New Species and Taxonomic Changes in *Styrax* (Styracaceae) from South America

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Abstract. Taxonomic modifications are made within *Styrax* series *Valvatae* (Styracaceae) in South America. *Styrax chrysocalyx*, *S. griseus*, *S. nunezii*, and *S. trichostemon* are described as new and illustrated. *Styrax guaiquinimae* (based on *S. tepuiensis* subsp. *guaiquinimae*), *S. neblinae* (based on *S. duidae* subsp. *neblinae*), *S. rotundatus* (based on *S. martii* var. *rotundatus*), and *S. yutajensis* (based on *S. guanayanus* var. *yutajensis*) are recognized at the species level. Lectotypes are selected for *S. martii* and *S. martii* var. *rotundatus*. The discovery of *S. trichostemon* supports the sister-group relationship between the gynodioecious clade and the rest of *S.* series *Valvatae* as inferred from a previously published molecular phylogenetic analysis.

Key words: South America, Styracaceae, *Styrax*.

Styrax L. (Styracaceae) consists of about 130 species distributed in the Americas, the Mediterranean region, and eastern Asia through Malesia. Fritsch (1999), in revising the infrageneric classification of *Styrax*, recognized two sections (*S.* sect. *Styrax* and *S.* sect. *Valvatae* Gürke), each with two series. The largest of the series (*S.* ser. *Valvatae* Perkins of *S.* sect. *Valvatae*; about 80 species) is endemic to the Neotropics. Species of this series are easily distinguished from other members of *Styrax* by the combination of persistent leaves and a fleshy to juicy, indehiscent mesocarp (Fritsch, 1999). Since the last worldwide monograph of *Styrax* (Perkins, 1907), the Mexican, Mesoamerican, and Antillean species of *S.* series *Valvatae* have been comprehensively revised (20 species; Gonsoulin, 1974; Fritsch, 1997), as have the members of the strictly South American *Pamphilia* group of this series (six species; = *Pamphilia* Martius ex A. DC., *S.* sect. *Pamphilia* (Martius ex A. DC.) B. Wallnöfer; Wallnöfer, 1997). Despite the serious need for a similar revision of the remaining members of *S.* series *Valvatae* (Fritsch, 1999), only regional treatments for this group exist (e.g., Macbride, 1959; Maguire & Huang, 1978; Fritsch & Steyermark, in press; Fritsch et al., 2002). As a prelude to a comprehensive taxonomic revision of Neotropical *Styrax*, four South American species of the genus are here newly described. Furthermore, one Brazilian taxon is elevated in rank from variety (*S. martii* var. *rotundatus* Perkins) to species, and lectotypes are chosen for both *S. martii* Seubert and *S. martii* var. *rotundatus*. Finally, three taxa are elevated in rank from either the subspecies or varietal level to the species level specifically in preparation for the treatment of Styracaceae for the *Flora of the Venezuelan Guayana*.

Styrax chrysocalyx P. W. Fritsch, sp. nov. TYPE: Brazil. Rio de Janeiro: Itatiaia, road from Monte Serrat to Maromba, 900–1100 m, 20 Oct. 1927 (fl), *H. Zerny s.n.* (holotype, W). Figure 1.

Arbor sempervirens. *Lamina* 13.6–21 × 6.7–10.8 cm chartacea, ovato-elliptica vel elliptica, apice brevi-acuminato, subtus pilis densis minutis albi-stellatis instructa, magis dispersis rigidis albi- vel fulvo-stellatis brachiis usque 0.7 mm longis intermixtis, venis tertiariis et quaternariis elevatis, paginis venarum tertiariarum fulvis plerumque manifestis subter indumentum, paginis venarum quaternariarum non manifestis subter indumentum. *Inflorescentiae* 6.5–11 cm longae. *Flos* 15–17 mm longus; *calyx* 5–7 × 8 mm dense aureo-fusco-stellato-hirsutus, ad medium brachiis pilorum usque 1 mm longis; *stamina* 10; *filamenta* ventraliter auriculata, infra auriculas 2 cristis prominentibus fulvo-aureo-stellato-tomentosis instructa, dorsaliter dense radiato-lepidota; *anthera* 7 mm longa loculis linearis ad apicem contractis; *connectivum* grande incurvum locula superante; *stylus* filiformis; *ovula* multa.

Evergreen tree to 4 m tall; young twigs gray-brown to brown stellate-tomentose. Petiole 9–15 mm long; lamina 13.6–21 × 6.7–10.8 cm, 1.6–2.3 times as long as wide, chartaceous, ovate-elliptic or elliptic, secondary veins 9 to 14 on each side of midvein; apex short-acuminate; base broadly cuneate to rounded; adaxially glabrous except on midrib, midrib and secondary veins slightly impressed; abaxially gray-green to the naked eye, with a dense base tomentum of minute green-white stellate trichomes, and more scattered, stiff, white to tawny stellate trichomes with arms to 0.7 mm long, tertiary veins raised, their tawny surfaces usually visible

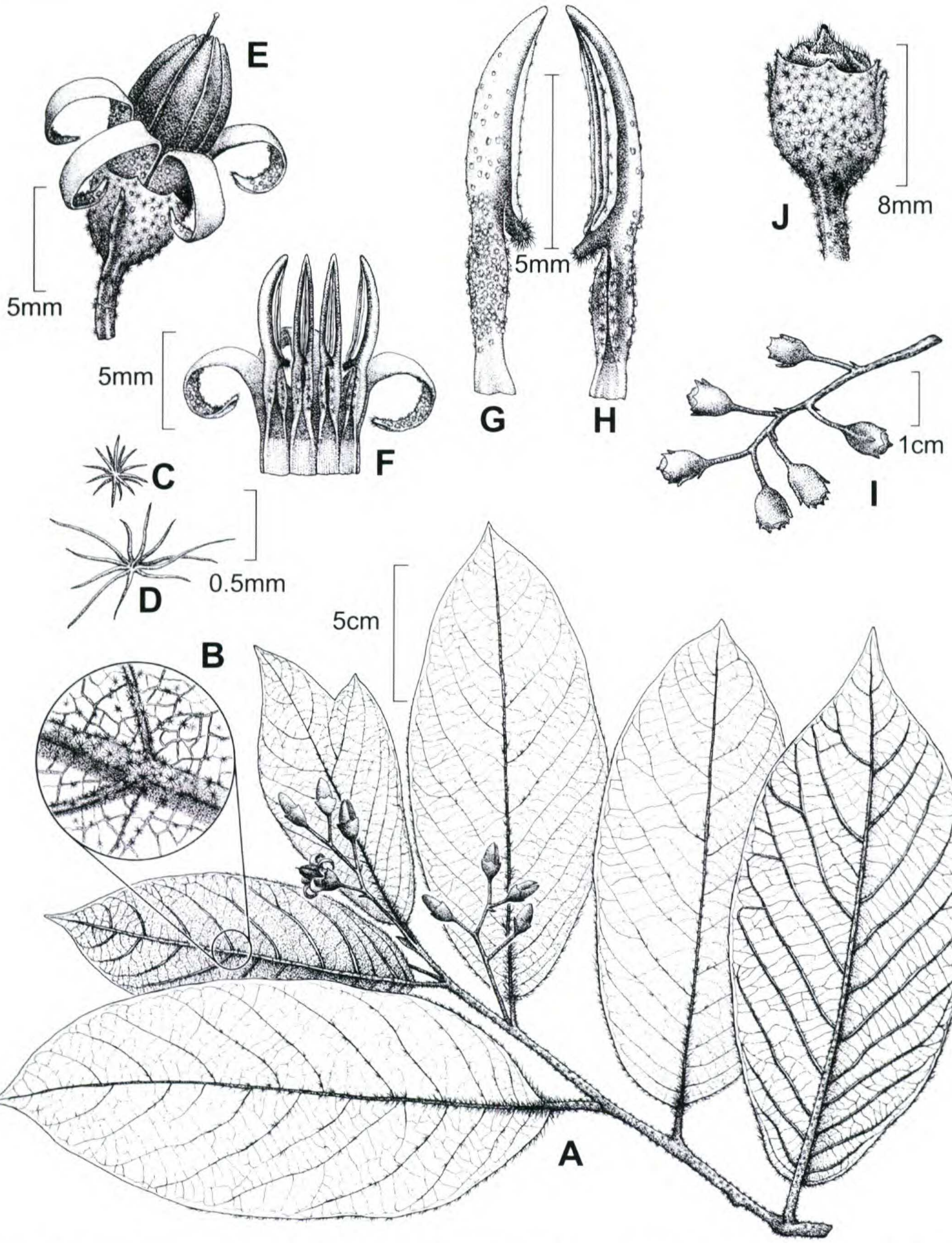

Figure 1. *Styrax chrysocalyx* P. W. Fritsch. —A. Flowering branch. —B. Leaf surface, abaxial view. —C. Stellate trichome from the base tomentum of the abaxial side of the leaf. —D. Larger stellate trichome from the abaxial side of the leaf. —E. Flower. —F. Part of corolla + androecium, opened. —G. Stamen, dorsal view. —H. Stamen, ventral view. —I. Immature infructescence. —J. Immature fruit. A–H based on the holotype, 20 Oct. 1927, *Zerny s.n.* (W); I, J based on *Irwin 2231* (UC).

through the pubescence, quaternary veins raised, their surfaces not visible through the pubescence; margin entire. Inflorescences axillary or terminal, racemose, one per node, 6.5–11 cm long, 4- to 6-flowered, densely golden brown stellate-hirsute, trichomes with somewhat stiff arms to 0.7 mm long; lower pedicels 11–18 mm long. Flowers hermaphroditic, 15–17 mm long; calyx 5–7 × 8 mm, broad-

ly cupuliform, the dense gray-green base tomentum of minute trichomes visible at the calyx margin, otherwise densely golden brown stellate-hirsute, trichomes at mid-calyx with arms to 1 mm long, margin truncate between the minute teeth, inner margin sparsely glandular; corolla 13–15 mm long, white; tube 2.5 mm, extending up to the calyx margin; lobes 5, 11–13 × 2.5–3 mm, reflexed, thin; stamens 10; free portion of stamen tube absent; distinct portion of filaments 4.5 mm long, ventrally with prominent auricles bearing a dense mass of tawny-golden stellate trichomes with arms to 0.5 mm long or nearly glabrous, below the auricles with 2 prominent densely tawny golden stellate-tomentose longitudinally oriented ridges, dorsally densely radiate-lepidote; anthers 7 mm long, the massive, incurved, densely radiate-lepidote (sparsely so distally) connectives exceeding the linear, apically tapered, glabrous thecae by ca. 1 mm; ovary densely tawny stellate-tomentose; style filiform, glabrous; ovules many. Mature fruit unknown.

Habitat, distribution, and phenology. Known through two collections from southeastern Brazil, only one of which has habitat information, in secondary forest growing on red clay at 900–1100 m, flowering October.

The first collection of this species was made in 1927, and apparently no attempt was made to identify it until 1990, when it was annotated as *Styrax oblongus* (Ruiz & Pavón) A. DC. The species was collected again in 1958 with a label determination of *S. latifolius* Pohl. *Styrax chrysocalyx* differs from both of these species through its incurved (vs. straight) anthers, prominent (vs. inconspicuous or absent) ventral stamen filament auricles subtended by two prominent longitudinal ridges (vs. filaments planar or merely incurved below the auricles), and lepidote (vs. glabrous) connectives. The combination of these features matches no other species of *Styrax*, and the prominent filament ridges and strongly incurved anthers appear to be unique in the genus. The presence of the filament auricles and prolonged connectives in this species suggest affinities to a group of *Styrax* species otherwise endemic to the Andes. *Styrax chrysocalyx* is apparently rare across its narrow range and is probably in danger of extinction if it is not already extinct.

Paratype. BRAZIL. **Minas Gerais:** Ponte Nova, Fazenda Varginha, 12 km E of Ponte Nova, 7 Dec. 1958, *H. S. Irwin 2231* (MICH, NY, R, TEX, UC, US).

Styrax griseus P. W. Fritsch, sp. nov. TYPE: Brazil. Pará: Marabá, along Highway p/N1, DOCEGEO camp, 20 May 1982 (fl, fr), *R. S. Secco, C. Sperling, M. Condon, A. Mesquita, B. Gilberto R. & L. Marinho 257* (holotype, CAS). Figure 2.

Arbor vel frutex sempervirens. *Lamina* 4.6–11.1 × 2.5–5.5 cm crassi-chartacea, elliptica vel ovato-, oblongo-, vel lanci-elliptica, apice obtuso vel brevi-acuminato, supra albi-stellato-hirsutula, subtus pilis densis minutis viridigriseis instructa, magis dispersis aurantiaco- vel aureostellatis brachiis usque 0.1 mm longis intermixtis, venis cinnamomeis vel fuscis, venis tertiariis leviter elevatis, venis quaternariis non elevatis, paginis venarum tertiariarum manifestis subter indumentum, paginis venarum quaternariarum non manifestis subter indumentum; margine revoluto. *Inflorescentiae* 2–5.5 cm longae. *Flos* 11–14 mm longus; *calyx* 3.5–5 × 3.5–5 mm dense griseo-viridi-stellato-tomentosus, ad medium brachiis pilorum usque 0.1 mm longis; *stamina* 10; *filamenta* ventraliter non auriculata pilis albi-stellatis brachiis usque 1.5–2.0 mm longis instructa, dorsaliter glabra; *anthera* 5–6 mm longa loculis linearis ad apicem contractis; *connectivum* locula aequante vel leviter superante; *stylus* filiformis; *ovula* multa. *Drupa* 6–9 × 5–6 mm, griseo-viridis, ellipsoidea vel globosa, apice depresso.

Evergreen shrub or tree to 4 m tall; young twigs densely brown stellate-tomentose. Petiole 5–13 mm long; lamina 4.6–11.1 × 2.5–5.5 cm, 1.8–2.5(–2.9) times as long as wide, thick-chartaceous, elliptic or ovate-, oblong-, or lance-elliptic, secondary veins 6 to 8(9) on each side of midvein; apex obtuse to short-acuminate; base broadly cuneate to subrounded; adaxially white stellate-hirsutulous, even on old leaves; abaxially dull gray or green-gray to the naked eye, with a dense base tomentum of dull minute green-gray stellate trichomes and widely scattered orange or golden yellow stellate trichomes with arms ± the same size as those of the base tomentum (to 0.1 mm long), the cinnamon to brown surface of the primary through tertiary veins visible through any pubescence, tertiary veins slightly raised, quaternary veins not raised, not visible through the pubescence; margin entire, revolute. Inflorescences axillary or terminal, racemose (rarely paniculate or 1- or 2-flowered), 1 or 2 per node, 2–5.5 cm long, 3- to 7-flowered, densely olive-green to brown stellate-tomentose, rachis slender; lower pedicels 3–6(–10) mm long. Flowers hermaphroditic, 11–14 mm long; calyx 3.5–5 × 3.5–5 mm, cupuliform, densely gray-green stellate-tomentose, trichomes at mid-calyx with arms to 0.1 mm long, margin truncate between the minute teeth, inner margin densely glandular; corolla 9–12 mm long, white; tube 2 mm long, extending up to the calyx margin; lobes 5, 7–10 × 1.5–2 mm, reflexed, thin; stamens 10; free portion of stamen tube to 0.5 mm

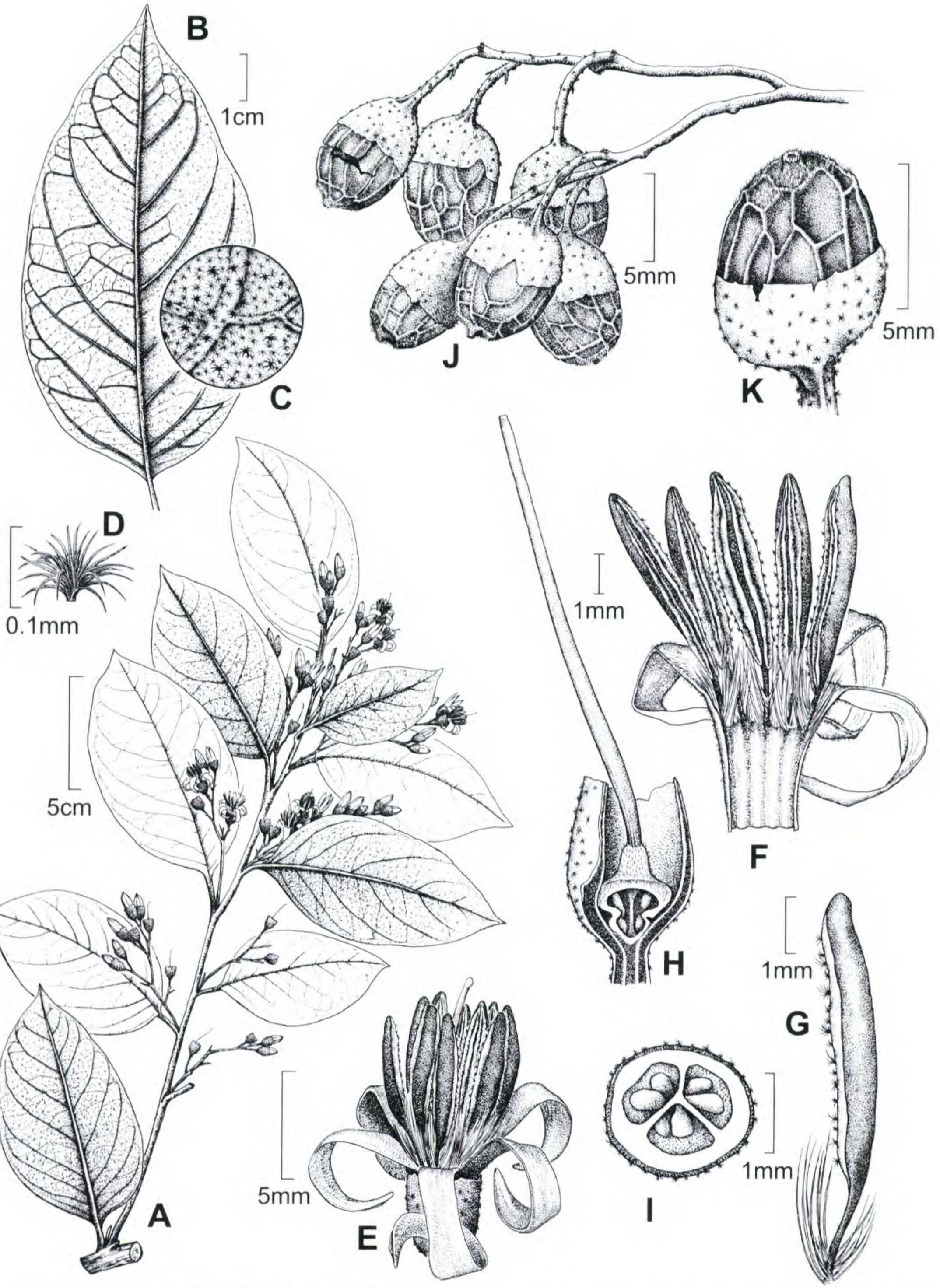

Figure 2. *Styrax griseus* P. W. Fritsch. —A. Flowering branch. —B. Leaf, abaxial view. —C. Leaf surface, abaxial view. —D. Stellate trichome from the abaxial side of the leaf. —E. Flower. —F. Part of corolla + androecium, opened. —G. Anther, lateral view. —H. Calyx + gynoecium, long-section. —I. Ovary, cross section. —J. Infructescence. —K. Mature fruit. A–I based on *Ratter et al. 1284* (K); J, K based on *Ribeiro 1382* (IAN).

long; distinct portion of filaments 2 mm long, ventrally without auricles, bearing a dense mass of somewhat stiff white stellate trichomes with arms to 1.5–2 mm long, the trichomes nearest the proximal end of the filament with arms predominantly pointing downward, those nearest the distal end with arms pointing upward, sinuses between the filaments densely stellate-hispid, trichomes with arms to 3.5 mm long, dorsally glabrous; anthers 5–6 mm long, the glabrous connectives ± equal to or slightly exceeding the linear, abruptly tapered, densely pubescent thecae; ovary densely gray-green stellate-tomentose; style filiform, glabrous; ovules many. Drupe 6–9 × 5–6 mm, gray-green, ellipsoid to subglobose, apex depressed, often annular-sulcate around the remains of the style base; wall irregularly and coarsely rugose on herbarium specimens; fruiting calyx broadly cupuliform, 3–4 × 4–6 mm, 0.45–0.67 times the length of the drupe proper.

Habitat, distribution, and phenology. Endemic to Brazil, occurring in the states of Bahia, Mato Grosso, Pará, and Rondônia in terra firme forest, scrub on rock outcrops, cerrado, cerradão, canga, capões, and roadsides at 450–950 m, flowering February, March, May, June, August, December, fruiting March–October.

Styrax griseus was first collected in 1964 in the state of Mato Grosso, Brazil, but despite at least 36 other collections of this species made since that time, it has remained unrecognized until now. The species seems closest morphologically to *S. camporum* Pohl and *S. pohlii* A. DC., with which it shares a similar leaf size and shape, relatively small flowers (11–14 mm long) and fruits (6–9 × 5–6 mm long), non-auriculate stamen filaments, and linear thecae. The most obvious difference between *S. griseus* and these species is the dull gray to gray-green cast to the abaxial surfaces of the leaves (for which the species is named) caused by the color of the short tomentum, versus usually longer, green-gray, green-white, or white stellate trichome covering, often with larger, scattered ferrugineous trichomes additionally present. The abaxial leaf surfaces of the Amazonian phase of *S. pohlii* are sometimes dark gray, but then are either not notably revolute or in possession of larger ferrugineous trichomes. In addition, the mature leaves of *S. griseus* are stellate-pubescent adaxially, whereas in *S. camporum* and *S. pohlii* the leaves are glabrous or glabrescent adaxially, at most retaining pubescence along the midrib proximally. Furthermore, the connectives of *S. griseus* are slightly prolonged apically beyond the tapered thecae, whereas in *S. camporum* and *S. pohlii* the non-tapered thecae are roughly equal to the connectives or prolonged beyond them.

Isotypes of *Styrax griseus* are to be expected at MG and NY.

Paratypes. BRAZIL. **Bahia:** Espigão Mestre, ca. 100 km WSW of Barreiras, 8 Mar. 1972, *W. R. Anderson et al. 36851* (C, F, K, NY, US); Igaporã, Highway BR–430, near road to Tanque Novo, 18 Mar. 1995, *G. Hatschbach 62031* (MBM); drainage of the Rio Corrente, ca. 5 km S of Rio Roda Velha, 15 Apr. 1966, *H. S. Irwin et al. 14882* (C, F, K, NY, US); São Desidério, Fazenda Duas Pátrias, bank of Rio Grande, Sítio Grande, 12 Dec. 1982 (fl), *C. Proença 324* (F); Correntina, Fazenda Jatobá, 9 Jan. 1991, *A. V. Rezende et al. 129* (UB[2]), 6 June 1992, *M. A. da Silva et al. 1339* (RB, UB), 2 Mar. 1991, *L. G. Viollati et al. 197* (CAS, K, UB). **Mato Grosso:** ca. 8 km from Utiariti, 5 Mar. 1978, *R. Becker 4* (F, RB[2]); Padronal, Vila Bela da Santissima Trinidade, BR–364, Cuiabá–Porto Velho, 9 June 1984, *C. A. Cid et al. 4410* (F, GH, INPA, MICH, NY); Padronal, Vila Bela da Santissima Trinidade, BR–364, Cuiabá–Porto Velho, Km 80, 10 June 1984, *C. A. Cid et al. 4435* (INPA, K, NY); vicinity of Garapú, 1 km NE of Garapú, 2 Oct. 1964, *H. S. Irwin & T. R. Soderstrom 6581* (C, F, LL, NY, UC, US); 1 km N of base camp, 16 Dec. 1967, *D. Philcox et al. 3542* (K); N of base camp, 28 Feb. 1968, *D. Philcox & A. Fereira 4372* (K, NY, U); ca. 0.5 km W of Km 264, road from Xavantina to Cachimbo, 20 Mar. 1968 (fl), *D. Philcox & A. Fereira 4589* (K, MO, NY, U, UC); Sararé, Radambrasil, 4 Aug. 1978, *J. M. Pires & M. R. Santos 16421* (NY); Charravascal, 140 km N of Paranatinga, 16 Sep. 1980, *J. M. Pires & P. P. Furtado 17104* (INPA, MO); 6 km S of Base Camp, ca. 270 km N of Xavantina, 4 May 1968 (fl), *J. A. Ratter et al. 1284* (IAN, K, MO, NY, U, UC); 2 km N of the Base Camp of the Expedition, ca. 270 km N of Xavantina, 29 May 1968, *J. A. Ratter et al. 1578* (K, NY); Nobres, road to Fazenda Santana, 9.6 km S of Rio Celeste, 19 Sep. 1985, *W. Thomas et al. 3907* (CAS, INPA). **Pará:** Itaituba, Highway BR–163 from Santarém to Cuiabá, Km 794, Serra do Cachimbo, Base Aérea, Cachimbo Airport, 27 Apr. 1983, *I. L. Amaral et al. 992* (F, GH, INPA, K, NY, RB); Cachimbo, edge of airport of the Serra do Cachimbo, 19 July 1977, *W. Benson* (INPA[2]); Marabá, Serra Norte, Serra dos Carajás, Mine N–1, 18 Apr. 1970, *P. Cavalcante 2646* (INPA); Serra do Cachimbo, Capoeira de Campina along Highway BR–163 from Cuiabá to Santarem, Km 852, 17 Feb. 1977, *J. H. Kirkbride Jr. & E. Lleras 2869* (INPA); Serra Norte, Serra dos Carajás, Mine N–1, 3 June 1986, *M. P. M. de Lima et al. 135* (CAS); Serra Norte, 19 Aug. 1973, *J. M. Pires & B. C. Passos 13190* (IAN, INPA); Marabá, Serra dos Carajás, 26 June 1976, *B. G. S. Ribeiro 1376* (RB), *1382* (IAN, RB), 29 Oct. 1985, *R. S. Secco & O. Cardoso 662* (MO), 15 Mar. 1984, *A. S. L. da Silva et al. 1832* (INPA, NY), 2 June 1983, *M. F. F. da Silva et al. 1308* (IAN, INPA), 2 Apr. 1977, *M. G. Silva & R. Bahia 2995* (INPA, MICH, NY[2]), 28 Aug. 1972, *N. T. Silva & B. S. Ribeiro 3630* (IAN); 2 km E of AMZA camp N–1, 25 May 1982, *C. R. Sperling 5825* (CAS). **Rondônia:** Porto Velho–Cuiaba, Km 642, 8 Mar. 1976, *P. Bamps 5472* (BR, K, NY, RB, US), 6 July 1977, *J. Oliveira* (CAS); Fazenda Cachoeira, 144 km S of Pimenta Bueno on Highway BR–364 to Vilhena, 19 Aug. 1999, *J. A. Ratter et al. R8240* (E).

Styrax guaiquinimae (Maguire & Steyermark) P. W. Fritsch, stat. nov. Basionym: *Styrax tepuiensis* subsp. *guaiquinimae* Maguire & Steyermark, Mem. New York Bot. Gard. 29: 218. 1978. TYPE: Venezuela. Bolívar: Cerro Guaiquinima, Río Paragua, Cumbre Camp, 2000 m, 25 Dec. 1951 (fl), *B. Maguire 32758* (holotype, NY; isotype, IAN).

Habitat, distribution, and phenology. Endemic to the summit of Cerro Guaiquinima, Bolívar state, Venezuela, in shrub islands and rocky savannas with sandstone at 1400–2000 m; flowering December, fruiting May.

This species was originally described as a subspecies of *Styrax tepuiensis* Steyermark & Maguire (as *S.* subsp. *guaiquinimae* Maguire & Steyermark). *Styrax guaiquinimae* is easily distinguished from *S. tepuiensis* by the abaxial leaf and calyx surfaces, both of which are stellate-lanate in *S. guaiquinimae* and lepidote in *S. tepuiensis*. I consider *S. tepuiensis* to be merely a thick-leaved form of *S. glaber* Swartz, a species ranging widely across Venezuela and northern Guyana, extending north through the Lesser Antilles (Fritsch, unpublished data). *Styrax guaiquinimae* is similar to *S. longipedicellatus* Steyermark, also endemic to the Guayana Highland, but differs by its narrower (1.9–3.3 cm wide vs. 3.2–4.6 cm wide), coriaceous (vs. chartaceous to subcoriaceous) leaves with thick (vs. thin) abaxial leaf tomentum, and the lateral leaf veins impressed to sulcate on the upper surface (vs. the upper surface planar). The extent of morphological differences between *S. guaiquinimae* and *S. longipedicellatus* clearly justifies the recognition of *S. guaiquinimae* at the species level.

Additional specimens examined. VENEZUELA. **Bolívar:** Heres, Meseta del Guaiquinima, NE sector of the meseta, 27 Mar. 1985, *O. Huber 10416* (MO, NY, US, VEN); Cerro Guaiquinima, Río Paragua, 1 km S of Cumbre Camp, 29 Dec. 1951, *B. Maguire 32814* (NY, VEN); Cerro Guaiquinima NE sector, near the border, vicinity of the headwaters of the NE branch of Río Carapo, 25 May 1978, *J. A. Steyermark et al. 117368* (F, MO, U); Cerro Guaiquinima, SE sector, near the border, *J. A. Steyermark et al. 117442* (MO, VEN).

Styrax martii Seubert, in Martius, Fl. Bras. 7: 194. 1868. TYPE: Brazil. Minas Gerais: Serra de Piedade near Caeté, May, *C. F. P. von Martius s.n.* (lectotype, selected here, M herb. no. 56; photo of lectotype, F, GH, MICH, M, MO, NY).

Styrax martii var. *microphyllus* Perkins, Pflanzenr. 4, 241: 40. 1907 (as *S.* "*microphylla*"). TYPE: Brazil. São Paulo: between Jacareí and Moji das Cruzes, Dec. (fl), *C. F. P. von Martius 526* (holotype, M).

Evergreen shrub or tree to 6(–15) m tall; young twigs densely dark brown stellate-lanate. Petiole (7–)10–19 mm long; lamina 5.9–11.7 × 2.6–6.0 cm, 1.7–2.3 times as long as wide, thick-chartaceous to subcoriaceous, broadly elliptic, ovate, or lance-ovate, secondary veins (5)6 to 9 on each side of midvein; apex acute to acuminate; base broadly cuneate to rounded, occasionally slightly truncate; adaxially densely dark ferrugineous stellate-lanate when young, glabrescent except on major veins; abaxially dark ferrugineous or brown to the naked eye, with a dense base tomentum of gray-white stellate trichomes, and abundant but more scattered dark ferrugineous woolly trichomes with arms to 0.1–0.2 mm long often completely obscuring the white base tomentum beneath especially in young leaves, sparse to absent in old leaves, tertiary and quaternary veins usually not well differentiated from each other, moderately raised, their surfaces not visible through the pubescence; margin entire or occasionally coarsely 1- to 3-toothed. Inflorescences axillary or terminal, racemose (or 1- or 2-flowered), 1(2) per node, 2.5–3.5 cm long, 3- to 6-flowered, subtending leaves often highly reduced, densely dark ferrugineous stellate-lanate; lower pedicels 1–5 mm long or nearly absent. Flowers hermaphroditic, 13–18 mm long; calyx 5–8 × 4–5 mm, narrow-cupuliform to subcylindrical, striate proximally, densely brown stellate-lanate, trichomes at mid-calyx with arms to 0.1 mm long, margin truncate, concave, or erose between the minute teeth, inner margin eglandular; corolla 11–16 mm long, white; tube 5–8 mm long, extending up to 4 mm beyond the calyx margin; lobes 5, 5–8 × 1.5–2.5 mm, spreading, thickened; stamens 10; free portion of stamen tube to 1 mm long; distinct portion of filaments 2 mm long, ventrally without auricles, bearing a dense mass of white stellate trichomes, the slightly undulate arms to 1 mm long, trichomes nearest the proximal end of the filament with arms not predominantly pointing in any particular direction, those nearest the distal end with arms predominantly pointing upward, dorsally white stellate-pubescent; anthers 3.5–4 mm long, the glabrous connectives ± equal to the linear, apically slightly tapered, stellate-pubescent thecae; ovary densely gray-green stellate-pubescent; style filiform, glabrous; ovules many. Drupe 9–16 × 6–7 mm, olive-green, ovoid to obovoid-ellipsoid, apex depressed, annular-sulcate around the remains of the style base; wall irregularly and coarsely rugose on herbarium specimens; fruiting calyx 6–10 × 6–8 mm, 0.5–0.8 times the length of the drupe proper.

Habitat, distribution, and phenology. Forests

and forest edges on hillsides and along rivers, campo rupestre among rocks and on steep iron-rich slopes and outcrops, campo de altitude, and capões at 1000–1800 m; flowering November–April, July, fruiting January–March, July, December.

A complete description and list of additional specimens examined of *Styrax martii* is provided here to clearly delimit this species from *S. rotundatus*, a taxon that I elevate to the level of species from *S. martii* var. *rotundatus* (see below).

Seubert (1868) listed several collections in the protologue of *Styrax martii*: unspecified collections of Martius (denoted only as "*M.*"), *Blanchet 3641* (assumed here to be a transcription error of *3614* because I have not been able to locate specimens of *Blanchet 3641* and *Blanchet 3614* is annotated as *S. martii* by Seubert), and *Gardner 4395*; thus, these collections are syntypes. Because I consider *Blanchet 3614* to belong to *S. rotundatus* (see below) and because I have not been able to locate collections of *Gardner 4395* despite examination of loaned specimens from numerous European herbaria, I have selected a Martius sheet (M herb. no. 56) as the lectotype of *S. martii*. I have chosen this sheet rather than the other Martius sheets of *S. martii* that I have seen from M (herb. nos. 47, 54 (*Martius 526*), 55, 57, and 58) because (1) herb. no. 47 is a specimen of *S. rotundatus* (see below) and herb. no. 54 (*Martius 526*) is the type of *S. martii* var. *microphyllus* Perkins; (2) the sheet has been annotated by Seubert as *S. martii* (like the others); (3) the sheet has more locality data than the others; and (4) unlike the others, photographs of this collection have been deposited in other major herbaria.

A second variety of *Styrax martii* (*S. martii* var. *microphyllus*), with the type *Martius 526* (Perkins, 1907), was distinguished from *S. martii* var. *martii* in the protologue by its small leaves. This character to me is taxonomically trivial and thus I consider *S. martii* var. *microphyllus* to be a synonym of *S. martii*. A third variety of *S. martii* (*S. martii* var. *gracilius* Warming) I consider to be a taxonomic synonym of *S. lancifolius* Klotzsch ex Seubert.

Additional specimens examined. **Locality unspecified:** *P. Claussen 277* (W); *F. Sellow s.n.* (K, L). BRAZIL. **State unspecified:** *A. F. M. Glaziou s.n.* (NY). **Minas Gerais:** Serra de Piedade, collector unspecified (M no. 496); Santa Luzia, Serra do Cipó, Km 137, road from Conceição do Mato Dentro, 25 Nov. 1938, *M. Barreto 8504* (F), Aug.–Apr. 1840, *P. Claussen* (BR, K), *P. Claussen 2* (R), 1841, *P. Claussen 8* (NY[2]); Serra do Espinhaço, Serra da Piedade near Caeté, along the main road, 16 Sep. 1990, *G. L. Esteves et al. 15440* (W), *Gardner 4995* (GH, K); Serra do Espinhaço, ca. 35 km E of Belo Horizonte, near Highway BR–31, 14 Jan. 1971, *H. S. Irwin et al. 30322* (C, F, NY, UB, US); Serra da Piedade, Nov. 1834, *P. W. Lund s.n.* (C), 18 Feb. 1951, *M. Magalhães 5270* (IAN), *C. F. P. von Martius s.n.* (M no. 57); Ouro Preto, *C. F. P. von Martius s.n.* (M no. 58); Serra da Piedade, 5 July 1986, *J. A. Paula & T. S. M. Grandi 1643* (F), *J. T. Reinhardt s.n.* (C); Itacolomi, *F. Sellow 1064* (US); Serra do Ibitipoca, Pico do Pião, Arenito da Série Lavras, 13 May 1970, *D. Sucre 6777* (CAS, W); Serra da Piedade, 2 Feb. 1866, *E. Warming 108* (C). **Paraná:** Bocaiúva do Sul, Sesmaria, Rio Capivari, 2 km W, 29 Jan. 1969, *G. Hatschbach 20942* (BM, C, F, INPA, K, L, MICH[2], NY[2], S, UC, US); Barras, Rio Taquari, 19 Mar. 1969, *G. Hatschbach 21285* (C, F, GH, K, L, MBM, MO, UC, US, WIS); Piraquara, Serra do Emboque, 9 Mar. 1972, *G. Hatschbach 26534* (C, LL, MBM, MICH, NY, S, UC, US); Morretes, Serra da Graciosa, 27 Apr. 1990, *I. Rauscher gra 18* (U, W); Trilha dos Jesuitas, Quatro Barras, Apr. 1990, *M. Sobral et al. 6213* (MBM[2]). **Rio de Janeiro:** Serra dos Orgãos, Caxambu, 22 Jan. 1887, *A. F. M. Glaziou 16247* (A, BM, BR, K, NY, US); Serra dos Orgãos, Apr. 1888, *A. F. M. Glaziou 17127* (BR, C, F, K, US); Santa Maria Madalena, Parque Estadual do Desengano, Pedra do Desengano, 20 Dec. 1988, *G. Martinelli 13229* (CAS). **Rio Grande do Sul:** Pólo Petroquímico, Montenegro, 8 Nov. 1977, *M. Barreto 1* (RB). **São Paulo:** without collector or locality (M no. 59); Moji-Guaçu, Nov. 1833, *P. W. Lund 728* (C); betw. Jacareí and Moji das Cruzes, *C. F. P. von Martius s.n.* (M no. 55).

Styrax neblinae (Maguire) P. W. Fritsch, stat. nov.
Basionym: *Styrax duidae* subsp. *neblinae* Maguire, Mem. New York Bot. Gard. 29: 210. 1978. TYPE: Venezuela. Amazonas: Cerro de La Neblina, Río Yatua, upper basin of Cañon Grande above Salto Grande, 1900–2000 m, 13 Dec. 1957 (fr), *B. Maguire, J. J. Wurdack & C. K. Maguire 42368* (holotype, NY; isotypes, IAN, MO, US).

Habitat, distribution, and phenology. Known only from Sierra de la Neblina and Cerro Aracamuni in extreme southern Venezuela, Amazonas state, in dwarf open thickets and dry forests on sandstone at 400–2100 m; flowering December, January, April, fruiting December.

Originally described as *Styrax duidae* subsp. *neblinae* Maguire, this species differs consistently from *S. duidae* Steyermark by its abaxial leaf surfaces, the white tomentum of which is easily visible through the scattered, 8- to 15-armed ferrugineous stellate trichomes (vs. completely obscured by the densely packed, 18- to 38-armed ferrugineous stellate trichomes). In addition, the drupes of *S. neblinae* are strongly depressed apically, whereas those of *S. duidae* are convex. These differences are at least as great as those between other species of *Styrax* with ferrugineous trichomes on the abaxial surfaces of the leaves that I am recognizing in the treatment of Styracaceae for the *Flora of the Venezuelan Guayana*, such as *S. guanayanus* Maguire

& K. D. Phelps and *S. sipapoanus* Maguire. Therefore, I have elevated *S. duidae* subsp. *neblinae* to the species level.

Additional specimens examined. VENEZUELA. **Amazonas:** Dept. Río Negro, Cerro Aracamuni, summit, Proa Camp, 31 Oct. 1987, *R. Liesner & G. Carnevali 22681* (MO, U); Sierra de la Neblina, Río Yatua, escarpment above Camp 4, 30 Dec. 1953, *B. Maguire et al. 37007* (NY); Sierra de la Neblina, Río Yatua, escarpment edge betw. Cumbre Camp & N Escarpment, 18 Jan. 1954, *B. Maguire et al. 37249* (NY); Sierra de la Neblina, Río Yatua, W of Cumbre Camp, 1–2 Dec. 1957, *B. Maguire et al. 42283* (NY); Dept. Río Negro, Sierra de la Neblina, above Río Marawinuma, E of Puerto Chimo camp, 26 Apr. 1984, *W. Thomas 3237* (CAS).

Styrax nunezii P. W. Fritsch, sp. nov. TYPE: Peru. Cuzco: provincia La Convención, distrito Echarati, E Río Apurimac, NE Pueblo Libre, Anchihuay and Bellavista Mountains, S Cordillera Vilcabamba, 2445 m, 12°51′S, 73°30′W, 3 Aug. 1998 (fl), *P. V. Núñez, W. Nauray, R. de la Colina & S. Udvardy 23320* (holotype, CAS; isotypes, AAU, BR, COL, F, GH, K, LOJA, LPB, MICH, MO, NY, TEX, US, W). Figure 3.

Arbor sempervirens. *Lamina* 7.0–9.3 × 3.5–4.0 cm crassi-chartacea ovata, apice acuminato, subtus pilis densis minutis albi-stellato-tomentosis instructa, magis dispersis sed densis lanatis atro-ferrugineo-stellatis brachiis usque 0.2 mm longis intermixtis, venis quaternariis leviter vel haud elevatis, paginis venarum non manifestis subter indumentum, ubi veteribus pilis ferrugineis absentibus et margine revoluto. *Flos* 10 mm longus; *calyx* 3 × 3–4 mm, dense pallidus fusco-stellato-tomentosus, ad medium brachiis pilorum usque 0.2 mm longis; *stamina* 10; *filamenta* auriculata pilis albi-stellatis undulatis vel aliquantum rigidis brachiis usque 0.8 mm longis instructa; *anthera* 3.5 mm longa loculis lineari-triangularibus ad apicem contractis; *connectivum* locula leviter superante; *stylus* filiformis; *ovula* multa.

Evergreen tree 6 m tall; young twigs densely brown stellate-tomentose. Petiole 10–11 mm long; lamina 7.0–9.3 × 3.5–4.0 cm, 1.8–2.5 times as long as wide, thick-chartaceous, ovate, secondary veins 7 to 10 on each side of midvein; apex acuminate; base broadly cuneate to subrounded; adaxially glabrous except on midrib; abaxially appearing light brown to the naked eye, with a dense base tomentum of minute white stellate trichomes, and more scattered but dense dark ferrugineous woolly stellate trichomes with arms to 0.2 mm long, surface of the veins not visible beneath the pubescence, ferrugineous trichomes often absent on older leaves, tertiary veins slightly raised, quaternary veins faintly or not at all raised; margin entire, revolute on old leaves. Inflorescences axillary or terminal, racemose (or 1- or 2-flowered or rarely paniculate), 1 to 3 per node, 2–3 cm long, 3- to 14-flowered, densely light brown stellate-tomentose; lower pedicels 4–6 mm long. Flowers hermaphroditic, 10 mm long; calyx 3 × 3–4 mm, cupuliform, densely light brown stellate-tomentose, trichomes at mid-calyx with arms to 0.2 mm long, margin truncate between the minute teeth, inner margin eglandular; corolla 9 mm long; tube 1 mm long, extending 1–2 mm beyond the calyx margin; lobes 5, 9 × 1.5 mm, spreading, thickened; stamens 10; free portion of stamen tube none; distinct portion of filaments 1 mm long, ventrally with auricles bearing white, undulating to somewhat stiff stellate trichomes with arms to 0.8 mm long, trichomes nearest the proximal end of the filament with arms predominantly pointing downward, those nearest the distal end with arms predominantly pointing upward, also stellate-pubescent in sinuses of filaments and dorsally, trichomes with arms to 1.3 mm long; anthers 3.5 mm long, the glabrous connectives slightly exceeding the linear-triangular, apically tapered, stellate-pubescent thecae; ovary densely gray-green stellate-tomentose; style filiform, glabrous; ovules many. Fruit unknown.

Habitat, distribution, and phenology. Known only from the type collection (I have only seen flowers, but the specimen label states "young flowres [sic] and fruits") in the cloud forest zone of the Cordillera Vilcabamba in southern Peru; flowering August.

This species resembles *Styrax rigidifolius* Idrobo & R. E. Schultes and several species of *Styrax* from the Guayana Highland, such as *S. guanayanus* and *S. sipapoanus*, in its abaxial leaf surfaces. These are abundantly covered with woolly ferrugineous stellate trichomes in addition to the white stellate base tomentum, rendering the surface light to dark brown to the naked eye. *Styrax nunezii* is easily distinguished from these species, however, by the presence (vs. absence) of auricles on the ventral portion of the stamen filaments. These auricles, as well as the presence of linear-triangular (vs. linear) anthers, allies *S. nunezii* with a group of Andean species with the same combination of features (e.g., *S. pavonii* A. DC., *S. pentlandianus* J. Rémy, *S. peruvianus* Zahlbruckner). No other species of this group is known to have the type of abaxial leaf surface possessed by *S. nunezii*. In addition, the small (10 mm long) flowers and short (2–3 cm) inflorescences are unusual in the group.

The species is named for my colleague Percy Núñez Vargas, curator of Herbario Vargas (CUZ) at the Universidad Nacional San Antonio Abad del Cusco, Cuzco, Peru, who collected the type and

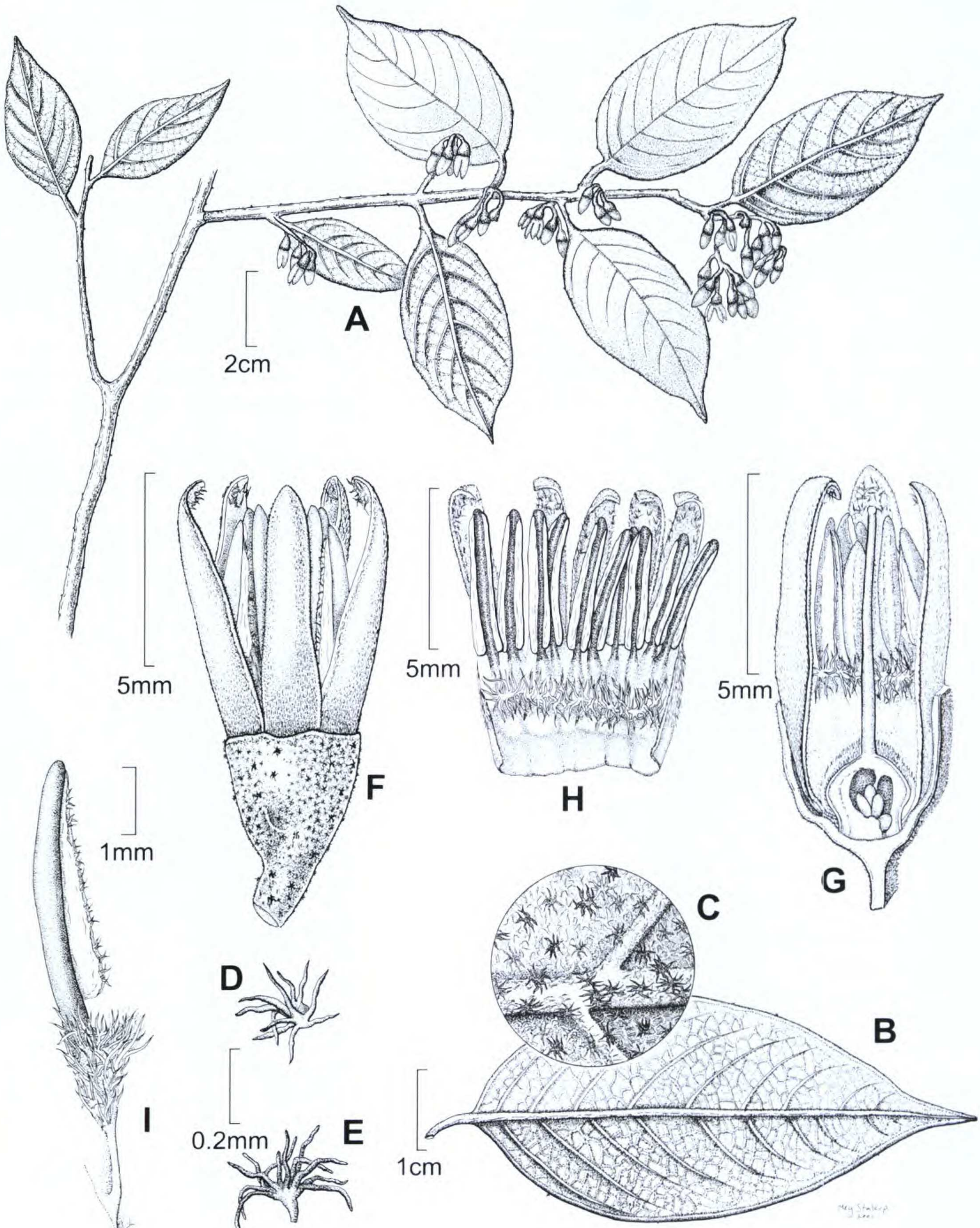

Figure 3. *Styrax nunezii* P. W. Fritsch. —A. Flowering branch. —B. Leaf, abaxial view. —C. Leaf surface, abaxial view. —D. Stellate trichome from the base tomentum of the abaxial side of the leaf. —E. Larger stellate trichome from the abaxial side of the leaf. —F. Flower. —G. Flower, median long-section. —H. Part of corolla + androecium, opened. —I. Stamen, lateral view. Based on the holotype, *Nuñez et al. 23320* (CAS).

generously made specimens available to me for examination. Additional isotypes are to be expected at CUZ and USM.

Styrax rotundatus (Perkins) P. W. Fritsch, stat. nov. Basionym: *Styrax martii* var. *rotundatus* Perkins, Pflanzenr. 4, 241: 40. 1907. TYPE: Brazil. Bahia: Jacobina, *J. S. Blanchet 3614* (lectotype, selected here, BR; isotypes, C, F[2], W; photo of C at F, MICH, MO).

Evergreen shrub to 3(4) m tall; young twigs densely tawny, gray-brown, dark ferrugineous, or brown stellate-tomentose. Petiole (2–)4–8 mm long; lamina 3.3–5.8(–6.6) × 2.1–4.3 cm, 1.3–2 times as long as wide, thick-chartaceous to subcoriaceous, elliptic, ovate-elliptic, ovate, or suborbicular, secondary veins 4 to 8 on each side of midvein; apex acute to subrounded; base broadly cuneate, rounded, truncate, or cordate; adaxially densely brown stellate-tomentose when young, glabrescent except on major veins; abaxially dark ferrugineous or brown to the naked eye, with a dense base tomentum of green-white minute stellate trichomes, and abundant but more scattered woolly ferrugineous trichomes with arms to 0.2–0.3 mm long that are sparse to absent in old leaves, tertiary and quaternary veins distinctly differentiated from one another, distinctly raised, their surfaces visible through the pubescence to completely obscured; margin entire, sometimes revolute. Inflorescences axillary or terminal, racemose or paniculate (axillary inflorescences occasionally 1- or 2-flowered), 1 or 2 per node, 2–6 cm long, 3- to 8-flowered, subtending leaves occasionally strongly reduced, densely gray, dark ferrugineous, or brown stellate-tomentose; lower pedicels 4–7 mm long. Flowers hermaphroditic, 10–13 mm long; calyx 3.5–5 × 2.5–3.5 mm, cupuliform to narrow-cupuliform, densely gray-green stellate-pubescent mixed with larger evenly scattered woolly golden or brown stellate trichomes with arms at mid-calyx to 0.5 mm long, margin truncate between the minute teeth, inner margin eglandular; corolla 8–11 mm long, white; tube 2–3 mm long, extending up to the calyx margin; lobes 5, 5–10 × 0.5–1.5 mm, recurved to reflexed, thin; stamens 10; free portion of stamen tube none; distinct portion of filaments 2 mm long, ventrally without auricles, bearing a dense mass of white stellate trichomes with thin, ± straight arms to 1.5 mm long, trichomes nearest the distal end of the filament with arms predominantly pointing upward, those nearest the proximal end with arms predominantly pointing downward, dorsally glabrous, trichomes along the edges of the filament and at the sinus between filaments with arms to 2 mm long; anthers 3–6 mm long, the glabrous connectives slightly exceeding the linear, apically tapered, stellate-pubescent thecae; ovary densely golden yellow stellate-tomentose; style filiform, glabrous; ovules many. Drupe 5–7 × 4–6 mm, gray-green to dull orange, subglobose, apex slightly to strongly depressed, annular-sulcate around the remains of the style base; wall irregularly and coarsely rugose on herbarium specimens; fruiting calyx 3–5 × 4–6 mm, 0.4–0.8 times the length of the drupe proper.

Habitat, distribution, and phenology. Endemic to Brazil, occurring in the states of Bahia and Minas Gerais in campo rupestre, among rocks, rarely on sandy soil at 900–1850(–?2000) m; flowering November–May, fruiting March–June.

Styrax rotundatus was originally described as a variety of *S. martii* by Perkins (1907; as *S. martii* var. *rotundatus*), who distinguished it from the typical variety by its orbicular leaves with rounded or broad-acuminate apices. In my view, the two taxa differ consistently not only through the shape of the leaves (although more subtly than Perkins has suggested, as indicated in the descriptions herein), but also through numerous other characters that, taken together, have prompted me to recognize *S. martii* var. *rotundatus* at the specific level. The following characters serve to delimit *S. rotundatus* from *S. martii*: petiole (7–)10–19 mm long (vs. (2–)4–8 mm long), lamina 3.3–5.8(–6.6) cm long (vs. 5.9–11.7 cm long), tertiary and quaternary veins distinctly differentiated from each other and conspicuously raised (vs. not well differentiated from each other and moderately raised), lower pedicels 4–7 mm long (vs. 1–5 mm long or nearly absent), calyx 3.5–5 × 2.5–3.5 mm (vs. 5–8 × 4–5 mm), not striate (vs. striate) proximally, flowers 10–13 mm long (vs. 13–18 mm long), corolla tube 2–3 mm long (vs. 5–8 mm long), corolla lobes 0.5–1.5 mm wide (vs. 1.5–2.5 mm wide) and recurved to reflexed (vs. spreading), and drupes 5–7 × 4–6 mm (vs. 9–16 × 6–7 mm), gray-green to dull orange (vs. olive). In addition, *S. rotundatus* is always a shrub, whereas *S. martii* can be either a shrub or a tree; *S. rotundatus* occurs exclusively in campo rupestre vegetation, whereas *S. martii* can occur in campo rupestre but also occurs in forests, forest edges, and campo de altitude. The ranges of the two species are nearly non-overlapping, with *S. rotundatus* occurring from extreme northern Bahia to south-central Minas Gerais, and *S. martii* occurring from south-central Minas Gerais to northern Rio Grande do Sul. The two species are apparently sympatric

only in the Serra do Cipó in south-central Minas Gerais, Brazil.

Perkins (1907) listed two collections in the protologue of *Styrax martii* var. *rotundatus*: *Blanchet 234* and *Blanchet 3614*. I have lectotypified this taxon on the BR specimen of *Blanchet 3614* because it was annotated by Perkins, and because duplicates of *Blanchet 3614* are apparently more widely distributed than those of *Blanchet 234* (I have detected only two sheets of *Blanchet 234*, from P and W, whereas *Blanchet 3614* is housed at BR, C, F, and W).

Additional specimens examined. BRAZIL. **State not specified:** *Glocker 234* (BM (the specimen has the same appearance and is at the same stage of development as collections of *Blanchet 234*; the numeral "*234*" is written on a label separate from another containing the words "Glocker. Brazil. Ex Herb. Shuttleworth.," suggesting that this is actually a duplicate of *Blanchet 234* that has been incorrectly attributed to Glocker)); *C. F. P. von Martius s.n.* (M no. 47). **Bahia:** Jacobina, ca. 24 km from Jacobina to Morro do Chapéu, 28 Oct. 1995, *A. M. A. Amorim et al. 1801* (CAS[3]); Palmeiras, Morro do Pai Inácio, 25 Jan. 1998, *A. M. A. Amorim et al. 2137* (CAS); Utinga, Morro Felix João (Morro da Torre da Embratel), 14 km from Utinga, 16 Mar. 1985, *A. P. de Araújo & W. N. da Fonseca 404* (UB); Morro do Chapéu, 27 Aug. 1980, *H. P. Bautista 414* (K), 5 Apr. 1984, *H. P. Bautista & O. A. Salgado 941* (GUA, MBM, RB), *J. S. Blanchet 234* (P, W); Bomfim, Mount Taboa, 8 May 1918, *H. M. Curran 174* (GH, NY, US); 34 km E of Morro do Chapéu along Highway BA–052, Chapada da Diamantina, 3 Apr. 1976, *G. Davidse et al. 11865* (MO); Morro do Chapéu, 2 Mar. 1997, *F. França et al. 5924* (K, W); 11–13 km from Mucugê along the new Andaraí–Mucugê road, 8 Sep. 1981, *A. Furlan et al. 2120* (K); Rio de Contas, Pico das Almas, 14 Dec. 1984, *A. M. Giulietti et al. 6865* (K), 3 Feb. 1997, *M. L. Guedes et al. 4978* (K); Morro do Chapéu, Highway BA–052, in the direction of Utinga, 8 km from Morro da Torre da Embratel, 30 Aug. 1990, *J. L. Hage et al. 2328* (UB); W of Jacobina, Serra do Tombador, road to Lagoa Grande, 23 Dec. 1984, *R. M. Harley et al. 7471* (K); 20 km N of Lençois on road to Seabra, 14 Feb. 1994, *R. M. Harley et al. 14052* (K, W); Serra do Rio de Contas, Pico das Almas, ca. 25 km WNW of Rio de Contas, 24 Jan. 1974, *R. M. Harley 15476* (K, NY); ca. 6 km N of Barra da Estiva near Rio Preto, 29 Jan. 1974, *R. M. Harley 15651* (K, M, MO, NY, U, US); Serra da Jacobina, W of Estiva, ca. 12 km N of Senhor do Bonfim on Highway BA–130 to Juazeiro, 28 Feb. 1974, *R. M. Harley 16561* (K, M, MO, NY, RB, U, US); 19.5 km SE of the town of Morro do Chapéu on the BA–052 road to Mundo Novo, by the Rio Ferro Doido, 2 Mar. 1977, *R. M. Harley 19270* (AAU, K, MO, NY, U, US); ca. 1 km S of small town of Mato Grosso on the road to Vila do Rio de Contas, 24 Mar. 1977, *R. M. Harley 19913* (AAU, K, NY, U); 15–19 km W of Barra da Estiva on the road to Jussiape, 22 Mar. 1980, *R. M. Harley 20733* (AAU, K, NY, U); Morro do Chapéu summit, ca. 8 km SW of the town of Morro do Chapéu to the W of the road to Utinga, 30 May 1980, *R. M. Harley 22775* (AAU, K, NY, U, US); Piatã, 31 km from Piatã along road to Inúbia, 15 Feb. 1987, *R. M. Harley et al. 24283* (K); Pico das Almas, 19 Feb. 1987, *R. M. Harley et al. 24380* (K), 20 Feb. 1987, *R. M. Harley et al. 24464* (K); Rio de Contas, Mato Grosso, 7 Apr. 1992, *G. Hatschbach 56802* (CTES, F, G, K, MBM, MICH); summit of Morro do Chapéu, ca. 7 km S of the town of Morro do Chapéu, 16 Feb. 1971, *H. S. Irwin et al. 32264* (BM, F, LL, MO, NY, UC, US); Morro do Chapéu, ca. 10 km SW of Morro do Chapéu, 22 Feb. 1993, *J. G. Jardim et al. 59* (CAS, MBM); vicinity of Pico das Almas, ca. 20 km NW of the town of Rio das Contas, 25 Jan. 1981, *L. R. M. King & L. E. Bishop 8661* (MO, US); Palmeiras, Morro do Pai Inácio, BR–242, Km 232, 31 Oct. 1979, *S. Mori 12894* (K, MO, NY); Rio de Contas, Serra das Almas, 5 km NW of Rio de Contas, 21 Mar. 1980, *S. A. Mori & F. Benton 13538* (K, NY); Palmeiras, Morro do Pai Inácio, BR–242 W of Lençois at Km 232, 12 Jun. 1981, *S. A. Mori & B. M. Boom 14380* (NY); Morro do Chapéu, Telebahia Tower, ca. 6 km S of Morro do Chapéu, 16 Jun. 1981, *S. A. Mori & B. M. Boom 14473* (K, NY); Palmeiras, near Caeté Acú, Cachoeira da Fumaça (Glass), 11 Oct. 1987, *L. Queiroz et al. 1909* (MBM, NY); Morro do Chapéu Morrão, Telebahia station, 14 Mar. 1995, *L. Queiroz & N. S. Nascimento 4256* (K, NY), 5 May 1983, *C. T. Rizzini & A. M. Filho 1591* (RB); road from Piatã to Inúbia, ca. 25 km NW de Piatã, 24 Feb. 1994, *P. T. Sano et al. 14489* (K, W[2]); Morro do Chapéu, near Moreira, 31 Mar. 1986, *A. C. Sarmento & H. P. Bautista 842* (GUA, RB); vicinity of Carnaiba, Apr. 1994, *M. Sobral & W. Ganev 7589* (MBM), *Ule 7339* (K, photo of B at F). **Minas Gerais:** Serra do Cabral, ca. 15 km W of Joaquim Felicio, road to Varzea da Palma, 21 May 1990, *M. M. Arbo et al. 4556* (C, CTES, F, MICH); Serra do Cipó, Km 134, 15 Apr. 1935, *M. Barreto 1018* (RB[2], UB); Serra do Cipó, betw. Km 130 & Km 132, 5 Apr. 1951, *G. A. Black & M. Magalhães 51-11889* (IAN); Serra do Cipó, Km 131 & Km 135, 25 Apr. 1950, *A. P. Duarte 2700* (CAS); Joaquim Felício, Serra do Cabral, Armazém da Laje, 16 Mar. 1997, *G. Hatschbach et al. 66308* (CAS); Santana do Riacho, Serra do Cipó, road to Conceição do Mato Dentro, Km 111–112, 26 Jan. 1986, *G. Martinelli 11355* (RB); Botumirim, summit of Serra da Canastra, extreme N, 19 Nov. 1992, *R. Mello-Silva et al. 680* (K, MBM, NY); Jaboticatubas, Km 127 from Lagoa Santa to Conceição do Mato Dentro, 7 Jan. 1973, *J. Semir & A. M. Joly 3802* (NY).

Styrax trichostemon P. W. Fritsch, sp. nov. TYPE: Ecuador. Loja: Loja Canton, Loja–Zamora Highway, 2400–2600 m, 03°58′S, 79°04′W, 23 Dec. 1991, *D. Rubio, C. Aulestia & K. Edwards 2251* (holotype, CAS). Figures 4, 5.

Arbor sempervirens. *Lamina* 5.5–9 × 2.4–3.7 cm coriacea oblanceolata vel oblanceolato-elliptica, apice late obtusa vel rotunda, subtus pilis densis minutis albi-stellatis instructa, magis dispersis sed densis lanatis fulvo- vel ferrugineo-stellatis brachiis usque 0.9 mm longis intermixtis, venis tertiariis et quaternariis prominentibus, paginis venarum tertiariarum et quaternariarum manifestis subter indumentum. *Inflorescentiae* 2–5 cm longae. *Flos* 7 mm longus; *calyx* 2–3 × 2.5–4 mm dense ferrugineo-stellato-tomentosus, ad medium brachiis pilorum usque 0.5 mm longis; *stamina* 10 (usque 12); *filamenta* ventraliter non auriculata ad apicem albi-stellato-tomentosa aliter glabra, brachiis pilorum usque 0.3 mm longis, dorsaliter glabra vel dense stellato-tomentosa; *anthera* loculis glabris linearis ad apicem non contractis connectivum su-

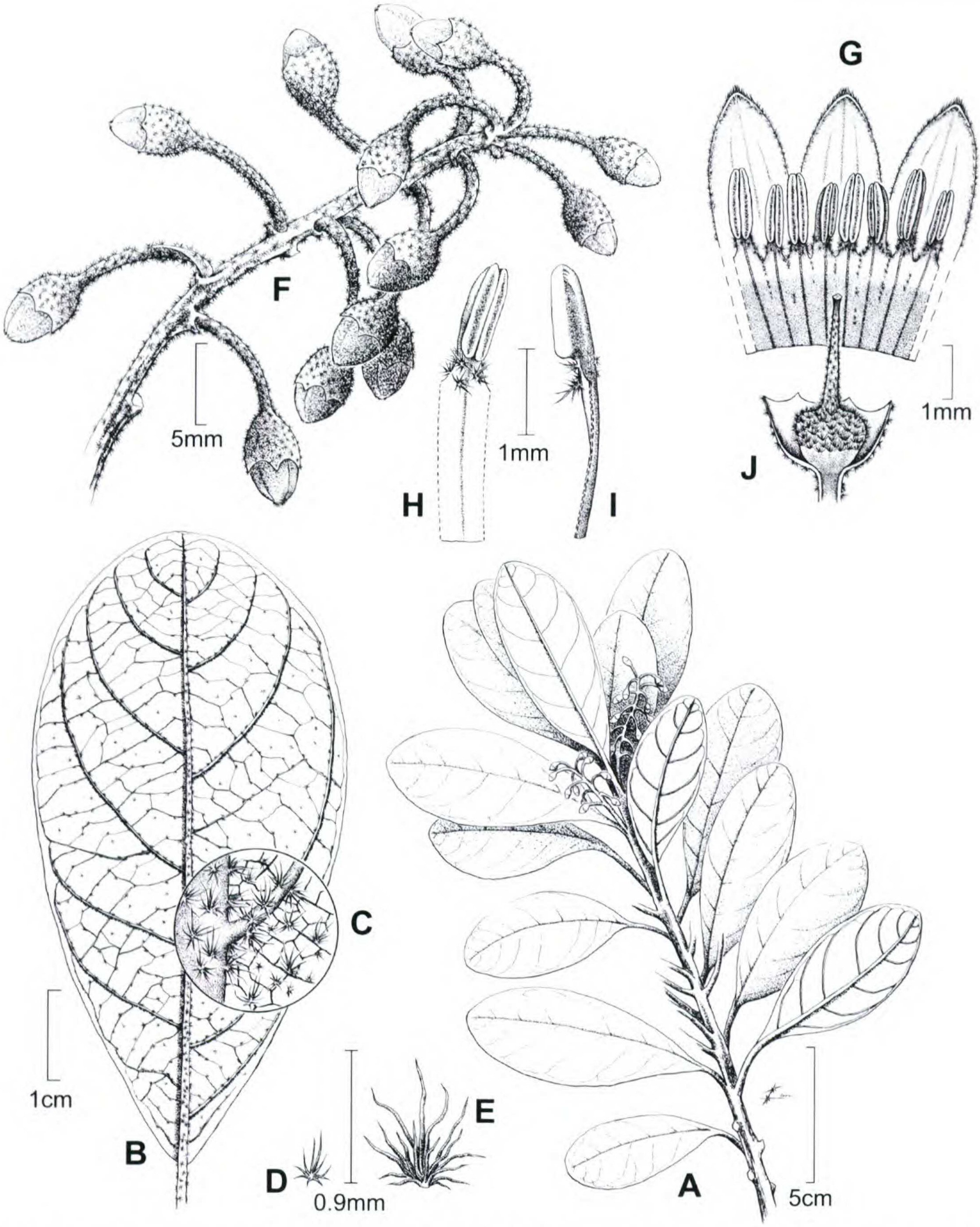

Figure 4. *Styrax trichostemon* P. W. Fritsch. —A. Branch with inflorescences in bud. —B. Leaf, abaxial view. —C. Leaf surface, abaxial view. —D. Stellate trichome from the base tomentum of the abaxial side of the leaf. —E. Larger woolly stellate trichome from the abaxial side of the leaf. —F. Inflorescence in bud. —G. Part of corolla + androecium, opened. —H. Stamen, ventral view. —I. Stamen, lateral view. —J. Calyx, long-section, and gynoecium. A–F based on the holotype, *Rubio et al. 2251* (CAS); G–J based on *Homeier 1026* (CAS).

perantibus; *stylus* subulatus, stellato-lanatus; *placentatio* basalis; *ovula* 3, 1 in quoque carpello.

Evergreen tree 4 m tall; young twigs robust, densely ferrugineous stellate-hirsute. Petiole 9–15 mm long; lamina 5.5–9 × 2.4–3.7 cm, 2.2–3.0 times as long as wide, coriaceous, oblanceolate to oblance-elliptic, secondary veins 6 or 7 on each side of midvein; apex broadly obtuse to rounded;

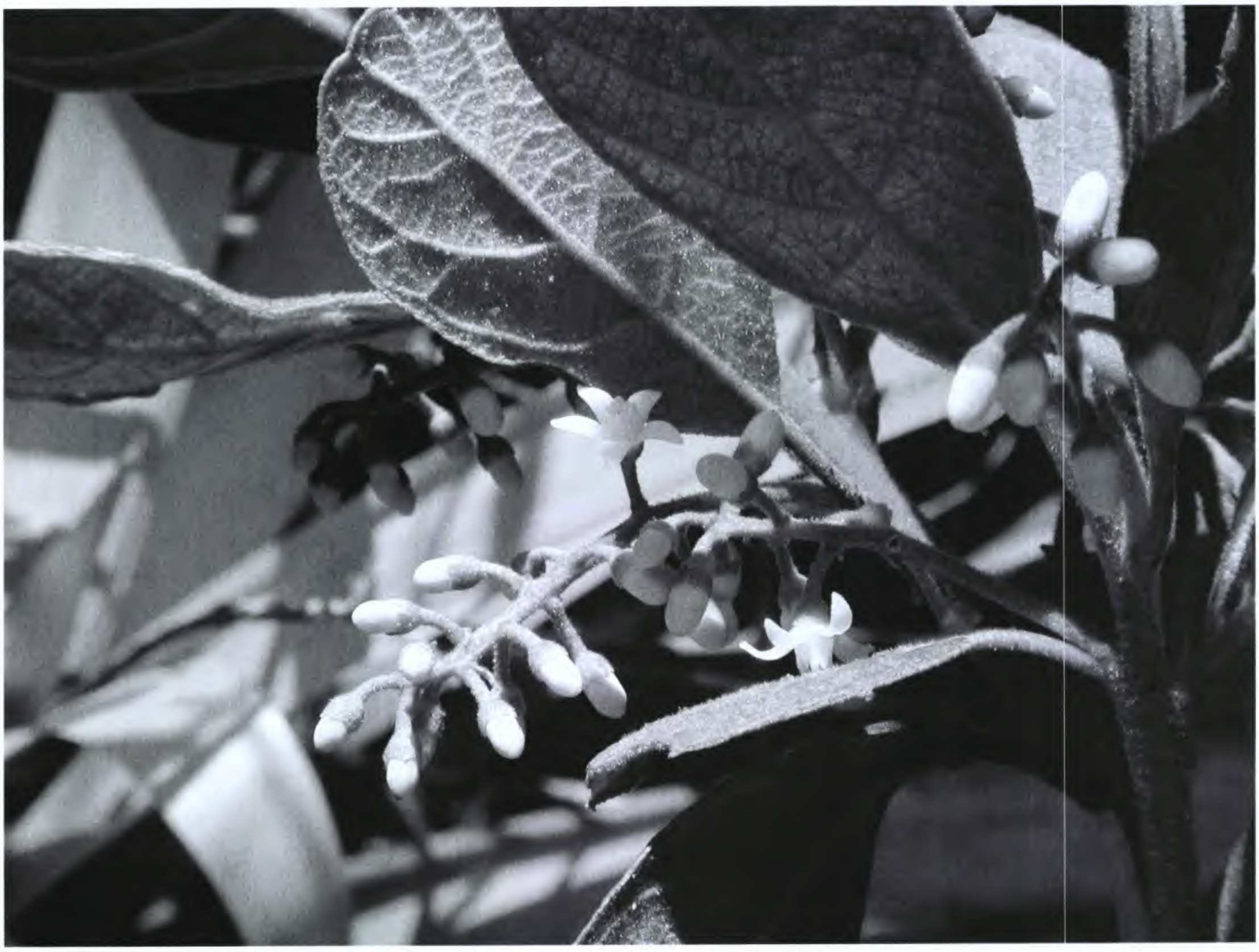

Figure 5. *Styrax trichostemon* in situ, Zamora-Chinchipe Province, Ecuador. Photograph courtesy of J. Homeier.

base cuneate; adaxially glabrous except on midvein, major veins slightly impressed; abaxially with a dense base tomentum of minute white stellate trichomes, and more scattered but dense tawny to ferrugineous woolly stellate trichomes with arms to 0.9 mm long, the prominently raised, tawny to crimson surface of the tertiary and quaternary veins visible beneath the pubescence; margin entire. Inflorescences axillary or terminal, racemose, 1 per node, 2–5 cm long, 7- to 13-flowered, densely ferrugineous-stellate-hirsute; lower pedicels 5–8 mm long. Flowers 7 mm long; calyx 2–3 × 2.5–4 mm, cupuliform, densely ferrugineous-stellate-hirsute, trichomes at mid-calyx with arms to 0.5 mm long, margin concave between the minute teeth, inner margin glandular; corolla white; lobes 5; stamens 10(to 12); free portion of the stamen tube 0–1 mm long; distinct portion of filaments 0.5–0.8 mm long, planar, ventrally often white stellate-pubescent distally, otherwise generally glabrous, arms of the trichomes to 0.3 mm long, dorsally glabrous to densely stellate-tomentose; anthers 1.1–1.2 mm long, glabrous, the linear, apically non-tapered thecae exceeding the connective. Ovary densely ferrugineous stellate-tomentose; style subulate, stellate-pubescent; placentation basal, ovules 3, 1 per carpel. Fruit unknown.

Habitat, distribution, and phenology. Known only from southern Ecuador in low montane humid forest near the cloud forest zone at 2400–2600 m, flowering October.

This species is clearly recognizable as a distinctive new member of the "gynodioecious" clade (see Fritsch, 1999, 2001), an endemic South American group within *Styrax* series *Valvatae* comprising all species of *Styrax* with five anthers (= *Pamphilia*; Andes and Minas Gerais, Brazil) plus *S. foveolaria* Perkins (Ecuador and Peru) and *S. nui* B. Wallnöfer (Bolivia and Peru). Because only hermaphroditic specimens have been seen by me, it is not known whether any individuals of this species are morphologically gynodioecious. Nonetheless, other features diagnostically place *S. trichostemon* in the gynodioecious clade: small flowers (7 mm long), planar stamen filaments, and a single ovule per carpel.

Results of a phylogenetic analysis based on morphological characters placed *Styrax obtusifolius* Grisebach (Cuba and Hispañiola) as sister to the

remaining members of the gynodioecious clade (Fritsch, 1999). The robust trichomes on the stamen filaments of this species resulted in a phylogenetically nested position of the gynodioecious clade within *S.* series *Valvatae* (the primitive type of trichome on the stamen filaments in the genus is small and delicate, and because the remaining members of the gynodioecious clade have glabrous filaments, they were scored as such in the analysis). In contrast, analyses based on DNA sequence data place the gynodioecious clade as the first-splitting lineage within *S.* series *Valvatae* and *S. obtusifolius* in a highly nested, well supported clade of the series (Fritsch, 2001, 2003). From these analyses it is clear that *S. obtusifolius* and the group comprising the rest of the gynodioecious species of *Styrax* have evolved their small flowers and gynodioecious morphology independently. The exclusion of *S. obtusifolius*, however, has until now left the main gynodioecious group without a clearly identifiable morphological character that corroborates its position in the molecular analyses. *Styrax trichostemon* seems to supply that character in the form of stamen filaments that are pubescent ventrally (for which the species is named) with diminutive trichomes up to 0.3 mm long.

Paratype. ECUADOR. **Zamora-Chinchipe:** Estación Cientifica San Francisco, Loja–Zamora road, ca. 35 km from Loja, 21 Oct. 2001, *J. Homeier 1026* (BIEL not seen, CAS, ECSF not seen, LOJA not seen, MO not seen, QCNE not seen).

Styrax yutajensis (Maguire) P. W. Fritsch, stat. nov. Basionym: *Styrax guanayanus* var. *yutajensis* Maguire (as *S.* "*guanayana* var. *yutajensis*"), Mem. New York Bot. Gard. 29: 207. 1978. TYPE: Venezuela. Amazonas: Serrania Yutajé, Cerro Yutajé, Río Manapiare, NW ridge above Camp Yutajé, 23 Feb. 1953 (fl), *B. Maguire & C. K. Maguire 35394* (holotype, NY; isotypes, IAN, US).

Habitat, distribution, and phenology. Known only from Cerro Yutajé and vicinity, Amazonas state, Venezuela, in dwarf forests on sandstone ridges, rocky areas, and borders of streams at 1300–2100 m; flowering February.

This species was originally described as a variety of *Styrax guanayanus* (as *S. guanayanus* var. *yutajensis* Maguire). It is similar in many respects to *S. guanayanus*: both species have their longer petioles 4–12 mm long, subcoriaceous leaves, abaxially with lateral veins stellate-tomentose and the surface of the veins obscured, lower pedicels 6–10 mm long, inflorescences 3–6 cm long, and a densely and uniformly ferrugineous stellate-tomentose calyx. There are, however, significant differences between the two taxa: *S. yutajensis* has leaf laminae 5.9–7.1 × 2.8–4.1 cm (vs. 8.1–10.0 × 4.8–6.1 cm in *S. guanayanus*), inflorescence branches 0.7–0.9 mm wide (vs. 1.1–1.5 mm wide), reflexed to revolute (vs. spreading) corolla lobes, anthers 6–7 mm long (vs. 3.5–4 mm long), and stamen filaments with stiff, more or less straight (vs. delicate, interwoven) trichomes. The magnitude of these differences is no greater than the difference between other species that I have recognized in the *Flora of the Venezuelan Guayana*. On this basis, I have recognized *S. yutajensis* as a species distinct from *S. guanayanus*.

Additional specimens examined. VENEZUELA. **Amazonas:** Atures, valley of Río Coro-Coro, W of Serrania de Yutajé, 7 Mar. 1987, *B. Holst & R. L. Liesner 3390* (MO, NY); Serrania Yutajé, Río Manapiare, left-hand fork Caño Yutajé, 15 Feb. 1953, *B. Maguire & C. K. Maguire 35241A* [= *34241A*] (MO, NY); Serrania Yutajé, Río Manapiare, Cerro Yutajé, S rim, 15 Feb. 1953, *B. Maguire & C. K. Maguire 35260* (INPA, MO); cliffs to summit, 17–19 Feb. 1953, *B. Maguire & C. K. Maguire 35291* (NY).

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