex trifolia* β *unifoliolata* Schau. in A. DC., *Prodr.* 11: 683. 1847. *Vitex trifolia* var. *unifoliolata* Mann, *Proc. Am. Acad.* 7: 194. 1867. *Vitex trifolia* α *obovata* Benth., *Fl. Austral.* 5: 67. 1870. *Vitex trifolia* var. *unifoliolata* Hillebr., *Fl. Haw. Isl.* 342. 1888. *Vitex agnus-castus* η *ovata* Kuntze, *Rev. Gen. Pl.* 2: 510 & 511. 1891. *Vitex trifolia* var. *ovata* (Thunb.) Mak., *Bot. Mag. Tokyo* 17: 92. 1903. *Vitex trifolia* var. *ovata* (Thunb.) Merr., *Sp. Blanc.* 332. 1918. *Vitex trifolia* var. *repens* Ridl., *Fl. Malay Penins.* 2: 631. 1923. *Vitex trifolia* var. *ovata* Mak. apud Degener, *Fl. Hawaii.* 3: 315. *Vitex* :Trif.: *Ovat.*, in syn. 1932. *Vitex trifolia* var. *unifoliolata* Schau. ex J. A. Harris, *Physico-chem. Prop. Plant Saps* 134, sphalm. 1934. *Vitex trifolia* var. *unifoliolata* Schau. ex Moldenke, *Prelim. Alph. List Invalid Names* 52, in syn. 1940. *Vitex trifolia* var. *obovata* Benth. ex Moldenke, *Prelim. Alph. List Invalid Names* 52, in syn. 1940. *Vitex trifolia* var. *unifoliolata* Hillebr. ex Moldenke, *Suppl. List Invalid Names* 11, in syn. 1941. *Vitex trifolia* var. *simplicifolia* Cham. & Schlecht. ex

Skottsbl., Meddel. Göteborg. Bot. Trädg. 15: 435. 1944. Vitex simplicifolia E. D. Merr., Plant Life Pacific World 282, sphalm. 1945 [not V. simplicifolia Oliv., 1875, nor C. B. Clarke, 1885]. Vitex trifolia var. ovata Thunb. ex Moldenke, Alph. List Invalid Names Suppl. 1: 29, in syn. 1947. Vitex ovata Lam. ex Moldenke, Alph. List Invalid Names Suppl. 1: 29, in syn. 1947. Vitex rotundifolia L. ex Beltrán, Cat. Sem. Hort. Bot. Univ. Valentin. 1948: 26, sphalm. 1948. Vitex trifolia Hemsl. apud Rehd., Bibliog. Cult. Trees 585, in syn. 1949 [not V. trifolia L., 1753]. Vitex trifolia var. unifoliata DC., in herb. Vitex trifolia var. unifoliolata DC., in herb.

Literature: Kwa-wi [trans. Savatier], Arbor. 2: pl. 6. 1759; L. f., Suppl. Pl. 294. 1781; Thunb., Fl. Jap. 257. 1784; R. Br., Prodr. Fl. Nov. Holl., ed. 1, 1: 511. 1810; Cham., Linnaea 7: 107. 1832; Hook. & Arn., Bot. Beechey Voy. 206 (1836) and pl. 47. 1841; Blanco, Fl. Filip., ed. 2, 358. 1845; Blanco, Fl. Filip., ed. 1, 513. 1837; Schau. in A. DC., Prodr. 11: 683. 1847; Seemann, Viti 440. 1862; F. Muell., Fragm. 3: 59. 1862; Mamm, Proc. Am. Acad. 7: 194. 1867; Benth. & Muell., Fl. Austral. 5: 67. 1870; Blanco, Fl. Filip., ed. 3, 2: 297. 1878; F. M. Bailey, Syn. Queensl. Fl. 379. 1883; Sinclair, Indig. Fl. Hawaii. Isls. pl. 26. 1885; Hillebr., Fl. Haw. Isl. 342. 1888; Hemsl., Journ. Linn. Soc. Lond. Bot. 26: 258. 1890; F. M. Bailey, Cat. Pl. Queensl. 35. 1890; Kuntze, Rev. Gen. Pl. 2: 510 & 511. 1891; Useful Pl. Jap. 2: pl. 447. 1895; Matsumura, Bot. Mag. Tokyo 13: 122. 1899; F. M. Bailey, Queensl. Fl. 4: 1179. 1901; Mak., Bot. Mag. Tokyo 17: 92. 1903; F. M. Bailey in Meston, Exped. Bell-Ker (Parliam. Rep.) 14. 1904; E. D. Merr., Bur. Govt. Lab. Philip. Bull. 6: 17--18. 1904; E. D. Merr., Bur. Govt. Lab. Philip. Bull. 27: 68. 1905; E. D. Merr., Journ. Philip. Sci. Bot. 3: 432. 1908; Matsumura, Ind. 2 (2): 534. 1912; F. M. Bailey, Compreh. Cat. 386. 1913; E. D. Merr., Sp. Blanc. 332. 1918; H. J. Lam, Verbenac. Malay. Arch. 182--183 & 370. 1919; Backer, Trop. Natuur 8: 7, fig. 13. 1919; Nakai, Trees & Shrubs Jap. 1: 350, fig. 190. 1922; Bakh. & Lam, Bull. Jard. Bot. Buitenz., sér. 3, 4 (2): 285. 1922; Ridl., Fl. Malay Penins. 2: 631. 1923; Nakai, Fl. Sylv. Koreana 14: 37, pl. 11. 1923; E. D. Merr., Enum. Philip. Pl. 3: 397. 1923; Mak., Ill. Fl. Jap. [217]. 1924; H. J. Lam in Engl., Bot. Jahrb. 59: 27. 1925; E. D. Merr., Lingnan Sci. Journ. 5: 158. 1927; Nakai, Trees & Shrubs Indig. Jap., ed. 2, 1: 474--475, figs. 224 & 990. 1927; Domin, Bibl. Bot. 22 (89-6): 1114--1115, fig. 181. 1928; Pope, Wayside Pl. Hawaii 196, pl. 111. 1929; Ridl., Disp. Pl. 309. 1930; Stapf, Ind. Lond. 6: 479. 1931; Honda & Sakisaka, Syst. Pl. Japon 362. 1931; P'ei, Mem. Sci. Soc. China 1 (3) [Verbenac. China]: 100. 1932; Degener, Fl. Hawaii. [1: 86] & 3: 315: Vitex: Trif.: Ovat. 1932; Ishidoya, Chines. Drogen 1: 100. 1933; Degener, Fl. Hawaii. fig. 712. 1933; Mak., Gensyoku Yagai-Shokubutsu [Nature Col. Wild Pl.] 4: 300. 1933; Terasaki, Nippon Shokubutsu Zufu [Jap. Bot. Illustr. Album] 712. 1933; Masam., Fl. & Geo. Yakus. 388. 1934; Kanehira, Formos. Trees, ed. 2, 653, fig. 609. 1936; Degener, Fl. Hawaii. 315: Vitex: Trif.: Simp. 1936; H. S.

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Illustrations: Kwa-wi [trans. Savatier], Arbor. 2: pl. 6. 1759; Hook. & Arn., Bot. Beechey Voy. pl. 47. 1841; Sinclair, Indig. Fl. Hawaiian Isls. pl. 26 (colored). 1885; Useful Pl. Jap. 2: pl. 447 (colored). 1895; Backer, Trop. Natuur 8: 7, fig. 13. 1919; Nakai, Fl. Sylv. Koreana 14: pl. 11. 1923; Mak., Ill. Fl. Jap. [217]. 1924; Nakai, Trees & Shrubs Indig. Jap., ed. 2, 1: 475, figs. 224 & 990. 1927; Domin, Bibl. Bot. 22 (89-6): 1115, fig. 181. 1928; Pope, Wayside Pl. Hawaii 196, pl. 111. 1929; Honda & Sakisaka, Syst. Pl. Japon. 362. 1931; Degener, Fl. Hawaii. 1: [86] 315: *Vitex*: Trif.: *Ovat.* 1932; Ishidoya, Chines. Drogen 1: 100. 1933; Mak., Gensyoku Yagai-shokubutsu [Nature Col. Wild Pl.] 4: 300 (colored). 1933; Terasaki, Nippon Shokubutsu Zufu [Jap. Bot. Illustr. Album] 712. 1933; Degener, Fl. Hawaii. fig. 712. 1933; Degener, Fl. Hawaii. 1: 315: *Vitex*: Trif.: Simp. 1936; Kanehira, Formos. Trees, ed. 2, 653, fig. 609. 1936; Dunselman, Trop. Natuur 28: 78, fig. 9. 1939; Kanehira, Formos. Trees, ed. 2, fig. 558. 1940; E. D. Merr., Plant Life Pacific World 42, fig. 46. 1945.

This variety differs from the typical form of the species in being usually a low bush or shrub of the seashores with procumbent or creeping stems, rooting at the nodes, and erect branches, its leaves mostly 1-foliolate and sessile or subsessile, the blades being smaller, 1.5--4.5 cm. long and 0.8--3.5 cm. wide, mostly broadly oblong, subrotund, or obovate-spatulate, and rounded at the apex and base or very abruptly short-acuminate, usually remaining densely puberulent above and sometimes velutinous-tomentellous beneath, and the mostly terminal and greatly abbreviated inflorescences.

A low, often prostrate, sprawling, trailing, or creeping shrub, 1--3 m. tall or less, sometimes scandent; stems usually

less than 2.5 cm. in diameter, usually several from one root-cluster, usually prostrate or creeping, to 4 m. long, usually abundantly rooting at the nodes for its whole length; wood rather bitter, greenish-white, odorless, soft, with large pith; bark brown, more or less finely shredded; branches usually less than 1 m. long, ascending or erect; branchlets and twigs slender, brownish, acutely or obtusely tetragonal, erect or suberect, often all ascending from one side of the prostrate branches, densely puberulent with sordid or cinereous hairs most conspicuous on the younger parts; nodes annulate; principal internodes 1.5--5 cm. long; leaves decussate-opposite, mostly ascending, normally 1-foliolate, very rarely 2- or 3-foliolate, silvery-green, sessile or subsessile; petioles (when present) slender, 1.5--5 mm. long, usually almost obsolete, convex beneath, flattened and somewhat canaliculate above, densely appressed-puberulent with sordid or whitish hairs, not noticeably ampliate at the base or apex; blades chartaceous, often more or less folded, dark-green and usually brunnescent or nigrescent in drying above, white or grayish beneath, mostly broadly oblong, subrotund, obovate, or obovate-spatulate, 1.5--4.5 cm. long, 0.3--3.5 cm. wide, mostly rounded at the apex and base or very abruptly short-acuminate, or attenuate to the base, entire or sometimes deeply 2- or 3-lobed at the base, densely and usually permanently puberulent above, densely tomentellous-puberulent or sometimes velutinous-tomentellous with white or grayish hairs beneath; midrib very slender, flat and usually more or less canescent above, prominulent beneath; secondaries very slender, 4--12 per side, arcuate-ascending, often branched, flat or subprominulent above, prominulent or hidden by the dense tomentum beneath, not anastomosing; vein and veinlet reticulation sparse, obscure or indiscernible on both surfaces; inflorescence mostly terminal and greatly abbreviated, paniculate, erect, 3--7 cm. long, 2--4 cm. wide, composed of several, opposite, subsessile, 1--3-flowered cymules, cinereous- or sordid-puberulent throughout; peduncles subobsolete, along with the rachis slender, usually acutely tetragonal, similar to the adjacent twigs in color, texture, and puberulence; sympodia usually few and abbreviated; pedicels very slender, about 1 mm. long or less, densely white-puberulent; foliaceous bracts often present in the lower part of the inflorescence, similar to the leaves in all respects, but smaller; bractlets and prophylla linear, 1--3 mm. long, densely white-puberulent; flowers fragrant or odorless; calyx cyathiform, 4--5 mm. long, 2.5--3.5 mm. wide, 5-nerved, very densely white-tomentellous externally, its rim shortly and acutely repand-dentate or the teeth blunt; corolla hypocrateriform, varying from blue, light-blue, blue-lavender, or bluish-lavender to faintly purple, purple, purplish-blue, reddish-purple, pink, or red, sometimes bluish-purple with whitish markings on the anterior lobe, pulverulent or puberulent externally, its tube infundibular, about 12 mm. long, the lower lip expanded into a villous tongue about 6 mm. long, the remaining lobes smaller; stamens and pistil exserted; fruiting-calyx cupuliform, herbaceous, about 5 mm. long and wide, densely cinereous-puberulent on

the outside, its rim regularly 5-dentate; fruit drupaceous, at first green, later light-blue, blue, red, or black, globose, about 4 mm. long and wide, very lightly puberulent or strigillose.

This plant is a widespread Asiatic variety native along sea-coasts from Mauritius and Bengal through Indochina, Thailand, Pahang, and Singapore, northward to southeastern China, Formosa, Japan, Hongkong, Hainan, and the Lantau Islands, east to the Philippines, Java, Sarawak, the Salajar Islands, New Guinea, the New Hebrides, and the Hawaiian Islands, south to Queensland. It is cultivated in China, Formosa, Hongkong, Germany, and Florida. It is an excellent sandbinder, found abundantly in ravines, along rocky roadsides, on coastal dunes, and along the seashore, fairly common on dry level land in sandy soil, on dry gentle slopes, in meadows and hedges, and on coral sand ridges along beaches. It has been found in anthesis from February through December and in fruit from July to October and in December, but probably flowers and fruits continuously throughout the year in its native haunts. It is cultivated for drug purposes on Honam Island according to McClure, and is used medicinally in the treatment of consumption, according to Ridley. Smitinand states that it is employed locally for medicine in Thailand. In Japan it is often infested by Cuscuta chinensis Lam.

The type was collected on sandy shores near Cavite, Luzon, Philippine Islands. In the Linnean Herbarium, London, under genus 811 [790], Vitex, specimen number 1 is inscribed "ovata" in the handwriting of Smith and "H B" [=Herb. Banks]. It is obviously this variety. The Dahl specimen cited below is inscribed "Dahl a Dr. Thunberg" and may be a cotype of Vitex ovata Thunb.; the two Thunberg collections (14 and s.n.) surely are cotypes of V. ovata.

The plant has been misidentified in herbaria as "Vitex triflora L.", while the Baker & Baker 164 distributed as "Vitex trifolia var. ovata" is actually something apocynaceous and Baker & Baker s.n. (Gg--31492) from Japan, also so misidentified, is something in the Asclepiadaceae. References in literature to the petioles of this variety attaining a length of 2 cm. refer to specimens that are now called V. trifolia var. heterophylla, which sometimes also has its leaves all or mostly 1-foliolate.

Skottsberg, in the reference cited above, refers to "Degener, Fl. Haw. 3/7/1938". Heller states that "The hoary under sides of the leaves, and the blue flowers make this a showy species. It is plentiful on the 'barking sands' of Mana, Kauai. The main stems, which are decumbent and quite long, spread out over the sand, sending up branches at intervals of half a foot or less. Horace Mann, Proc. Am. Acad. 7: 194, calls this 'Vitex trifolia. LINN., var.? unifoliolata,' and Hillebrand has it 'var. unifoliolata', with no indication that he is not the author of the varietal name. However, it is a nomen nudum, as Mann does not describe it, and if it were distinct, would probably have to be called Vitex ovata THUNB. My specimens show leaves varying from three-foliolate to entire, some of them being two-lobed. The original spelling in

the Species Plantarum is Vitex 'trifoliis', undoubtedly a typographical error."

Fosberg states that on Oahu it forms large low masses, the stems being prostrate with ascending branches and lavender-purple flowers, while Henderson calls it a seashore creeper with mauve flowers in Pahang. Merrill reports that on Luzon the flowers are pale-blue or nearly white, and that the plant has branches 1--2 feet long, ascending from the long creeping stem which roots for its whole length of 8--12 feet. He states that it forms an excellent sandbinder on sandy seacoasts; also "although very distinct in habit, and in its leaves usually reduced to a single leaflet, I doubt very much if it is specifically distinct from the erect Vitex trifoliata Linn." He adds that it is called "lagunding dagat" (lagunding = Vitex trifolia; dagat = ocean), an indication that even the natives recognize the close relationship of this form to the erect form of the species.

Degener says "A shrub forming a large part of the coasta[l] vegetation of all the Islands. Flowering in summer....Widely distributed throughout Polynesia and as far as Japan and India on coastal dunes. Notably in the Philippines Vitex trifolia L., a trifoliolate shrub or small tree, grows inland; the unifoliolate variety grows along the shore. There is some evidence that the latter when grown inland will develop into the typical species, and would hence be but an ecovariety. According to Ridley Fl. Malay Pen. p. 631, speaking of V. trifolia and V. trifolia var. repens [simplicifolia?], 'The two forms look so utterly unlike that they might be easily taken for two species, but the sea-shore form taken inland soon becomes the tree form.' Whether this statement also applies to the Hawaiian plant is worth investigating. A single clump of these plants growing some distance from the coast near Kamalo, Molokai, were essentially the same as those growing nearer shore."

Domin says "An der Küste in der Nähe der Russell-Mündung (Domin I. 1910), in Gesellschaft der V. trifolia, von dieser jedoch schon habituell durch den Wuchs gänzlich verschieden und durch keinerlei Übergänge verbunden." Meeuse, in a letter to me dated December 9, 1953, also feels that it should have specific rank. He says "Several botanists who spent some time in the Indies, among them the well-known and celebrated Dr. C. A. Backer, have told me that the form with unifoliolate leaves is (1) a coastal form growing on sandy dunes, (2) prostrate and always (3) unifoliolate, and that typical V. trifolia is (1) found far inland, (2) erect and (3) always trifoliolate. Ridley...mentions that the creeping coastal form soon changes into the shrubby form inland, but Dr. Backer, who as you know is almost unrivalled as a collector and student of the Javanese flora, says: 'Never! They are two distinct forms and there are no intermediate specimens.' Therefore, in the tentative Flora of Java I retained it as a well-defined species, on ecological as well as on morphological grounds, as Vitex ovata Thunb. I have never seen any intermediate specimens myself and think Ridley's remark is another of

his little lapses. V. ovata must be a good species."

Merrill, in the 1904 publication cited above, says under V. ovata: "This widely distributed species is apparently distinct from V. trifoliata L. f. to which it has been reduced by various authors. It is represented in our herbarium by No. 323, Aparri, Province of Cagayan, Luzon, June 22, 1902, and No. 898, Calapan; Mindoro, 1903. At both of these localities the trailing form only was found. On Lubang Island, however, in April, 1903, this form was found associated with V. trifoliata L. f., and no intergrading forms were observed. V. trifoliata L. f. was always an erect shrub, 2 to 3 m. high, with trifoliate leaves, while V. ovata Thunb. was always trailing, and with simple ovate or obovate leaves. Vitex ovata Thunb. is found on sandy sea beaches, where it is a valuable sand-binder, trailing 3 to 4 m., the stem rarely exceeding 1 cm. in diameter, and sending up numerous erect branches 1 to 6 dm. in length. No one seeing the two forms growing together would confuse them, as they appear very distinct. Tagalog, Lagunding gapang."

Dr. Lam uses the varietal name "unifoliolata" for this taxon with the comment "Wir haben Schauers Varietäten beibehalten - obgleich diejenigen Chamisso's die Priorität besitzen - weil sie die richtigsten sind." Instead of "most correct" he obviously means "most appropriate", because under the International Rules of Botanical Nomenclature they are not the correct names to be used. In his 1919 publication he says "Properly speaking Chamisso's varieties have the priority, but we retain those of Schauer, the names being the most exact." Whether an epithet is descriptively accurate or not has no bearing whatever on its legality under the Rules. If we changed the names of our plants and animals because other names would be more accurately descriptive, we would be changing names continuously and there would be no hope of nomenclatural stability. As an example of what would happen we need only consider the works of Richard Anthony Salisbury! Chamisso's name is the first to have been applied validly to this taxon in the varietal category and is therefore the one that must be employed if we consider the taxon to be a variety.

Dr. Van Steenis, in a letter to me dated October 4, 1956, states that he regards the plant as worthy of subspecies status and that he plans to re-name it in this category in his forthcoming book on Malaysian vegetation. "After work in the Herbarium and taking notice of the literature I agree fully with you that it does deserve distinction but that this should be in the infraspecific level. It is clearly of (ecotypical) racial rank, but genetically defined and not a mere phenotypical thing. In our Flora we are following the practice of discriminating between variety and subspecies in the way a great number of taxonomists have interpreted these infraspecific taxa, viz: subspecies for any partial population, that is a part of a species population which is geographically or ecologically defined, respectively has its own area of distribution and/or ecology (e.g. a mountain

race, or littoral race, or ecologically a swamp race, etc.); variety for all other deviating paramorphs worthy to distinguish." On this basis he concludes that our plant should receive designation as a subspecies, and doubtless it will have to be thus treated in the forthcoming discussion of the family which I am preparing for the Flora Malesiana. However, I personally do not approve of the use of "subspecies", nor of the dozens of other categories which certain taxonomists now are proposing for recognition in the scientific names of plants and animals. In my opinion it is not advisable to attempt to indicate too much in the name of an organism. If we continue in this trend the names of organisms will become the cumbersome polynomials from which the binomial system of Linnaeus attempted to free us. For this and other reasons I do not adopt the trinomial system with its silly repetition of the specific name. If any name can be more ridiculous than Cardinalis cardinalis cardinalis or Bison bison bison, I hope I never see it! Similarly, placing "subsp.", "clon", "subform", "ecotype", etc., and also an "x" or "+" within the scientific name of a plant tends to be more confusing to the average reader and user of these name than it is worth. Let us go back to the Linnean concept of having a name merely as a handle for the recognition of a plant or animal population and let us not try to indicate too much else as to our opinions about the genetic or other history or constitution or relationship of the population in the name. Names are not for that purpose. "Variety" and "form" are, in my opinion, sufficient infraspecific categories for nomenclatural use. I use "variety" in the sense that Van Steenis uses "subspecies", and I use "form" in the sense of his "variety".

Lam cites Ari Kotara s.n. from Chichigunu, Okasawara, in the Bonin Islands, a collection not yet seen by me. He also records the variety from Réunion, Ceylon, Malacca, and the Andaman Islands. He cites Horsfield s.n. (Ut--49902) from Java and Docters van Leeuwen-Reijnvaan 1863 from the Salajar Islands -- the latter said to be "partly an erect shrub, partly a characteristic, creeping shore plant." Seeman, in the reference cited above, refers to his no. 354 as "V. trifolia Linn." from the Fiji Islands. The McClure 639 specimen in the Langlois Herbarium shows stems rooting at the nodes. Heller 2731 at the University of Michigan shows the twigs all ascending from one side of the procumbent branches. Degener's illustration shows a 3-foliolate leaf. The Bijhouwer 173 specimen cited below exhibits a few 3-foliolate leaves, all with characteristic abbreviated or subobsolete petioles, enabling one to distinguish them at a glance from the 3-foliolate leaves of var. heterophylla and from the typical form of the species. Tsang describes the plant as "erect, 1 m. tall", but it is most probable that he refers here to the erect branches from prostrate stems.

There is some doubt as to the exact identity of Kuntze's Vitex agnus-castus var. subtrisecta. The specimens from the type locality cited by Kuntze -- Willisgebirge, Java -- seem to be typical

V. trifolia, but another specimen in the Britton Herbarium on which Kuntze actually wrote his original diagnosis of var. subtrisecta and which was collected "cult. Sindangbaja" and is not cited by him at all in his publication, is a mixture of V. trifolia and its var. simplicifolia. The type was collected at 2000 feet altitude and the other material at 3500 feet. If so, it seems most probable that the portion which is var. simplicifolia is an extraneous mixture added from a seacoast station by error. If this is not the case and if the material now on this sheet did actually come from the same plant growing at 3500 feet altitude, it would be excellent proof that the variety is actually an eco-variety as suggested by Degener and Ridley.

The material employed by Harris in his experiments on the physico-chemical properties of plant saps was collected on low coral sand dunes along the shore of Waimanalo Bay, Oahu, and is cited below under his collection numbers. Menninger states (1946) that the Fairchild Tropical Garden has distributed this variety propagated from seed collected by Dr. Fairchild "on a beach in the south seas". Dr. Fairchild actually says in the work cited above (1943) "I was disappointed not to find more interesting plants on the dunes [of Ilcas Norte]; but one lavender-flowered shrub with fragrant, entire leaves seemed attractive, and Conicosa and I gathered the few seeds we could find. It is Vitex trifolia, var. ovata, and it appears to be making an unusual record where it is growing in the Fairchild Garden, adding another desirable shrub to the rather meager list of plants that will grow near the sea."

Common names recorded for this variety are "agubarau", "beach vitex", "daldaláki", "dancundi", "danglá-ti-baybai", "dunglá", "kolokolo kahakai", "lagondi", "lagundi", "lagundi-dágat", "lagunding dagat", "lagunding gapang", "lagunding-gapáng", "paak pui ip", "paak pui man king", "pak-muk-ying", "polinalina", "si saw", "so pa", and "vulokaka".

Citations: BRAZIL: Rio de Janeiro: Wallis s.n. (B). CHINA: Chekiang: Chiao 14644 (Go); Ching 1967 (Ba). Fukien 2224 (Bz--25223). Hopeh: M. K. Clemens 6363 (Br, Br, Br, Br). Kwangtung: F. A. McClure 639 [Canton Chr. Coll. 7425] (I, Mi--photo, N); s.n. [Herb. Lingnan Univ. 13095] (I, N, N); W. T. Tsang s.n. [Herb. Lingnan Univ. 16649] (I, N, N). Shantung: Chiao 2774 (N, N); F. N. Meyer 328 (Ar--19793), 380 (Du--13533). Province undetermined: Krons s.n. (S). HONAM ISLAND: F. A. McClure 58, in part (Ar--11240). FORMOSA: Oldham 382 (C, S); Sasaki s.n. [Herb. Govt. Formosa 21595] (La, S); T. Tanaka 5355 (N); Yamamoto 2380 (N). JAPAN: Honshiu: Makino s.n. [Rikuzen, 1899] (Bl--42353); Maries s.n. [Nikko] (Pa); Y. Matsumura 5910 (N), 6020 (N); Maximowicz s.n. [Yokohama, 1862] (Br, S); Sasaki & Togasi 606 (N). Kiushiu: Maximowicz s.n. [Nagasaki, 1863] (C); Oldham 626 (S); T. Tanaka 100.7 [406.7] (N). Island undetermined: Bunge s.n. (M); Collector undesignated s.n. [Tozumi, 30/9/95] (S); Herb. Ames s.n. [30 Jul.]

(Oa); Herb. Lugd.-Bat. s.n. (S); Herb. Sci. Coll. Imp. Univ. s.n. [Ise; Aug. 16, 1889] (Vt); Thunberg s.n. [Japan] (N--photo, S, Z--photo); Uno E.30 (Mi). MACAO: Meyen s.n. [8/31; Herb. Prager 18674] (Gg--31481). HONGKONG: W. Y. Chun 6552 (Du--200917); Dahlström 52 (S); Ford s.n. (N); Fortune 90 (S); Milford s.n. [Hong Kong] (Pa); C. Wright s.n. (T). LANTAU ISLANDS: F. A. McClure s.n. [Herb. Lingnan Univ. 13095] (N, S). LAPPAS ISLAND: Vachell s.n. [17 July 1830] (Br). HAINAN ISLAND: How 73817 (Bz--25222); Lei 1087 (N), 1093 (N); Liang 62926 (N, S), 64027 (N); C. Wang 33826 (N), 34847 (N), 34899 (N). INDOCHINA: Annam: Clemens & Clemens 3028 (Gg--156759, Mi, N, Ut--254a). PHUQUOC ISLAND: Pierre s.n. [2/1874] (S). THAILAND: Smitinand 1458 [Herb. Roy. Forest Dept. 6840] (Z). MALAYA: Pahang: Corner s.n. [Herb. Bot. Gard. Singapore 25784] (N); M. R. Henderson 18415 (Bz--25216); Nur 21758 (Bz--25226). Singapore: N. J. Andersson s.n. [Singapore, 28 Jan. 1853] (S). LIUKIU ISLANDS: Okinawa: Conover 947 (W--1993131); Field & Loew 210 (W--1942624); Koidzumi s.n. [V.1923] (W--2071018); Walker, Tawada, & Amano 5781 (W--2093196), 5868 (N), 6009 (W--2093401), 6028 (N). BONIN ISLANDS: Herb. Torrey s.n. (T). PHILIPPINE ISLANDS: Luzon: N. J. Andersson s.n. [Jan. 1853] (S); H. M. Curran s.n. [Herb. Philip. Forest. Bur. 5968] (Bz--25353); Escritor s.n. [Herb. Philip. Bur. Sci. 21171] (Cm); R. Kienholz s.n. (Ur); Madarang s.n. [Gates 8493] (Ka--64770); R. C. McGregor s.n. [Herb. Philip. Bur. Sci. 10072] (Br); E. D. Merrill 323 (Bz--25350, N), Sp. Blanc. 814 (Bz--25354, N); D. D. Wood s.n. [Herb. Philip. Forest Bur. 13069] (Gg--31484). Mindoro: Mangubat s.n. [Herb. Philip. Bur. Sci. 926] (Bz--25352, N); E. D. Merrill 898 (N). Panay: R. C. McGregor s.n. [Herb. Philip. Bur. Sci. 32477] (Bz--25349). Sibuyan: A. D. E. Elmer 12135 (Bz--25351, N, Ut--29235, Vt). Island undetermined: Née 30 (Q), 46 (Q), 47 (Q), 48 (Q), 53 (Q). MADURA ISLAND: Backer 19583 (Bz--25343, Bz--25344, Bz--25345), 19976 (Bz--25338, Bz--25339, Bz--25340, Bz--25341), 21226 (Bz--25342, Bz--25675); Rant s.n. [28.XII.1924] (Bz--25337). JAVA: Backer 2880 (Bz--25332, Bz--25333, Bz--25334, Bz--25335, Bz--25336), 19583 (Bz--25680); Bijhouwer 173 (Bz--25174); Collector indig. s.n. [1920] (Bz--24483). ANAMBAS ISLANDS: Temaja: M. R. Henderson 20462 (Bz--25224). SARAWAK: Hose 267 (Ph). BORNEO: Dunselman 59 (Bz--72796); Polak s.n. [1-7-1949] (Bz--266-02). LESSER SUNDA ISLANDS: Banka: Anta 359 (Bz--72689); Berkhout 502 (Bz--25356); Teijsmann s.n. [Muntok] (Bz--25355). Kisar: Bloembergen 3894 (Bz--72654). Savoe: Bloembergen 3291 (Bz--72655, Bz--72656). MOLUCCA ISLANDS: Mangole: Atjeh 213 (Bz--25346, Bz--25347). NEW GUINEA: Dutch New Guinea: J. W. R. Koch s.n. (Bz--25348). Papua: Reedy s.n. [Katau River] (Mb). HAWAIIAN ISLANDS: Kauai: Fosberg 12734 (Du--292997); A. A. Heller 2731 (C, Mi, N).



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